

Up to date, new stents in carotid artery treatment

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Editorial

The development of endovascular techniques, their diffusion around the world and the idea of less invasive techniques led to the improvement of devices involved in carotid artery stenting (CAS). Stent implantation with the concept of brain protection represented a historic advance [1-3]. It is being widely performed in patients with symptomatic and asymptomatic disease, at high risk for carotid endarterectomy [1-5].

The safety and efficacy of CAS has been well demonstrated in multiple trials and is accepted as an alternative therapy to the surgical approach [1-5]. With the advances in CAS device technologies, a variety of products with different properties are available to contemporary CAS operators. The stent's scaffolding capacity plays a major role in preventing procedural events. To date, the ideal stent design has been discussed, yet remains unclear [5].

The new double-layer micro-mesh stents (DLMCS) show the most promising points on this topic. In general, closed-cell stents have a smaller cell size and less plaque protrusion through the stent struts than open-cell stents [6]. On the other hand, open cell stents have better wall apposition and less thrombus formation outside the placed stent [7]. DLMCS tried to synthesize both these characteristics.

As a consequence of this careful engineering a lower incidence of perioperative microembolization has been described. In patients with high-risk, lipid-rich plaque undergoing CAS, roadsaver led to the lower microembolic signals count comparing to a classic stent. Perhaps, a key to reduce the need for postoperative dual-antiplatelet therapy [8,9] (Figure 1).

There have been still concerns about the safety, since this technology is still aiming for maturity, presenting its first long-term results with an acceptable 2.3% in-stent restenosis risk in 4-year follow-up [10]. Further cohorts are yet to be published, to

strengthen the case for the DLMCS, although the first manuscripts seem promising, we have a few years to wait for overwhelming evidence.

Aiming for perfection and event free procedures with another emerging technology. Optical Coherence Tomography (OCT) is an invasive intravascular imaging technique that provides very high quality images in order to detect and evaluate peculiar features with significant similarities to histological patterns [11].



Figure 1: RoadSaver™ carotid stent.5.

The high-resolution OCT images allow physicians to really evaluate the plaque features and stent struts [8]. By providing unprecedented microstructural information, OCT may identify the features of vulnerable carotid plaque and, by identifying possible defects after stent implantation as malapposition and plaque prolapse, it may help the tailoring approach to CAS [12].

Evidence, mostly from Japan, has been steadily imposing this type of approach for CEA. Technical errors such as, plaque protrusion, stent-edge dissection/flap or inadequate plaque coverage by the stent, can easily be missed by regular angio, and could be a frequent cause of Major adverse events.

Vascular surgeons should look forward for newly designed pragmatic Randomized Clinical Trials, summing up the cutting edge technology on this field. Long term reports are also lacking, although preliminary results are promising. The clinical role of endovascular in this field is to be redefined.

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