

## INVITED COMMENTARY

## Commentary on 'Risk of Recurrent Stroke in Patients with Symptomatic Mild (20–49% NASCET) Carotid Stenosis'

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The authors of this retrospective regional study report that patients with symptomatic mild carotid artery stenosis on current best medical management had a 7.4% cumulative incidence of recurrent ipsilateral stroke in 3-year follow-up.<sup>1</sup> This was a significantly higher risk of ipsilateral stroke than that of a comparable set of asymptomatic patients with similar mild carotid stenosis, as well as that of patients with symptomatic moderate or severe stenosis in the 3 years after CEA. If these results are supported by future studies, a prospective randomized trial is needed to determine whether CEA or current best medical therapy is recommended.

There is solid evidence that plaque morphology determined by MRI, ultrasound or other modern plaque imaging methods is a major independent variable for predicting stroke risk. Even though plaque morphology was not available for this study, the results strongly suggest that patients with symptomatic mild carotid stenosis deserve a thorough evaluation of ipsilateral plaque morphology. While carotid plaque burden may correlate with percent stenosis, carotid plaque morphology may not. The observation that unstable carotid plaque morphology correlates better with TIA/stroke than degree of stenosis is not new.<sup>2</sup> Why should 50–69% diameter stenosis plaques be more likely to become unstable than 20–49% stenotic ones? Carotid diameter stenosis >50% generally produces systolic turbulent flow, as evidenced by a bruit, but turbulence is not a prerequisite for plaque instability. Carotid plaque morphology may carry as much weight as percent carotid stenosis as a harbinger/predictor of embolic stroke and for mild stenosis plaque morphology may trump percent stenosis. The addition of carotid plaque morphology to the stroke risk equation opens the door for re-evaluation of patients with symptomatic moderate carotid stenosis in addition to those with mild stenosis.

An example of the combinations of mild (20–49%) and moderate (50–69%) percent stenosis with stable or unstable plaque morphology for carotid origin embolic recurrent stroke risk in symptomatic patients is given in the following 2 × 2 matrix. The four combinations for recurrent stroke risk are: (a) low % stenosis and stable plaque, (b) low % stenosis

and unstable plaque, (c) moderate % stenosis and stable plaque, and (d) moderate stenosis and unstable plaque. One might predict that (a) be strongly considered for current best medical therapy and that (d) be recommended for CEA. The optimal management outcomes for (b) and (c) are unknown and clearly deserve a trial. If I had a TIA or minor stroke and (b), mild stenosis and an unstable plaque, I would strongly consider CEA. In contrast, if I had (c), moderate stenosis, and stable plaque, I might choose current best medical management, unless I was already on it. While CEA for symptomatic patients with moderate stenosis is supported by NASCET and ECST,<sup>3,4</sup> the presence of a stable fibrous plaque (c) may warrant current best medical therapy not CEA. If the Gothenburg region of Sweden can identify 162 patients with mild symptomatic stenosis over a 5-year period, surely national or multinational trials of adequate power can be done.

I confess to having occasionally recommended and performed CEA on symptomatic patients with ipsilateral mild stenosis and angiographically irregular/ulcerated or ultrasound echo lucent/complex plaque (both before and after NASCET and ECST guidelines). In these cases it was reassuring when an ulcerated or hemorrhagic plaque came into view with CEA arteriotomy. Whether or not CEA for this small subset of patients becomes an accepted guideline for CEA, an accurate and standardized method of grading of carotid plaque morphology is needed. In the meantime it would seem advisable to determine plaque morphology in symptomatic patients with mild ipsilateral carotid stenosis.

### REFERENCES

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