A New Classification System For Type 1A Endoleaks After Ch/EVAR: How It Can Help To Determine The Best Secondary Procedure To Fix Them

David J Minion, MD, Konstantino Donas, MD, Giovanni Torsello, MD

Disclosures

• Consulting: Endologix, Cook

The Pericles Registry

• 517 patients from 13 centers.
• Mean Follow-up of 17 Months
  – 94% Primary Patency of 898 Chimney grafts
  – Mean Sac Regression = 4.4 mm
  – No aortic ruptures
  – Overall survival of 79%
• Type IA Endoleaks
  – Intra-operative = 7.9%
  – Late/Persistent = 2.9%

Proximal Failure in Parallel Grafts

Classification of Chimney EVAR-Related Endoleaks: Insights From the PERICLES Registry Collaborators

• Identified 3 Basic Patterns of Proximal Endoleaks
• Goals:
  – Provide Guidance for Treatment of Leaks
  – Establish Boundary Parameters for "IFU type" Recommendations for Parallel Endografts

Failure Pattern A

Observe vs Reinforcing Stent

Infolding from excessive oversizing
Failure Pattern B
Inadequate oversizing
Extend vs Obliterate Gutters

Failure Pattern C
Inadequate sealing length
Extend

Case Report

Contained Rupture

The Proximal Landing Zone

How does that help?

9.8 cm
9 mm
9 mm
Failure Pattern C
Inadequate Sealing Length

The Pericles Registry
- Type IA Endoleaks
  - Intra-operative = 7.9%
  - Late/Persistent = 2.9%
- Average Seal Length = 21 mm
  - Included 4.8 mm Infrarenal neck

Complex Sealing Interactions

The Proximal Landing Zone

Aneurysmal Seal Zone

Excluder IFU

<table>
<thead>
<tr>
<th>Device Diameter (mm)</th>
<th>Intended Aortic Diameters (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>23</td>
<td>19–21</td>
</tr>
<tr>
<td>26</td>
<td>22–23</td>
</tr>
<tr>
<td>28.5</td>
<td>24–26</td>
</tr>
<tr>
<td>31</td>
<td>27–29</td>
</tr>
<tr>
<td>35</td>
<td>30–32</td>
</tr>
</tbody>
</table>
Failure Pattern B

Inadequate Oversizing

Fuzzy Math?

6 mm + 35 mm = 41 mm

The Best Conditions for Parallel Stenting During EVAR: An In Vitro Study

- Recommended 30% oversizing as optimal choice to minimize gutters without excessive infolding
- But never completely obliterated gutters

Parallel Graft IFU?

<table>
<thead>
<tr>
<th>Device Diameter (mm)</th>
<th>30% Oversizing (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>23</td>
<td>17.7</td>
</tr>
<tr>
<td>26</td>
<td>20.0</td>
</tr>
<tr>
<td>28.5</td>
<td>21.9</td>
</tr>
<tr>
<td>31</td>
<td>23.8</td>
</tr>
<tr>
<td>35</td>
<td>26.9</td>
</tr>
</tbody>
</table>

The Pericles Registry

- Type IA Endoleaks
  - Intra-operative = 7.9%
  - Late/Persistent = 2.9%
- Average Seal Length = 21 mm
  - Included 4.8 mm Infrarenal neck
- Average Neck Diameter = 26.4 mm
- Single Most Predictive Factor for Type IA
  - Neck Diameter >30 mm (HR=4.86)

Failure Pattern B

Inadequate Oversizing

Failure Pattern C

Extend

Inadequate sealing length
The Real Proximal Landing Zone

Treatment?

30 mm

Endovascular Salvage of Gutter Leak

Summary

• Recognizing Failure Patterns Can Provide Insight into Appropriate Treatment of Gutter Leaks
  – Infolding: Observe vs Re-inforcing Stent
  – Inadequate Oversizing: Extend vs Obliterate Gutters
  – Inadequate Length: Extend
• Many Gutter Leaks Can Be Eliminated with More Realistic Case Planning
  – At least 20 mm of Overlap Zones.
  – More Overlap needed if no Infrarenal Neck
  – 30% Aortic Graft Oversizing for Round Snorkel