Treatment of a hot carotid

More fuel is needed to clarify the best treatments

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Practice Current: How do you manage patients with a “hot carotid”?

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The majority of patients presenting with a stroke or TIA receive imaging for carotid stenosis. Treatment of symptomatic carotid stenosis is familiar to most neurologists since high-profile clinical trials have been conducted in the past. The most well-known in North America is the North American Symptomatic Carotid Endarterectomy Trial (NASCET).¹ NASCET and additional analysis by Rothwell et al.² led to the recommendation that if the patient is an otherwise suitable candidate for carotid endarterectomy (CEA), then performing the operation within 2 weeks of the last symptomatic event is desirable.

For the latest Practice Current,³ in this issue of *Neurology® Clinical Practice*, Ganesh et al.⁴ look at modern-day practice patterns in the evaluation and treatment of symptomatic carotid stenosis. In the clinical vignette, the patient has symptoms of right hemiparesis for several hours but brain imaging findings are not mentioned. If the patient has an ischemic lesion on MRI, then the patient would meet the criteria for stroke rather than TIA. Concomitant symptoms, such as presence or absence of language dysfunction, are not mentioned. Questions are then posed regarding preferred imaging modalities, choice of antithrombotic therapy, and timing of carotid revascularization. Three neurology experts from diverse international locations also provide their recommendations.

In the survey results (n = 275), CT angiography (CTA) (70%) and Doppler ultrasound (58%) are the preferred imaging modalities. Regarding choice of procedure, 64% prefer CEA and 33.5% opt for carotid artery stenting (CAS). Slightly more than half of the respondents state carotid revascularization would typically be performed within 7 days, with 43% responding that a similar patient would wait more than 7 days at their hospital for revascularization. Aspirin and clopidogrel (either alone or in combination) are the preferred antithrombotic agents, with heparin or low molecular weight heparin being selected by approximately half of the respondents if there is an intravascular thrombus present.

Are the survey results rational and evidence-based? The report card is mixed. The migration to CTA is not surprising since CTA is frequently performed in the emergency department as part of an acute stroke evaluation. Many centers will utilize 2 concordant imaging studies before proceeding to carotid revascularization.

It is somewhat surprising that CAS was selected as the revascularization option by about one-third of the survey respondents. In the United States, close to 80% of carotid revascularization procedures are CEA operations.⁵ In addition, a combined analysis of several trials found that among symptomatic patients who had a procedure performed within 7 days of the last symptomatic event, CAS had a notably higher stroke/death rate compared to CEA (8.3% vs 1.3%).⁶ This translates into a number needed to harm of 14. All 3 expert physicians preferred CEA.

Performing the revascularization procedure within 7 days is preferred by most respondents. This may have been influenced by the transient nature of the patient's symptomatology. If there

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Table Medical therapy then and now

	1991	2018
Antiplatelet therapy	Aspirin monotherapy	Short-term dual antiplatelet therapy
Lipid-lowering medication	Little use	Widespread use
High-potency statins	Not available	Commonly used
Blood pressure control	Suboptimal	More stringent targets
Lifestyle	No organized approach	Mediterranean diet/increased physical activity recommended

is a radiologically proven stroke, then surgery is sometimes delayed. Factors such as infarct size and the severity of the clinical deficit then enter the equation. In real-world practice, a recent analysis found that in one center, only 37% of procedures were performed within 2 weeks.⁷

Choice of antithrombotic therapy is an evolving area. Two recent studies, in patients with a minor stroke or high-risk TIA, have found that dual antiplatelet therapy with aspirin and clopidogrel is associated with a reduced stroke rate compared to only one antiplatelet agent.^{8,9} Dual antiplatelet therapy has also been associated with a decrease in microemboli to the brain using transcranial Doppler (TCD).¹⁰ The utilization of heparin instead of antiplatelet therapy for patients with an intravascular thrombus is a common practice but high-quality studies are lacking. The 3 neurology experts sometimes use short-term anticoagulation followed by reimaging. If the thrombus is resolving or nonmobile, antithrombotic therapy can be continued. If the thrombus is mobile or not resolving and especially if the patient has further symptoms, then a more aggressive approach is taken.

