



Could New Dual Layer Carotid Artery Stent Provide a Safe Carotid Artery Stenting (CAS) Treatment in Patients with Acute Cerebral Ischemia?

Enrico Sbarigia*

Department of Vascular Surgery, Graduate School of Vascular Surgery, University of Rome, Italy

Editorial

Epidemiological and observational data demonstrated that carotid artery stenosis is responsible of 5% to 7% of acute cerebral ischemia in patients hospitalized in the stroke units of emergency departments. In these cases, international guidelines recommend early carotid endarterectomy (within 2 weeks) to remove the embolic plaque because in case of hemodynamically significant stenosis a recurrent neurologic symptom may occur in more than 20% of the cases in the first 24 h [1]. On the other side, prompt carotid endarterectomy, in well-selected patients, brings no more risk if compared to elective carotid surgery [2].

In the last decade, carotid artery stenting has gained a relevant role in treatment of carotid artery stenosis both asymptomatic and symptomatic and nowadays is an alternative to carotid endarterectomy in patients with appropriate anatomical condition. The rapid and widespread diffusion of carotid stenting mainly depends on its low invasiveness. Nevertheless, in case of early symptomatic carotid plaque, carotid artery stenting did not reach the same diffusion if compared to carotid endarterectomy because the results of the all trials comparing carotid stenting and surgery in this setting, disclosed worse results of the former. A recent review of the results of four randomized trials [3] showed that only 2.3% of the patients underwent carotid stenting (287/4187) within 7 days from sentinel event and perioperative complication rate was 8.6% vs. 1.3% in 223 patients who underwent carotid surgery in the same interval of time (RR (95% IC): 6.74 (2.07-21.92); p=0.002). Yet, the results of carotid stenting in early symptomatic patients coming from high volume centers disclose a perioperative stroke/death rates ranging from 5% to 2.7% operated on within 14 days [4-7]. These data demonstrate room for carotid stenting in the acute setting.

Nonetheless, remains concern to treat by stenting a recently symptomatic carotid plaque due to the possibility of prolapse of carotid plaque from the stent struts and the risk of cerebral hemorrhage related to the double antiplatelet therapy after stent implantation.

Regarding the occurrence of prolapse of portion of plaque through the struts of the stent, a new generation of carotid stent entered into the clinical practice (dual layer carotid stents). Yet, their double layer of mesh or membrane reduces the dimensions of the struts up to less than 200-micron permanently covering thrombus or portion of plaque, as demonstrated by Optical Coherence Tomography *in vivo* studies [8]. Recent papers report the effectiveness of these stents in prevention of the embolization just after stent implantation both in asymptomatic and in symptomatic patients [9,10]. However, the use of this type of stents to treat acutely symptomatic carotid plaque is scant in the literature, in fact, there are only sporadic and small series, but results from these reports seem promising, as peri-procedural embolic complications are low [11,12].

Finally, the risk of a high occurrence of cerebral hemorrhage due to double antiplatelet therapy after stenting in the setting of a recently symptomatic stenosis, the available data of real world clinical practice in the literature demonstrate that this risk is overestimated. In fact, post-procedural brain hemorrhage in three papers dealing with carotid stenting in the setting of patients recently symptomatic related to carotid plaque (within 14 days from index event) ranges from 0% to 2.2%, compared to 0% to 3% in patients operated on later than 14 days [4-7].

In conclusion, the answer to the abovementioned question is probably yes.

It is time to check the effectiveness of this new generation stents by a multicenter register first, and by a prospective multicenter randomized trial comparing surgery to implantation of these new stents, thereafter.

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*Correspondence:

Enrico Sbarigia, Department of Vascular Surgery, Graduate School of Vascular Surgery, University of Rome, "Sapienza", Italy,
E-mail: enrico.sbarigia@fastwebnet.it

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