Carotid Wars Episode VI: Return of the Standard

Carlos A. Molina, MD, PhD; Magdy H. Selim, MD, PhD

In modern medicine, a novel treatment or procedure typically needs decades to demonstrate efficacy compared with the previous standard and to make its way into routine clinical practice. More than 20 years ago, the young Challenger, carotid endarterectomy (CEA), defeated the old Standard, medical treatment, in the battlefields of North American Symptomatic Carotid Endarterectomy Trial (NASCET) and European Carotid Stenosis Trial (ECST). This victory established a new era of “The Surgical Empire,” and CEA was crowned as the treatment of choice for moderate and severe symptomatic carotid stenosis. However, despite the overall robust benefit from CEA, there were some fronts where the victory was less rotund. Subgroup analysis of pooled data from the large randomized controlled trials (RCTs) showed the lowest degree of benefit from surgery in women, patients <75 years of age, and patients undergoing CEA beyond 2 weeks after their last ischemic event. For patients with symptomatic stenosis >50%, the number needed to treat by CEA increased 4-fold in women, 3-fold in patients aged <65 years, and 25-fold in whom surgery was performed >12 weeks after the ischemic event. Women had lower risk of ipsilateral ischemic stroke on medical treatment and higher operative risk than men.

Our protagonists express different arguments to defend a similar position. Drs Brown and Chaturvedi agree that medical treatment has dramatically evolved since the early CEA trials. Contemporary medical forces include more effective antithrombotic regimens, wide use of high-dose statins and low-density lipoprotein goal (<70 mg/dL), and aggressive reduction of vascular risk factors using guidelines-derived blood pressure and diabetes management as well as more effective smoking cessation and physical activity programs. The revolution was consummated with the landing of Stenting and Aggressive Medical Management for Preventing Recurrent stroke in Intracranial Stenosis (SAMMPRIS) starship, which widely opened the eyes of the stroke community to the finding that optimal medical treatment (OMT) was superior to the best endovascular treatment available for symptomatic intracranial stenosis in the setting of an RCT. However, optimal surgical treatment has also evolved in the meantime. The results of NASCET and ECST led to massive endorsement of CEA, which became a widespread procedure with low rates of periprocedural complications in most high-volume centers. The surgical technique of performing CEA still continues to evolve. Although the use of eversion endarterectomy has largely replaced the traditional longitudinal endarterectomy, a review of 5 RCTs showed no significant differences in the rates of perioperative stroke, any stroke, death, or local complications compared with conventional endarterectomy. The use of patch of autologous vein or synthetic material represents another technical advance and is associated with a significant reduction in perioperative risk of stroke or death (60%), perioperative arterial occlusion (85%), and restenosis on long-term follow-up (80%).

Furthermore, unlike initial carotid trials, CEA under local anesthesia is becoming more widespread. Although small randomized trials suggest that the use of local anesthesia may be associated with a trend toward a reduced perioperative death, a large multicenter RCT has shown no difference in operative risk of stroke or death combined. Overall, the rate of ipsilateral stroke or death at 30 days after CEA is ≈6% in recent RCTs of CEA versus carotid angioplasty/stenting, on top of contemporary medical treatment, despite the optimization of technical and surgical management!

Additional factors other than the degree of carotid stenosis should be considered when deciding on CEA plus OMT versus OMT alone in our patient. Early surgery might be preferred in the presence of an irregular or ulcerated plaque or even mobile thrombus on carotid ultrasound or 3D-MRI, since it is a marker of plaque instability. Scattered infarcts on diffusion-weighted imaging in recently symptomatic patients may reflect plaque aggressiveness and high risk of early recurrence. High or even moderate surgical risk would shift the balance toward OMT. There are also factors that need to be considered when attempting to optimize medical therapy. Aggressive blood pressure control may be challenging if the patient has a contralateral carotid occlusion. Blood pressure lowering regimen needs to be carefully selected based on the...
patient’s comorbidities and treatment goals. Although dual antiplatelet therapy seems to be effective shortly after treatment initiation, its long-term safety is uncertain. The time required for other strategies including statins and aggressive risk factors control for reducing the risk of stroke is uncertain. Last, although optimal and aggressive medical treatment has been demonstrated to reduce the stroke risk in RCTs, its feasibility and implementation in routine patients care remains challenging in many parts of the world.

In light of the available evidence, it seems that improvement curves of both treatment modalities did not run in parallel over the past 2 decades. Milestone advances in medical stroke prevention strategies have led to an unavoidable intersection of the 2 curves in some patients with symptomatic carotid stenosis. It seems that contemporary OMT is ready to challenge CEA on some fronts. How should we treat our patients? We are divided, but anxiously await the initiation and completion of CREST-2 trial to find out whether OMT will take revenge.

Disclosures

None.

References


Key Words: carotid stenosis • endarterectomy • treatment