Controversies in endovascular aortic repair – EVAR outside the instructions for use

ON LABEL vs. OFF LABEL INDICATIONS: ARE CONTEMPORARY DEVICES REDUCING THE GAP IN CLINICAL OUTCOME?

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Disclosure

Speaker name:

NICOLA TROISI

I have the following potential conflicts of interest to report:

☐ Consulting
☐ Employment in industry
☐ Stockholder of a healthcare company
☐ Owner of a healthcare company
☐ Other(s)

☑️ I do not have any potential conflict of interest
It is no secret that many aortic stent-grafts are implanted in patients with anatomical criteria outside of the manufacturer’s instructions for use (IFU).
BACKGROUND

A meta-analysis of outcomes of endovascular abdominal aortic aneurysm repair in patients with hostile and friendly neck anatomy

George A. Antoniou, MD, PhD, a George S. Georgiadis, MD, b Stavros A. Antoniou, MD, c Ganesh Kuhar, MD, FRCS, a and David Murray, MD, FRCS, a Manchester, United Kingdom; Alexandroupolis, Greece; and Marburg, Germany


Table IV. Summary of meta-analysis outcomes

<table>
<thead>
<tr>
<th>Outcome measure</th>
<th>Meta-analysis model</th>
<th>OR (95% CI)</th>
<th>P</th>
<th>P for publication bias</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjunctive procedures</td>
<td>Fixed effects</td>
<td>3.050 (1.884-4.938)</td>
<td>&lt;.001</td>
<td>.810</td>
</tr>
<tr>
<td>Technical success</td>
<td>Fixed effects</td>
<td>0.139 (0.015-1.275)</td>
<td>.081</td>
<td>NA</td>
</tr>
<tr>
<td>30-day mortality</td>
<td>Fixed effects</td>
<td>1.022 (0.419-2.493)</td>
<td>.962</td>
<td>.391</td>
</tr>
<tr>
<td>30-day morbidity</td>
<td>Fixed effects</td>
<td>2.278 (1.025-5.063)</td>
<td>.043</td>
<td>NA</td>
</tr>
<tr>
<td>Reintervention within 30 days</td>
<td>Fixed effects</td>
<td>1.082 (0.096-12.186)</td>
<td>.949</td>
<td>NA</td>
</tr>
<tr>
<td>Type I endoleak within 30 days</td>
<td>Fixed effects</td>
<td>2.467 (0.562-10.823)</td>
<td>.232</td>
<td>.574</td>
</tr>
<tr>
<td>Type I endoleak at 1 year</td>
<td>Fixed effects</td>
<td>4.563 (1.430-14.558)</td>
<td>.010</td>
<td>NA</td>
</tr>
<tr>
<td>Reinterventions at 1 year</td>
<td>Fixed effects</td>
<td>0.990 (0.547-1.792)</td>
<td>.974</td>
<td>.539</td>
</tr>
<tr>
<td>Aneurysm-related mortality at 1 year</td>
<td>Fixed effects</td>
<td>9.378 (1.595-55.137)</td>
<td>.013</td>
<td>.251</td>
</tr>
</tbody>
</table>

CI, Confidence interval; OR, odds ratio; NA, not applicable.
DOUBTS/OPEN QUESTIONS

- The level of evidence is very low
- The criticism is in response to bad experiences with early-generation devices
- Do new devices drive better EVAR performance in hostile anatomy with more violation of IFU?
Endurant Stent Graft: A New-Generation Device for a New Generation of Vascular Specialist

Nicola Troisi, MD¹,²; Giovanni Torsello, MD¹,²; and Konstantinos P. Donas, MD, PhD²

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Multiple publications described feasibility and promising results of the Endurant Stent Graft in "off label" conditions.
OFF-LABEL APPLICATION

Evaluation of the Endurant stent graft under instructions for use vs off-label conditions for endovascular aortic aneurysm repair

Giovanni Torsello, MD, Nicola Troisi, MD, Konstantinos P. Donas, MD, and Martin Autermann, MD, Münster, Germany


