Parallel graft techniques for the iliac landing zone

Armando C Lobato, MD, PhD

São Paulo Vascular & Endovascular Institute (ICVE-SP), São Paulo, Brazil
✓ Nothing to Disclose
Background

- Despite the improvement in endovascular techniques, one aspect of aneurysmal disease that continues to be challenging is the management of HA aneurysms.
- Up to 30% of patients with AAA due to concomitant iliac artery aneurysmal disease are unfit for standard EVAR.
- Sacrificing the hypogastric artery for effective treatment is not without sequelae, which may include buttocks claudication, colonic ischemia, spinal cord ischemia, as well as buttock and scrotal necrosis.
Clinical impact of hypogastric artery occlusion in endovascular aneurysm repair.
Kalteis M¹, Gangi G², Huber F³, Adelsgruber P², Kastner M⁴, Lugmayr H⁴.

- Of 106 endovascular aneurysm repair patients treated at the vascular unit from 2001 to 2010, 24 had undergone additional hypogastric artery embolization.
- Hypogastric artery embolization resulted in late rupture (1.2% vs. 12.5%; \( p = 0.036 \)), buttock claudication (8.6% vs. 43.8%; \( p = 0.001 \)) and new onset erectile dysfunction (17.3% vs. 42.9%; \( p = 0.043 \)).
A total of 71 patients required 75 IOHA procedures.

The technical success rate was 100%.

Two patients (2.8%) experienced fatal acute pelvic ischemic complications in the postoperative period after EVAR.

Another patient died of iliac rupture during EVAR, leading to an operative mortality rate of 4.3%.

Eighteen patients (25.3%) suffered BC, among whom 11 cases resolved at a median follow-up of 42 months.
Background

Endovascular aneurysm repair of aortoiliac aneurysms with an iliac side-branched stent graft: studying the morphological applicability of the Cook device.
Gray D, Shahverdyan R, Jakobs C, Brunkwall J, Gawenda M.

RESULTS: In 66 patients, 88 targeted iliac aneurysms were studied. Of these, 36/88 (40.9%) were compliant with the manufacturer's IFU, 35/88 (39.8%) were compliant with the published criteria, and 51/88 (58.0%) were compliant with the in-house protocol. The most common morphological exclusion criterion was an aneurysmal IIA.

• 40.9% were compliant with IFU
• 39.8% were compliant with published criteria
• 58.0% were compliant with institutional protocol
• The most common morphological exclusion criterion was an aneurysmal IIA

CONCLUSION: In the present cohort with aorto-iliac aneurysm, a maximum of 58% could have been treated with an iliac side branch based on the current experience. In particular, an aneurysmal IIA seems to be a limiting factor for the use of the iliac side-branched stent graft.
Only 35% of the aneurysm repairs involving common iliac arteries would have been candidates for the 2 iliac branch devices currently in trial based on anatomic criteria.

The major common reason for exclusion is the internal iliac landing zone for both devices.

Design modifications for future generation iliac branch technology should focus on diameter accommodations for the hypogastric branch stent and proximal and distal sizes of the iliac branch components.

Familiarity with alternate branch preserving techniques is still needed in the majority of cases.
Endovascular Treatment of Complex Aortic Aneurysms Using the Sandwich Technique

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São Paulo Vascular & Endovascular Institute (ICVE-SP), São Paulo, Brazil.

TABLE 2
Preoperative Aneurysm Anatomical Features

<table>
<thead>
<tr>
<th></th>
<th>AcA (n=3)</th>
<th>TAAA (n=15)</th>
<th>AIA (n=52)</th>
<th>AAA w/CIA (n=2)</th>
<th>Isolated IAA (n=6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symptomatic</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Aneurysm diameter, mm</td>
<td>78±6.5</td>
<td>69±5.2</td>
<td>55±7.2</td>
<td>61±1.8</td>
<td>39±8.5</td>
</tr>
<tr>
<td>Aneurysm type</td>
<td>2 fusiform, 1 sacular</td>
<td>15 fusiform, (I: 4, II: 2, III: 3, IV: 6)</td>
<td>52 fusiform,</td>
<td>2 fusiform, (1 anastomotic)</td>
<td></td>
</tr>
<tr>
<td>CIA</td>
<td>3/15</td>
<td>1/20</td>
<td>4*</td>
<td>3/3</td>
<td></td>
</tr>
<tr>
<td>Acute aneurysm</td>
<td>2 expanding, 1 contained ruptures</td>
<td>2 contained ruptures</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AEF</td>
<td>1</td>
<td>0</td>
<td>1 AAD</td>
<td>1 AAA</td>
<td></td>
</tr>
<tr>
<td>Previous open aortic surgery</td>
<td>1 JRAIA, 1 AAD</td>
<td>1 AAD</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concomitant TAAA</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urgent setting</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unfit for open repair</td>
<td>3</td>
<td>8</td>
<td>7/2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Unfit for branched devices</td>
<td>3</td>
<td>4</td>
<td>33</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

Continuous data are presented as the means ± standard deviation; categorical data are given as the counts (percentage).


