Internal iliac artery aneurysms: When to intervene and outcomes of EVAR

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• Typically 20–30% of cases of AAA involve the common iliac artery, and 0.3% of AAAs are associated with internal iliac artery (IIA) aneurysm (IIAA) \(^1\)

• In such cases, adequate sealing of a stent graft requires the external iliac artery (EIA) to be the distal landing zone, and therefore the IIA orifice is overstented

• However, IIA embolization prior to stent-graft coverage of the IIA orifice is associated with significant complications, especially buttock claudication. ²

• several studies have found no difference in the rate of IIA-associated type II endoleaks between embolization and non-embolization groups.³


Objective

• To report the midterm clinical outcomes of IIA occlusion in the presence of embolized and non-embolized IIAs, both with and without IIAA
Materials and Methods

A prospectively captured clinical database

With IIAA (20) & Without IIAA (37, 25/12)
• Indication for the IIA embolization
  • IIAA
  • CIA aneurysm or ectasia without narrowing at the CIA orifice
Before D/C  
CTA
12 months  
CTA
Annually  
CTA

Patients follow up
Materials and Methods

• Patient demographics
• Aneurysm morphology
• Frequency of type II endoleak caused by retrograde flow from the IIA
• Secondary intervention related to the IIA
• Buttock claudication
• Diameter changes of the IIIA or IIA thrombosis
The main end points

- The IIAA diameter change or IIA thrombosis
- Buttock claudication
- IIA associated type II endoleak
- Secondary intervention related to the IIA
Materials and Methods

• **Statistics analysis**
  • Student $t$ test for comparison of continuous variables
  • Proportions were compared with $x^2$ or Fisher’s exact test if $N < 5$
  • Differences were considered significant if $P < 0.05$
Results

• Total 57 patients (56 males)
• With IIAA 20 cases
• Without IIAA 37 cases
• Mean follow-up was 34.2 months
## Demographic characteristics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Without IIAA (n = 37)</th>
<th>With IIAA (n = 20)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age (± SD), range</td>
<td>72.3 ± 8.3 (47-90)</td>
<td>72 ± 8 (53-82)</td>
<td>0.87</td>
</tr>
<tr>
<td>Male gender</td>
<td>36 (97)</td>
<td>20 (100)</td>
<td>0.95</td>
</tr>
<tr>
<td>Hypertension</td>
<td>21 (56.7)</td>
<td>7 (35)</td>
<td>0.35</td>
</tr>
<tr>
<td>Diabetes</td>
<td>5 (13.5)</td>
<td>2 (10)</td>
<td>0.73</td>
</tr>
<tr>
<td>History of coronary artery disease(^a)</td>
<td>11 (29.7)</td>
<td>6 (30)</td>
<td>0.99</td>
</tr>
<tr>
<td>Cerebrovascular accident</td>
<td>5 (13.5)</td>
<td>8 (40)</td>
<td>0.08</td>
</tr>
<tr>
<td>COPD</td>
<td>6 (16.2)</td>
<td>5 (25)</td>
<td>0.51</td>
</tr>
<tr>
<td>Smoking history</td>
<td>24 (64.8)</td>
<td>6 (30)</td>
<td>0.14</td>
</tr>
<tr>
<td>Hyperlipidemia</td>
<td>11 (29.7)</td>
<td>5 (25)</td>
<td>0.78</td>
</tr>
<tr>
<td>History of peripheral vascular disease(^b)</td>
<td>7 (18.9)</td>
<td>5 (25)</td>
<td>0.67</td>
</tr>
</tbody>
</table>
## Aneurysm morphology

<table>
<thead>
<tr>
<th>Aneurysm Type</th>
<th>Without IIAA (n=37)</th>
<th>With IIAA (n=20)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abdominal aorto-iliac aneurysm</td>
<td>32 (86.5)</td>
<td>12 (60)</td>
</tr>
<tr>
<td>AAA</td>
<td>0</td>
<td>2 (10)</td>
</tr>
<tr>
<td>CIA aneurysm</td>
<td>0</td>
<td>4 (20)</td>
</tr>
<tr>
<td>Isolated CIA aneurysm</td>
<td>5 (13.5)</td>
<td>NA</td>
</tr>
<tr>
<td>Isolated IIAA</td>
<td>NA</td>
<td>2 (10)</td>
</tr>
</tbody>
</table>

NA: not applicable
Without IIAA
IIA trunk thrombosis

- Embolization: 100% (P=0.72)
- No embolization: 84%

UMC Utrecht
Type II endoleak (IIA source) & Secondary intervention

- Embolization: 0%
- No embolization: 8.3%

$p = 0.16$
Buttock claudication

$P=0.13$

- Embolization: 20%
- No embolization: 0%
With IIAA
IIA aneurysm sac status

- Stable: 67%
- Decrease: 21%
- Increase: 13%
## Clinical outcomes in patients with IIAA

<table>
<thead>
<tr>
<th>Variable</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Total n=24)</td>
<td>(Total n=24)</td>
</tr>
<tr>
<td>Type II endoleak (IIA source)</td>
<td>2 (8.3)</td>
</tr>
<tr>
<td>Secondary intervention</td>
<td>1 (4.2)</td>
</tr>
<tr>
<td>Buttock claudication</td>
<td>4 (16.7)</td>
</tr>
</tbody>
</table>
Buttock claudication

$P=0.14$

- Embolization: 20%
- No embolization: 0%
Buttock claudication

Bilateral: 75%
Unilateral: 14.6%

$P = 0.046$
Conclusions

• IIA embolization might not be necessary prior to EVAR of an aortoiliac aneurysm without IIAA
• Only stent-graft coverage of the IIA orifice without embolization was effective, with a lower incidence of buttock claudication and an acceptable incidence of type II endoleak
Conclusions

• In cases where IIA embolization is inevitable at least one IIA should be preserved