the number of TAAA cases performed nationally and a decline in the rate of ruptured TAAA ($P < .001$).

Conclusions: A decline in the number of TAAA cases was observed over the study period; however, the costs associated with treatment increased significantly. The overall in-hospital mortality is decreasing for TAAAs. A sharp rise in the use of endovascular techniques for the management of TAAA was seen over the study period. The overall mortality of TEVAR was significantly lower compared with OAR.

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Upper Extremity Steal Syndrome Is Associated With Atherosclerotic Burden and Access Configuration
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Objectives: Clinically significant steal syndrome (SS) occurs in a subset of dialysis patients with arteriovenous (AV) access. Factors associated with SS are poorly understood. Severe symptoms require access revision or sacrifice, potentially jeopardizing access options. Our objective was to review our dialysis access experience to identify factors associated with SS.

Methods: We reviewed all adult patients undergoing their first upper extremity access, AV fistula (AVF) or AV graft (AVG), between January 2008 and July 2011 at a single center. Medical, demographic, and access characteristics were collected from our electronic medical record and a local dialysis center’s database. Patients who required correction of SS were compared with the larger access cohort. Statistical analyses included the Fisher exact test and $\chi^2$ for noncontinuous variables and the unpaired $t$-test for continuous variables.

Results: Of 303 patients, 15 required correction for SS (eight of 232 AVF and seven of 71 AVG). Eight were ligated; two were initially banded, then ligated; and five underwent distal revascularization with interval ligation. Coronary artery disease was more prevalent in SS patients (66.7% vs 25%; $P = .001$); the same was found with peripheral arterial disease (40% vs 13.8%; $P = .02$). Further, more patients with SS were on Plavix for cardiovascular reasons compared with OAR. SS only developed with AVF/AVG using brachial artery inflow; no cases of SS arose from radial/ulnar inflow ($P = .03$). All AVGs with SS had a straight configuration; no looped AVG developed steal ($P = .02$). Other patient characteristics such as age, sex, race, hypertension, diabetes mellitus, congestive heart failure, cerebrovascular accident, cause of end-stage renal disease, and other medication history were not different between groups.

Conclusions: Clinically significant SS is associated with disease in coronary and peripheral arterial beds. In addition, the use of brachial artery inflow and straight AVG configuration are associated with SS. Patients with these characteristics need additional vigilance for steal-associated symptoms.

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Descending Thoracic Aortic Surgery Is Common After Type A Aortic Dissection Repair: Perspectives From Thomson Reuters MarketScan Database
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Objectives: The current standard of surgical repair for type A aortic dissection (TAAD) does not guarantee freedom from subsequent aortic operations; therefore, consideration of simultaneous treatment beyond the ascending aorta is warranted. This study was conducted to report the national rates and the timing of proximal and distal reoperations after operative repair of TAAD based on available patient-level admissions data.

Methods: Admissions data for patients with TAAD were identified and obtained from Thomson Reuters MarketScan Database using International Classification of Diseases, 9th Revision, Clinical Modification codes. From 2003 to 2011, patients aged $>18$ years with thoracic or thoracoabdominal diagnoses who underwent surgical repair or aortic resection, or both, were identified. From this population, 2041 patients with $\geq 12$ months of follow-up data who were discharged alive after index admissions for TAAD were described. Primary outcome measures were rates of reoperation for any aortic location. Patient demographics, comorbidities at admission, and interval to reoperation were also obtained from the database.

Results: A total of 3463 patients with TAAD who underwent repair were identified. The mortality rate was 7.8% for the initial repair. Of 3018 patients who were available for follow-up, 2041 patients had $>1$ year of follow-up. The mean age was $58.0 \pm 13.2$ years, and 70% were male. Eighty-seven patients (4.26%) required 95 reoperations (33.1% of reoperations) for the ascending aorta, and 162 (7.94%) patients required 192 (66.9%) reoperations for the descending thoracic aorta. The mean intervals were $436.7 \pm 593.9$ days for ascending aortic surgery and $324.0 \pm 431.2$ days for the descending thoracic aorta after the initial admission for TAAD surgical procedures.

Conclusions: TAAD is a highly morbid and mortal diagnosis. The initial surgery is high-risk, but our data demonstrate that future surgery is common. In fact, the majority of the repeat surgical procedures are for descending thoracic aortic complications. We believe that more aggressive aortic stabilization may be warranted.

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Endovascular Versus Open Repair of Thoracoabdominal Aneurysms: Long-Term Results
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Fig 1. Observed survival.

Fig 2. Survival for propensity-matched cohorts.
Objectives: Advancements in endovascular therapy have made the minimally invasive repair of juxtarenal and thoracoabdominal aneurysms a possibility. Comparison of long-term results of endovascular repair (ER) vs open repair (OR) of thoracoabdominal aneurysms is required to determine the most appropriate treatment options.

Methods: The Inpatient Medicare database from 2004 to 2011 was investigated using International Classification of Diseases, 9th Revision procedure codes for repair of abdominal, thoracic, and thoracoabdominal aortic aneurysms with associated concomitant renal or mesenteric revascularization for OR and ER. Fenestrated endovascular grafting codes were used once available in 2011. Demographics, preoperative comorbidities, mortalities, and postoperative complications were analyzed using the t-test for continuous and the x^2 test for categoric variables. Kaplan-Meier curves and multivariable Cox models were used to estimate effect of treatment on survival.

