Unilateral and bilateral primary and secondary iliac artery aneurysms – endovascular first!

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Disclosure

Speaker name: Martin Storck

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I have the following potential conflicts of interest to report:

Speaker honorarium and travel expenses Medtronic, Endologix
Clinical sequaelae of occlusion the internal iliac artery

- Claudicatio glutealis >50%
- Erectile Dysfunktion
Complex and variable anatomy of iliac artery branches

Established Indications for Iliac Bifurcated Devices (IBD)

• Aneurysm of common iliac artery
  > 25mm with inclusion of iliac bifurcation

• Coexisting aneurysm of the internal iliac artery

• Contralateral occlusion of internal iliac artery

• Young age (male)
Bilateral iliac aneurysms

Right AIC 41 mm, left AIC 31 mm, left AII 20 mm

m, 65 ys.

Indication for bilateral IBD
Iliac Bifurcated Devices (IBD) - selection -

Figure 2  Photograph of the Zenith Bifurcated Iliac Side (ZBIS) device (Cook Inc., Bloomington, IN) illustrating the straight side branch for preservation of the internal iliac artery (IIA).

Figure 3  Photograph of the Helical Branch Endograft (HBE) developed by Greenberg et al incorporating a directional side-branch for preservation of the IIA.
# Standard IFU indications

<table>
<thead>
<tr>
<th>IFU criteria</th>
<th>Cook Zenith branch endovascular graft-iliac bifurcation</th>
<th>GORE Exclude iliac branch endoprosthesis</th>
</tr>
</thead>
</table>
| **Iliofemoral access vessel size/morphology** | 20 Fr delivery profile  
Minimal thrombus, calcification, tortuosity | 16 Fr delivery profile  
Thrombus <2mm thick and/or <25% of vessel circumference in intended seal zone |
| **CIA morphology** | Length >50mm  
Flow lumen diameter >8mm | Flow lumen diameter >17mm |
| **EIA landing zone** | Length > 20 mm  
Outer wall diameter 8 mm - 11 mm | Length > 30mm (at least 10mm non-aneurysmal)  
Diameter 6.5–25mm |
| **IIA landing zone** | Length >10mm (20–30 mm preferred)  
Diameter 7–10mm | Length >30mm (at least 10mm non-aneurysmal)  
Diameter 6.5–13.5mm |

**Freedom from significant femoral/iliac artery occlusive disease that would impede flow or outflow of stent-grafts**
Bilateral iliac aneurysms with aortic ectasy

M, 60 ys.

Bilateral AIC-Aneurysm (right 4 cm, left 2.8 cm)
Bilateral IBD combined with EVAR
Right Type Ib – Endoleak

Typ Ib Endoleak right AII

Secondary Extension via transbrachial access
Endoleak-free Result
m, 71 ys.
aortobiiliacal graft,
Growing All Aneurysm left side 3,5 cm
Contralateral All occlusion

