

Relationship between vascular anatomy and silent cerebral ischemia after carotid artery stenting

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We have recently read with great interest the article by Köklü et al. [1] entitled "Plaque morphology effect on periprocedural asymptomatic cerebral embolism in carotid artery stenting using first-generation carotid stents: A diffusion-weighted magnetic resonance imaging study". We commend the authors for their study describing the effect of plaque morphology on periprocedural asymptomatic cerebral embolism (ACE) in carotid artery stenting (CAS). On the other hand, we believe that some major drawbacks need to be addressed. The reasons for our concern are as follows.

First of all, several investigators indicated that the presence of complex vascular anatomy increases the risk of ACE [2–5]. The difficulty of cannulation that can be attributed to technical problems related to anatomical factors is associated with ACE. In 2021, we found a significant relationship between ACE and the presence of type III aortic arch, as shown by several other authors [3, 4]. Moreover, the importance of the tortuosity in vascular anatomy in CAS procedures for technical success, procedure time, and poor clinical outcome is well known [2]. More understandably, increased proximal tortuosity index (TI) is statistically significantly associated with increased technical failure and risk of neurological complications, and shows an increased risk of complications in the presence of severe arterial elongation [2, 4]. Previously, several authors have demonstrated that the common carotid artery (CCA)-internal carotid artery (ICA) angle may be a factor determining the location of atherosclerotic plaques of the carotid artery, probably altering hemodynamics [6, 7]. Also, they showed that patients with high-apical plaques had a higher CCA-ICA angle and were more likely to have large cerebral ischemia. Recently, we

have reported that ACE was statistically more frequent in the patient group with a CCA-ICA angle ≥ 34.5 degrees [4]. The authors stated that patients with severe CCA tortuosity underwent surgery. The readers may wonder whether there are certain cut-off values associated with tortuosity. It should be noted that the atheroma plaque has a significant impact on the risk of ischemic events, such as the presence of ulceration or irregular surface. In this study, we believe that the authors should provide more detailed information on plaque morphology and vascular anatomy.

Second, it was surprising that the association between detailed periprocedural parameters such as fluoroscopy time and subclinical embolism was not investigated, as increased procedural time is a recognized risk factor for embolic events. Moreover, several authors have previously demonstrated that fluoroscopy time is an independent predictor of stroke and ACE [3, 5]. The readers may wonder whether periprocedural parameters after carotid artery stenting contribute to the incidence of new cerebral ischemia.

Third, serum biochemical or physiological indices, such as TNF- α levels, intra-arterial oxidative stress, and white matter damage, may be associated with ACE.

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