How to identify patients at risk of cardiovascular adverse events after EVAR

How to identify patients at risk of death after EVAR to explain “catch-up” mortality

Data from an individual patient meta-analysis of trials of EVAR vs open repair for elective AAA repair

No Disclosures

Merging the data Pinar Ulug, Statistics Michael Sweeting

Elective trials Chief Investigators: Roger Greenhalgh, Jan Blankensteijn, Frank Lederle, Jean-Pierre Becquemin

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EVAR 1, DREAM, OVER, ACE trials merged data

Why the catch-up mortality?

Better survival in EVAR group

Similar results from Medicare data set

IPD: accounting for different cohorts because of significant inter-trial difference for all baseline variables

- EVAR-1 had oldest patients, with largest AAA, longest follow-up
- DREAM had most never smokers
- OVER had highest proportion with diabetes
- ACE had the youngest patients, smallest AAA, shortest follow-up

Time EVAR-1 N=1252 DREAM N=351 OVER N=881 ACE N=299

randomisation to repair – median (IQR)

40 days (1, 576) 39 days (3, 209) 17 days (0, 290) 27 days (1, 203)

Follow up median (IQR)

6.0 years (3.9, 7.3) 6.0 years (5.0, 6.8) 5.4 years (4.1, 6.8) 3.1 years (2.1, 3.4)

No, all better with EVAR

Are there any sub-groups who do not gain the early (0-6m) or mid-term (0-4y) survival advantage from EVAR?

- Aneurysm morphology (max diameter, neck diameter, neck length)
- Age, sex
- Comorbidities
- Renal dysfunction
- Coronary disease
- Peripheral arterial disease

Many subgroups & several time periods - interpret results cautiously

Time periods for mortality: 0-6 months, 6 months-4y, 4+ year

0-6m: previous angina/myocardial infarction

Homogenous results: patients with previous MI or angina showed no early survival benefit from EVAR

<table>
<thead>
<tr>
<th>Time period</th>
<th>subgroup</th>
<th>HR (95% CI)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-6 months</td>
<td>None</td>
<td>1.00 (0.78, 1.26)</td>
<td>0.99 (0.72, 1.41)</td>
</tr>
<tr>
<td>6m-4 years</td>
<td>None</td>
<td>1.00 (0.77, 1.20)</td>
<td>0.99 (0.71, 1.39)</td>
</tr>
<tr>
<td>&gt;4 years</td>
<td>None</td>
<td>1.00 (0.78, 1.27)</td>
<td>0.99 (0.71, 1.39)</td>
</tr>
</tbody>
</table>

The patients with peripheral arterial disease (ABPI < 0.9) have the highest mortality at all times. Overall 30-day mortality 4.2% (vs < 3% all other subgroups).

<table>
<thead>
<tr>
<th>Time period</th>
<th>Subgroup</th>
<th>Risk</th>
<th>stats</th>
<th>Interaction</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-6 months</td>
<td>ABPI &lt; 0.9</td>
<td>3</td>
<td>885</td>
<td>0.50 (0.39, 1.00)</td>
<td>0.50, 0.00, 1.00, 0.00, 0.143</td>
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<td>ABPI ≥ 0.9</td>
<td>3</td>
<td>866</td>
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</tr>
<tr>
<td>6m-4 years</td>
<td>ABPI &lt; 0.9</td>
<td>3</td>
<td>401</td>
<td>1.67 (1.12, 2.49)</td>
<td>0.05, 0.00, 0.00, 0.022</td>
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<td>ABPI ≥ 0.9</td>
<td>3</td>
<td>975</td>
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<tr>
<td>&gt;4 years</td>
<td>ABPI &lt; 0.9</td>
<td>3</td>
<td>329</td>
<td>1.00 (0.59, 1.80)</td>
<td>0.00, 0.00, 0.00, 0.715</td>
</tr>
<tr>
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<td>ABPI ≥ 0.9</td>
<td>3</td>
<td>1411</td>
<td></td>
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</tr>
</tbody>
</table>

The complex relationship between the benefits of EVAR & patient fitness.

Patients with coronary & peripheral arterial disease are at high risk of cardiovascular death after EVAR & need better preoperative care.