Transbrachial access
Unilateral IBD after aortobiiliac graft

Transbrachial access left side
Final result
Bilateral IBD with EVAR

f, 67ys
Bilateral AIC aneurysms (right 6 cm, left 3 cm)
Bilateral IBD with EVAR

Right transfemoral and left transbrachial access
# Outcome after IBD

<table>
<thead>
<tr>
<th>Author, year</th>
<th>Mortality % (n)</th>
<th>Technical success % (n)</th>
<th>Initial clinical success (&lt;30 days) % (n)</th>
<th>Short-term clinical success (30 days–6 months) % (n)</th>
<th>Mid-term clinical success (6 months–5 years) % (n)</th>
<th>Operating time (min)</th>
<th>Iodine dose</th>
<th>IIA bridging stent-graft*</th>
<th>Additional adjuncts deployed in IIA*</th>
<th>Brachial or axillary access required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dias/Malina et al, 2008/2006</td>
<td>9.1% (2/22) 0 aneurysm-related</td>
<td>91.3% (21/23) 2 IBD occlusions</td>
<td>87% (20/23) 1 IBD occlusion</td>
<td>83% (19/23) 1 IBD occlusion</td>
<td>74% (17/23) 2 IBD occlusions</td>
<td>279 (234–327)</td>
<td>58 (48–78)</td>
<td>Advanta V12 (10)</td>
<td>Jomed (6) Fluency Plus (7)</td>
<td>Advanta V12 (3) Jomed stent-graft (2) AVE stent (1) Lumineux (1) Genesis expandable</td>
</tr>
<tr>
<td>Haulon/Greenberg et al, 2007/2006</td>
<td>13% (7/52) 0 aneurysm-related</td>
<td>94% (49/52) 2 unable to visualise IIA1 unable to cross aortic bifurcation</td>
<td>79% (41/52) 6 IBD occlusions (2 CIA)</td>
<td>79% (41/52) 0 further complications</td>
<td>79% (41/52) 0 further complications</td>
<td>--</td>
<td>208</td>
<td>Fluency Plus Advanta V12 (2)</td>
<td>Common (exact no. not stated)</td>
<td></td>
</tr>
<tr>
<td>Ziegler et al, 2007</td>
<td>1st Generation Unibody IBD:</td>
<td>0</td>
<td>62% (16/26)</td>
<td>72% (33/46) 0 further complications</td>
<td>63% (29/46) 4 IBD occlusions</td>
<td>63% (29/46) 0 further complications</td>
<td>183 (100–330)</td>
<td>88</td>
<td>Not described</td>
<td>Not described</td>
</tr>
<tr>
<td></td>
<td>2nd Generation IBD:</td>
<td>0</td>
<td>89% (17/20)</td>
<td>0 further complications</td>
<td>62% (9/15) 0 further complications</td>
<td>62% (9/15) 0 further complications</td>
<td>183 (100–330)</td>
<td>88</td>
<td>Not described</td>
<td>Advanta V12 (8)</td>
</tr>
<tr>
<td>Serracio-Inglott et al, 2007</td>
<td>0</td>
<td>100% (8/8)</td>
<td>88% (7/8) 1 IBD occlusion</td>
<td>88% (7/8) 0 further complications</td>
<td>88% (7/8) 0 further complications</td>
<td>101 (84–130)</td>
<td>103</td>
<td>Fluency Plus Advanta V12 (8)</td>
<td>--</td>
<td>2/27</td>
</tr>
<tr>
<td>Tielliu et al, 2009</td>
<td>11.1% (3/27) 0 aneurysm-related</td>
<td>96% (26/27)</td>
<td>86% (18/21) 3 IBD occlusions</td>
<td>86% (18/21) 3 IBD occlusions</td>
<td>86% (18/21) 3 IBD occlusions</td>
<td>185 ± 31</td>
<td>--</td>
<td>Advanta V12 (23) Jomed (3)</td>
<td>Advanta V12 (19) Fluency (13)</td>
<td>&quot;Self-expanding stent&quot; (5)</td>
</tr>
<tr>
<td>Verzini et al, 2009</td>
<td>3% (1/32) 0 aneurysm-related</td>
<td>94% (30/32) 2 IBD occlusions</td>
<td>94% (30/32) 2 IBD occlusions</td>
<td>94% (30/32) 2 IBD occlusions</td>
<td>94% (30/32) 2 IBD occlusions</td>
<td>153 (no range or s.d.)</td>
<td>--</td>
<td>Advanta V12 (19) Jomed (3)</td>
<td>Advanta V12 (23) Jomed (3)</td>
<td>&quot;Self-expanding stent&quot; (5)</td>
</tr>
<tr>
<td>Cambridge Vascular Unit (unpublished), 2009</td>
<td>0</td>
<td>75% (6/8) 2 IBD occlusions</td>
<td>75% (6/8) 2 IBD occlusions</td>
<td>75% (6/8) 2 IBD occlusions</td>
<td>75% (6/8) 2 IBD occlusions</td>
<td>290 (230–390)</td>
<td>--</td>
<td>Advanta V12 (6)</td>
<td>--</td>
<td>1/8</td>
</tr>
</tbody>
</table>

* The following bridging stent-grafts or adjuncts were deployed: AVE Stent, Medtronic Vascular, Santa Rosa, CA, USA; Lumineux Stent, CR Bard, Inc. Tempe, AZ, USA; Fluency Plus Vascular Stent-Gratf, CR Bard, Tempe, AZ, USA; Advanta V12, Atrium Medical, Hudson NH, USA; Jomed Stent-graft, ABBOT Vascular Devices, Rangendingen, Germany; Genesis Balloon Expandable Stent Graft, Cordis, Great Lakes, NJ, USA.
Primary and secondary iliac aneurysms

<table>
<thead>
<tr>
<th>Author, year</th>
<th>IBD as Secondary Procedure</th>
<th>AAA+ CIA aneurysm</th>
<th>Solitary CIA aneurysm</th>
<th>IIA aneurysm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dias/Malina et al, 2008/2006</td>
<td>4.3</td>
<td>60.7</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>Haulon/Greenberg et al, 2007/2006</td>
<td>—</td>
<td>80</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Ziegler et al, 2007</td>
<td>8.7</td>
<td>73.9</td>
<td>17.4</td>
<td></td>
</tr>
<tr>
<td>Serracino-Inglott et al, 2007</td>
<td>12.5</td>
<td>75</td>
<td>—</td>
<td>12.5</td>
</tr>
<tr>
<td>Tielliu et al, 2009</td>
<td>—</td>
<td>74</td>
<td>26</td>
<td>—</td>
</tr>
<tr>
<td>Verzini et al, 2009</td>
<td>—</td>
<td>78</td>
<td>12</td>
<td>19</td>
</tr>
<tr>
<td>Cambridge Vascular Unit, 2009</td>
<td>—</td>
<td>88</td>
<td>12</td>
<td>25</td>
</tr>
</tbody>
</table>

58% on IFU in this series

Gray et al. EJVES 2015; 49:283-288
Conclusion

• Endovascular therapy is the therapy of choice for treatment of:

• Most primary iliac aneurysms (IFU/Non-IFU)
• Combined aorto-iliac aneurysms
• Secondary iliac aneurysms

• Number of “Non- IFU cases” increasing!
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