Physician-modified endografts (PMEG) for endovascular treatment of hostile AAA

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Disclosure

Speaker name:

I have the following potential conflicts of interest to report:

☐ Consulting
☐ Employment in industry
☐ Stockholder of a healthcare company
☐ Owner of a healthcare company
☐ Other(s)

☑️ I do not have any potential conflict of interest
Introduction

- 30-40% of AAA have unsuitable anatomy for conventional EVAR
  - Challenging proximal neck anatomy most common
  - Not all patients are fit enough for open repair
- Complex endovascular strategies are increasingly being used to treat AAA with hostile anatomy
  - FEVAR is now widely accepted to extend proximal landing zone to “healthy aorta”
- PMEG can be an alternative treatment modality in “device-poor countries” where FEVAR/IBD are not available, or in urgent cases
- PMEG definition: Making modifications to conventional endografts to treat hostile AA not amenable for routine EVAR/TEVAR procedures
Pararenal AAA, TAAA

23 articles (15 PMEG, 8 OSFG), 2001-2015, 308 patients

936 target visceral arteries

MAE: 12.8% PMEG, 7.4% OSFG

Treatment success: 91.4% PMEG, 95% OSFG

Branch vessel patency: 96.7% PMEG, 97.9% OSFG (@ 12 months)

Mortality: 3.2% PMEG (1.1% aneurysm-related)

**Conclusion:** OFSG and PMEG seems effective and safe in both elective and acute settings for treatment of complex aortic aneurysms
Back-table modification

- Unsheathing (partial/complete)
- Fabric disruption (ophthalmic bovie)
- Fen reinforcement (snare/GW tip)
- Ant/post markers (GW tip, pigtail gold markers)
- Suprarenal fixation removal (optional)
- Diameter reducing ties (optional)
- Wire preloading (optional)
- Resheathing

Small fen
- 6 (W) x 6-8 (H) mm
Large fen
- 8-12 (W) x 8-12 (H) mm
Scallop
- 10 (W) x 6-12 (H) mm
Preoperative planning

Planning is essential!
Planning considerations

- Number of fens, scallops needed (to achieve sufficient proximal landing zone)
- Small fen, large fen, super large fen
- Distance of fens from proximal graft edge
- Direction of visceral arteries (relative to 12 o’clock position): \( \theta/360 = d/2\pi r \)
- Tortuosity issues
PMEG vs FEVAR

Photo courtesy by Dr. Sukgu Han
SNUBH experience

- Total 19 cases
- Feb 2016 – March 2019
- G/A
- Fenestrated: 12 cases
  - Short neck: 10
  - Suprarenal AAA: 1
  - Type la endoleak: 1
- IBD 7 cases
  - AAA + CIAA (+IIAA): 3
  - CIAA: 2
  - IIAA: 1
  - Short CIA: 1

<table>
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<tr>
<th>Parameters</th>
<th>N=19</th>
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<tr>
<td>Mean age (yrs)</td>
<td>74.3 ± 8.4</td>
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<tr>
<td>Sex (M:F)</td>
<td>18:1</td>
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<tr>
<td>Hypertension</td>
<td>12 (63%)</td>
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<tr>
<td>Diabetes</td>
<td>5 (26%)</td>
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<td>CAD</td>
<td>3 (16%)</td>
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<td>Stroke/hemorrhage</td>
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<td>Smoking</td>
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<td>BMI</td>
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<td>Median ASA classification</td>
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Mycotic: 2 cases
Ruptured: 4 cases
SNUBH experience

- Technical success: 17/19 (89.5%)
  - Failed renal artery cannulation: 2 cases
- 30-day mortality: 0
- Late mortality
  - Aneurysm-related: 0
  - All-cause: 2 cases (cancer, pneumonia)
- Mean f/u: 18.4 ± 11.5 months
SNUBH experience

- Reintervention: 2 cases
  - 1 early open conversion: @ POD 1 d/t technical failure (failure of fen cannulation in rupture case)
  - 1 late open conversion: @ 1-yr d/t recurred type Ia endoleak
- Endoleak
  - Ia: 2 cases
  - II: 2 cases
- Branch occlusion: 1/22 (IBD, antiplatelets self-stopped)
- 1-yr, 3-yr TBV patency: 93.3%, 93.3%
Summary

- PMEG can solve the unmet needs when commercial FEVAR/IBD are unavailable or in emergent cases
- Should be considered in high risk patients unfit for open repair
- Technical success is high, but requires meticulous planning and experience
- Feasible and safe, although long term durability is still to be determined
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