Two-Year Evaluation of Fenestrated and Parallel Branch Endografts for the Treatment of Juxtrarenal, Suprarenal and Thoracoabdominal Aneurysms at a Single Institution

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Disclosure

WL Gore – Consultant
Bolton Medical – SAB
Cook IDE for Fenestrated and Branch Grafts – no Financial benefit
Spectranetics – SAB
Abbott Medical – Speakers Panel
Introduction

• Endovascular management of juxtarenal (JRA), suprarenal (SRA), and thoracoabominal aortic aneurysms (TAAA) remains challenging especially in acute cases

• Fenestrated endovascular aortic aneurysm repair (fEVAR) has gained popularity to treat JRA.

• Zenith fenestrated AAA endovascular graft (Cook Medical, Bloomington, Ind) is now commercially available in the US. P-Branch OTS(Off the Shelf) undergoing clinical trials.
Introduction

• Other investigational thoracic branched endografts to treat SRA and TAAA are limited to physician-sponsored Investigational Device Exemption and custom manufacturing times

• Thus, other endovascular techniques such as parallel branch endografts (pEVAR) have been utilized

• Various configurations reported: snorkel, chimney, periscopes, sandwich, etc.

• The endograft patency, gutter endoleak and re-intervention rates remain a concern
Objectives

• To assess the outcome of fEVAR and pEVAR in endovascular management of JRA, SRA, and TAAA at a single institution

• To evaluate mortality, morbidity, graft patency and re-intervention rates for fEVAR and pEVAR for the repair of complex aortic aneurysms
Methods

• This is a retrospective review of prospectively collected database

• Inclusion criteria:
  – All consecutive patients with JRA, SRA, or TAAA who underwent endovascular repair from August 2014 to March 2017 at our institution

• Exclusion criteria:
  – Aortic rupture
Methods II

- Type of repair was a single surgeon decision based on anatomy and urgency of repair

- Patient demographics, hospital course, and follow up visits were analyzed

- Outcome measures analyzed:
  - Perioperative mortality
  - Graft patency
  - Re-intervention rates
  - Survival
Fenestrated Endograft Technique

- Hybrid Suit, Siemens Artis Zeego
- Standard Cook Zfen Endograft
- Local or General Anesthesia
- Percutaneous femoral access
- Renal artery balloon expandable endografts (iCast, VBX)
- Selective SMA self expanding bare metal stent
Parallel Endograft Technique

- **Parallel Endografts**
  - Visceral and renal antegrade access via subcalvian/axillary cut-down
  - 20-30% over sizing
  - Self expanding (Viabahn) or balloon expandable (iCast, VBX) endografts
  - Snorkel-Sandwich technique if more than 2 parallel grafts needed
  - Long stent graft configuration to increase opposition
  - Staged procedure if long coverage needed with spinal drain
117 complex endovascular aortic repairs were performed
100% technical success rate

Demographics

- pEVAR
  - 38 patients
  - celiac: 21
  - SMA: 28
  - renal: 58

- fEVAR
  - 32 patients
  - celiac: 2
  - SMA: 30
  - renal: 62
## Demographics

<table>
<thead>
<tr>
<th>Groups</th>
<th>fEVAR</th>
<th>pEVAR</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (Years)</td>
<td>75.1 ± 8</td>
<td>76.5 ± 12</td>
<td>0.5</td>
</tr>
<tr>
<td>Female (%)</td>
<td>28%</td>
<td>39.5%</td>
<td>0.4</td>
</tr>
<tr>
<td>Aortic size (cm)</td>
<td>6.44</td>
<td>6.36</td>
<td>0.9</td>
</tr>
</tbody>
</table>

No difference between two groups
Comorbidities
Freedom from Aortic Mortality

Median follow-up was 12 months (1 – 32 month range).
Overall Survival

78%

P=0.7
Endograft Thrombosis

P = 0.5

fEVAR: 3.2% (3/94)
pEVAR: 1.8% (2/109)
Reinterventions

- **fEVAR group**
  - 2 renal stent occlusions
  - 1 colonic ischemia
  - 1 iliac limb occlusion
  - 1 perinephric hematoma

- **pEVAR endografts**
  - 3 endoleaks
  - 2 renal thrombosis
  - 1 celiac thrombosis
  - 1 renal stent kink
  - 1 gutter leak embolization
Reintervention Free Survival

- 74% fEVAR
- 58% pEVAR
- P=0.6
## Univariate Analysis of Reintervention

<table>
<thead>
<tr>
<th>Groups</th>
<th>Odd Ratio (OR)</th>
<th>95% Confidence interval (CI)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parallel Endograft</td>
<td>0.7</td>
<td>0.2 - 2.3</td>
<td>0.56</td>
</tr>
<tr>
<td>Age</td>
<td>1.03</td>
<td>0.2 - 1.6</td>
<td>0.35</td>
</tr>
<tr>
<td>Male</td>
<td>0.8</td>
<td>0.2 - 2.8</td>
<td>0.7</td>
</tr>
<tr>
<td>Aortic size</td>
<td>1.005</td>
<td>0.8 - 1.3</td>
<td>0.9</td>
</tr>
<tr>
<td>Number of endografts</td>
<td>1.11</td>
<td>0.7 - 1.8</td>
<td>0.65</td>
</tr>
</tbody>
</table>
Perioperative Complications

fEVAR

- 1 bowel ischemia
- 1 ischemic LLE (CFA endarterectomy)
- 1 iliac limb occlusion
- 1 perinephric hematoma,

pEVAR

- 1 bowel ischemia
- 1 wound infection
- 1 brachial hematoma
- 1 MI
- 1 transient paralysis

p < 0.05
Conclusions

• pEVAR and fEVAR have acceptable perioperative mortality in treating JRA, SRA, TAAA

• Parallel branch endografts have acceptable patency rates with low rates of reinterventions

• Snorkel-sandwich technique appears a viable option if 4 vessel off-the-shelf reconstruction is needed

• Staged procedure is critical when long segment of aorta is treated such as type II/III TAAA
Thank you

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