* Mean 29±1.2 mm.
Sandwich Technique Strategies
Sandwich Technique Strategies
Sandwich Technique Strategies

Viabahn

Iliac Limb
Sandwich Technique Strategies

Viabahn
Iliac Limb
Sandwich Technique Strategies

Iliac Limb

Latex Balloon

Viabahn
Sandwich Technique Strategies

Iliac Limb

Viabahn
## Methods

### Inclusion Criteria

<table>
<thead>
<tr>
<th>Vessel Attribute</th>
<th>Sandwich Technique</th>
<th>IBD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Common iliac artery</strong></td>
<td>&gt; 8</td>
<td>&gt; 16</td>
</tr>
<tr>
<td>• Patent lumen (mm)</td>
<td>&gt; 20</td>
<td>&gt; 50</td>
</tr>
<tr>
<td>• Length (mm)</td>
<td>&gt; 24</td>
<td>&gt; 24</td>
</tr>
<tr>
<td>• Diameter (mm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>External iliac artery</strong></td>
<td>&gt; 20</td>
<td>&gt; 20mm</td>
</tr>
<tr>
<td>• Length (mm)</td>
<td>&lt; 25</td>
<td>8-11mm</td>
</tr>
<tr>
<td>• Diameter (mm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hypogastric artery aneurysm</strong></td>
<td>No distal neck</td>
<td>-</td>
</tr>
<tr>
<td>• Length (mm)</td>
<td>&gt; 4 (gluteal artery)</td>
<td></td>
</tr>
<tr>
<td>• Distal landing zone (mm)</td>
<td></td>
<td>-</td>
</tr>
</tbody>
</table>

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April 05-08, 2017
Sheraton São Paulo WTC Hotel,
São Paulo, Brazil
www.cice.com.br
Methods

Complex Hypogastric Artery Aneurysm

✓ From Jan 2000 to December 2016, 43 patients with asymptomatic HAA (mean Ø: 25 mm) associated with AAA and/or CIAA underwent elective EVAR at our Institution.

✓ A total of 49 HAA were treated using the Sandwich technique.
# Results

## Complex Hypogastric Artery Aneurysm

<table>
<thead>
<tr>
<th>Metric</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median Follow-up (months)</td>
<td>18</td>
</tr>
<tr>
<td>Technical Success Rate</td>
<td>95.6</td>
</tr>
<tr>
<td>Early Related Mortality Rate</td>
<td>0</td>
</tr>
<tr>
<td>Related Mortality Rate</td>
<td>2.3</td>
</tr>
<tr>
<td>Postoperative Aneurysm Rupture Rate</td>
<td>0</td>
</tr>
<tr>
<td>Reinterventions Rate</td>
<td>13.8</td>
</tr>
<tr>
<td>• Type 2 Endoleak</td>
<td>4.6</td>
</tr>
<tr>
<td>• Contralateral iliac limb occlusion</td>
<td>2.3</td>
</tr>
<tr>
<td>• Ipsilateral external iliac artery occlusion</td>
<td>2.3</td>
</tr>
<tr>
<td>• Brachial pseudoaneurysm</td>
<td>2.3</td>
</tr>
<tr>
<td>• Femoral pseudoaneurysm</td>
<td>2.3</td>
</tr>
</tbody>
</table>
# Results

## Complex Hypogastric Artery Aneurysm

<table>
<thead>
<tr>
<th>Complex Hypogastric Artery Aneurysm</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Early Endoleak Rate</strong></td>
<td></td>
</tr>
<tr>
<td>Type I</td>
<td>11.5</td>
</tr>
<tr>
<td>Type II</td>
<td>4.6</td>
</tr>
<tr>
<td>Type III</td>
<td>6.9</td>
</tr>
<tr>
<td><strong>Late Endoleak Rate</strong></td>
<td>4.6</td>
</tr>
<tr>
<td>Type I</td>
<td>0</td>
</tr>
<tr>
<td>Type II</td>
<td>0</td>
</tr>
<tr>
<td>Type III</td>
<td>4.6</td>
</tr>
<tr>
<td><strong>Acute Hypogastric endorevascularization occlusion</strong></td>
<td>4.6</td>
</tr>
<tr>
<td><strong>Late Hypogastric endorevascularization occlusion</strong></td>
<td>2.3</td>
</tr>
<tr>
<td><strong>Buttock claudication related Sandwich occlusion</strong></td>
<td>4.6</td>
</tr>
<tr>
<td><strong>Aneurysm Sac Evolution</strong></td>
<td></td>
</tr>
<tr>
<td>• Shrink</td>
<td>73.5</td>
</tr>
<tr>
<td>• Stable</td>
<td>26.5</td>
</tr>
<tr>
<td>• Expansion</td>
<td>0</td>
</tr>
</tbody>
</table>
Results

Complex Hypogastric Artery Aneurysm
Results

Complex Hypogastric Artery Aneurysm
Results
Complex Hypogastric Artery Aneurysm

Length: 7.663 cm (97.909 pix)
Length: 7.496 cm (95.654 pix)
Results

Complex Hypogastric Artery Aneurysm

2.76 cm
Results

Complex Hypogastric Artery Aneurysm
Results

Complex Hypogastric Artery Aneurysm

Length: 1.673 cm (26.441 p.x)
Results

Complex Hypogastric Artery Aneurysm

AAA

RCIAA

LCIAA

REIAA

LEIAA

RHAA

LHAA

5.44 cm
5.39 cm

4.41 cm
4.42 cm

4.74 cm
4.90 cm

1.96 cm
1.47 cm

2.61 cm
2.06 cm

5.41 cm
7.64 cm

2.84 cm
3.69 cm
Results

Complex Hypogastric Artery Aneurysm

Iliac Limb Extension
16x120x18

Hypogastric Artery Patent

External Iliac Artery

Hypogastric Artery Aneurysm Exclusion

Viabahn 6x150
Results

Complex Hypogastric Artery Aneurysm
Conclusions

The Sandwich Technique facilitates safe and effective aneurysm exclusion and target vessel revascularization in adverse anatomical scenarios, with sustained durability in midterm follow-up.
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