Carotid Plaque Echolucency Predicts the Risk of Stroke in Carotid Stenting According to the Type of Brain Protection Device and the Learning Curve

To the Editor:
Dr Reiter analyzed the relationship between carotid plaque morphology and the risk of stroke after carotid artery stenting (CAS), showing that the grayscale median (GSM) is not associated with adverse outcome.1

In the CREST Study, we demonstrated that GSM is a predictor of stroke during CAS.2

Dr Cremonesi, with one of the biggest CAS experiences, has already demonstrated Dr Reiter’s findings. They treated patients with a GSM <25 with a proximal brain protection device not requiring the crossing of the soft lesion.3 Interestingly, they found visible debris during the procedure in 66.7% of patients, confirming the embolic potential of carotid plaques with a GSM <25. Using this brain protection device, the rate of stroke was not increased by GSM. The message is that a tailored technique in skilled interventionalists can overcome the risk of stroke caused by echolucent carotid plaques. For few centers with excellent results, carotid plaque morphology could not be a predictor of stroke, but for most centers not performing hundreds of cases per year (or starting a CAS program!), GSM is a strong predictor of stroke.

The same conclusion could be reached analyzing the outcome of CAS in octogenarians. The CREST Trial showed that the rate of stroke and death increases at older ages, being 12.1% in octogenarians.4 However, Dr Cremonesi showed that CAS is safe in elderly patients, with an overall death and stroke rate of 2.12%.5

Why are Cremonesi’s and Reiter’s conclusions not consistent with those in previous articles (CREST or ICAROS)? Those authors performing hundreds of procedures are unrepresentative of interventionalists with smaller number of cases. The learning curve in CAS is fundamental. The same author (Cremonesi participated in the ICAROS) may have both an increased and a nonincreased risk of stroke during CAS treating echolucent plaques, according to an improving learning curve over time because of a higher number of cases. How many interventionalists have treated 698 consecutive patients with such an excellent result (2.9%) to be allowed to discharge the GSM analysis before CAS? The issue is that the results published in the medical journals by few excellent centers are far better than those of the majority of the other hospitals. The EVA3S confirmed this finding, because the rate of stroke after CAS was far higher than showed by previous articles, probably because of a nonacceptable level of physician training.6

Should we perform the GSM analysis or not? The message should be the following:
In case of echolucent plaques, the embolic load to the brain will be higher. The rate of stroke will be increased.
The stroke rate could not be influenced by carotid plaque morphology if there is huge experience in carotid stenting (several hundreds of cases) or if proximal brain protection device is used that does not require the crossing of the lesion; however, the correct selection of a brain protection device may depend on GSM.
Carotid plaque morphology could influence the risk of late neurological dysfunction. The incidence of silent brain ischemia following CAS is high (∼20% to 30%), both in protected and unprotected procedures. The higher the incidence of silent ischemia, the higher the risk of dementia. The use of the GSM has the potential to select patients with the lower embolic load to the brain, reducing the risk of late neurological dysfunction.
The evaluation of carotid plaque echolucency should always be recommended for risk stratification in CAS patients.

Disclosures
None.

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