

for CMI were 1.8/2.0/2.1% for OR, 7.1/9.5/9.8% for repeat PTA/S, and 6.6/7.8/8.4% for readmission without repair. During the index admission, mortality after OR was higher than PTA/S for both AMI (35% vs 19%; $P < .001$) and CMI (10% vs 2%; $P < .001$). Three deaths occurred during a revisit: two after OR, one after PTA/S; all three for CMI. When revisits were excluded, the rise in PTA/S procedures persisted for CMI (Fig).

Conclusions: Revisits after mesenteric revascularization are most frequent after PTA/S for CMI. After excluding reinterventions, numbers of PTA/S are still increasing, so the rise in PTA/S is attributable mostly to treatment of new patients. PTA/S is increasingly being performed in the outpatient setting.

Evolving Treatment Patterns for Type B Aortic Dissection: Sicker Patients, Better Results

Douglas W. Jones,¹ Philip P. Goodney,² Brian W. Nolan,² Benjamin S. Brooke,² Richard J. Powell,² David H. Stone.² ¹New York Presbyterian Hospital/Weill-Cornell Medical Center, New York, NY; ²Dartmouth-Hitchcock Medical Center, Lebanon, NH

Objectives: The application of thoracic endovascular aortic repair (TEVAR) has changed treatment paradigms for thoracic aortic disease. We sought to better define specific treatment patterns and outcomes for Type B aortic dissection treated with TEVAR or open surgical repair (OSR).

Methods: Medicare patients undergoing thoracic aortic dissection repair (2000-2010) were identified using a validated International Classification of Diseases-Ninth Revision diagnostic and procedural code-based algorithm. Trends in utilization were analyzed by procedure type (OSR vs TEVAR), and secular patterns in patient characteristics and outcomes were examined.

Results: Total thoracic aortic dissection repairs increased by 21% between 2000 and 2010 (2.5 to 3 per 100,000 Medicare patients; $P < .001$; Fig). A concomitant increase in TEVAR was seen during the same interval (0.03 to 0.8 per 100,000; $P < .001$). By 2010, TEVAR comprised 27% of all repairs. TEVAR patients had higher rates of comorbid congestive heart failure ($P < .001$), chronic obstructive pulmonary disease ($P < .001$), diabetes ($P < .001$), and chronic renal failure ($P < .001$) when compared with OSR. For all repairs, patient comorbidity burden increased over time (proportion of patients with Charlson comorbidity score greater than 2: 13% in 2000, 18% in 2010; $P < .001$). During this same interval, in-hospital mortality rates declined from 47% to 23% ($P < .001$). While in-hospital mortality rates and 3-year survival were similar between patients selected for TEVAR and OSR, women had slightly lower 3-year survival following TEVAR (60% women vs 63% men; $P = .05$).

Conclusions: Surgical treatment of type B aortic dissection has increased over time, reflecting an increase in the utilization of TEVAR, and is currently performed in sicker patients with better outcomes. While perioperative mortality has improved for both OSR and TEVAR, slightly worse survival for women with TEVAR requires further investigation.

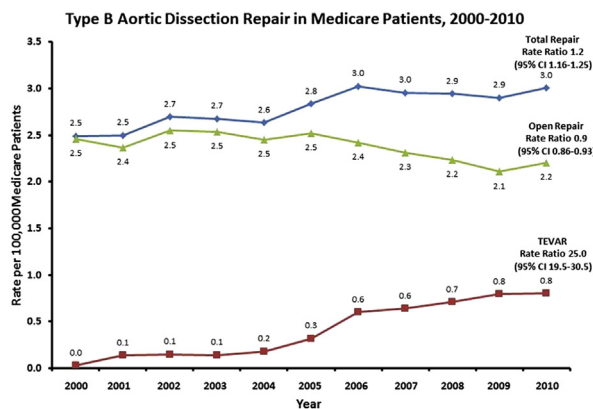


Fig.

