Vein or polytetrafluoroethylene patch closure after carotid endarterectomy reduced stroke and recurrent stenosis


Question
In patients who have had a carotid endarterectomy (CEA), how do different types of closures (primary closure, vein patch [jugular or saphenous veins], and polytetrafluoroethylene patch [PTFE-P]) affect clinical outcomes and recurrent stenosis?

Design
Randomised controlled trial with a mean follow-up of 30 months.

Setting
Charleston, West Virginia, United States.

Patients
357 patients who had 399 CEAs: 315 unilateral and 42 bilateral procedures. Exclusion criteria were repeat CEAs, CEAs with concomitant coronary artery bypass grafting, or internal carotid artery diameter < 4 mm.

Intervention
Patients were allocated to 1 of 3 methods of closure: primary closure (135 CEAs), PTFE-P (134 CEAs), and vein patch (130 CEAs: 70 saphenous vein and 60 jugular vein). CEAs were done using general anaesthesia, systemic heparin, and routine shunting with a carotid Argyle shunt. Patients were given aspirin, 325 mg/d, within 24 hours after the CEA.

Main outcome measures
The main outcome measure was recurrent stenosis ≥ 50%. Secondary outcome measures were stroke, transient ischaemic attack, reversible ischaemic neurological deficit, and death.

Main results
Fewer patients in the PTFE-P and vein-patch groups than in the primary-closure group had recurrent stenoses ≥ 50% (2% and 9% vs 34%, P < 0.001 for both comparisons) and ipsilateral strokes (1% and 0% vs 5%, P = 0.03 and P = 0.008 for comparisons between primary closure and PTFE-P and primary closure and vein patch, respectively) (Table). Fewer patients in the PTFE-P group than in the vein-patch group had recurrent stenoses ≥ 50% (P < 0.05), but the groups did not differ for ipsilateral stroke (Table). Freedom from recurrent stenoses at 48 months was 47% for the primary-closure group, 84% for the vein-patch group, and 96% for the PTFE-P group (P < 0.001). No difference existed among treatments for transient ischaemic attacks, reversible ischaemic neurological deficit, or death.

Conclusions
Patients who had vein-patch or PTFE-P closure for CEA had fewer recurrent stenoses ≥ 50% and ipsilateral strokes than those with primary closure for CEA. Fewer stenoses ≥ 50% recurred in the PTFE-P group than in the vein-patch group.

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Vein patch, polytetrafluoroethylene patch (PTFE-P), or primary closure after carotid endarterectomy at a mean follow-up of 30 months

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>PTFE-P</th>
<th>Vein patch</th>
<th>Primary closure</th>
<th>RRR (95% CI)</th>
<th>NNT (CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥ 50% recurrent stenosis</td>
<td>2%</td>
<td>9%</td>
<td>34%</td>
<td>93% (80 to 98)</td>
<td>4 (3 to 5)</td>
</tr>
<tr>
<td></td>
<td>2%</td>
<td>9%</td>
<td>34%</td>
<td>74% (53 to 86)</td>
<td>4 (3 to 7)</td>
</tr>
<tr>
<td>Ipsilateral stroke</td>
<td>1%</td>
<td>0%</td>
<td>5%</td>
<td>86% (12 to 98)</td>
<td>23 (11 to 203)</td>
</tr>
<tr>
<td></td>
<td>1%</td>
<td>0%</td>
<td>5%</td>
<td>100%</td>
<td>20 (12 to 70)</td>
</tr>
</tbody>
</table>

*Abbreviations defined in Glossary; RRR, NNT, and CI calculated from data in article.

The use of a patch when closing an arteriotomy after carotid endarterectomy substantially reduced the frequency of > 50% restenosis and ipsilateral stroke; the use of a PTFE patch was better than a vein patch in this respect. To patch or not to patch has long been a question among vascular surgeons, and several randomised trials now exist, such as this study by AbuRahma and colleagues, that try to answer that question. They all show or suggest that patch closure is of benefit for reducing recurrent symptoms and development of restenosis (1). However, most vascular surgeons still patch selectively, and surgeons dealing with carotid endarterectomy must do the same. This study supports patching. Large, randomised trials are needed, however, to better define risk factors that will help us to decide exactly when a patch is necessary.

Based on evidence from this study and others on the same topic, I am more willing to use patch closure in patients with small arteries (< 4 mm), in women, in patients with linked arteries, and when technical problems exist. I would certainly welcome a randomised study with sufficient statistical power to determine the best choice of patch material and its use in different populations.

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Reference