When and How to Treat Type II Endoleaks: How Often is Treatment Effective; How Often is it Not

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Disclosures

- Consulting: Abbott, Cook, Endologix, Medtronic, Silk Road

Type II Endoleak after EVAR

- 2013 Meta-analysis:
  - 10% of all EVAR
  - Single-center reports as high as 20%
  - 1/3 resolve spontaneously
  - Rupture from isolated type II endoleak: 1% of all type II endoleaks

Type II Endoleak after EVAR

- 2018 Meta-analysis:
  - Persistent endoleak with sac expansion is most common indication for treatment
  - Multiple treatment modalities
  - High initial technical success: 88%
  - Recurrent endoleak and repeat interventions common
    - Overall clinical success: 68%

Type II Endoleak after EVAR

- Natural history of both treated and untreated type II endoleaks remains poorly understood

- No strong evidence for treatment

Transarterial Lumbar Embolization
Transarterial Lumbar and IMA Embolization

Direct Sac Puncture

Direct Sac Puncture

Transcaval Sac Embolization

BIDMC Experience

- Patients treated for type II endoleak at BIDMC

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
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<tbody>
<tr>
<td>Total procedures</td>
<td>102</td>
</tr>
<tr>
<td>Patients</td>
<td>56</td>
</tr>
<tr>
<td>Procedures per patient</td>
<td>2 (1 – 7)</td>
</tr>
<tr>
<td>Age</td>
<td>79 ± 8</td>
</tr>
<tr>
<td>Sex, female</td>
<td>9 (16 %)</td>
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<tr>
<td>Time from EVAR to endoleak procedure (months)</td>
<td>37 (8 – 138)</td>
</tr>
<tr>
<td>Follow-up (months)</td>
<td>27 (0.03 – 127)</td>
</tr>
<tr>
<td>Index EVAR at BIDMC</td>
<td>31 (55 %)</td>
</tr>
<tr>
<td>Referred from OSH</td>
<td>25 (45 %)</td>
</tr>
<tr>
<td>Type II endoleak treatment prior to treatment at BIDMC</td>
<td>6 (11 %)</td>
</tr>
</tbody>
</table>
BIDMC Experience

Index Procedure at BIDMC (N = 57)

- Transarterial Lumbar Embolization (54%)
- Transarterial IMA Embolization (18%)
- Direct Sac Puncture (7%)
- Transcaval Embolization (21%)

30 patients (53%) underwent at least 1 repeat endoleak intervention
- 1-year freedom-from repeat endoleak intervention = 55%

Repeat Endoleak-related Interventions (49 Procedures)

- Open Repair (10 patients, 18%)
- Transcaval Embolization
- Transarterial Lumbar Embolization
- Transarterial IMA Embolization
- Direct Sac Puncture
- Iliac Limb Extension
- Proximal PMEG
- Proximal Extension / Anchors

10 patients (18%) underwent open repair
- 1-year freedom-from open repair = 94%

Open Repair Details (N = 10)

- Graft Explant
  - Replacement with tube graft (N = 1): 2009
- Sacotomy
  - No proximal reinforcement (N = 2): 2013, 2015
  - One case performed for rupture from isolated type II endoleak
  - Proximal felt pledget (N = 1): 2015
  - Prior PMEG (N = 1): 2014
  - Proximal fixation with pre-operative endoanchors (N = 3): 2016 x3

Clinical Success*

- Stable sac w/o any endoleak-related reintervention: 33%
- Stable sac including endovascular reintervention only (open repair = failure): 67%
- Stable sac including endovascular or open reintervention: 88%

*only patients with >6 months follow-up
Large Type II Endoleak w Sac Expansion >5mm

- Transarterial Embolization via Hypogastric
- Transarterial Embolization via SMA
- Transcaval Embolization
- Translumbar Sac Puncture
- Sacotomy

*Goal of treatment is embolization of nidus AND source*

Small Type II endoleak with sac expansion >5mm

Type Ia, Ib, or III endoleak?
- Thorough search including angiogram

- YES

- NO

Poor proximal or distal seal/apposition w/o visible Ia or Ib endoleak? (Type V, Positional 1A?)

- YES

- NO

Type II Endoleak Treatment

Small T2E w Poor Apposition but no 1A or 1B