

## Commentary

We have read very carefully and with great interest the article titled “Endovascular treatment of acute ischemic stroke: A review.” It is without doubt an excellent review article on the endovascular treatment of acute ischemic stroke (AIS).<sup>[1]</sup>

As we know, AIS is a leading cause of death and disability in the developed world. For the patient, a stroke can be devastating, involving problems such as loss of mobility, independence, and communication, and comprehension skills, thus leading to huge costs in healthcare and loss of productivity.

Treatment of AIS is time-dependent, with the best outcomes resulting from the earliest interventions. Options for acute stroke treatment include those conditions that do not require interventional access, such as intravenous thrombolysis, and those that require intervention, such as intra-arterial loco-regional thrombolysis or endovascular artery revascularization.

Nowadays, for patients with AIS who present with serious neurological deficits associated with a high-grade

stenosis of the internal carotid artery (ICA), despite maximal medical treatment, an effective intervention to improve their neurologic symptoms and clinical outcome has not yet been established; so, this paper could add more to our knowledge.

By the way, the paper does not focus at all on the possibility of an endovascular procedure to the extracranial ICA.

In our opinion, it could be very helpful for the reader and useful for the clinician to keep in mind that despite Level 1 evidence seems clearly in favor of carotid endarterectomy in symptomatic patients,<sup>[2-4]</sup> carotid artery stenting (CAS) has been proposed as a possible alternative in selected cases, if the procedure is performed in a high-volume center with documented low perioperative stroke and death rates.

We have already published our single-center experience reporting the outcome from 43 patients with symptomatic carotid stenosis >70%. In this series, CAS was performed in patients with either a positive history of recurrent transient ischemic attack (TIA)

or a single episode of TIA, and in patients suffering from minor stroke, according to the stabilization of cerebral symptoms. The new neurological events rate in the TIA patients at 1 month was 3.8%, while in the minor stroke group, at 1 month, 58.8% of patients experienced an improvement in their initial neurological deficit (decrease in National Institutes of Health Stroke Scale [NIHSS] < 2), the deficit remained stable in 35.3% of patients, and a neurological impairment was found in only one patient.<sup>[5]</sup>

In a retrospective analysis including 17 patients with AIS and admitted within 7 days of onset, Imai *et al.*<sup>[6]</sup> pointed out that emergency CAS placement can improve the 7-day neurologic outcome and may improve the 90-day clinical outcome. Of note, irreversible complications occurred in two patients (12%), including distal embolism in one and intracerebral hemorrhage in the other, while no ipsilateral ischemic stroke recurred.

Some authors have also reported the role of CAS in case of symptomatic “string sign” stenosis. Lesions described as “string sign” or pseudo-occlusions of the common or internal carotid artery are characterized by the appearance of tapering of the vessel lumen and a poststenotic region of significantly reduced caliber. The slow flow and the collapse of the poststenotic region have been thought to be a result of decreased perfusion pressure and decreased flow rather than atherosclerotic disease. Some believe that carotid revascularization for carotid near occlusion is a necessary emergency procedure while others call it dangerous. Historically the presence of string sign detected during carotid angiography has been correlated to high morbidity and mortality risk.<sup>[7]</sup>

Recently, Nikas *et al.*<sup>[8]</sup> reported CAS in patients with severe symptomatic carotid stenosis and angiographic string sign as feasible, with an acceptably low periprocedural complication rate (100% early technical and clinical success).

Some authors<sup>[9]</sup> have also described emergency endovascular treatment for ICA occlusion in patients who fulfilled the inclusion criteria. The four predefined major exclusion criteria considered were: Admission at >6 h of the onset of stroke symptoms, serious neurologic symptoms (NIHSS ≥ 5), total occlusion of the ICA as shown by the magnetic resonance angiography (MRA) with a diffusion/perfusion mismatch of more than 30%, and a faint visible collateral circulation on MRA. In this particular setting,

emergency CAS was performed in 10 patients, revealing to be able to improve the 7-day neurologic outcome and the 90-day clinical outcome.

So, in conclusion, CAS, particularly if associated with intracranial procedures, in the right hands and with the appropriate materials may safely correct a critical stenosis or stabilize the embolic source to the brain, resolving the ischemia in a short time without reduction in cerebral blood flow in the affected hemisphere during the procedure.

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