Experience with the new Thoraflex graft for aortic arch replacement

Friedrich W. Mohr

http://www.vascutek.com/thoraflex-hybrid/
Frozen elephant trunk

Since 2007

Thoraflex, Vascutec

Since 2010
Conclusions:
• the graft adds to the frozen elephant trunk concept for treating the arch and proximal descending aorta;

• excellent 30-day survival;

• combining the frozen elephant with a four-branched arch graft increases the armament of the surgeon in the treatment of complex and diverse aortic arch pathology.
Total aortic arch replacement with the frozen elephant trunk technique: 10-year follow-up single-centre experience†

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Abstract

OBJECTIVES: Since August 2001, the frozen elephant trunk (FET) technique has been used at our institution to treat degenerative or dissecting aneurysms involving the aortic arch and descending aorta as a potential ‘single-stage’ procedure. The aim of this study was to review our FET experience and to present the 10-year results.

METHODS: Between August 2001 and January 2012, 131 patients underwent FET implant with three different prostheses: the custom-made Chavan-Haverich (n = 66), the Jotec E-vita (n = 30) and the Vascutek Thoraflex (n = 35) prostheses. Concomitant procedures included aortic valve-sparing operations (David, n = 17) and aortic root replacement (Bentall, n = 25). Patient records and the first postoperative and last available computer tomography (CT) were retrospectively reviewed.

RESULTS: Incidence of rethoracotomy for bleeding, stroke, spinal cord injury, prolonged ventilatory support (>96 h) and acute renal failure requiring dialysis were 18, 11, 1, 41 and 16%, respectively. In-hospital mortality was 15%. The mean follow-up was 42 ± 37 (range 1–134 months). At 1, 5 and 10 years, survivals were 82 ± 3, 72 ± 5 and 58 ± 8%, respectively. Freedoms from distal aortic operation were 81 ± 4, 67 ± 5 and 43 ± 13%, respectively. Thirty-six patients underwent 40 distal aortic operations, either open surgical (n = 22, 55%) or endovascular (n = 18, 45%). Chronic aortic dissection was identified as an independent risk factor for distal aortic operation (odds ratio = 3.8; 95% confidence interval 1.5–9.3; P = 0.004). At last CT control, false-lumen thrombosis rates up to 93% were achieved around the stent graft.

CONCLUSIONS: An FET concept adds to the armament of the surgeon in the treatment of complex and diverse aortic arch pathologies. The preoperative patient risk profile explains the postoperative morbidity and in-hospital mortality. The FET can potentially be still a ‘one-stage’ procedure in selected patients. However, the extension of FET to patients with extensive aortic aneurysms has led to an increase in second-stage procedures.

Keywords: Frozen elephant trunk • Aortic surgery • Aneurysm • Dissection
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- Rethoracotomy for bleeding - 18%
- Stroke – 11 %
- Spinal cord injury – 1 %
- Prolonged ventilation - 41 %
- Dialysis - 16%

No difference between three FET prosthesis
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No difference between three FET in survival
Follow up CT scan **no difference between prosthesis type regarding**:

- incidence of endoleak;
- incidence of aneurysm and false-lumen thrombosis;
- true lumen growth among patients with a dissecting aneurysm;
- aortic growth rate among patients with a degenerative aneurysm.
<table>
<thead>
<tr>
<th>Condition</th>
<th>n = 31</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Age</td>
<td>68.5±9.4</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>38.7%</td>
<td></td>
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<tr>
<td>Arterial hypertension</td>
<td>93.5%</td>
<td></td>
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<tr>
<td>CAD</td>
<td>22.6%</td>
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<tr>
<td>Diabetes mellitus</td>
<td>6.5%</td>
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<tr>
<td>COPD</td>
<td>6.5%</td>
<td></td>
</tr>
<tr>
<td>Dialysis</td>
<td>3.2%</td>
<td></td>
</tr>
<tr>
<td>PVD</td>
<td>35.5%</td>
<td></td>
</tr>
<tr>
<td>Previous cerebrovascular accident</td>
<td>12.9%</td>
<td></td>
</tr>
<tr>
<td>Previous cardiovascular surgery</td>
<td>16.1%</td>
<td></td>
</tr>
<tr>
<td>Operation</td>
<td></td>
<td></td>
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<tr>
<td>-----------------------------------------------</td>
<td>--------</td>
<td></td>
</tr>
<tr>
<td><strong>Total aortic arch replacement</strong></td>
<td><strong>100 %</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Supraaortic vessels reimplantation</strong></td>
<td></td>
<td></td>
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<tr>
<td>Island</td>
<td>41.9 %</td>
<td></td>
</tr>
<tr>
<td>Separate</td>
<td>51.6 %</td>
<td></td>
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<tr>
<td><strong>Arterial cannulation</strong></td>
<td></td>
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<tr>
<td>Axillary artery</td>
<td>48.4 %</td>
<td></td>
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<tr>
<td>Aorta</td>
<td>22.6 %</td>
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</tr>
<tr>
<td>Truncus brachiocephalicus</td>
<td>29 %</td>
<td></td>
</tr>
</tbody>
</table>
Results

- In hospital mortality: 12.9%
- Dialysis: 38.7%
- Sepsis: 3.2%
- Bleeding: 9.7%
- GI Complication: 12.9%
- Permanent focal neurological deficit: 6.5%
- Permanent spinal cord injury: 3.2%

*Mortality increased in acute Type A dissection patients*
Patient post OP
Conclusions

In hospital mortality:
improve early and medium term outcome also in patients
with acute Type A aortic dissection

Surgery:
• 3 branches and perfusion side branch – allowed to
  perform complex reconstruction of supraaortic vessels
• Collar – simplify distal anastomosis
• Stent of FET – provide ideal landing zone for future
  endovascular completion
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