



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, MMSc,^a

Eric B. Schneider, PhD,^c Richard P. Cambria, MD,^a and Christopher J. Kwolek, MD,^a *Boston, Mass, and Baltimore, Md*

- Success defined as resolution of the persistent type 2 endoleak

Table III. Univariate analysis of long-term interventional success of initial secondary intervention

<i>Endovascular secondary interventions</i>	<i>Procedures, No.</i>	<i>Long-term success</i>	<i>P value</i>
Onyx glue	11	10 (91%)	<.001
Non-Onyx embolization	40	9 (23%)	

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 2 Technical and clinical success

Primary endoleak treatment results	Initial TS (%)	Initial CS (%)	Delayed CF (%)
Type I/II	2/2 (100)	2/2 (100)	0 (0)
Type II	14/16 (87.5)	14/16 (87.5)	5/16 (31.2%)
Total	16/18 (88.9)	16/18 (88.9)	5/18 (27.8)

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,^a Christine O. Menias, MD,^b Luis A. Sanchez, MD,^a Daniel Picus, MD,^c Nael Saad, MD,^c Brian G. Rubin, MD,^a John A. Curci, MD,^a and Patrick J. Geraghty, MD,^a *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

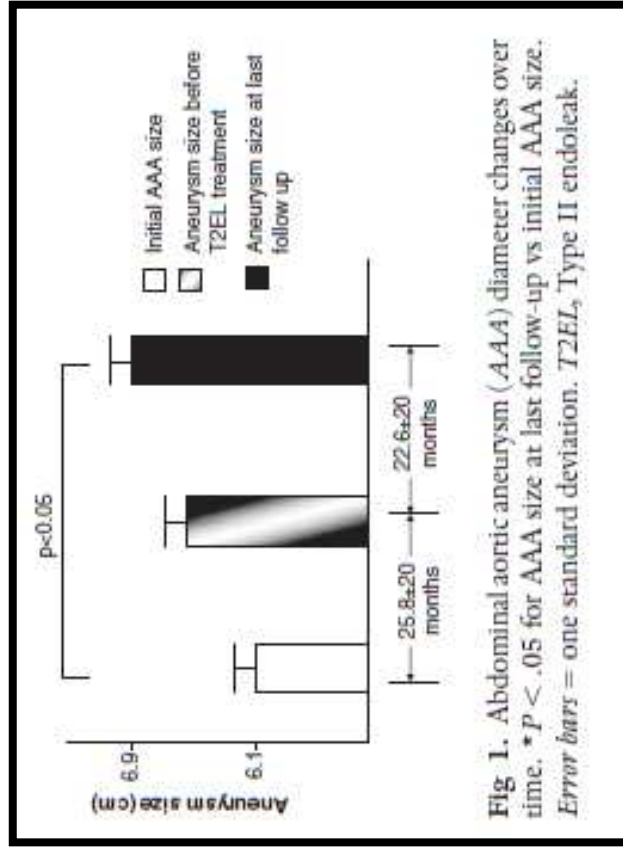


Fig 1. Abdominal aortic aneurysm (AAA) diameter changes over time. * $P < .05$ for AAA size at last follow-up vs initial AAA size. Error bars = one standard deviation. T2EL, Type II endoleak.

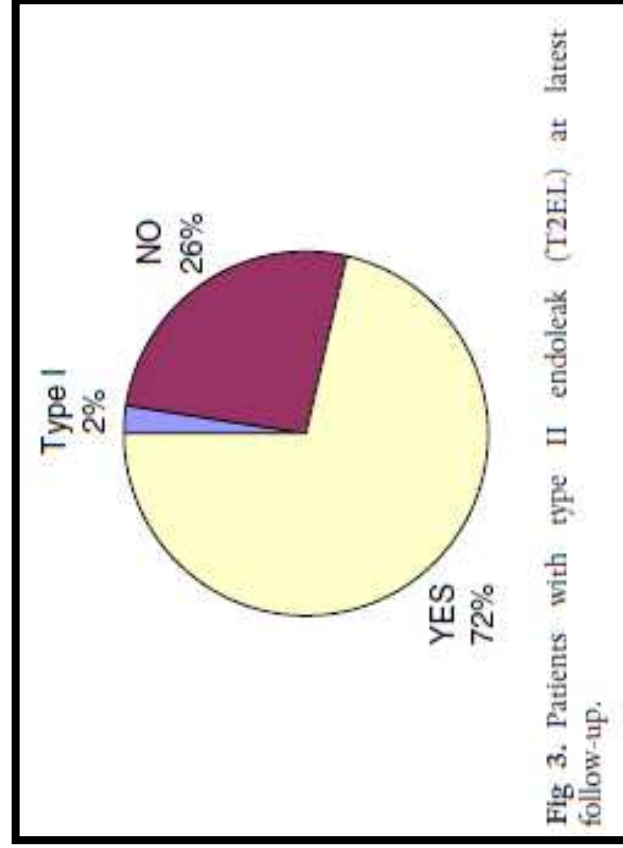


Fig 3. Patients with type II endoleak (T2EL) at latest follow-up.

