Outcomes of Aortic Surgery after Previous Sternotomy

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Background / Study Objective

• Reoperative cardiac surgery carries increased risk
  • advanced patient age/comorbidities
  • the nature of the previous procedure

• Aortic disease is a complex pathology
  • Reoperations may be necessary\(^1\)

• Limited data currently exists on the outcomes of reoperative aortic surgery, or cardiac surgery in general.

• This study aims to assess the outcomes of reoperative aortic surgery after previous sternotomy.

Methods

• All procedures with a redo sternotomy CPT code collected via query of institutional STS database between January 1, 2002, and June 30, 2016. (n=7038)

• Patients who underwent aortic surgery (graft replacement of the aortic root, ascending, or arch) identified by CPT code. (n=746)
  • Previous aortic surgery and previous non-aortic cardiac surgery (including aortic valves)

• Univariate Chi square analyses and t-tests were used to compare pre-operative comorbidities and post-operative outcomes.

• Univariate Kaplan-Meier survival estimates were used for survival analysis.

• Multivariate logistic regression was used for 30-day mortality endpoint analysis.
Baseline Patient Characteristics

*Denotes significant p values (p<0.05)
Operative Indications

Reason for Reoperation

- Aortic Dissection: 13.4%
- Aortic Aneurysm: 60.6%
- Infection: 34.6%

- Previous Cardiac Surgery (n=419)
- Previous Aortic Surgery (n=327)
Operative Characteristics

Current Repair Type

- **ROOT/ASCENDING**
  - Previous Cardiac Surgery (n=419): 37.9%
  - Previous Aortic Surgery (n=327): 43.7%

- **ASCENDING**
  - Previous Cardiac Surgery (n=419): 5.8%
  - Previous Aortic Surgery (n=327): 4.1%

- **ASCENDING/ARCH**
  - Previous Cardiac Surgery (n=419): 25.1%
  - Previous Aortic Surgery (n=327): 24.1%

- **ROOT/ASCENDING/ARCH**
  - Previous Cardiac Surgery (n=419): 31.2%
  - Previous Aortic Surgery (n=327): 28.2%

- **46%**
- **54%**
Results

Outcomes, Previous Cardiac Surgery vs. Previous Aortic Surgery

KM 5-year Mortality, Previous Cardiac Surgery vs. Previous Aortic Surgery

Product-Limit Survival Estimates
With Number of Subjects at Risk

Logrank p=0.0312

Study Group
1: Previous Cardiac Surgery
2: Previous Aortic Surgery
Results

### Multivariate Logistic Model – 30 day mortality

<table>
<thead>
<tr>
<th>Variable</th>
<th>Odds Ratio</th>
<th>95% Wald Confidence Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>1.03</td>
<td>1.006 - 1.044</td>
</tr>
<tr>
<td>Male</td>
<td>0.82</td>
<td>0.494 - 1.369</td>
</tr>
<tr>
<td>Diabetes</td>
<td>1.18</td>
<td>0.677 - 2.063</td>
</tr>
<tr>
<td>Chronic Lung Disease</td>
<td>1.38</td>
<td>0.602 - 3.171</td>
</tr>
<tr>
<td>Previous CVA</td>
<td>1.54</td>
<td>0.883 - 2.685</td>
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<tr>
<td>Previous CABG</td>
<td>1.72</td>
<td>0.888 - 3.33</td>
</tr>
<tr>
<td>Previous CABG/Valve</td>
<td>2.20</td>
<td>1.133 - 4.256</td>
</tr>
</tbody>
</table>
Conclusion

• Aortic surgery after previous open heart surgery is reasonable with acceptable post-operative outcomes.

• Patients who underwent previous aortic surgery were more likely to have a postoperative CVA or prolonged ventilation time (>24 hours).

• Patients who underwent previous cardiac surgery without aortic repair had higher 30 day mortality.

• Patients who previously underwent CABG/Valve were at 2 times higher risk of death at 30 days.
  • Different treatment therapy for this group of patients?