Table IV. Overall 30-day results

<table>
<thead>
<tr>
<th>Result</th>
<th>IFU (n = 121)</th>
<th></th>
<th>OL (n = 56)</th>
<th></th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. (%)</td>
<td></td>
<td>No. (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technical success</td>
<td>121 (100)</td>
<td>54 (96.4)</td>
<td>1</td>
<td>0.09</td>
<td></td>
</tr>
<tr>
<td>Clinical success</td>
<td>117 (96.7)</td>
<td>54 (96.4)</td>
<td>0.62</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mortality</td>
<td>2 (1.6)</td>
<td>1 (1.8)</td>
<td>0.68</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Major morbidity</td>
<td>11 (9.1)</td>
<td>6 (10.7)</td>
<td>0.46</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Systemic complications</td>
<td>9 (7.4)</td>
<td>8 (14.3)</td>
<td>0.12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Device-related complications</td>
<td>2 (1.6)</td>
<td>2 (3.6)</td>
<td>0.38</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access site complications</td>
<td>5 (4.1)</td>
<td>0</td>
<td>0.14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Postimplantation syndrome</td>
<td>16 (13.2)</td>
<td>9 (16.1)</td>
<td>0.38</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reinterventions</td>
<td>4 (3.3)</td>
<td>0</td>
<td>0.21</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

IFU, Instructions for use; OL, off-label.

At 30 days, the risk of type I endoleak was higher in the OL group, but this did not reach the statistical significance (P=.09)
OFF-LABEL APPLICATION

Evaluation of the Endurant stent graft under instructions for use vs off-label conditions for endovascular aortic aneurysm repair

Giovanni Torsello, MD, Nicola Troisi, MD, Konstantinos P. Donas, MD, and Martin Austermann, MD, Münster, Germany


Estimated 1-year freedom from type I endoleak was 100% in the IFU group and 93.3% in the OL group (P=.01)

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Mean follow-up was 31 months

At 5 years, there were no differences in terms of survival (67.9% IFU vs. 54.1% OL, p=0.3), freedom from any device-related reintervention (91.2% IFU vs. 92.4% OL, p=0.8), or freedom from graft thrombosis (97.5% IFU vs. 92.7% OL, p=0.3).
OFF-LABEL APPLICATION

- Estimated 5-year freedom from type I endoleak was significantly better in the IFU group than in the OL (100% vs. 96.2%, \( P = .03 \))

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DEBATE:
Not So! Off-label Use Of Newer EVAR Devices Does Not Lead To Higher Failure Rates: Why the Discrepancy

Patrice Mwipatayi, MD
for the ENGAGE Investigators
Department of Vascular Surgery,
Royal University Hospital
Perth, Australia

Engage Registry
Outcomes through Follow-up

<table>
<thead>
<tr>
<th>Secondary Endovascular Procedure</th>
<th>Off-Label</th>
<th>On-Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>Through 1 Year</td>
<td>6.5%</td>
<td>0.738</td>
</tr>
<tr>
<td>Through 2 Year</td>
<td>1.9%</td>
<td>0.514</td>
</tr>
<tr>
<td>Through 3 Year</td>
<td>2.7%</td>
<td>0.801</td>
</tr>
<tr>
<td>Through 4 Year</td>
<td>9.5%</td>
<td>0.229</td>
</tr>
</tbody>
</table>

Engage Registry
Summary

- Standard EVAR treatment in Off-label pts indications is feasible with Endurant Stent Graft if you consider a strict follow up and re-interventions to treat potential Type 1 endoleaks
- The significant incidence of Type I endoleak in the “Off-label” group identified at 2 year did not persist in this patient population up to 4 years
- No differences between IFU vs “Off-label” in:
  - Occlusion
  - Migration
  - Sac Enlargement
  - Rare instances of rupture and conversion

No Significant Difference
TAKE HOME MESSAGES

ARE CONTEMPORARY DEVICES REDUCING THE GAP IN CLINICAL OUTCOME? The answer is YES but...

✓ The majority of data is about Endurant stent-graft with consolidated midterm outcomes

✓ Off label use should be performed in high-volume centers with experience in complex aortic aneurysms and confidence in adjunctive procedures (chimney, endostapling, etc.)

✓ A strict surveillance schedule is mandatory to properly identify early type I endoleak

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TAKE HOME MESSAGES

VASCULAR LEGAL FORUM

Legal implications of pushing the endovascular envelope

O. William Brown, MD, JD, Royal Oak, Mich

"Application of these technologies without first obtaining proper informed consent may result in medical malpractice litigation. Similarly, use of these technologies without proper government and/or hospital approval may result in both criminal and/or civil liability. Care must be taken when pushing the envelope of endovascular interventions."

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Thank you for your attention
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