Technical Tips for Endograft Repair of AAA

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Disclosures

• Consultant: Spectranetics
• Advisory Board: Cordis, BSC, Medtronic, eV3, Edwards Lifesciences, Angioslide, Angioscore, Biocardia, SquareOne, NexGen, ReVascular, Novostent
• Equity Interest: AccessClosure
Device Selection

Are there significant differences?
FDA-approved Devices

- AnCure: ’99 – ’03
  - Off the market at this time
  - Perioperative complications
- AneuRx: ’99
- Excluder: ’02
- Zenith: ’03
- Powerlink: ’04
AneuRx
AAAdvantage
Stent Graft System
AneuRx AAAAdvantage Stent Graft System

Advantages
- Easy and accurate deployment
- Modular design can be customized to varying anatomy
- Long track record

Disadvantages
- No proximal fixation
- Increased risk of late migration
- Cannot treat larger neck diameters
- Increased risk of late graft failure?
Gore Excluder® Endoprosthesis
Gore Excluder Device

- **Advantages**
  - Flexible, easy to deliver
  - Low profile
  - Proximal fixation

- **Disadvantages**
  - Reduced rate of aneurysm shrinkage (problem solved with low porosity graft material)
  - Cannot treat larger aortic neck diameters
Cook Zenith Endograft

- Modular bifurcated design
- Long suprarenal attachment
- Proximal attachment hooks
- 16Fr and 18Fr delivery catheters
Cook Zenith Endograft

• Advantages
  – More secure fixation – less risk of late stent graft migration
  – Able to treat larger aortic neck diameters
• Disadvantages
  – More complex delivery mechanism
  – Suprarenal fixation mandatory – may be undesirable in some cases
Powerlink System® (ENDOLOGIX)

- Bifurcated unibody system.
- Single wire Cobalt chromium stent.
- ePTFE covered, sutured only at the ends.
- Neck diameters 25 & 28 mm.
- Lengths 135, 140 & 155 mm.
- Limbs 16 mm diameter.
Endologix Powerlink Endograft

• Advantages
  – Unibody construction – no risk of Type III endoleak
  – Long aortic body – longer attachment zone and potential to buttress against aortic bifurcation

• Disadvantages
  – Limited aortic and iliac diameters
  – No proximal fixation
## FDA-Approved Endografts for AAAs

<table>
<thead>
<tr>
<th></th>
<th>AneuRx</th>
<th>Excluder</th>
<th>Zenith</th>
<th>Powerlink</th>
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<tbody>
<tr>
<td>Metal</td>
<td>Nitinol</td>
<td>Nitinol</td>
<td>Stainless Steel</td>
<td>Cobalt-Chromium</td>
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<td>MRI Compatible</td>
<td>YES</td>
<td>YES</td>
<td>NO</td>
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<td>Graft Material</td>
<td>PET</td>
<td>ePTFE</td>
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<td>Infrarenal</td>
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<td>Anchoring Barbs</td>
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<tr>
<td>Modular</td>
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<td>YES</td>
<td>YES</td>
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<td>Fully Supported</td>
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<tr>
<td>Aortic Diameters</td>
<td>20-28 mm (17-25 mm)</td>
<td>23-28.5 mm (18-26 mm)</td>
<td>22-36 mm (18-32 mm)</td>
<td>25 &amp; 28mm (18-26 mm)</td>
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<tr>
<td>Delivery Diameters</td>
<td>21.4 F OD</td>
<td>21.7 F OD</td>
<td>22-26 F OD</td>
<td>21 F OD</td>
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<td>Iliac limb Diameters</td>
<td>12-24 mm 16-19 F OD</td>
<td>10-20 mm 14-19 F OD</td>
<td>8-24 mm 17-19 F OD</td>
<td>16-20 mm 11-17 F OD</td>
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</table>
Case Selection
Aneurysm Morphology

Ilio-iliac Axis $\delta < 90^\circ$

Angulation Proximal Neck $\beta > 60^\circ$
Case Example

- 75 year old female
- 6 cm AAA
- Small, calcified iliofemoral vessels
- EVAR performed with Zenith endograft
- Following removal of sheath, hypotension occurs and angiography reveals extravasation from right external iliac artery
Endovascular Stent-Grafting Technique

**Critical Dimensions:**

- Diameter and length of proximal neck
- Diameter of the common iliac arteries (attachment site)
- Diameter of external iliac and common femoral arteries (for device passage)
- Length from renal arteries to aortic bifurcation and iliac bifurcation (device selection)
Endovascular Procedure

- Cath Lab or OR Suite (Fluoroscopy)
- General, Epidural, or Local Anesthesia
- Bilateral Small Groin Incisions vs. Preclose technique
- Bifurcated Graft
- Discharge on post op day one or two
Endoluminal Stent-Grafts

- 88 year old male
- History of COPD and pacemaker
- High surgical risk
- 6.5 cm AAA
Accessory Tools for EVAR

- Large Palmaz Stent
- Balloon for molding
Accessory Tools for EVAR
Other Equipment

Snares

Coils
Amplatz Super Stiff™ Guidewires (BSC)

- Maximum stiffness
- Soft, atraumatic tip
- Teflon coating
- Different tip lengths and configurations
.035” Guidewires – Extra Support

- **LUNDERQUIST** (Cook)
  - Stainless steel mandril tip
  - Maximum rigidity
  - Shapeable distal tip
  - 145 and 260 cm lengths

- **ROSEN WIRE** (Cook)
  - Heavy Duty wire with 2 cm flexible tip
  - Atraumatic tip
IVUS During EVAR

iLab System

Atlantis PV Catheter
Role of IVUS during EVAR

**During Device Deployment**

- Document position *within graft* during deployment of contralateral limb
- Evaluation adequacy of proximal and distal seal
- Evaluate expansion of iliac limbs of graft
- Rule out dissection in iliac arteries distal to graft
Conclusions

• Patient selection is the most important factor
• Knowledge about the devices and their differences is key
• You must have a full inventory of guidewires, catheters and bailout equipment
• Many cases can be performed percutaneously with the Preclose technique