Long-Term Results After TEVAR Are Not So Great: Some Notes of Caution

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Disclosures
• Consultant
  – Endologix, Endomax, Gore, Medtronic
• Research Grant /research support
  – Gore, Maquet, Medtronic, Siemens
• Advisory Board
  – Endologix, Gore, Medtronic, Siemens
• Paid speaker
  – Endologix, Gore, Maquet, Medtronic, Siemens
• Major stokeholder
  – none

TEVAR – evolved since 1994

Ref: Dake M. NEJM 1994;331:1729
Transluminal Placement of Endovascular Stent-Grafts for the Treatment of Descending Thoracic Aortic Aneurysms
Michael D. Dake, D. Craig Miller, Charles P. Semba, R. Scott Mitchell, Philip J. Walker, and Robert P. Liddell

TEVAR – First Choice Treatment

Aneurysm  Dissection  Trauma  Postsurgical

Achilles’ Heel of EVAR in Long-Term

• Endoleak
• AAA sac enlargement
• Migration
  ➢ Reinterventions
  ➢ Ongoing risk of rupture
  ➢ Surveillance

What about TEVAR?

Durability and Survival
**Limited Longterm Results in the Literature?**

- Non randomized multicentre trial
  - 160 TEVAR vs 70 OR in 42 sites
  - 5 yrs results for DTAA & PAU

- Non randomized multicentre trial
  - 74 TEVAR in 4 sites
  - 5 yrs. for blunt trauma

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**Heidelberg Experience n =457**

March 1997 – November 2015

- Thoracic aortic aneurysm (TAA)
- Ruptured TAA
- Thoracoabdominal aneurysm

Retrospective single center study

100 out of 269 aneurysm pat. who completed 5 yrs. FU

Study endpoint: Long-term outcome at 5 yrs.
- 80 descending TAA including 23 ruptured
- 20 TAAA including 2 rTAAA

Ref. Bischoff MS, Ante M, Böckler D, et al. JVS 2015, accepted for publication

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**Patient Demographics (n=100)**

- Posttraumatic aneurysm patients were younger (50 vs. 68 yrs.)

Ref. Bischoff MS, Böckler D, et al. JVS 2015, accepted for publication

**Comorbidities**

- typical cv risc faktors

**Comorbidities**

- typical cv risc faktors
  - no significant difference regarding comorbidities
Comorbidities

- Typical CV risk factors
- No significant difference regarding comorbidities
- Mainly ASA 3 & 4

Posttraumatic aneurysm patients were fitter

5 year freedom from all cause mortality

5 year freedom from TEVAR rel. mortality

Survival at 5 years - elective vs. emergent

Survival at 5 years - Subtypes
Causes of deaths within 5 year follow up

<table>
<thead>
<tr>
<th>Cause of death</th>
<th>No. (%)</th>
<th>TEVAR-related</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiac</td>
<td>13 (30%)</td>
<td>9</td>
</tr>
<tr>
<td>Indeterminate</td>
<td>9 (18%)</td>
<td>1</td>
</tr>
<tr>
<td>Cancer</td>
<td>5 (10%)</td>
<td>0</td>
</tr>
<tr>
<td>Respiratory failure</td>
<td>5 (10%)</td>
<td>3</td>
</tr>
<tr>
<td>Aneurysmal disease progressions</td>
<td>5 (10%)</td>
<td>4</td>
</tr>
<tr>
<td>Stroke</td>
<td>3 (6%)</td>
<td>1</td>
</tr>
<tr>
<td>Septic</td>
<td>2 (8%)</td>
<td>0</td>
</tr>
<tr>
<td>Surgical complications</td>
<td>2 (4%)</td>
<td>2</td>
</tr>
<tr>
<td>Rupture (nonidiopathic)*</td>
<td>1 (2%)</td>
<td>0</td>
</tr>
<tr>
<td>Multi organ failure</td>
<td>1 (2%)</td>
<td>1</td>
</tr>
<tr>
<td>Renal failure</td>
<td>1 (2%)</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>21</td>
</tr>
</tbody>
</table>

5 Year Freedom from Complications

- 71% (95% CI = 61.1-79.9%)

Complications within 5 years

<table>
<thead>
<tr>
<th>Complication</th>
<th>%</th>
<th>TEVAR-related</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall complication rate</td>
<td>52%</td>
<td></td>
</tr>
<tr>
<td>Endoleak Type 1 &amp; 3</td>
<td>15%</td>
<td></td>
</tr>
<tr>
<td>Cardiac</td>
<td>12%</td>
<td></td>
</tr>
<tr>
<td>Renal Failure</td>
<td>9%</td>
<td></td>
</tr>
<tr>
<td>Conversion</td>
<td>8%</td>
<td></td>
</tr>
</tbody>
</table>

5 Year Freedom from Reintervention

- 71.2% (95% CI = 61.1-79.6)

TEVAR in ruptured DTAA

Endovascular repair of ruptured thoracic aortic aneurysms is associated with high perioperative mortality and morbidity.

- 48% in-hospital mortality due to cardiac complications
- 30% survival at 3 yrs.

AND FINALLY, SOME WORDS OF CAUTION:
TEVAR in Connective Tissue Diseases

Endoleaks after TEVAR

Type II Endoleaks after TEVAR

Long-Term Results - TEVAR in Dissections

Reintervention after TEVAR

TEVAR - Stroke

21.11.2015
TEVAR - Paraplegia

- 9.4% SCI (permanent 4.3%)
- 8.8% In-hospital mortality
- Minority returns to baseline function
- Mean survival: 9 mths.

Summary

- TEVAR is well established as 1st choice treatment
- Long-term data are rare, due to CV mortality
- Natural history of most thoracic pathologies is poor
- Long-term outcome regarding survival after TEVAR is acceptable but not great
- Young pat. after blunt trauma and post Coa do well

Conclusions

- More intensive follow up is needed for more evidence
- Outcome is more disease-related than device-related
- TEVAR should be performed in specialized, high-volume centers
- Probably, medical treatment & stentgraft technology will improve long-term outcome after TEVAR