Results: A total of 4749 patients met inclusion criterion: 3757 OR and 992 ER groups. The 30-day mortality was significantly less after ER (mean mortality: 12.3 for OR vs 8.2 for ER; P < .001). Patients after OR had higher rates of renal failure (15.3% vs 9.4%) and cardiac (4.5% vs 2.3%) and pulmonary insufficiency (11.5% vs 8.6%). ER patients had higher rates of peripheral vascular (1.8% vs 1%) and device malfunction (1.1% vs 1.1%) and survival up to almost 2 years was better after ER, survival curves converged after 21 months of follow-up (Fig 1). Propensity-matched patients confirmed a 2-year advantage for ER over OR (Fig 2).

Conclusions: Like ER of abdominal aortic aneurysm, ER of thoracoabdominal and juxtarenal aneurysms has a distinct 2-year advantage but then becomes not statistically different at up to 7 years of follow-up. This may reflect the prevalence of other comorbidities resulting in late mortality in both groups. This preliminary study based on national results does support more in-depth long-term prospective analysis, especially as techniques for thoracoabdominal repair become more standardized and widespread.

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The Impact of Intravascular Ultrasound Utilization on Infragenual Intervention Outcomes
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Objectives: Angiography alone may underestimate lower extremity (LE) arterial disease burden. Intravascular ultrasound (IVUS) as an adjunctive tool has been theorized to improve patency and lessen secondary procedures. We identified IVUS use for LE endovascular procedures to assess outcomes.

Methods: Medicare beneficiaries undergoing infragenual endovascular procedures with IVUS were identified from 2005 to 2009 MedPAR and Carrier files using Current Procedural Terminology codes. Patients were matched 1:2 to patients not receiving IVUS by a propensity score based on age, gender, race, and comorbidities. The x^2 test, Wilcoxon rank sum test, Kaplan-Meier survival analysis, and Cox proportional hazards modeling were used.

Results: A total of 1362 patients undergoing LE intervention with IVUS were matched to 2724 patients not receiving IVUS. Mean age was 75 years, 52.6% were men, and 79.1% were white. The most common indications were claudication (29.6%) and ulceration/gangrene (25.9%). No differences in complications for IVUS vs non-IVUS, respectively, were identified: cardiac (2.3% vs 2.4%; P = .9), renal (6.8% vs 7.9%; P = .3), bleeding (8.3% vs 8.2%; P = .9), and embolism or thrombus (6.4% vs 7.4%; P = .8). Total charges ($73,516 vs $69,221; P = .046) and supply costs ($23,644 vs $15,322; P < .001) were significantly greater with IVUS. The 30-day above-knee (1.8% vs 1.4%; P = .9) and below-knee (3.2% vs 3.1%; P = 9) amputation rates did not differ between IVUS and non-IVUS, respectively (Fig 1). The 30-day rates of repeat angioplasty (9.6% vs 8.7%; P = 3) and embolotomy (1.3% vs 1.6%; P = 4) did not differ, whereas rates of stenting (7.5% vs 5.5%; P = 0.1) and thrombolysis (3.4% vs 1.3%; P < .001) were higher for IVUS. Modeling demonstrated that IVUS use was not associated with reduced amputation rates (hazard ratio [HR], 1.03; 95% confidence interval [CI], 0.76-1.4), whereas black race (HR, 1.58; 95% CI, 1.12-2.3), renal failure (HR, 1.82; 95% CI, 1.30-2.56), and disease severity were associated with amputation.

Conclusions: As an adjunctive tool during infragenual interventions, IVUS was not associated with improved 30-day major amputation but was more frequently associated with thrombolysis and stenting. Total charges and supply costs were significantly greater with IVUS, suggesting that IVUS does not improve outcomes while increasing hospital utilization.

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Aortic Arch Morphology and Aortic Length in Patients with Dissection, Traumatic, and Aneurysm Disease
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Objectives: This study assessed aortic arch morphology and aortic length in patients with dissection, traumatic injury, and aneurysm undergoing thoracic endovascular aortic repair and identified characteristics specific to the different pathologies.

Methods: We retrospectively evaluated the aortic arch morphology and aortic length of 210 patients (49 dissection, 99 traumatic injury, and 62 aneurysm) enrolled in three trials who received the conformable Gore TAG thoracic endoprosthesis. The mean age was 43 ± 19.6 years for trauma patients, 57 ± 11.7 years for dissection patients, and 72 ± 9.6 years for aneurysm patients. A standardized protocol was used to measure aortic arch diameter, length, and take-off angle, and clock-face orientation of branch vessels. Differences in arch anatomy and length were assessed using analysis of variance and independent t-tests.

Results: Of the 210 arches evaluated, 22% had arch vessel common trunk configurations. The Table contains highlights of comprehensive measurements. The aortic diameter and the distance from the left main coronary to the left common carotid were greater in dissection patients than in trauma or aneurysm patients (P < .05). The distances from the branch vessels to the celiac artery were greater in dissection and aneurysm patients than in trauma patients (P < .05). Aortic diameter was greater in aneurysm patients compared with trauma patients (P < .05). The take-off angle of the innominate, left common carotid and left subclavian were greater, between 19% and 36%, in trauma patients than in dissection and aneurysm patients (P < .05). Clock-face orientation of the arch vessels varied between pathologies.

Conclusions: Arch anatomy has significant morphologic differences when comparing aortic arch morphology. Describing these differences in a large sample of patients is beneficial for device designs and patient selection that plays a critical role in outcomes.

Fig 1. 30-day freedom from major amputations after infragenual endovascular interventions with and without IVUS.