Extra-anatomic visceral-renal artery debranching

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Acknowledgements

• Medtronic

• Cook

• Nuros
<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
<th>n=</th>
<th>Mortality</th>
<th>Paraplegia</th>
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</thead>
<tbody>
<tr>
<td>Svensson</td>
<td>1993</td>
<td>1509</td>
<td>8.0%</td>
<td>16%</td>
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<tr>
<td>Safi</td>
<td>2003</td>
<td>1004</td>
<td>13.8%</td>
<td>2.4-6.8%</td>
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Vascular Unit
St Marys Campus
Imperial branch & fenestrate practice

Hansen ‘Sensei’ robotic endovascular system
Endovascular management of thoraco-abdominal aneurysms

Hybrid Surgery

Open surgical approach
Visceral Debranching
SMA ANASTOMOSIS
COELIAC ANASTOMOSIS

Completed Visceral and Renal Revascularization

6mm End-to-End grafts to renal arteries

10mm access graft

SMA

Coeliac axis
Origin of Visceral Revascularisation

Visceral hybrid from distal aorta

From right iliac artery

Vascular Unit
St Marys Campus

Division of Circulation Science
TAAA No previous surgery

Type I

Type II
67 TAAA Visceral Hybrid Patients
(elective: 47; urgent: 15; emergency: 5)

<table>
<thead>
<tr>
<th>Class</th>
<th>Number of Patients</th>
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<tbody>
<tr>
<td>I</td>
<td>7</td>
</tr>
<tr>
<td>II</td>
<td>32</td>
</tr>
<tr>
<td>III</td>
<td>23</td>
</tr>
<tr>
<td>IV</td>
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Unclassifiable = 4
Indications & Comorbidity

Age: median 76, range 26-81
Mean TAAA diameter 6.4 cm

- Dissection: 17
- Ulcer/Intra-mural haematoma: 4
- Marfans: 8
- Mean ASA score 3.3
  - Severe COPD: 15
    *(FEV1 < 60% of predicted)*
  - Chronic renal impairment: 7
    *(not requiring dialysis)*
Visceral Hybrid Operation

- **3/67 procedures: Operation abandoned**
  - Bradycardia x2 & low inflow
  - One successful second attempt

- **Duration:** 7.1h (4.5h-13h)

- **Blood loss:** 3.9 l (1.2-13l)

- **Ischaemia time:**
  - SMA and Coeliac: 15 min (13-27 min)
  - Renal arteries: 15 min (13-21 min)
Results: Mortality - In Hospital

30 day mortality: 13/64
- Elective: 6/47 (12.7%)
  - Trash embolisation
  - Pneumonia + MI
  - PE
  - MOF
- Urgent: 4/15 (26%)
- Emergency: 3/5 (60%)

30-day Elective & Urgent 10/52 (16.1%)

- ASA 3+
- 50% Females
- Extensive, large diameter aneurysms
Results: CV Morbidity & Resource use

- **Paraplegia**: 6/64 (9.3%)
- **Temporary neurology**: 3/64 (4.6%)
- **Stroke**: 3/64 (4.6%)
- **Median ITU stay**: 4 days (1-40 days)
- **Hospital stay**: 26 days (14-92 days)
Outcome and experience

Percentage

30 40 50 60 70 80 90 100

Number of cases

0 10 20 30 40 50 60 70

Mortality
Paraplegia

Vascular Unit
St Marys Campus
Results: Endoleaks

**Type I endoleak:** 9
- Proximal: 7
  - Extension of stent 6
  - Conservative 1
- Distal: 2
  - Embolisation 1
  - Conservative 1

**Type II endoleak:** 7
- Observe – 4
- Surgery- 3

**Type III endoleak:** 3
- Late rupture before intervention 1
- Stenting 2
Debranching for TAAA

Advantages
• Any anatomy, now
• No thoracotomy
• No bypass
• No supra-coeliac clamp
• No visceral ischaemia

May reduce surgical insult

Disadvantages
• Major abdominal surgery
• Spinal cord
• Landing zones
• Endoleaks / Stent failures
• Graft patency

Morbidity & mortality

Technology of branched stents