Infective complications after TEVAR: Incidence and treatment options

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Disclosure

Speaker name:

Andrea Kahlberg

I have the following potential conflicts of interest to report:

- Consulting
- Employment in industry
- Stockholder of a healthcare company
- Owner of a healthcare company
- Other(s)

X I do not have any potential conflict of interest
Aortic SG infection: open problems

• Rare

• Unrecognized etiology

• Heterogeneity of reported series
  - Abdominal / Thoracic
  - With or without fistula
  - Semi-elective / Emergent
Risk factors for infection after TEVAR

- Performed NOT in OR
- TEVAR for pseudoaneurysm
- Emergency procedures
- Local or pulmonary complications
<table>
<thead>
<tr>
<th>Author, year</th>
<th>N.</th>
<th>Prosthesis</th>
<th>Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Svensson., ’93</td>
<td>15</td>
<td>Surg. graft</td>
<td>80%</td>
</tr>
<tr>
<td>Lawrie et al., ’94</td>
<td>11</td>
<td>Surg. graft</td>
<td>100%</td>
</tr>
<tr>
<td>Coselli et al, ’99</td>
<td>3</td>
<td>Surg. graft</td>
<td>67%</td>
</tr>
<tr>
<td>Kieffer et al. ’01</td>
<td>11</td>
<td>Surg. graft</td>
<td>30%</td>
</tr>
<tr>
<td>Heyer et al, ’09</td>
<td>5</td>
<td>Endograft</td>
<td>40%</td>
</tr>
<tr>
<td>Chiesa et al., ‘10</td>
<td>7</td>
<td>Endograft</td>
<td>71%</td>
</tr>
</tbody>
</table>
“EuReC 3” registry

- 2,387 TEVARs (17 centers)
- 36 AEFs after TEVAR (1.5%)
- Mortality at 1 year:
  - Conservative treatment 100%
  - Aggressive surgery 54%

Option 1
Conservative treatment
“Semi-conservative” approach?

Drainage

ABT irrigations
Option 2
Aggressive treatment
Aortic surgical replacement
Aortic surgical replacement

Stent-graft removal
Aortic surgical replacement

Aorto-esophageal fistula
Esophageal associated repair

Direct repair
(small esophageal lesion)
Aortic *in situ* surgical replacement

Aortic reconstruction (Silver-coated graft)

Intercostal muscle flap interposition
In case of large esophageal lesions...

Esophageal resection and gastric tubulization
Option 3
Endovascular strategy
Emergent TEVAR for AEF

- ♂, 57 years
- Previous distal DTA repair
- Hematemesis, shock

Peri-esophageal air bubbles

Aorto-esophageal fistula
Case report

TEVAR in emergency

life-saving

Air collection
Case report

Esophagogram shows esophageal leak (3 days after emergent TEVAR)
5 days after TEVAR...

Right thoracotomy

Intercostal muscle flap preparation
Esophageal repair
Intercostal muscle interposition
Follow-up

\[ ^{18}\text{F-FDG PET/CT} \]

at 3 years

(no abnormal tracer captation)
## Infection of thoracic aortic grafts

**OSR experience 1993 - 2016**

<table>
<thead>
<tr>
<th></th>
<th>N = 25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>N = 25</td>
</tr>
<tr>
<td>Infection of surgical graft</td>
<td>14 (56%)</td>
</tr>
<tr>
<td>Infection of endoprosthesis</td>
<td>11 (44%)</td>
</tr>
<tr>
<td>Associated esoph. / bronch. fistula</td>
<td>17 (68%)</td>
</tr>
<tr>
<td>Mean interval from index procedure</td>
<td>16 ± 19 months</td>
</tr>
</tbody>
</table>
# Infection of thoracic aortic grafts

## OSR experience 1993 - 2016

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Pts. (N = 25)</th>
<th>Mortality at 1 year</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Opt 1) Conservative</strong></td>
<td>2</td>
<td>100%</td>
</tr>
<tr>
<td><strong>Opt 2) Primary surgical conversion</strong> (+/- esophageal or bronch. repair)</td>
<td>15</td>
<td>33%</td>
</tr>
<tr>
<td><strong>Opt 3) Endovascular strategy</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Definitive (TEVAR alone)</td>
<td>2</td>
<td>100%</td>
</tr>
<tr>
<td>Followed by esoph. repair / muscle flap</td>
<td>6</td>
<td>16%</td>
</tr>
<tr>
<td>Study period</td>
<td>1998-2008</td>
<td></td>
</tr>
<tr>
<td>------------------------------------</td>
<td>-----------</td>
<td></td>
</tr>
<tr>
<td>Total TEVARs analyzed</td>
<td>1,113</td>
<td></td>
</tr>
<tr>
<td>Post-TEVAR infection</td>
<td>19 (1.7%)</td>
<td></td>
</tr>
<tr>
<td>Associated fistulae</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Aorto-esophageal</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>- Aorto-bronchial</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Chiesa R, Kahlberg A et al., Eur J Vasc Endovasc Surg 2010
### Results (Italian Registry)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Pts (N = 19)</th>
<th>30-day mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conservative treatment</td>
<td>8</td>
<td>100%</td>
</tr>
<tr>
<td>Surgical treatment</td>
<td>11</td>
<td>64%</td>
</tr>
<tr>
<td>Aortic surgical replacement</td>
<td>3</td>
<td>67%</td>
</tr>
<tr>
<td>Re-TEVAR</td>
<td>2</td>
<td>100%</td>
</tr>
<tr>
<td>Only esoph. / bronchial rep.</td>
<td>6</td>
<td>50%</td>
</tr>
</tbody>
</table>
Conclusions
TEVAR infection / fistulization

- Incidence not negligible
- Conservative treatment $\rightarrow$ poor survival
- Primary aggressive surgery: high early mortality
- TEVAR has a role in acute setting
- Always address the associated esophageal or bronchial lesions
Thank you!

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