Endografts With Parallel Grafts (Chimneys Or Periscopes) To The Renovisceral Arteries Are The Best Treatment For Juxta- Or Pararenal AAAs: Tips And Tricks For Doing Them Right

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Nothing to disclose

RATIONALE FOR NEW TREATMENT OPTIONS FOR COMPLEX AORTIC ANEURYSMS

The outcome in the United States after thoracoabdominal aortic aneurysm repair, renal artery bypass, and visceral revascularization

Mortality

20%

Complications

62%

AAA – ENDOVASCULAR TREATMENT OPTIONS

FENESTRATED DEVICE

BRANCHED DEVICE

OTHER TREATMENT OPTIONS FOR COMPLEX AORTIC ANEURYSMS: PARALLEL GRAFTS
A. From remote access route to the target arteries
B. Deployment of chimney/periscope grafts
C. Deployment of aortic stent-graft to exclude the aneurysm and maintaining the blood flow into the reno-visceral arteries

**EVAR (CHIMPS) Procedure for PAAA**

**EVAR (CHIMPS) Procedure for PAAA**

**TYPE OF CHIMNEY GRAFT IN UHZ**
**SELF EXPANDABLE COVERED GRAFT**
**(VIABAHN®)**

- Low Profile
- Anti-thrombotic coating
- Flexible
- Wide range of diameter
- One millimeter oversizing

**WHY SELF EXPANDABLE COVERED SG**
**(VIABAHN®)**?

* A New Sutureless Telescopig Anastomotic Technique for Major Aortic Branch Revascularization With Minimal Dissection and Ischemia

**SIZEING OF CHIMNEY-PERISCOPE**
**GRAFT: IN GENERAL 1MM OVERSIZING**

<table>
<thead>
<tr>
<th>Viabahn (mm)</th>
<th>Target vessel</th>
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<tbody>
<tr>
<td>2mm</td>
<td>4.0mm - 4.7mm</td>
</tr>
<tr>
<td>6mm</td>
<td>4.8mm - 5.5mm</td>
</tr>
<tr>
<td>7mm</td>
<td>5.6mm - 6.9mm</td>
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<tr>
<td>8mm</td>
<td>6.6mm - 7.9mm</td>
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**SIZING AORTIC SG**
**MEDTRONIC GORE JOTEC COOK**

**MAD + 1/2 PG diameter**

24mm + 1/2 (7mm+6mm) = 30.5mm

**MAD**: >70y = Mean Aortic Diameter
<70y = MAD+10%
1. Diseased Aortic arch and branches

Limitations

1. Diseased Aortic arch and branches
2. Limitation: diameter < 3.8mm

3. Limitation: Short stem of the artery

4. Limitation(relative): severe/diffuse disease

5. Limitation: Ruptured PRAA requiring endoclamping
UNIVERSITY HOSPITAL ZURICH EXPERIENCE

8-year experience (bailouts excluded)

100 patients treated with parallel grafts during the period Jan 2008 –2015

Mean FU @ January 2015 of 29.0 (r: 0-56; SD: 17) months:
- 59 patients with FU > 2 years
- 30 patients with FU > 3 years
- 16 patients with FU > 4 years

Patients: Procedure Type

<table>
<thead>
<tr>
<th>Procedure Type</th>
<th>Elective</th>
<th>Non-Elective</th>
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<tbody>
<tr>
<td>Diaphragm</td>
<td>25</td>
<td>23</td>
</tr>
<tr>
<td>Kidney</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Renal artery</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Open surgery</td>
<td>1</td>
<td>1</td>
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</tbody>
</table>

USZ EXPERIENCE: RESULTS

- Immediate Technical Success Rate: 99%
  - Unable to address 2 renal arteries

- 30-day mortality rate: 2%
  - Elective: 1.4% (1/73)
  - Nonelective: 4% (1/27)

100 CHIMPS PATIENTS

Aortic aneurysm type 100

- Pararenal: 69
- Juxtarenal: 44
- Suprarenal: 25
- Thoracoabdominal: 31
  - Crawford I: 7
  - Crawford II: 4
  - Crawford III: 3
  - Crawford IV: 9
- Arch to Visceral: 8

21 x 1 PG
47 x 2 PG
19 x 3 PG
13 x 4 PG

224 vessels (mean 2.2; SD 0.9)
- Chimney graft: 135
- Perscope graft: 89

USZ EXPERIENCE: RESULTS

Survival

- Survival Function
- Overall
- 75% @ 4 years
USZ EXPERIENCE: RESULTS

Failures

- Intraoperative/30-day/Follow-up
- Aortic branch
  Connection/patency
- Aortic aneurysm
  sealing

Branch issues - intraoperative

- Missed connection (2)
  - Branch cannulation: 2
  - Slipped out (6)
    - Reintroduced: 3
    - Lost and parked: 3

- Branch occlusion (0)

Branch issues @ FUP

- Failed connection
  - Slipped out: 0

- Branch occlusion (7)
  - Lysis/stenting (3)
    - Successful: 1
    - Untreated (4)
Endoleaks (33%)

Primary Endoleak I/III (n=21)
- Treatment during initial hospitalisation: 4
- Treated during secondary hospitalisation: 7
- Observance: 10

Primary Endoleak I/III (n=21)
- Treatment (11)
  - Redo stentgrafting/PG (6)
    - Successful: 5
  - Coil/Onyx embolisation (5)
    - Successful: 4

Management of ELs

Aneurysm sac behavior

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<tbody>
<tr>
<td>MAD preop</td>
<td>72 (SD:23 mm)</td>
</tr>
<tr>
<td>MAD @ FU</td>
<td>62 (SD: 22mm) p&lt;.001</td>
</tr>
</tbody>
</table>

- Decrease 79
- Increase 5
- No changes 16

Conclusions (1)

There is no „magic formula“ for parallel grafts than only:
1. Take time for intensive planning
2. Technique needs to be standardized
3. Be aware of failure and necessity for secondary intervention
4. Respect limitations
5. More investigations for indications
Conclusions (2)

• CP-EVAR seems to be valuable option to treat PRAA and TAAA
  – Best results are achieved in elective patients where ≤ 2 chimney or periscope grafts are used to preserve perfusion of vessel(s) >4mm diameter

Conclusions (3)

• More experience and comparative studies are required to demonstrate real value of CP-EVAR, especially in regard to FEVAR and/or conventional open repair