An important topic not mentioned by Ganesh et al. is the extremely outdated evidence base on which patients with symptomatic carotid stenosis are treated. Initial results from NASCET were published in 1991. At that time, clopidogrel was not in use, high-potency statins were not available, CAS was still being refined, and management of blood pressure was suboptimal (table). Is there any other area of modern neurology where patients are treated on the basis of data that are 28 years old? Some neurology trainees were not even born in 1991, yet the ghost of NASCET marches forward in clinical practice guidelines.

Clearly, modern randomized controlled trials are needed for symptomatic carotid stenosis. It is likely that many

patients will fare well with intensive, multimodal therapy. Symptomatic patients with a lower predicted stroke risk (retinal ischemia, women, absence of microemboli on TCD) would be a logical group to study in new clinical trials.¹¹ The authors rightfully point out that updated trials are needed considering the frequency of carotid revascularization procedures. More fuel is needed to propel these trials forward.

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Disclosure

S. Chaturvedi serves as an Executive Committee member for the ACT I study and CREST 2 study; serves on the editorial boards of *Neurology* and *Journal of Stroke & Cerebrovascular Disease*, Assistant Editor for *Stroke*, and Associate Editor for *NEJM Journal Watch Neurology*; participates in clinical studies supported by Boehringer-Ingelheim; receives research support from the FDA for serving on circulatory devices panel; and has received compensation for expert witness testimony in medico-legal cases. Full disclosure form information provided by the authors is available with the full text of this article at Neurology.org/cp.

References

1. North American Symptomatic Carotid Endarterectomy Trial Collaborators. Beneficial effect of carotid endarterectomy in symptomatic patients with high-grade carotid stenosis. *N Engl J Med* 1991;325:445–453.
2. Rothwell PM, Eliasziw M, Gutnikov SA, et al. Endarterectomy for symptomatic carotid stenosis in relation to clinical subgroups and timing of surgery. *Lancet* 2004; 363: 915–924.
3. Practice Current: An Interactive Exchange on Controversial Topics. Available at: neurology.org/collection/practice_current. Accessed October 10, 2018.
4. Ganesh A, Wong JH, Menon BK. Practice Current: How do you manage a “hot carotid”? *Neurol Clin Pract* 2018;8:527–536.
5. Lichtman JH, Jones MR, Leifelt EC, et al. Carotid endarterectomy and carotid artery stenting in the US Medicare population, 1999–2014. *JAMA* 2017;318: 1035–1046.
6. Rantner B, Kollerits B, Roubin GS, et al. Early endarterectomy carries a lower procedural risk than early stenting in patients with symptomatic stenosis of the internal carotid artery. *Stroke* 2017;48:1580–1587.
7. Noronen K, Vikatmaa P, Sairanen T, Lepantolo M, Venermo M. Decreasing the delay to carotid endarterectomy in symptomatic patients with carotid stenosis: outcome of an intervention. *Eur J Vasc Endovasc Surg* 2012;44:261–266.
8. Wang Y, Wang Y, Zhao X, et al. Clopidogrel with aspirin in acute minor stroke or transient ischemic attack. *N Engl J Med* 2013;369:11–19.
9. Johnston SC, Easton DJ, Farrant M, et al. Clopidogrel and aspirin in acute ischemic stroke and high-risk TIA. *N Engl J Med* 2018;379:215–225.
10. Batchelder J, Hunter J, Cairns V, Sandford R, Munshi A, Naylor AR. Dual antiplatelet therapy prior to expedited carotid surgery reduces recurrent events prior to surgery without significantly increasing peri-operative bleeding complications. *Eur J Vasc Endovasc Surg* 2015;412–419.
11. Chaturvedi S. Aggressive medical therapy alone is adequate in certain patients with severe symptomatic carotid stenosis. *Stroke* 2013;44:2957–2958.