Long term outcomes of coil embolization for Type II endoleak after EVAR

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Disclosure

Speaker name:

.................................................................

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
Background

Recently, EVAR has been established as the standard treatment for AAA.

Aneurysm expansion due to type 2 endoleak (EL) is one of the major troubles after EVAR.

Long-term outcome about persistent type 2 EL and coil embolization is still unclear.
Current Study Population: 418 patients

EVAR Registry
426 consecutive patients underwent EVAR between November 2006 and July 2014

Encovascular therapy for stenotic lesion: 2 cases
Secondary EVAR for type I endoleak: 3 cases
EVAR for pseudo aneurysm at anastomosis site: 2 cases
EVAR for ruptured AAA: 1 case

Study flow

Type II EL - 342 cases
Type II EL + 76 cases

Endpoint
✓ Major adverse event (MAE): Free from type I/III leak, aneurysm related death, aneurysm rupture, surgical conversion, graft infection or thrombosis, aneurysm expansion (>5mm)
✓ Additional endovascular procedure
### Patient characteristics

<table>
<thead>
<tr>
<th></th>
<th>Type II(+) n=76</th>
<th>Type II(- ) N=342</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Male</strong></td>
<td>80%</td>
<td>85%</td>
<td>0.27</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td>75.3±7.6</td>
<td>76.5±7.8</td>
<td>0.10</td>
</tr>
<tr>
<td><strong>Aneurysm diameter</strong></td>
<td><strong>51.2±8.7</strong></td>
<td><strong>48.8±10.6</strong></td>
<td><strong>0.04</strong></td>
</tr>
<tr>
<td><strong>HTN</strong></td>
<td>66(87%)</td>
<td>280(82%)</td>
<td>0.34</td>
</tr>
<tr>
<td><strong>DM</strong></td>
<td>11(14%)</td>
<td>52(15%)</td>
<td>0.86</td>
</tr>
<tr>
<td><strong>DLP</strong></td>
<td>51(67%)</td>
<td>220(65%)</td>
<td>0.69</td>
</tr>
<tr>
<td><strong>IHD</strong></td>
<td>30(39%)</td>
<td>142(42%)</td>
<td>0.71</td>
</tr>
<tr>
<td><strong>Medication</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Aspirin</strong></td>
<td>43(57%)</td>
<td>203(59%)</td>
<td>0.65</td>
</tr>
<tr>
<td><strong>Thienopyridine</strong></td>
<td>11(14%)</td>
<td>54(16%)</td>
<td>0.77</td>
</tr>
<tr>
<td><strong>Anticoagulants</strong></td>
<td>7(9.2%)</td>
<td>40(12%)</td>
<td>0.53</td>
</tr>
</tbody>
</table>
**Major adverse event (MAE):** Free from type I/III leak, aneurysm related death, aneurysm rupture, surgical conversion, graft infection or thrombosis, aneurysm expansion (>5mm)
Additional Endovascular Therapy

![Graph showing cumulative incidence vs. interval (days) for Type II EL(-) and Type II EL (+). The graph indicates a significant difference with P < 0.0001.]

<table>
<thead>
<tr>
<th>Interval</th>
<th>0 day</th>
<th>1 year</th>
<th>2 year</th>
<th>3 year</th>
<th>4 year</th>
<th>5 year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type II -</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N of pts at risk</td>
<td>342</td>
<td>277</td>
<td>209</td>
<td>158</td>
<td>111</td>
<td>73</td>
</tr>
<tr>
<td>Type II +</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N of pts at risk</td>
<td>76</td>
<td>59</td>
<td>44</td>
<td>30</td>
<td>20</td>
<td>9</td>
</tr>
</tbody>
</table>
Additional endovascular intervention 46 cases

<table>
<thead>
<tr>
<th>Graft</th>
<th>n=26/418</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zenith</td>
<td>5/54(9.2%)</td>
</tr>
<tr>
<td>Excluder</td>
<td>16/207(7.7%)</td>
</tr>
<tr>
<td>Endurant</td>
<td>2/54(3.7%)</td>
</tr>
<tr>
<td>Powerlink/AFX</td>
<td>3/21(14%)</td>
</tr>
</tbody>
</table>
Our indication of coil embolization for type II endoleak

- Sac enlargement due to type II endoleak after index EVAR
- Sac re-enlargement after once sac diameter was shrinkage
- Definite type II endoleak and sac diameter AAA>55mm IAA>40mm

Sac re-enlargement case

Pre 49mm 1y 37mm 2y 43mm
Type II EL after EVAR
Our strategy of coil embolization for Type II EL

Key point: Inflow-Sac-Outflow embolization
Coil embolization for Type II EL after EVAR
Coil embolization for Type II EL after EVAR
Coil embolization for Type II EL after EVAR
<table>
<thead>
<tr>
<th>Re-enlargement after once sac shrinkage</th>
<th>11 cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sac shrinkage after coil</td>
<td>10/11 cases</td>
</tr>
</tbody>
</table>

Diameter change before and after coil embolization

10/11 cases successfully control sac enlargement after coil embolization
Persistent enlargement / large diam | 15 cases
---|---
Sac shrinkage after coil | 8/15 cases

Diameter change before and after coil embolization

8/15 cases can control sac enlargement after coil embolization. 2 cases needed open conversion.
Summary

Persistent type II EL was associated with high incidence of MAE and additional endovascular procedure.

Coil embolization could control sac enlargement in 90% (10/11) of re-enlargement cases.

However, it was difficult to control sac enlargement in half of persistent (7/15) with enlargement cases.
Conclusion

Careful observation and additional intervention should be considered for persistent type 2 EL. Success rate to control sac enlargement in 70% (18/26) cases.

We should consider about control type II endoleak during index EVAR procedure to improve long-term outcome.
Junichi Tazaki
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Thank you for your attention!
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