INTRODUCTION

The prevention of perioperative ischemic brain lesion is essential, since they are markers of increased risk of recurrent cerebrovascular events, and recurrent strokes have a strong association with post-stroke dementia. To overcome this issue, the research focused on the development of embolic protection devices and mesh-covered stents designed to offer a better coverage of the plaque by the stent after its deployment. The aim of our study is to evaluate the early (incidence and time of onset of early micro-embolism after CAS) and mid-term results (patency of the stent and destiny of the external carotid artery) with two different mesh-covered stents (Roadsaver stent from Terumo, and CGuard stent from InspireMD).

MATERIALS & METHODS

Single-institution prospective study including 50 patients (33 male, median age 74 years) who underwent CAS with Roadsaver® or CGuard™. All patients with primary stenosis (37/50, 74%) had carotid plaque DW-MRI pre-procedure, with both qualitative evaluation of the hyperintensity and ADC (Apparent Diffusion Coefficient) measurement of the plaque. All patients had brain DW-MRI pre-procedure, at 1h, 24h and 30 days post-procedure to evaluate the appearance of hyperintense lesions over time. Imaging analysis was performed in a double-blinded fashion by two radiologists. Doppler US was performed at 6 months, one and two years after the procedure.

RESULTS

No statistically significant differences between the two stents both in the incidence at 1h (p=0.23) and 24h (p=0.36) and in the volume of new DWI hyperintense brain lesions at 24h (p=0.27).

34 new asymptomatic lesions in 19 patients (38%) reported: 4 (11.8%) at 1h, 30 (88.2%) at 24h. The 30-day DWI-MR showed complete resolution of all lesions and no evidence of new lesion. Significantly higher incidence of new lesions at 24h in patients with DWI hyperintense carotid plaques (12/16, 75% vs. 0/21, 0%, p<0.0001, ADC value 0.83±0.21 vs. 1.42±0.52).

Patency evaluation at midterm (2 years) follow-up showed a 10% intrastent restenosis rate of 6% (5/50, 1 at 6 months and 4 at 1 year; p 0.19) and ECA restenosis rate of 4% (p 0.24, all in the Roadsaver group), not related neither to the device or to plaque activity.

CONCLUSIONS

The majority of early asymptomatic brain lesion occurred during the first 24h after CAS. Pre-procedure high DWI signal of the plaque was associated with an increased incidence of post-procedure microembolizations. Intrastent restenosis and ECA stenosis rates were consistent with what reported for conventional carotid stents (10% and 3.8% respectively), with no relation with plaque activity or the device.

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