RR28.
In-Hospital Mortality of Open Thoracoabdominal Aortic Aneurysm Repair in the United States Prior to Widespread Use of Hybrid and Endovascular Branched Techniques

Gustavo S. Oderich1, Eric B. Rosero2, Joseph J. Ricotta, II1, Peter Glorieux1, Thomas C. Bower2, Audra A. Duncan1, Manju Kalra1, Carlos Timaran2. 1Mayo Clinic, Rochester, MN; 2University of Texas Southwestern, Dallas, TX

Objectives: Hybrid debranching procedures and branched stent grafts have been proposed as alternative treatments to lower the morbidity and mortality associated with open thoracoabdominal aortic aneurysm (TAAA) repair. The purpose of this study was to determine in-hospital mortality and factors predicting in-hospital death after open repair of TAAA in the United States, prior to the widespread use of new technologies.

Methods: The Nationwide Inpatient Sample (NIS) identified open repair procedures for non-repaired TAAA performed during the years 2000-2006. Risk stratification was based on the Charlson comorbidity index (CCI), which provides aggregate measures of 18 clinical parameters. Weighted logistic regression analyses were used to determine independent predictors of in-hospital mortality and complications taking into account the NIS sample design.

Results: There were 5,776 open repairs for non-repaired TAAA performed during the 7-year period. The median age was 70 years and 43% were women. Major comorbidities included hypertension (56%), chronic pulmonary disease (38%), and myocardial infarction (8%). The in-hospital mortality was 16%. Postoperative complications included acute renal insufficiency (25%), respiratory insufficiency (10%), acute mesenteric ischemia (3%) and myocardial infarction (3%). Acute renal insufficiency (ARI) was the main independent predictor of in-hospital mortality (odds ratio [OR], 3.5; 95% confidence interval [95%CI], 3.0-4.1), and independent factors associated with higher postoperative ARI rates were age, CCI, chronic renal insufficiency, and rural and non-teaching hospital. In addition to ARI, logistic regression analysis identified age, male gender, chronic renal insufficiency, CCI, and rural and non-teaching hospital location as independent predictors for in-hospital death.

Conclusions: Open surgical treatment of TAAAs carries high in-hospital mortality (16%) in the US. Renal insufficiency, age, gender, higher Charlson comorbidity index, and rural and non-teaching hospital are important predictors of in-hospital death. These benchmark data provide a standard for comparison against which surgeons can compare their own results with newer hybrid and endovascular branched techniques proposed to treat TAAA.

Author Disclosures: G.S. Oderich, Cook Medical and WL Gore; E.B. Rosero, None; J.J. Ricotta, None; P. Glorieux, None; T.C. Bower, None; A.A. Duncan, None; M. Kalra, None; C. Timaran, None.

RR29.
Malrotation and Bending of Multi-Branched Thoracoabdominal Stent Grafts

Ki-Hyuk Park1,2, Jade S Hiramoto1, Linda M Reilly1, Timothy A M Chuter1. 1UCSF, San Francisco, CA; 2Daegu Catholic University School of Medicine, Daegu, Republic of Korea

Objective: To assess the accuracy of thoracoabdominal stent graft deployment and the effect of stent graft orientation on angulation of the visceral branches.

Methods: Multi-branched stent grafts were assembled in-stitu, using covered stents to connect short, caudally-directed cuffs on the stent graft with the corresponding visceral arteries. Measurements of actual cuff orientation (ACO), actural vessel orientation (AVO), and longitudinal branch length (LBL) were based on 3-dimensional analysis (TeraRecon) of postoperative CT scans. The actual orientation of the cuff (ACO) was compared with the planned orientation (PCO) to assess malorientation (ACO-PCO). The ACO was also compared with AVO to assess branch angulation in trans-axial (ACO-AVO) and longitudinal (LBA) planes. The ACO-PCO of the 36 cuff was compared with the ACO-PCO of distal cuffs to assess twisting between cuffs.

