Long-term Survival after TEVAR depends on Indication for Surgery, and is Shorter than Expected after Ruptured Thoracic Aneurysm

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Introduction: Thoracic endovascular aortic repair (TEVAR) is used in treatment of type B aortic dissections and descending aortic aneurysms increasingly often. TEVAR is associated with lower peri-operative mortality when compared to open surgery in retrospective studies. We assessed long-term survival after TEVAR depending on diagnosis.

Methods: All patients who underwent TEVAR for type B aortic dissection or thoracic aortic aneurysm at Uppsala University Hospital between December 1999 and December 2013 were included. Traumatic aortic transections, thoraco-abdominal- and mycotic aneurysms, as well as type A dissections were not included. Patient characteristics and survival data were collected from medical records. 30 day survival was analyzed with chi² and 5 year survival was estimated with Kaplan-Meier. Age-adjusted hazard ratio for survival was estimated with a Cox regression analysis.

Results: Of the 250 patients who underwent TEVAR, 190 were included (excluded: traumatic transections n = 17, thoraco-abdominal hybrid procedures n = 20, mycotic aneurysms n = 5, type A dissections n = 8, others n = 10). Diagnosis distribution was acute type B aortic dissection (ABAD) n = 63; chronic type B aortic dissection (CBAD) n = 45; intact aneurysm (iTAA) n = 57 and ruptured aneurysm (rTAA) n = 25. Mean follow up was 49 months. Mean age of the patients was ABAD 66.5 years; CBAD 61.9; iTAA 71.6; rTAA 74.5 (p < 0.001). The male to female ratio was ABAD 41:22; CBAD 34:11; iTAA 34:23; rTAA 12:13 (p = 0.132). 30 day survival was ABAD 92.1%, CBAD 95.6%, iTAA 96.5%; rTAA 72.0% (p = 0.002). 5 year survival was ABAD 79.2%; CBAD 79.6%; iTAA 66.0%; no patient with 5 year follow up after rTAA was alive, and 3 year survival was 30.8%, see attached figure (Log-Rank p < 0.001). In a Cox regression analysis of mid-term survival for patients who survived the initial 30 day peri-operative period, age-adjusted hazard ratio for death was 5.7 after rTAA compared to the other diagnoses.

Conclusion: Long-term survival after TEVAR was adequate for patients with type B aortic dissection and intact aortic aneurysm. Considering the poor long-term survival after TEVAR for ruptured aortic aneurysm, it may be necessary to be more selective when deciding which of these patients benefit from open surgery.

Renal Dysfunction following Thoraco-abdominal Aortic Surgery: Occurrence and Long-Term Mortality

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Introduction: Renal failure is a significant source of morbidity and mortality in patients who require thoraco-abdominal (TAA) aortic repair. We reviewed our 25 year experience with open descending thoracic and thoraco-abdominal repair to identify risk factors for and potential therapeutic targets to prevent renal failure.

Methods: We performed 1896 operations in 1795 patients. The majority of cases were performed using cerebrospinal fluid drainage and distal aortic perfusion, and visceral perfusion was used selectively in patients with repairs that involved the origins of the celiac, superior mesenteric and renal arteries. Renal failure was defined as new-onset renal dysfunction in patients without existing chronic renal disease, and included an increase in post-op creatinine >1 mg/dl/day over the first two post-op days, an absolute creatinine >4 mg/dl or need for dialysis. Multivariable statistics were used to assess pre-and intra-operative risk factors for renal dysfunction, and the effect of renal morbidity on long-term survival was evaluated by Kaplan-Meier analysis.

Results: Mean population age was 64.2 +/- 13.9, and 669/1795 (37%) patients were female. Renal failure occurred after 488/1896 (25.7%) operations. Multivariable pre-operative predictors of post-operative renal failure were patient age (OR 1.03/yr, p < 0.0001), TAA extent 1 (OR 2.02, p < 0.0001), TAA2 (OR 5.9, p < 0.0001), TAA3 (OR 4.2, p < 0.0001), iTAA4 (OR 2.9, p < 0.0001), emergency presentation (OR 1.4, p < 0.04) and coronary artery disease (CAD; OR 1.3, p < 0.04). Addition of intra-operative variables identified patient age (OR 1.03/yr, p < 0.0001), aortic dissection (OR 0.62, p < 0.002), involvement of the aortic segment containing the visceral vessel origins (OR 1.5, p < 0.005), COPD (OR 1.3, p < 0.02), aortic cross clamp time (OR 1.02/min, p < 0.0001), and PRBC use (OR 1.04/unit, p < 0.0001). Visceral perfusion was associated with modestly increased risk (OR 1.3, p < 0.04) among patients with aneurysm extents (TAA 1, 2, and 4) involving the visceral vessels. Incidence of renal dysfunction has risen gradually over time. Long-term survival is strongly influenced by post-operative renal failure (Figure, p < 0.0001).

Conclusion: New-onset renal dysfunction is common after thoraco-abdominal aortic surgery, and is strongly associated with reduced long-term survival. Renal protection strategies are urgently needed, and treatments that can reduce the effects of ischemic time and transfusion are likely intervention targets.

Acute Endovascular Repair of Ruptured Thoraco-abdominal Aneurysms with Branched Stentgrafts

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Introduction: Endovascular repair of thoraco-abdominal aneurysms with branched stent grafts (bEVAR) has shown promising results in the elective situation. Off the shelf devices have been introduced recently allowing endovascular treatment of TAAA in the acute setting, including rupture (rTAAA). However, very little is known about acute bEVAR for the treatment of rTAAA. Our aim is to report the results of acute bEVAR in patients with rTAAA.

Methods: A retrospective review of patients undergoing acute bEVAR between 2008 and April 2015 in a single centre with large experience of the elective procedures. Stent grafts used consisted mostly of off the shelf endograft with 4 caudally oriented branches. Spinal drainage use was decided depending on the emergency character of the operation. Values are presented as median and range when not stated otherwise.

Results: 10 patients, (5 males, 64 (34–77) years old) underwent bEVAR during the study period. TAAA had a median pre-operative diameter of 70 (57-90) mm and the anatomy according to Crawford was: 2 type I, 4 type II, 3 type III and 1 type IV. Median operative time was 436 (245–785) minutes. Endovascular conduit had to be used in 2 patients. Six patients had all 4 visceral arteries incorporated in the repair while 2 and 1 patient had 3 and 2 arteries, respectively. One patient died intra-operatively before the branches could be extended, making the immediate technical success 90 % (n = 9). Two more patients died within 30 days of bEVAR (30 day mortality of 30 %). Four of the nine patients surviving bEVAR (44%) developed signs of post-operative spinal cord ischemia. Three of the patients recovered completely while one developing the symptoms 4 days after bEVAR remained paraplegic. The 7 patients surviving more than 30 days were followed-up for 13 (1–38) months. During this period only one patient died of unrelated causes. During the CT follow up (median of 13 (1–38) months) no aneurysms expanded. One patient underwent an arch repair 9 months post-

Abstracts