Review of the literature: type 2 endoleaks

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Disclosure

Speaker name: Richard G McWilliams

I have the following potential conflicts of interest to report:

Lecture fee - Covidien
Structure

• Manuscripts >2010
• Single centre/review articles
• Conclusions
Improved results using Onyx glue for the treatment of persistent type 2 endoleak after endovascular aneurysm repair

Christopher J. Abularrage, MD, a,b Virendra I. Patel, MD, a Mark F. Conrad, MD, MMS, a
Eric B. Schneider, PhD, a Richard P. Cambria, MD, a and Christopher J. Kwolek, MD, a Boston, Mass; and Baltimore, Md

J Vasc Surg 2012;56:630-6
Success defined as resolution of the persistent type 2 endoleak

<table>
<thead>
<tr>
<th>Endovascular secondary interventions</th>
<th>Procedures, No.</th>
<th>Long-term success</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Onyx glue</td>
<td>11</td>
<td>10 (91%)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Non-Onyx embolization</td>
<td>40</td>
<td>9 (23%)</td>
<td></td>
</tr>
</tbody>
</table>

Table III. Univariate analysis of long-term interventional success of initial secondary intervention.
Treatment of Type II Endoleak Using Onyx With Long-Term Imaging Follow-Up

Minhaj S. Khaja · Auh Whan Park · Warren Swee · Avery J. Evans · J. Fritz Angle · Ulku C. Turba · Saher S. Sabri · Alan H. Matsumoto
2005-2010

- N=18
- 16 type 2, 2 type 2/1
- Persistent >6 months N=3
- Enlarging aneurysm N=13
- Physician preference N=2
- Clinical success = stable or decreasing diameter
Mean follow-up 32.8 months, 5/16 (31.2%) second treatment

<table>
<thead>
<tr>
<th>Primary endoleak treatment results</th>
<th>Initial TS (%)</th>
<th>Initial CS (%)</th>
<th>Delayed CF (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type I/II</td>
<td>2/2 (100)</td>
<td>2/2 (100)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Type II</td>
<td>14/16 (87.5)</td>
<td>14/16 (87.5)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>16/18 (88.9)</td>
<td>16/18 (88.9)</td>
<td>5/18 (27.8)</td>
</tr>
</tbody>
</table>

TS technical success, CS clinical success, CF clinical failure
Running conclusion

1. 69% clinical success with a liquid agent
Outcomes of percutaneous endovascular intervention for type II endoleak with aneurysm expansion

Abdulhameed Aziz, MD, Christine O. Menias, MD, Luis A. Sanchez, MD, Daniel Picus, MD, Nael Saad, MD, Brian G. Rubin, MD, John A. Curci, MD, and Patrick J. Geraghty, MD
St. Louis, Mo

2003-2008

- 42 T2EL interventions for expansion
- 7/42 repeat T2EL intervention
- 9/42 occult 1/3 at angiography
- Embolisation — majority translumbar coils and/or glue
- Follow-up 23+/-20 months
Fig 1. Abdominal aortic aneurysm (AAA) diameter changes over time. *P < .05 for AAA size at last follow-up vs initial AAA size. Error bars = one standard deviation. T2EL, Type II endoleak.

Fig 3. Patients with type II endoleak (T2EL) at latest follow-up.
Running conclusion

1. 69% clinical success with a liquid agent
2. Exclude type 1/3. Minimal benefit for type 2 embolisation
Long-term follow-up of type II endoleak embolization reveals the need for close surveillance

Timur P. Sarac, MD, Connor Gibbons, MD, Lina Vargas, MD, Jane Liu, MD, Sunita Srivastava, MD, James Bena, MS, Tara Mastracci, MD, Vikram S. Kashyap, MD, and Daniel Clair, MD, Cleveland, Ohio
2000-2008

- 95 patients
- 140 embolisations
- 61% glue
- 29% coils
- 7% glue/coils
- 3% gelfoam
Running conclusion

1. 69% clinical success with a liquid agent
2. Exclude type 1/3. Minimal benefit for type 2 embolisation
3. Freedom from sac growth 44% at 5 years
Editor's Choice — Type II Endoleak: Conservative Management Is a Safe Strategy  

D.A. Sidloff a,*, V. Gokani a, P.W. Stather a, E. Choke a, M.J. Bown b, R.D. Sayers a  

a Vascular Surgery Group, Department of Cardiovascular Sciences, University of Leicester, Leicester, UK  
b NIHR Leicester Cardiovascular Biomedical Research Unit, University of Leicester, Leicester, UK  

WHAT THIS PAPER ADDS  
This study suggests that patients with isolated type II endoleak demonstrate equivalent aneurysm-related mortality and an improved all-cause survival. A conservative approach to the treatment of type II endoleak appears to be safe.
1995-2013

• 904 EVAR
• 175 (19%) type 2
• 9 type 2 interventions
• Survival higher in group with T2EL
• No difference in ARM or type 1EL
Running conclusion

1. 69% clinical success with a liquid agent
2. Exclude type 1/3. Minimal benefit for type 2 embolisation
3. Freedom from sac growth 44% at 5 years
4. A conservative approach is safe. Equivalent ARM and improved survival
Current Evidence Is Insufficient to Define an Optimal Threshold for Intervention in Isolated Type II Endoleak After Endovascular Aneurysm Repair

Alan Karthikesalingam, MA, MRCS; Sri G. Thrumurthy, MRCS; Dan Jackson, PhD; Edward Choke, PhD, MRCS; Robert D. Sayers, MD, FRCS; Ian M. Loftus, MD, FRCS; Matt M. Thompson, MD, FRCS; and Peter J. Holt, PhD, FRCS

J Endovasc Ther. 2012;19:200–208
Systematic review

- 10 series met criteria
- 2705 patients
- 231 T2EL
Thresholds

- Conservative
- Selective (high threshold): >5mm, >12 mth
- Selective (low threshold): >6 mth only
- Aggressive: >3 mth only
Results

• No evidence that any strategy, compared to a conservative approach, reduced sac expansion or improved sac regression.
setting of isolated type II endoleak. Although these endoleaks appear largely benign, the interventionist should be aware of a high-risk subgroup of EVAR patients in whom targeted treatment and surveillance remain prudent.
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5. No clear threshold for intervention
Systematic review

Type II endoleak after endovascular aneurysm repair

D. A. Sidloff\textsuperscript{1}, P. W. Stather\textsuperscript{1}, E. Choke\textsuperscript{1}, M. J. Bown\textsuperscript{1,2} and R. D. Sayers\textsuperscript{1}

\textsuperscript{1}Vascular Surgery Group, Department of Cardiovascular Sciences, University of Leicester, and \textsuperscript{2}Leicester National Institute for Health Research Cardiovascular Biomedical Research Unit, Leicester, UK

Correspondence to: Mr. D. A. Sidloff, Vascular Surgery Group, Department of Cardiovascular Sciences, University of Leicester, Leicester LE2 7LX, UK (e-mail: ds343@le.ac.uk)
Systematic review

- 21,744 EVAR
- 1515 T2EL
- 393 interventions
- 28.5% unsuccessful
- TL success 81% > TA 62.5% (P=0.024)
- Recurrent EL: TL 19% < TA 35.8% (P=0.036)
- Complications: TL none < TA 9.2% (P=0.043)
Running conclusion

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4. A conservative approach is safe. Equivalent ARM and improved survival
5. No clear threshold for intervention
6. Translumbar rather than transarterial
Conclusion

- >6 months T2EL
- >10mm growth
- Consent
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