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, 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

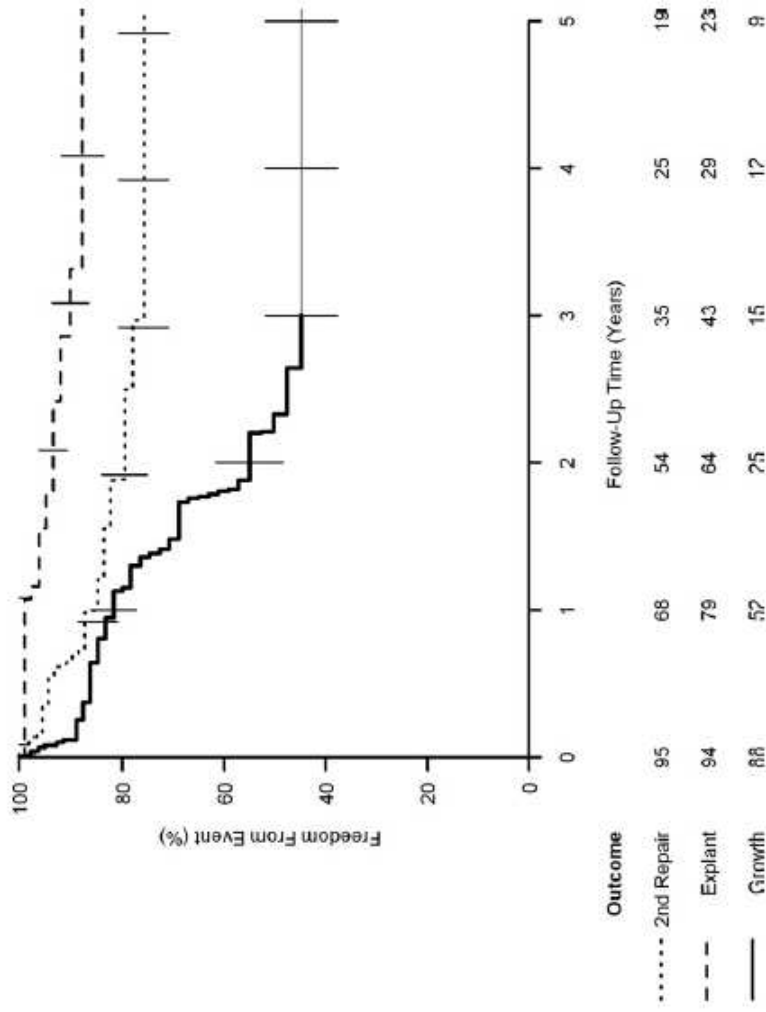


Fig. Kaplan-Meier curves show freedom from event. Note that the standard error (*vertical lines*) for freedom from sac growth >10% after 3 years.

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 **CME**

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

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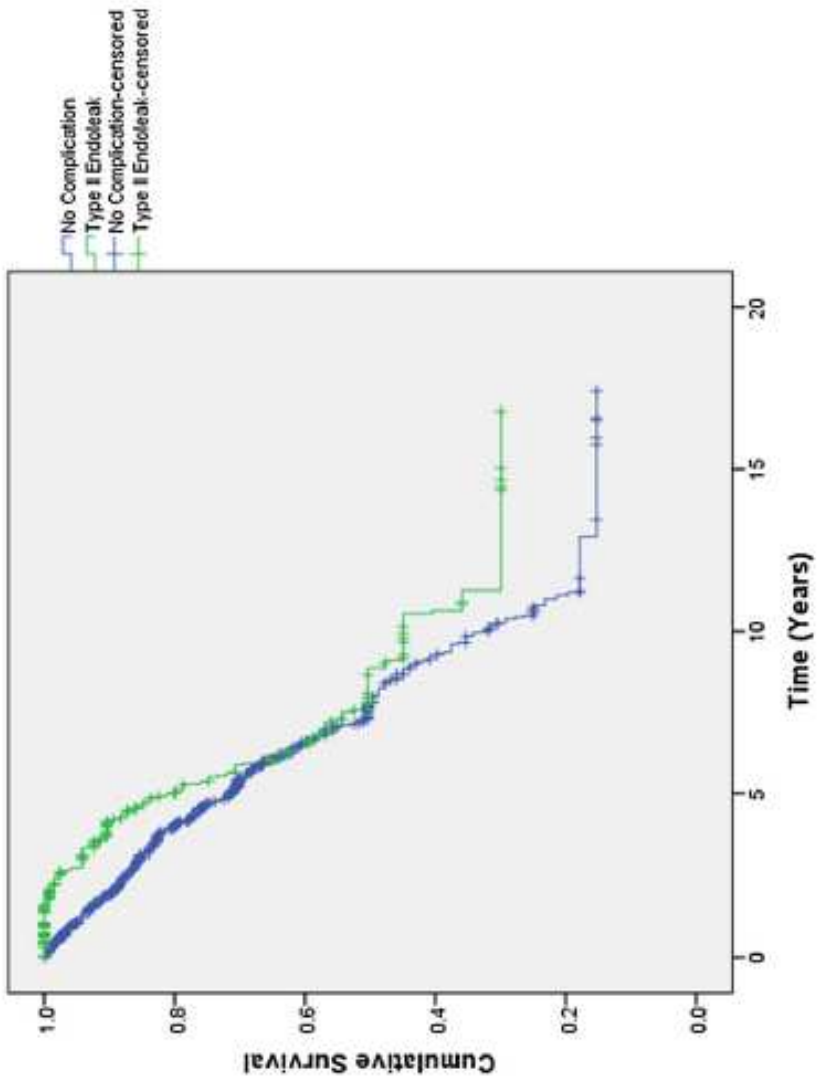
^b NIHR Leicester Cardiovascular Biomedical Research Unit, University of Leicester, Leicester, UK

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

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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, MRCS¹; Sri G. Thrumurthy, MRCS¹; Dan Jackson, PhD²;
Edward Choke, PhD, MRCS³; Robert D. Sayers, MD, FRCS³; Ian M. Loftus, MD, FRCS¹;
Matt M. Thompson, MD, FRCS¹; and Peter J. Holt, PhD, FRCS¹**

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. Sidloff¹, P. W. Stather¹, E. Choke¹, M. J. Bown^{1,2} and R. D. Sayers¹

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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)

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

Conclusion

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

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