Objectives: Experimentally measured pullout forces for stent grafts (SGs) are used in clinical discussions and as reference values in bench studies. However, available benchmarks in the literature have only been obtained straight along the axial direction, whereas studies show that displacement forces are directed more anteriorly. We hypothesize that increasing angulation of the displacement force results in decreasing pullout force.

Methods: Sixty bifurcated SGs (10 new specimens for each of six devices: Endurant, Medtronic Endurant, Medtronic Talent, and Vascutek Anaconda) were deployed in fresh bovine aortas and then pulled out using an electronic motor at 1 mm/s while tension force was measured continuously using a digital load cell. The SG off-axis angulation was changed from 0° to 90° in increments of 10°. The test system was submerged in a custom-built saline bath at 37°C. At least three tests were performed for each device at each angle except for the Cook Zenith Flex, which experienced plastic deformation of its bars. Each aortic specimen was used once and then discarded. Hand-stitched aortic anastomoses were used as a reference.

Results: Of 415 specimens of aorta that were tested, 67 tests were excluded due to failure of the aortic specimen or of the apparatus before device pullout. The remaining 348 pullouts are included in the Fig, which shows the trends for the decreasing trend in pullout force with increasing angle along the SGs. The mean pullout force for the handsewn anastomoses was 63 N (testing >70 N limited by apparatus failure).

Conclusions: This study supports the hypothesis that pullout forces generally decrease with increasing SG device angulation.


Ruptured Abdominal Aortic Aneurysms in the Province of Quebec from 2006-2012: A Three-Steps Model for Centralization
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Objectives: Better survival for ruptured abdominal aortic aneurysm (RAAA) has been associated with the use of endovascular aneurysm repair (EVAR) compared with open surgical repair (OSR), high case volume, and young age. Is this also true in Quebec?

Methods: This was a retrospective review of data obtained from the Quebec hospital discharge database for RAAA repaired operatively between April 1, 2006, and March 31, 2012. OSR was compared with EVAR in two hospital volumes (low: <40 surgeries vs high: ≥40 surgeries). Logistic and binomial regression analyses identified the risk of 30-day mortality with age, hospital volume, and surgical groups as variables.

Results: For ages ≥65 years, 772 RAAA were found, with 725 OSR (93.9%) and 47 EVAR (6.1%). The rate of RAAA repair declined over the study period, from 11.57 to 9.66 per 100,000. The 30-day mortality was 56.6% for OSR compared with 19.2% for EVAR (P = 0.017). Low (39.5%) vs high (33.6%) hospital volume had similar 30-day mortality (P = 0.108). The relative risk was 1.94 (P = 0.0209) for OSR and was 1.54 (P = 0.001) for patients aged ≥80 years. Hospital volume was not statistically significant.

Conclusions: Only the surgical group and age were significantly associated with 30-day mortality. EVAR was used only in 6% of the time for RAAA in Quebec; however, the relative risk of 30-day mortality was lower compared with OSR. Furthermore, hospitals with a low volume of OSR are not associated with a higher mortality. There is a trend towards a reduction of RAAA in Quebec.

Objectives: The province of Saskatchewan presents unique challenges for ruptured abdominal aortic aneurysms (AAAs), including variable access to health care resources and large transportation distances to tertiary care centers. The goal of this study was to assess the rates of ruptured and unruptured aneurysms to determine whether there are areas of high aneurysm incidence that would benefit from further study and the possible implementation of a targeted screening protocol to improve management and prevention of aneurysm rupture.

Methods: All diagnoses of AAA from 2001 to 2011 in the province of Saskatchewan were reviewed, with patients grouped by health region of residence. Diagnoses of ruptured and unruptured AAA were obtained from the Saskatchewan Discharge Abstract Database, Medical Services Billings Claims data, and Vitalis Stats data. International Classification of Diseases, 9th Revision and 10th Revision, codes were used to identify specific patients with the diagnosis of AAA.

Results: A total of 6163 AAAs were diagnosed, and 1667 AAAs were repaired over the study period. Mean age at diagnosis was 71.7 years, with 68% of all aneurysm diagnoses in men. Only 2% of patients were aboriginal. The provincial age-adjusted rate of AAA was 5.45 per 100,000 (95% confidence interval [CI], 5.18-5.59). The highest age-adjusted rate of AAA was found in the Five Hills Health Region (FHHHR, 65.1 per 100,000; 95% CI, 57.63-69.03), which was significantly higher than the provincial average (P < 0.05). The rate of ruptured aneurysms in FHHHR was nearly twofold higher than the provincial average (65.8 vs 32.1 per 100,000, respectively). The lowest aneurysm rates were found in the north of the province (age-standardized rate, 4.96 per 100,000; 95% CI, 3.47-5.73).

Conclusions: There are significant geographical variations in the incidence of ruptured and unruptured AAA in the province of Saskatchewan, with the highest incidence of unruptured and ruptured aneurysms localized to the FHHHR. Why there is a preponderance of aneurysms in this area is unclear, but it suggests targeted screening may help reduce the number of aneurysms treated emergently for rupture.


Predictors of Discharge Disposition Following Repair of Blunt Thoracic Aortic Traumatic Injuries
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Objectives: Blunt thoracic aortic injury (BTIA) can be a highly lethal injury, but in the last decade, major advances have been made in diagnostic accuracy, injury grading, and therapy. Traditionally, emphasis has been on maximizing survival after injury, with a paucity of studies examining the discharge characteristics of patients that survive a BTIA. The purpose of this study was to define the epidemiology and predictors of disposition in patients with BTIA in a provincial database.

Methods: The Ontario Trauma Registry was used to identify all patients who were hospitalized with a BTIA between 1999 and 2009. Trends in therapy and discharge disposition were determined.

Results: We identified 264 patients with BTIA. Of these, 157 were discharged from the hospital, with 36% (n = 56) going directly home and 64% (n = 101) going to continuing care facilities. There was no difference in disposition in those with BTIA treated operatively or nonoperatively (P = 0.48) in those that had repair of BTIA, and there was no difference in discharge home between open and endovascular repair (P = 1.00). Univariate analyses identified younger age, male sex, lower Injury Severity Score, and lower Charlson comorbidity indices as being predictors of discharge home. On adjusted multivariate regression analysis, a lower Injury Severity Score (odds ratio, 0.91; 95% confidence interval, 0.87-0.95; P < .001) and male sex (odds ratio, 2.89; 95% confidence interval, 1.02-8.23; P = .047) were the only independent predictors of discharge home.

Conclusions: Our findings suggest that the only independent predictors for discharge home for patients who survive is the overall severity of all their injuries as well as male sex, irrespective of their condition on admission or management of their BTIA. It is unclear why being female is associated with lower rates of discharge home. Further study is required to investigate and address this disparity between the sexes.