Late Aortic Remodeling Persists in the Stented Segment After Endovascular Repair of Acute Complicated Type B Aortic Dissection

Mark F. Conrad, Christopher J. Kwolek, Shankha Mukhopadhyay, Virendra I. Patel, Richard P. Cambria. Massachusetts General Hospital, Boston, Mass

Objectives: Thoracic endovascular aortic repair (TEVAR) for acute complicated type B dissection (cTBD) promotes early positive aortic remodeling. However, little is known about the long-term effect of TEVAR on the dissected aorta, which is the goal of this study.

Methods: Between August 2005 and August 2009, 31 patients with cTBD were treated with TEVAR and had long-term (>1 year) follow-up imaging. CTA obtained at 1 month (1M), 1 year (1Y), and long-term (LT; average 42 months) were compared with baseline (BL) scans. The largest diameters of the stented thoracic aorta (SMAX), stented true lumen (STL), and stented false lumen (SFL) were recorded at each time point, as were the values in the unstented distal thoracic aorta and the abdominal aorta. Changes over time were evaluated using a mixed effect analysis of variance model of repeated measures.

Results: Demographics: age 56 years; 74% male. Indications for TEVAR: 61% malperfusion, 32% refractory hypertension, 45% impending rupture, 32% persistent pain; 58% had >one indication. The average length of aorta covered was 19 cm. Aortic remodeling along the stented segment is summarized in Fig 1. The SMAX remained stable ($P =$ not significant), STL increased ($P < .001$), and SFL decreased ($P < .001$) over time; 84% had complete false lumen (FL) obliteration. For the uncovered segment, the maximum diameter increased ($P = .014$), as did TL ($P < .001$) and the visceral segment ($P < .001$). The FL was stable ($P =$ not significant). The

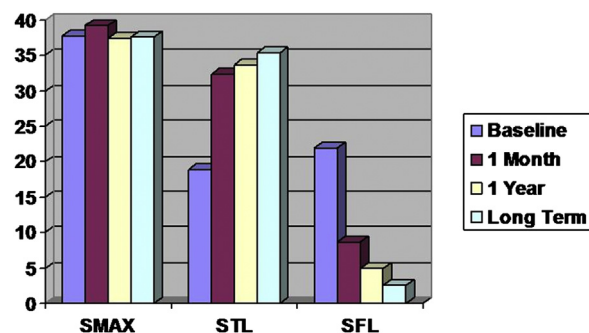


Fig 1. Remodeling of the stented aortic segment over time. SFL, Stented false lumen; SMAX, maximum stented diameter; STL, stented true lumen.

average growth of the visceral segment was 31% in patients with a patent FL vs 3% in those without ($P = .004$). One patient had aneurysmal degeneration of the false lumen and required an additional endograft at 2 years.

Conclusions: TEVAR of cTBD promotes long-term remodeling across the stented segment with FL obliteration in 84% of patients. However, FL obliteration beyond the stented segment appears necessary to prevent late aneurysmal degeneration.

Results of Transcaval Embolization for Sac Expansion from Type II Endoleaks After EVAR

Kristina Giles,¹ Mark F. Fillinger,¹ Randall R. De Martino,¹ Andrew W. Hoel,² Richard J. Powell,¹ Daniel B. Walsh.¹ ¹Dartmouth Hitchcock Medical Center, Lebanon, NH; ²Northwestern University Feinberg School of Medicine, Chicago, Ill

Objectives: The increase of endovascular aortic repair (EVAR) has been accompanied by a consequent increase in Type II endoleaks. This study reports our experience with transcaval coil embolization (TCCE), a novel strategy to treat this complication.

Methods: We reviewed 24 consecutive patients undergoing TCCE from 2010 to 2013. Demographics, operative details, and outcomes were assessed.

