Bridging Stent Grafts in F/BEVAR: Long-term Durability & Need for Improvements?

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• Speaker fees
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  – W.L. Gore

• Consultant
  – Bentley InnoMed
The Ideal Bridging Stent in F/BEVAR?
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- Proximal Segment
  - Good flaring capability (for fens)
  - High radial force

Mendes BC, Oderich GS. Current techniques with Fenestrated, Branched and Parallel Stent-Grafts, Selection for optimal bridging stents for fenestrations and branches 359-374
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  - Flexible and kink-resistant (transition zone)

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  - Flexible and kink-resistant (transition zone)
- Resistant to Thrombosis/intimal hyperplasia

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Existing Bridging Stents in F/BEVAR

• Literature
• Nuremberg Experience
Existing Bridging Stents in F/BEVAR

- Literature
- Nuremberg Experience
Cleveland Clinic Experience

Durability of branches in branched and fenestrated endografts

Tara M. Mastracci, MD, Roy K. Greenberg, MD, Matthew J. Eagleton, MD, and Adrian V. Hernandez, PhD, Cleveland, Ohio

(J Vasc Surg 2013;57:926-33.)

- 650 pts with FEVAR/BEVAR
  - Mean F/U: 3 ± 2.3 years (range: 1-9 years)
- Reintervention for
  - CA: 0.6%, SMA: 4%, Renal arteries: 5.5%
- Branch related mortality: n=3 (0.46%)
  - All three due to mesenteric ischemia
Cleveland Clinic Experience

Durability of branches in branched and fenestrated endografts

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→ Branches of FEVAR/BEVAR are Durable and Rarely the Cause of Patient Death
Balloon- or Self-Expandable Stent?

- No Difference between BE & SE Stents

- Renal Branches fail more often than Visceral Branches
  - Smaller vessel diameter?
  - Material fatigue due to respiratory movements?
  - Kidney: High-resistance end organ?

Editor’s Choice — Effect of Branch Stent Choice on Branch-related Outcomes in Complex Aortic Repair


Eur J Vasc Endovasc Surg (2016) 51, 536–542
Performance of Bridging Stent Grafts in Fenestrated and Branched Aortic Endografting

G. Panuccio, T. Bisdas, B. Berekoven, G. Torsello, M. Austermann
Department of Vascular Surgery, St. Franziskus Hospital and University Clinic of Muenster, Muenster, Germany

- 2004-2014
  - 150 pts, 523 target vessels
- Patency: 85% at 3 years
- Freedom from reintervention: 91% at 3 years
• Branches:
  – ↑ reinterventions vs fenestrations
• 281 pts (Nuremberg, No Learning curve)

• Target vessels: N=667 (excluding scallops)
  – Advanta V12: N=665 (99.7%)
Estimated Target Vessel Patency

98.6 ± 0.5% at 1 year
98.1 ± 0.6% at 3 years

*Advanta V12 (99.7%)
## Reinterventions (N=15)

<table>
<thead>
<tr>
<th>Reintervention</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Target vessel relining/extension</strong></td>
<td>5</td>
</tr>
<tr>
<td>Coil embolization (Type II Endoleak)</td>
<td>3</td>
</tr>
<tr>
<td>Iliac PTA</td>
<td>1</td>
</tr>
<tr>
<td>Distal stent-graft extension (Type Ib Endoleak)</td>
<td>1</td>
</tr>
<tr>
<td>Groin drainage due to seroma infection</td>
<td>1</td>
</tr>
<tr>
<td>Cuff + Chimney + Endoanchors (Type III Endoleak)</td>
<td>1</td>
</tr>
<tr>
<td>Laparotomy for lumbar ligation (Type II Endoleak)</td>
<td>1</td>
</tr>
<tr>
<td>Conversion (Type Ib Endoleak)</td>
<td>1</td>
</tr>
<tr>
<td>Fem TEA</td>
<td>1</td>
</tr>
</tbody>
</table>
Branches’ Potential Problems

Mastracci et al. JVS 2013
Existing Bridging Stents in F/BEVAR

- Literature
- Nuremberg Experience
Nuremberg Experience
(Patients with FU in Nuremberg)

• TAAA: N= 211
  – Advanta V12: N=696 (83.7%)
• Pararenal: N= 299
  – Advanta V12: N= 689 (92.0%)
• IBD: N= 94 (122 IBDs)
  – Advanta V12: N=104 (85.2%)

Total N: 1703 (87.4% Advanta V12)
Target Vessel Patency 
(N=1703)

98.6 ± 0.3% at 1 year
95.7 ± 0.9% at 5 years
Target Vessel Patency
(N=1703)

- Fenestrations
  - 99.5 ± 0.2% at 1 year
  - 98.7 ± 0.6% at 5 years

- Branches
  - 96.4 ± 1.0% at 1 year
  - 89.0 ± 2.4% at 5 years

P<0.001*
Target Vessel Patency
(N=1581, IBDs excluded)

- Renal Arteries
  - 95.6 ± 1.1% at 5 years

- SMA*
  - 99.1 ± 0.9% at 5 years

- CT
  - 96.4 ± 2.0% at 5 years

P=0.04*
Freedom from Reintervention
(N=1703)

98.3 ± 0.4% at 1 year
95.7 ± 0.8% at 5 years
Conclusions

• Bridging stent-grafts in FEVAR/BEVAR
  – Perform generally well
    • Relatively low event rates
  – Still the most common reason for reintervention...
    • Room for improvement...
Desired Improvements

- A more F/BEVAR dedicated stent

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Desired Improvements

- Smoother distal transition...
Desired Improvements

- Tapered Bridging stent-grafts

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Desired Improvements

- Options for **early bifurcation** of target vessel

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Desired Improvements

• Options for multiple small target vessels
Desired Improvements

• More evidence on antiplatelets/anticoagulation?
Better is the enemy of good.

Voltaire