Review: Endovascular treatment and carotid endarterectomy do not differ for carotid stenosis


Clinical impact ratings: Hospitalists ★★★★★☆ Neurology ★★★★★☆☆

Question
In patients with carotid stenosis, what are the risks and benefits of endovascular treatment compared with carotid endarterectomy?

Methods
Data sources: Cochrane Stroke Group Specialized Register (September 2003), Cochrane Central Register of Controlled Trials (Issue 3, 2003), MEDLINE (1966 to October 2004), EMBASE/Excerpta Medica (1980 to October 2004), Science Citation Index (1981 to October 2004), conference proceedings, researchers in the field, and balloon catheter and stent manufacturers.

Study selection and assessment: Randomized controlled trials that compared carotid endovascular treatment with carotid endarterectomy in patients with symptomatic or asymptomatic carotid artery stenosis. Quality of individual studies was assessed for method of randomization, allocation concealment, intention-to-treat analysis, blinded outcome assessment, and follow-up.

Outcomes: Death or any stroke at 30 days; death or disabling stroke at 30 days, death or any stroke at 1 year; cranial neuropathy at 30 days; and death, any stroke, or myocardial infarction at 30 days.

Main results
5 trials (n = 1269) met the inclusion criteria. 75% of patients were symptomatic. Blinding of intervention or outcome was not present in any trial, but allocation concealment was adequate in all trials. Endovascular treatment reduced cranial neuropathy; groups did not differ for any other outcome (Table).

endovascular treatment vs carotid endarterectomy for carotid artery stenosis

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Number of trials (n)</th>
<th>Weighted event rates</th>
<th>RRI (95% CI)</th>
<th>NNH (CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30-d death or any stroke</td>
<td>5 (1269)</td>
<td>8.3%</td>
<td>6.3%</td>
<td>29% (13 to 91)</td>
</tr>
<tr>
<td>30-d death or disabling stroke</td>
<td>3 (716)</td>
<td>5.5%</td>
<td>4.5%</td>
<td>19% (36 to 123)</td>
</tr>
<tr>
<td>1-y death or any stroke</td>
<td>3 (1057)</td>
<td>13.4%</td>
<td>13.3%</td>
<td>1% (26 to 37)</td>
</tr>
<tr>
<td>30-d death, stroke, or myocardial infarction</td>
<td>5 (1269)</td>
<td>8.1%</td>
<td>7.8%</td>
<td>4% (28 to 50)</td>
</tr>
<tr>
<td>30-d cranial neuropathy</td>
<td>4 (1050)</td>
<td>0.5%</td>
<td>6.5%</td>
<td>96% (78 to 99)</td>
</tr>
</tbody>
</table>

*Abbreviations defined in Glossary; weighted event rates, RRI, RRR, NNH, NNT, and CI calculated from data in article using a fixed-effects model.

Commentary
Endovascular therapy (carotid angioplasty and/or stenting) for carotid stenosis has great appeal. It is less invasive than carotid endarterectomy, has lower rates of cranial nerve injury, and may even be less expensive. The key question is whether endovascular therapy is as good as or better than carotid endarterectomy. Coward and colleagues found no difference in outcomes at 30 days (stroke or treatment-related death and stroke, any death, or myocardial infarction) or at 1 year (stroke or death).

In addition, few data exist to guide decisions for the care of individual patients. Older symptomatic patients benefit from carotid endarterectomy; but do worse with endovascular therapy (3). However, endovascular therapy may be the only alternative in technically difficult cases (e.g., distal stenosis or stenosis from radiation injury).

Carotid endarterectomy is the standard and should remain so until clinical trial data firmly establish endovascular therapy as a safe and effective alternative.

Lawrence M. Brass, MD
Yale University School of Medicine
New Haven, Connecticut, USA

References