Results: Since 2006, over 450 EVARs have been performed at our institution with 24 TCCE performed in 22 patients for sac expansion from Type II endoleaks. Patients were male (87%) former or current smokers (87%) with an average age of 78 (± 7.2) years. TCCE was performed a mean of 4.2 (± 4) years after initial EVAR (21% for rupture). Endoleaks resulted in a mean sac growth of 1.2 (± 0.9) cm diameter and 38% \pm 35% volume. Forty-two percent had failed prior procedures (five translumbar, two transcaval, two aortic cuff, two internal iliac branch embolization, and one fenestrated branched endograft). Two patients had ultimate sac access between the endograft iliac limb and arterial wall after transcaval puncture failed with an overall 87% technical success (79% for

transcaval technical success). Mean fluoroscopy time was 28 (± 14) minutes with 29 (± 22) mL contrast used and mean 9.7 coils per case. Additional adjuncts included thrombin injection (21%), intravascular ultrasound (13%), sac pressure measurements (29%), and on table integrated computed tomography (17%). Median length of stay was 1 day (range, 0-5 days). Reintervention was required in four cases (two repeat TCCE, one open sac plication, one branched fenestrated endograft for proximal degeneration). On last follow-up, 77% experienced no further leak and stable sac diameters, 9% had continued endoleak with sac expansion, and 14% are awaiting follow-up imaging. There have been no ruptures during follow-up.

Conclusions: TCCE is a safe technique which provides another option for treatment of aneurysm enlargement due to Type II endoleaks.

Outcomes Reported by the Vascular Quality Initiative and the National Surgical Quality Improvement Program Are not Comparable

Francesco Aiello, Bing Shue, Nisha Kini, William Robinson III, Louis Messina, Andres Schanzer. University of Massachusetts Medical School, Worcester, Mass

Objectives: The Vascular Quality Initiative (VQI) and the National Surgical Quality Improvement Program (NSQIP) are databases of vascular surgery outcomes. VQI uses self-reporting to capture all vascular procedures during the inpatient period. NSQIP employs nurse abstractors to capture a sample of procedures and covers 30-day events. We hypothesize that patients undergoing lower extremity bypass (LEB) exhibit high concordance for preoperative variables and low concordance for postoperative variable.

Methods: All LEB patients at University of Massachusetts in both VQI and NSQIP databases were reviewed (2008-2012). Concordance between shared variables was analyzed by Kappa Coefficient. Postoperative variables were compared during equivalent inpatient stay. Events between discharge and 30 days were tabulated.

Results: For 241 patients in both VQI and NSQIP, concordance of preoperative variables was high, except for congestive heart failure ($\kappa = 0.14$). Concordance for inpatient postoperative variables was high for mortality ($\kappa = 1.0$) and myocardial infarction ($\kappa = 0.75$) but low for wound infection ($\kappa = -0.01$), pneumonia ($\kappa = -0.004$), change in renal function ($\kappa = -0.007$), and return to operating room ($\kappa = 0.45$). A majority of postoperative events (67%) occurred between discharge and 30 days, with a significantly higher incidence of wound infections in the outpatient setting (9.1% vs 90.9%; $P = .0001$).

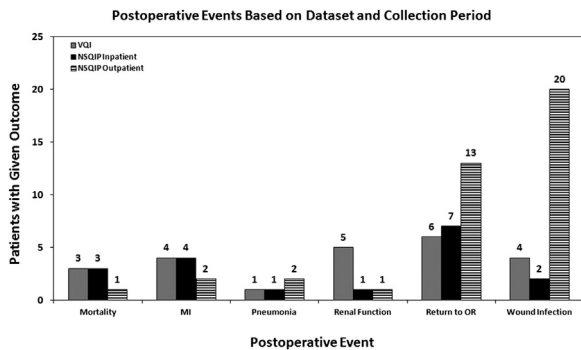


Fig.

Conclusions: VQI and NSQIP demonstrate high concordance for most preoperative variables but low concordance for most postoperative variables, even at identical collection periods. This discordance is a result of differences in data collection methods and variable definitions. Outcomes between the two databases should not be compared between institutions.

