Transcaval Sac Puncture—
The First Choice in the Treatment of Type 2 Endoleaks with Aortic Sac Enlargement

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Disclosure

Speaker name:
Erin Moore, MD FACS

I have the following potential conflicts of interest to report:

- Consulting: Terumo, Inc
- Employment in industry
- Stockholder of a healthcare company
- Owner of a healthcare company
- Other(s)

- I do not have any potential conflict of interest
The Problem

-EVAR is associated with a 12-18% incidence of re-intervention
-Type 2 Endoleaks occur in 18-20% of patients
-Persistent Type 2 Endoleaks (>6 months post-EVAR) are associated with increased risk of adverse events
  • Sac Growth
  • Rupture
  • Need for Open Conversion
Freedom from Reintervention

- Patients without endoleak
- Patients with type II endoleak

<table>
<thead>
<tr>
<th>Patients at risk</th>
<th>0</th>
<th>12</th>
<th>24</th>
<th>36</th>
<th>48</th>
<th>60 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>without endoleak</td>
<td>2548</td>
<td>1671</td>
<td>908</td>
<td>491</td>
<td>170</td>
<td>22</td>
</tr>
<tr>
<td>with endoleak type II</td>
<td>304</td>
<td>194</td>
<td>91</td>
<td>37</td>
<td>10</td>
<td>-</td>
</tr>
</tbody>
</table>
Table II. Significance of persistent type 2 endoleaks on late outcomes after multivariate analysis

<table>
<thead>
<tr>
<th>Outcome</th>
<th>RR</th>
<th>95% CI</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rupture</td>
<td>3.9</td>
<td>1.7-8.8</td>
<td>.04</td>
</tr>
<tr>
<td>Aneurysm sac growth</td>
<td>2.5</td>
<td>1.69-3.78</td>
<td>.01</td>
</tr>
<tr>
<td>Reintervention rate</td>
<td>5.5</td>
<td>3.5-8.8</td>
<td>.001</td>
</tr>
<tr>
<td>Conversion to open repair</td>
<td>5.3</td>
<td>2.0-13.5</td>
<td>.04</td>
</tr>
<tr>
<td>AAA-related death</td>
<td>2.6</td>
<td>0.77-8.8</td>
<td>.12</td>
</tr>
</tbody>
</table>

RR, Relative risk; CI, confidence interval; AAA, abdominal aortic aneurysm.

ONE SOLUTION
Traditional: CT Guided Transabdominal/Lumbar
TROUBLE IN PARADISE....
Type 2 from Left Hypogastric despite coils placed at original operation
Coil embolization via CT/Angio guidance
Infection... Disaster!!
A BETTER WAY...
Results of transcaval embolization for sac expansion from type II endoleaks after endovascular aneurysm repair

Kristina A. Giles, MD, Mark F. Fillinger, MD, Randall R. De Martino, MD, MPH, Andrew W. Hoel, MD, Richard J. Powell, MD, and Daniel B. Walsh, MD, Lebanon, NH

Objective: Management of type II endoleaks after endovascular aneurysm repair can be problematic. This study reports our experience with a relatively novel strategy to treat this complication, transcaval coil embolization (TCCE) of the aneurysm sac.

Methods: We reviewed 29 consecutive patients undergoing TCCE from 2010 to 2013. Demographics, operative details, and outcomes were assessed.

Results: Since 2006, 29 TCCEs have been performed at our institution in 26 patients for sac expansion from type II endoleaks. Patients were male (83%) and former or current smokers (88%), with an average age of 78 ± 7.1 years. TCCE was performed a mean of 4.2 ± 4 years after initial endovascular aneurysm repair. Endoleaks resulted in a mean sac growth of 1.2 ± 1 cm in diameter and 37% ± 32% by volume. Forty-six percent had prior procedures (5 translumbar, 3 transarterial, 3 transcaval, 1 aortic cuff, and 1 iliac limb extension). Two patients had no flow identified in the aneurysm sac after puncture was successful, and one was found to have a hygroma rather than arterial flow. An additional two patients had ultimate embolization from sac access between the endograft iliac limb and arterial wall after transcaval puncture failed, for a 90% procedural success (83% for transcaval technical success). Mean fluoroscopy time was 27 ± 13 minutes with 29 ± 21 mL of contrast material used and a median of 10 coils per case. Additional adjuncts included thrombin injection (17%), intravascular ultrasound (14%), sac pressure measurements (28%), and on-table integrated computed tomography (17%). Median length of stay was 1 day (range, 0-5 days). There were no procedural adverse events. Reintervention was required in five cases (three repeated TCCEs, two graft relinings). One-year freedom from reintervention was 95%. At a mean 16.5 months of follow-up, 70% experienced no further endoleak and had stable or decreasing sac diameters. There have been no ruptures during follow-up.

Conclusions: In this series, TCCE for treatment of aneurysm enlargement due to type II endoleaks was safe and relatively effective despite prior failed interventions in nearly half of the cases. TCCE is a useful alternative in cases in which the anatomy makes other approaches difficult or impossible. (J Vasc Surg 2015;61:1129-36.)
THE TECHNIQUE
“Side View”

AP

LAO 79°

RAO 20°

“Line of sight” for puncture
Side View at 12° RAO

Line of Site at 78° LAO

102°
IVUS of the IVC
Side View

trocar/stylet and co-axial 5 fr catheter in sac

Metal cannula abuts sac

Line of Sight View
Rotation from “Down the Barrel” to Transverse View
THE TOOLS
## GORE TIPS Set

<table>
<thead>
<tr>
<th>Catalogue Number</th>
<th>Gauge</th>
<th>Size (Fr)</th>
<th>Effective Length (cm)</th>
<th>Accepts Guidewire Diameter (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSET1016</td>
<td>16</td>
<td>—</td>
<td>56</td>
<td>≤ 0.035</td>
</tr>
<tr>
<td>Needle</td>
<td>16</td>
<td>—</td>
<td>56</td>
<td>≤ 0.035</td>
</tr>
<tr>
<td>Guiding Catheter</td>
<td>—</td>
<td>10</td>
<td>49</td>
<td>≤ 0.035</td>
</tr>
<tr>
<td>Introducer Sheath</td>
<td>—</td>
<td>10</td>
<td>40</td>
<td>≤ 0.035</td>
</tr>
<tr>
<td>Dilator</td>
<td>—</td>
<td>10</td>
<td>47</td>
<td>≤ 0.035</td>
</tr>
</tbody>
</table>
A CASE...
Advantages Experienced

• 38 cases to date performed with no infections
• One DVT with PE (found proximal to the sheath site in the SFV by duplex)
• No hematomas
• 5 repeat interventions for persistent endoleak (SMA\(\rightarrow\)IMA coiling and/or repeat transcaval approach at 6 to 17 months)
• Surveillance via CTA with Aortic US
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