Risk Factors For Retrograde Type A Dissections After TEVAR Procedures And How To Avoid Them and Treat Them

Dr. Frank R. Arko, III
Chief, Vascular and Endovascular Surgery
Professor, Cardiovascular Surgery
Co-Director, Aortic Institute
Sanger Heart and Vascular Institute, Atrium Health
Charlotte, NC

DISCLOSURES

• CONSULTANT FOR MEDTRONIC AND GORE

Experience at Atrium Health

Single Center Retrospective Study

Patients who underwent TEVAR to treat Type B Aortic Dissection

N=186

Comparison of patients who developed RTAD vs those who did not:

RTAD: n = 15 (8% incidence)

No-RTAD: n = 171

Results

Non-significant risk factors in this study:

Demographics
Comorbidities
Arch type
Type of graft used
Presence of proximal struts
Great vessel debranching
Stents placed in visceral or renal vessels

Aortic Diameter at Presentation

Risk: Ascending diameter ≥ 40mm (No other differences in measurements)

False Lumen Status at Presentation

Risk: partial or complete false lumen thrombosis at presentation
Proximal Landing Zone

Risk: Landing in the arch

<table>
<thead>
<tr>
<th>RTAD (n=15)</th>
<th>No-RTAD (n=171)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proximal Landing Zone 0, 1, or 2</td>
<td>14 (93.3)</td>
<td>109 (63.7)</td>
</tr>
<tr>
<td>Proximal Landing Zone 0.04</td>
<td>0.04</td>
<td>0.04</td>
</tr>
<tr>
<td>Zone 0</td>
<td>1 (6.7)</td>
<td>2 (1.2)</td>
</tr>
<tr>
<td>Zone 1</td>
<td>4 (26.7)</td>
<td>8 (4.68)</td>
</tr>
<tr>
<td>Zone 2</td>
<td>9 (60.0)</td>
<td>99 (57.9)</td>
</tr>
<tr>
<td>Zone 3</td>
<td>1 (6.7)</td>
<td>44 (25.7)</td>
</tr>
<tr>
<td>Zone 4</td>
<td>0 (0)</td>
<td>18 (9.4)</td>
</tr>
<tr>
<td>Zone 5</td>
<td>0 (0)</td>
<td>2 (1.2)</td>
</tr>
</tbody>
</table>

Time to RTAD after TEVAR

Kaplan Meier Estimate of Freedom from RTAD

- 30 days: 97% (SE, 1%)
- 1 year: 93% (SE, 2%)
- 3 years: 90% (SE, 3%)
- 5 years: 86% (SE, 4%)

Kaplan Meier Freedom from Aorta-related Mortality

Literature

Risk factors in the literature:
- Presence of IMH
- IMH in landing zone
- Dilated ascending >37
- Bicuspid valve
- Graft oversizing >10%

Case TBAD and TEVAR

85 year old male presented with TBAD
BP control and anti-impulse therapy
Left renal ischemia
Small amount of hematoma near LSA
Medical therapy with plans to re-evaluate

TEVAR

Re-imaged after 2 weeks:
- Increasing size
- Diminished flow to left kidney
- Narrowed SMA

TEVAR performed with 1:1 proximal sizing
- Valiant tip capture 36mm x 36mm x 150mm
- SMA covered

SMA and left renal arteries stented
- SMA: 10 x 40 self expanding
- Left renal: 5 x 12 racer, 7 x 18 racer
At 36 days s/p TEVAR, was doing well, though blood pressure was high (154/83). CTA demonstrated RTAD extending into ascending aorta and patient was evaluated for surgery. 5 days later, presented to the ED with tearing chest pain. Patient taken emergently to OR for surgery.

Case RTAD s/p ascending repair

- Ascending aortic replacement
- Hemiarch repair
- Right axillary artery chimney graft creation

Patient is now over 4 years s/p repair of RTAD, and is active and doing well with no further complaints.

Conclusions

- Known incidence of RTAD - 1.8-2.5% following TEVAR
- Known risk factors include: ascending aortic diameter, IMH, zone deployment, valve type, connective tissue disorder, graft oversizing
- High degree of suspicion and liberal imaging necessary for early diagnosis
- Continued aggressive medical management mandatory after TEVAR to reduce RTAD risk
- Multi-specialty team approach reduces risk and increases early identification capabilities

Thank You