Kissing Covered Stents To Facilitate EVAR In AAA And Other Aortic Disease Patients With Small Necks And Small Iliac Access Arteries: Technique And Results

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I have no conflict of interest to disclose

Background

- EVAR has been increasingly applied in AAA and some other aortic diseases
- 37% of patients have unsuitable anatomy for standard EVAR
  - narrow aneurysmal neck
  - compressed aortic lumen
  - small access arteries

Objectives & Methods

- To study the safety and efficacy of kissing covered stents in abdominal aortic diseases with anatomical challenges
- Data were retrospectively collected in our center between January 2016 and June 2018
- Patients were treated with this technique only if they were unsuitable for either open repair or standard EVAR

Results

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number of patients (or mean ± SD) (N=12)</th>
<th>Percentage (%) or range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender (male)</td>
<td>17</td>
<td>100</td>
</tr>
<tr>
<td>Age (years)</td>
<td>63.7 ± 13.5</td>
<td>31 - 94</td>
</tr>
<tr>
<td>Risk factors or comorbidities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypertension</td>
<td>10</td>
<td>59</td>
</tr>
<tr>
<td>Chronic obstructive pulmonary</td>
<td>2</td>
<td>12</td>
</tr>
<tr>
<td>History of smoking</td>
<td>10</td>
<td>59</td>
</tr>
<tr>
<td>Coronary atherosclerosis disease</td>
<td>2</td>
<td>12</td>
</tr>
<tr>
<td>Renal failure dialysis</td>
<td>2</td>
<td>12</td>
</tr>
<tr>
<td>Severe COPD</td>
<td>2</td>
<td>12</td>
</tr>
<tr>
<td>Severe insulin resistance</td>
<td>4</td>
<td>24</td>
</tr>
<tr>
<td>Metastatic abdominal carcinoma</td>
<td>2</td>
<td>17</td>
</tr>
<tr>
<td>Case</td>
<td>Aortic diseases</td>
<td>Maximal aneurysm diameter (mm)</td>
</tr>
<tr>
<td>------</td>
<td>----------------</td>
<td>--------------------------------</td>
</tr>
<tr>
<td>1</td>
<td>True AAA</td>
<td>46</td>
</tr>
<tr>
<td>2</td>
<td>True AAA</td>
<td>40</td>
</tr>
<tr>
<td>3</td>
<td>True AAA</td>
<td>47</td>
</tr>
<tr>
<td>4</td>
<td>True AAA</td>
<td>35</td>
</tr>
<tr>
<td>5</td>
<td>Pseudo-aneurysm</td>
<td>54</td>
</tr>
<tr>
<td>6</td>
<td>Pseudo-aneurysm</td>
<td>52</td>
</tr>
<tr>
<td>7</td>
<td>Pseudo-aneurysm</td>
<td>19</td>
</tr>
<tr>
<td>8</td>
<td>Pseudo-aneurysm</td>
<td>33</td>
</tr>
<tr>
<td>9</td>
<td>Dissection + penetrating ulcer</td>
<td>-</td>
</tr>
</tbody>
</table>

- 4 true AAA, 4 pseudoaneurysm, 8 dissection and/or penetrating ulcers, and 1 common iliac artery dissection
- Small or occluded femoral access: 3 cases (18%)
- True AAA (n=4)
  - diameter of the proximal necks: 18.5 ± 1.7 mm (17-21 mm)
  - length of the proximal necks: 43.5 ± 6.5 mm (39-53 mm)
- Dissection and/or penetrating ulcers (n=8)
  - minimal diameter of true lumen: 14.8 ± 3.1 mm (10-18 mm)

Patient 1

- Male, 63 yrs
- Right lower limb intermittent claudication for 1 year, rest pain for 3 months
- CTA: right iliac artery occlusion; AAA (4.8cm)

Kissing stents: Excluders 16-14.5-100 mm (Gore) * 2
Extension: (Left) Excluder 16-10-70 mm, (Right) Excluder 16-12-100 mm

At 12 months
- Patient stents
- No endoleak
- Sac shrinkage
Patient 2

- Male, 78 yrs
- Pain in left lower abdomen for 1 week
- Severe alcoholic liver cirrhosis, COPD >10 yrs

Patient 3

- Male, 84 yrs
- Abdominal pain for 20 days
- CTA: Abdominal aortic pseudoaneurysm
- Compressed true lumen, minimal diameter = 6.9mm

Kissing stents: Excluder 16-14.5-100mm (Gore) * 2
Extension: (Left) Excluder 16-10-70mm, (Right) Excluder 16-12-100mm

CTA at 8 months: patent stents w/o endoleak, marked sac shrinkage

Kissing stents: Endurant 16-13-120mm * 2
Extension: (Left) Endurant 16-16-95mm, (Right) Endurant 16-16-120mm
• Technical success: 100%
• 5 mild type I endoleak in completion angiography
• Postoperative complications:
  – 1 supraventricular tachycardia
  – 1 pneumonia combined with heart failure
  – 1 acute renal insufficiency + ARDS
• No perioperative death

Mean f/u: 16.1 ± 10.1 months (1-31 months)
All endoleaks disappeared at 3 months
No stenosis or occlusion of stents
Sac shrinkage of 6.5 ± 7.0 mm (0-17 mm) in AAA or pseudoaneurysm
No morbidity or mortality during f/u

Prevention of Type I endoleak
– Suitable cases with long and narrow aneurysmal neck
– Selection of appropriate stent size based on strict calculation

Kissing covered stents may facilitate EVAR in abdominal aortic diseases with small neck and access, and narrow aortic lumen
Key points to avoid endoleak
  – case with long neck: ≥20mm
  – proper SG selection: d = 0.82D
• Long-term f/u is needed for further evaluation
Thank you