The Correlation Between the Psoas Muscle/Vertebral Body Ratio and Severity of Peripheral Artery Disease

Sarah Swanson, Robert Patterson. Brown University, Providence, RI

Objectives: The measurement of psoas muscle area is a new and potentially useful tool for assessing the frailty of patients in the context of various disease states ranging from cancer to abdominal aortic aneurysms (AAA). Considering the similarity of risk factors for frailty and atherosclerosis, we sought to investigate whether patients with peripheral artery disease (PAD) have smaller psoas muscle areas in general. Further, we investigated whether PAD symptom severity correlates with psoas muscle size.

Methods: A chart review was conducted on 146 patients with PAD. Of these patients, 85 (58%) had a computed tomography (CT) scan within the last 5 years and were included in the study. Fifty-five patients with AAA and no occlusive disease were included as controls. Cross-sectional areas of the psoas muscles and L4 vertebral body were collected at the mid-L4 level for all patients. Total psoas muscle area (TPA) was calculated and divided by L4 area to correct for body habitus. Ankle-brachial indices, claudication, rest pain, ulceration, tissue loss, and Rutherford classification were collected as measures of PAD symptom severity. Logistic and multiple regressions were run to assess the difference in TPA/L4 ratio between patients with PAD and AAA, and within PAD patients, respectively.

Results: Lower TPA/L4 ratio controlled for gender and age is a significant predictor of having PAD vs AAA ($P < .05$). However, among patients with PAD, TPA/L4 ratio does not correlate with severity of symptoms.

Conclusions: Using psoas muscle area as a measure of frailty, patients with PAD may be generally frail as a group. However, the severity of each patient's PAD symptoms does not appear to correlate with the patient's degree of frailty. Prospective studies with larger populations are needed to clarify whether the psoas muscle area has any prognostic value in PAD.

The Cost-effectiveness of Managing Non-healing Foot Wounds in Patients with Critical Limb Ischemia and End-Stage Renal Disease

Neal R. Barshes,¹ Panos Koungias,¹ C. Keith Ozaki,² Philip P. Goodney,³ Michael Belkin². ¹Baylor College of Medicine, Houston, Tex; ²Brigham and Women's Hospital, Boston, Mass; ³Dartmouth-Hitchcock Medical Center, Lebanon, NH

Objectives: Limb revascularization in patients with end-stage renal disease (ESRD) has been criticized because of the low rates of wound healing, limb preservation, and survival that characterize this patient population. We undertook a formal cost-effectiveness analysis to evaluate the role of revascularization in the ESRD population.

Methods: A probabilistic Markov model was used to simulate the clinical events and long-term outcomes following six different strategies for managing non-healing foot wounds in patients with critical limb ischemia and ESRD. All scenarios considered all-cause mortality and major amputation for failure of limb salvage. The estimates of parameters used in the model, including costs, functional outcomes, and clinical events, were derived from primary data or published literature. One-year wound healing probabilities of 20% and 50% with and without revascularization, respectively, were assumed; these were varied from 10% to 90% in deterministic sensitivity analyses. Costs are reported in 2011 USD.

Table. Projected long-term costs and health benefits of the strategies examined

Management strategy	Limb salvage at 5 years, %	Median 10-year total costs, 2011 USD	Median years of limb preservation	Median years of ambulatory ability	Cost per year of ambulation, 2011 USD
Local wound care	14.1	117,148	0.95	1.71	Reference
Purely endovascular intervention	57.7	125,036	1.81	1.87	50,943
Endovascular intervention; surgical bypass for failure	56.7	127,465	1.75	1.82	Dominated
Surgical bypass; endovascular reintervention if needed	55.1	138,126	1.63	1.73	Dominated
Surgical bypass; surgical reintervention as needed	55.1	139,848	1.63	1.73	Dominated
Primary major amputation	0	151,041	0	1.20	Dominated