Clinical Outcomes and Rates of Aortic Growth and Reoperation Following 1-Stage Repair of Extensive Chronic Thoracic Aortic Dissection

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No disclosures
The Problem
General Approaches to the Surgical Treatment of Extensive Chronic Thoracic Aortic Dissection

<table>
<thead>
<tr>
<th>Approach</th>
<th>1st Stage</th>
<th>2nd Stage</th>
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</thead>
<tbody>
<tr>
<td>&quot;Classic&quot; Two – Stage Elephant Trunk Procedure</td>
<td>Open or endovascular repair of DTA or TAA</td>
<td>Open or endovascular repair of DTA or TAA</td>
</tr>
<tr>
<td>Stented (frozen) Elephant Trunk Procedure</td>
<td>Open or endovascular repair of DTA or TAA</td>
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<tr>
<td>Hybrid procedure</td>
<td>Open or endovascular repair of DTA or TAA</td>
<td>Open or endovascular repair of DTA or TAA</td>
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<tr>
<td>One-Stage Procedure</td>
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</table>
Rationale for Single-Stage, Arch-First Technique with Bilateral Anterior Thoracotomy

- **Bilateral anterior thoracotomy permits access to:**
  - Entire Thoracic Aorta
  - Aortic Root and Aortic Valve
  - Coronary Arteries
  - Mitral and Tricuspid Valves
1-Stage Repair of Extensive Chronic Thoracic Aortic Dissection

-Objectives-

• Analyze:
  • Early and late clinical outcomes
  • Rates of growth of remaining dissected aorta
  • Rates of aortic reoperation
Clinical Characteristics

80 Patients

- Mean age: 57 years (22 - 81)
- 73 Type A, 7 type B with retrograde extension
- 89% previous sternotomy
- 15% connective tissue disorder
- 90% extension into abdominal aorta
- 78% replacement of ½ or more of DTA
Early Outcomes

- 2.5% Hospital mortality
- 1.2% Stroke
- 1.2% Spinal cord ischemic injury (paraplegia)
- 7.5% Renal failure (dialysis)
- 7.5% Reoperation for bleeding
- 42% Ventilatory support > 72 hours
- 15% Tracheostomy
Major Complications

Late Outcomes

- Mean duration of follow-up = 6.6 years (1-18)
- CT or MR imaging to assess growth of remaining dissected aorta available for 83% of 78 hospital survivors
- 47 patients followed > 5 years
- 21 patients followed > 10 years
1-Stage Repair

Change in Diameter of Remaining Dissected Aorta
1-Stage Repair

Growth Rates of the Contiguous Distal Aorta

<table>
<thead>
<tr>
<th></th>
<th>mm/yr</th>
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</thead>
<tbody>
<tr>
<td>All Imaged Aortas (N = 65)</td>
<td>1.7</td>
</tr>
<tr>
<td>Distal Aortic Diameter</td>
<td></td>
</tr>
<tr>
<td>&gt; 4.5 cm (N = 12)</td>
<td>2.5</td>
</tr>
<tr>
<td>&lt; 3.0 cm (N = 5)</td>
<td>0.4</td>
</tr>
<tr>
<td>Distal Extent of Dissection</td>
<td></td>
</tr>
<tr>
<td>DTA (N = 8)</td>
<td>-0.2</td>
</tr>
<tr>
<td>Abdominal Aorta (N = 57)</td>
<td>1.9</td>
</tr>
</tbody>
</table>

+ 40 positive growth: 16 no growth, 9 negative growth
1-Stage Repair

- **Reoperation**
  - 1 year: 98.6% (95% CI: 90.4%, 99.8%)
  - 5 years: 95.4% (95% CI: 86.3%, 98.5%)
  - 10 years: 93.0% (95% CI: 82.0%, 97.4%)
  - 15 years: 74.4% (95% CI: 26.5%, 93.6%)

- Patients at Risk: 80, 45, 21, 3
1-Stage Repair

**Freedom from Reoperation on Contiguous Aorta (%)**

- **Reoperation**
  - 1 year: 98.6% (95% CI: 90.4%, 99.8%)
  - 5 years: 95.4% (95% CI: 86.3%, 98.5%)
  - 10 years: 93.0% (95% CI: 82.0%, 97.4%)
  - 15 years: 74.4% (95% CI: 26.5%, 93.6%)

**Patients at Risk**
- 0: 80
- 5: 45
- 10: 21
- 15: 3
1-Stage Repair

1 year: 97.3% (95% CI: 89.5%, 99.3%)
5 years: 89.2% (95% CI: 78.5%, 94.7%)
10 years: 81.4% (95% CI: 67.4%, 89.9%)
15 years: 60.1% (95% CI: 26.8%, 82.2%)
1-Stage Repair

Freedom from Any Aortic Reoperation (%)

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<th>Years Postoperatively</th>
<th>Freedom from Reoperation</th>
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Patients at Risk: 80, 42, 19, 3
1-Stage Repair

**Survival**

- 1 year: 89.8% (95% CI: 80.7%, 94.8%)
- 5 years: 76.4% (95% CI: 64.6%, 84.7%)
- 10 years: 52.6% (95% CI: 38.2%, 65.1%)
- 15 years: 18.8% (95% CI: 6.7%, 35.7%)

**Patients at Risk**

- 0 years: 80
- 5 years: 47
- 10 years: 21
- 15 years: 3
1-Stage Repair

Survival
1 year 89.8% (95% CI: 80.7%, 94.8%)
5 years 76.4% (95% CI: 64.6%, 84.7%)
10 years 52.6% (95% CI: 38.2%, 65.1%)
15 years 18.8% (95% CI: 6.7%, 35.7%)

Patients at Risk
0 years 80
5 years 47
10 years 21
15 years 3
Conclusions

• 1-Stage procedure is a safe and suitable alternative to the 2-stage, frozen elephant trunk, and hybrid procedures
• Mortality and major morbidity rates do not exceed those for the first stage of the 2-stage, frozen elephant trunk, and hybrid procedures
• Prevalence of spinal cord ischemic injury is less than that for the frozen elephant trunk procedure (2% - 11%)
• Freedom from reoperation on the contiguous aorta (93% at 10 years) is substantially higher than for the 2-stage, frozen elephant trunk, and hybrid procedures
• Because of variable growth rates of the remaining dissected aorta, life-long surveillance is required