Results: Between Nov 2005 and Dec 2008, 38 patients underwent multi-branched thoracoabdominal aortic repair with a total of 141 branches to the visceral arteries. Small degrees of malorientation (ACO-PCO) were common, but severe malorientation (>45 degrees) was rare.

The cuff-bearing portion of the stent graft usually rotated as a single unit. Only one patient had > 30 degrees of twisting between the CA and SMA cuffs and only 4 had > 30 degrees between the CA and LRA. For any given degree of malrotation, higher LBL resulted in lower LBA. 91% of visceral arteries lay within a vertical 60 degree-wide arc (LBA <2), centered on the outer orifice of the corresponding cuff. Although the mean values of PCO and AVO were similar, individual values often differed because PCO referred to the centerline of the aorta and AVO to the centerline of the stent graft.

Author Disclosures: C.L. Stout, None; C.A. Messerschmidt, None; G.C. Schneider, None; A.I. Richardson, None; G.K. Stokes, None; J.M. Panneton, None.

RR30.
Early Outcomes Following Endografting or Open Surgery for Thoracic Aortic Pathology: Data From the National Surgical Quality Improvement Project

David A. Peterson, Hardeep Aihawalia, Mihir Gandhi, Sonny Tucker, Leila Careybee, Cynthia K. Shortell. Duke University Medical Center, Durham, NC

Background: Literature comparing thoracic endografting (TEVAR) to open surgery for thoracic aortic pathology includes reports from single institutions or industry-maintained registries focusing on aneurysmal disease. We hypothesized that early outcomes are improved in patients undergoing TEVAR rather than open repair of thoracic aortic pathology, based on independent, multicenter data.

Methods: Patients who underwent TEVAR or open repair of thoracic aortic pathology (aneurysms, ruptured aneurysms, dissections or traumatic injuries) from 2006 to 2008 were identified in the American College of Surgeons National Surgical Quality Improvement Project (ACS-NSQIP) database. Data collection included: 30 day mortality; confounding variables (age, gender, American Society of Anesthesiologists class, diabetes, serum albumin, renal function, and cardiopulmonary status); intra- and post-operative outcomes. Inferential statistics and generalized linear models were used to compare TEVAR and open outcomes.

Results: Two hundred sixty-nine (N = 269) patients underwent repair of thoracic aortic pathology (TEVAR: 129 vs. OPEN: 140). Two hundred and seven (77%) patients had intact aneurysms, 42 (16%) had dissections or traumatic injuries, and 20 (7%) had ruptured aneurysms. Bivariate analysis revealed no significant differences in 30 day mortality (TEVAR: 9% vs. OPEN: 11% [5%]). Adjusted outcomes demonstrated significant decreases (p<0.05) in TEVAR: length of stay (median [med] TEVAR: 6.5 days, 95% confidence interval [CI]: 5.2, 7.8 vs. OPEN: 14.7 days, CI: 13.2, 16.2); operative time (med: 141 minutes, CI: 117, 165 vs. 355 minutes, CI: 348, 401); occurrence of post-operative pneumonia (N = 11 [8%] vs. 47 [36%], odds ratio [OR]: 0.16, CI: 0.06, 0.42); readmission (N = 11 [8%] vs. 25 [19%], OR: 0.21, CI: 0.06, 0.68); and acute renal failure (N = 4 [3%] vs. 16 [12%], OR: 0.11, CI: 0.02, 0.64).

Conclusions: Among patients undergoing repair of thoracic aortic pathology, TEVAR is associated with similar mortality but decreased early morbidity, operative time, and length of stay when compared to open surgery. These findings suggest that broader adoption of TEVAR for thoracic aortic disease will lead to reductions in early morbidity, operative time, and length of stay associated with repair.

Author Disclosures: D.A. Peterson, None; H. Aihawalia, None; M. Gandhi, None; S. Tucker, None; L. Murrebee, None; C.K. Shortell, BTG Varisolve Advisory Board Member.