Favorable Impact of TEVAR on Long-term Survival of Patients with Acute Complicated Type B Aortic Dissection

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Background

• Complicated type-B aortic dissection (CTBAD) is a rarely studied yet highly morbid condition.
• It remains unclear how long term survival has changed with the introduction of thoracic endovascular aortic repair (TEVAR).
• This study assesses outcomes of patients with CTBAD comparing the treatment modalities of medical therapy alone (MED), open surgical repair (OPEN), and TEVAR.

Hypothesis

• Real world long term survival in acute CTBAD will be improved in TEVAR vs. MED
• TEVAR implementation is associated with improved survival over time

Methods

• California Office of Statewide Planning and Development Database for Years 2000-2010 was utilized
• Inclusion Criteria: Thoracic Aortic Dissection ICD-9: 441.0, Thoracoabdominal Dissection ICD-9: 441.03, Emergent admit
• Exclusion Criteria: Type A dissection, Cardioplegia (ICD-9: 39.63), Valve repair (ICD-9: 35.00-35.99)
  Operations on vessels of the heart (ICD-9: 37.0-37.2, 37.31-37.9, 37.93-37.990) trauma, age<18
• Complicated Type B Dissection were defined as including the following: Bowel Ischemia (ICD-9: 557.9, 785.4) Lower Extremity Ischemia (ICD-9: 459.9)
  Shock/Acidosis/Gas Gangrene (ICD-9: 40.0, 276.2, 276.4, 276.5, 276.9, 785.4, 785.5, 785.0, 785.1 785.2)
• Statistical Analysis: Bivariate analysis (χ², t-test, and Fisher’s exact test as appropriate)
  Kaplan Meier survival analysis by treatment
  Multivariable Cox Regression with model entrance Criteria p<.1
  Costs were adjusted to 2010 US dollars

Results

• Within 3194 cases 1923 (91%) were MED, 142 (5.9%) OPEN, and 76 (3.2%) TEVAR. Presentation included acidosis in 34%, shock in 15%, acute renal failure in 70%, and bowel or lower extremity ischemia in 4%
• Mean age was 66 ± 15 years. Females represented 37% with 31% underrepresented minorities, and 27% Charlson comorbidity score >3.
• Overall inpatient complication rate was 77%, paraplegia occurred in 3.2%, respiratory complications in 27.4%, hemorrhage in 7%, sepsis in 8%, acute renal failure in 56%, bowel ischemia 1.2%, and lower extremity ischemia 3%.
• Length of stay was 13±19 days for MED and 22 ± 24 days OPEN, and 21 ± 17 days TEVAR.
• Inpatient mortality was 18%, where 8% died within the first 24 hours. Inpatient mortality decreased during the time period after introduction of TEVAR (Table 1).
• After discharge, survival was 73% at 30-d, 64% at 1-year, and 53%-year survival. After adjusting for age, acidosis, shock, renal disease and high Charlson comorbidity score, TEVAR was associated with an adjusted improved overall survival compared to MED [Hazards Ratio (HR) 0.63 (95% confidence interval(CI): 0.41-1.0); P=0.05].
  OPEN conferred an increased adjusted risk of death [HR 1.3 (CI: 1.0-1.6); P=0.028].
• Inpatient cost by treatment was $123,762±$184,505 for MED, $304,089±$312,424 for MED, $357,937±$16,290 TEVAR.

Conclusions

• Symptomatic type B aortic dissection confers significant mortality and morbidity with attendant healthcare resource utilization.
• An apparent trend towards improved outcomes is evident in those treated with TEVAR, suggesting this addition to the armamentarium may improve outcomes based on an associated adjusted improved survival in these patients.