

CAROTID DEBATE**Near occlusion of the internal carotid artery: interventional or conservative treatment?****Part II: For the motion. Carotid near occlusion should be treated conservatively****Vangelis G. Alexiou**

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In 2003, Rothwell et al published an analysis of pooled data from the NASCET and ECST trials, the only to date completed RCTs that compare CEA with BMT in patients with symptomatic carotid stenosis.¹ The researchers revisited the angiograms of all patients included in the above RCTs to identify near-occlusions based on uniform criteria; namely the NASCET angiographic criteria: severe stenosis with evidence of flow reduction in the distal ICA (delay of contrast arrival into the distal ICA, or presence of collateral flow towards the symptomatic cerebral hemisphere) and presence of narrowing of the ICA distally to the stenosis (lumen diameter similar to, or less than, the ipsilateral ECA and less than the contralateral ICA). The researchers reported no significant benefit of CEA over BMT. Based on the above evidence, the current ESVS guidelines recommend conservative management with BMT for symptomatic patients with a chronic ICA near-occlusion.²

It should be noticed that, based on the above angiographic definitions, carotid near-occlusion is a severe stenosis with distal artery collapse; this collapse may range from subtle, referring to just an obvious reduction of the vessel diameter compared to the original size, or even almost total, including cases of an extremely narrow residual lumen and a collapsed distal portion that resembles a thin string - a threadlike appearance.³ It is reported that more than 90% of the patients studied by the NASCET and ECST trials had carotid near-occlusion with subtle distal collapse.³

In 2015, a study by Johansson et al., confirmed that patients with a symptomatic ICA near occlusion with a subtle distal collapse had a very low 90-day risk (actually 0%) of stroke recurrence.⁴ This is in keeping with the RCTs and the guide-

lines.^{1,2} However, the study raised a question about patients with near-occlusion and total distal collapse - same as the patient whose management we are debating in this paper.⁴ There were only 4 patients with near-occlusion and total distal collapse and those had an increased risk for recurrent stroke (43%). Of course, it is extremely unsafe to draw any conclusions based on a sample of 4 patients. Similar results were reported by Gu et al in 2020.⁵ Still, the small numbers and the non-RCT design of such studies should make us really skeptical about the applicability of their results.

Interestingly, a study, published in 2020, assessing the sensitivity and specificity of computed tomography angiography (CTA) for carotid near-occlusion diagnosis showed that carotid near-occlusion is systematically under-reported.⁶ Even experienced radiologists may mistake near-occlusion for stenosis without distal artery collapse, by not noticing and by interpreting incorrectly a subtle distal collapse or by mistaking a near-occlusion with total collapse for carotid total occlusion. Impressively, the average sensitivity for correct diagnosis of carotid near-occlusion, among the radiologists participating in this study, was 8% and the diagnosis that was most frequently missed was near occlusion without distal collapse.⁶ The above makes the results of studies, based on a CTA diagnosis of carotid near-occlusion, questionable.

Most of the modern studies that compare BMT with interventions (CAS or CEA), in patients with symptomatic carotid near-occlusion, do not separate the two entities of subtle and total collapse, do not share definitions and common design. Thus, the attempts to pool results and draw conclusions may be based on erroneous assumptions and oversimplifications.^{7,8}

Furthermore, even if we assume that there is some benefit, in operating the small subgroup of near-occlusions that have total distal collapse, most of these cases may be surgically unfeasible. A carotid patch angioplasty on a collapsed distal vessel is extremely demanding and may easily fail leading to acute thrombosis and a perioperative stroke. An eversion endarterectomy may be more appropriate but is less commonly practiced and very few surgeons have the required experience. Regarding CAS, wire manipulation in an ICA with near occlusion may increase the risk for stroke and there is also a ques-

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ISSN 2732-7175 / 2022 Hellenic Society of Vascular and Endovascular Surgery Published by Rotonda Publications
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tion about the proper deployment of a cerebral embolic protection device in a severely collapsed distal vessel. Of interest, a recent report by Johansson et al raises the issue of intracerebral hemorrhage when trying to revascularize near-occlusions with total distal collapse. In the small series of 10 patients, the authors report an incidence of 20% of this detrimental complication⁹. In theory, it makes sense to suspect that stenoses that reduce the flow to a degree that causes distal collapse also have a high chance to lead to hyperperfusion and potentially to intracerebral hemorrhage when removed.

Finally, it should be noticed that there are very few contemporary studies reporting on BMT for patients with symptomatic carotid near-occlusion. A meta-analysis by Antonopoulos et al. has identified 21 studies, however, only 5 of them were done after 2010. There were 13 studies with a study period in the 1990s or even earlier weighing a total of more than 70% in the pooled results.⁷ As such, it is doubtful that the current BMT that includes aggressive statin medications, smoking cessation regimens, blood pressure optimization, optimum diabetes mellitus control, antiplatelet therapy, exercise and balanced diet has been compared with traditional CEA and contemporary CAS.

To summarize, it is clear that it is more than safe and evidence-based to manage the debated case with BMT. Until a modern and properly designed RCT, with clear definitions and carefully selected interventions, is done to shade more light in the question of interventional management of symptomatic carotid near-occlusion, the ESVS guideline recommendations should be followed.²

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