

HOW SHOULD WE TREAT ASYMPTOMATIC CAROTID STENOSIS (ACS)?

MEDICAL THERAPY

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There is no doubt that patients with symptomatic severe carotid stenosis benefit from carotid endarterectomy: the number needed to treat (NNT) to prevent one ipsilateral stroke in 2 years is only 6 for patients age <75, and only 3 for those age ≥75(1). On the other hand, the NNT for asymptomatic carotid stenosis (ACS) is 67-83% according to various estimates(1;2). Furthermore, those estimates are predicated on the low (3%) surgical risk seen in clinical trials, whereas in real-world practice the 30-day risk of stroke or death with endarterectomy is 5%(3). The risk of carotid stenting in most trials has been higher than that of endarterectomy(4;5).

Rothwell has shown that women with ACS did not benefit from endarterectomy in ACAS or in ACST(6). Reasons why routine revascularization of ACS is inappropriate were recently reviewed(7;8). However, the assumption that patients with ACS will benefit from revascularization is based on historical medical therapy which has now been superseded. Intensive medical therapy can reduce the risk of stroke by 80-90% in high-risk patients(9).

Transcranial Doppler detection of microemboli can determine which patients with ACS might benefit from revascularization: those with microemboli have a 15% risk of stroke in 1 year, so they may very well benefit; however those without microemboli have only a 1% risk of stroke in 1 year, so they cannot benefit from procedures with a risk of 4-5%(10).

We showed in 2002 that patients in the top quartile of carotid plaque area had 3.4-fold higher risk of stroke, death or myocardial infarction, compared to those in the lowest quartile, after adjusting for age, sex, cholesterol, blood pressure, diabetes, homocysteine or treatment of lipids or blood pressure. During the first year of follow-up, those with plaque progression (50% of the patients) had twice the risk of these events, after adjustment for the same risk factors(11). We therefore changed the paradigm for treatment in our clinics, from treating risk factors to treating arteries: patients with plaque progression are treated more intensively regardless of the levels of their risk factors such as LDL(12;13). The proportion of patients with microemboli has been reduced by more intensive medical therapy from 12.6% before 2003 to 3.7% since 2003; this means that less than 5% of ACS patients could possibly benefit from revascularization.

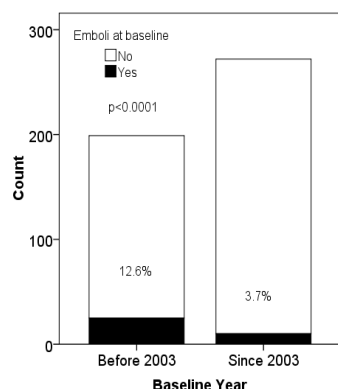


Figure 1. Decline of microemboli since introduction of more intensive medical therapy

Microemboli have declined from 12.6% of patients with asymptomatic carotid stenosis to 3.7% ($p<0.0001$).

More intensive medical therapy has also reduced the 1-year risk of stroke in patients with ACS from 4% to 0.8%, and has also reduced the 1-year coronary risk from 6.5% to 0%.

Patients with ACS should be treated medically; only those with microemboli should be considered for revascularization.

References

- Barnett HJ, Meldrum HE, Eliasziw M. The appropriate use of carotid endarterectomy. *CMAJ* 2002 April 30;166(9):1169-79.
- Barnett HJ, Eliasziw M, Meldrum HE, Taylor DW. Do the facts and figures warrant a 10-fold increase in the performance of carotid endarterectomy on asymptomatic patients? [see comments]. *Neurology* 1996 March;46(3):603-8.
- Kresowik TF, Bratzler D, Karp HR, Hemann RA, Hendel ME, Grund SL et al. Multistate utilization, processes, and outcomes of carotid endarterectomy. *J Vasc Surg* 2001 March;33(2):227-34.
- Alberts MJ, for the publications committee of the WALLSTENT. Results of a multicenter prospective randomized trial of carotid artery stenting vs carotid endarterectomy. *Stroke* 32, 325. 2001.
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- Spence D, Eliasziw M. Endarterectomy or angioplasty for treatment of carotid stenosis? *Lancet* 2001;357:1722-3.
- Rothwell PM. ACST: which subgroups will benefit most from carotid endarterectomy? *Lancet* 2004 October 25;364(9440):1122-3.
- Chaturvedi S, Bruno A, Feasby T, Holloway R, Benavente O, Cohen SN et al. Carotid endarterectomy--an evidence-based review: report of the Therapeutics and Technology Assessment Subcommittee of the American Academy of Neurology. *Neurology* 2005 September 27;65(6):794-801.
- Spence JD. Intervention can't be justified without more precise patient selection. Part 2 in: Three views of carotid stenosis. Ed. Cohen SN. *Practical Neurology* 2005;5:28-9.
- Hackam DG, Spence JD. Combining multiple approaches for the secondary prevention of vascular events after stroke: a quantitative modeling study. *Stroke* 2007 June;38(6):1881-5.
- Spence JD, Tamayo A, Lownie SP, Ng WP, Ferguson GG. Absence of microemboli on transcranial Doppler identifies low-risk patients with asymptomatic carotid stenosis. *Stroke* 2005 November;36(11):2373-8.
- Spence JD, Eliasziw M, DiCicco M, Hackam DG, Galil R, Lohmann T. Carotid plaque area: a tool for targeting and evaluating vascular. *Stroke* 2002;33(12):2916-22.
- Spence JD. Ultrasound measurement of carotid plaque: Uses in patient management, genetic research and evaluation of new therapies. *Nature Clinical Practice Neurology* 2006;2:611-9.
- Spence JD. Point: uses of carotid plaque measurement as a predictor of cardiovascular events. *Prev Cardiol* 2005;8(2):118-21.