

Ischemic stroke on DOAC and non stenosing high risk carotid plaque: are we looking up?

Matteo Zaccagnino¹, Alvise Fattorello Salimbeni¹, Ludovica De Rosa¹, Federica Viaro¹, Alessio Pieroni¹, Stefano Mozzetta¹, Claudio Baracchini¹

¹ Stroke Unit and Neurosonology Lab, Padua University Hospital, Padua, Italy

Background and purposes

Establishing the etiology of ischemic stroke (IS) despite direct oral anticoagulant (DOAC) treatment in patients with non-valvular atrial fibrillation (NVAF) is crucial in guiding secondary stroke prevention. A complete neurovascular assessment including carotid ultrasound is pivotal in tailoring treatment strategies, as the risk of focusing solely on anticoagulation may expose these fragile patients to major neurovascular events of competing etiology. The aim of this study was to establish the prevalence of non-stenosing high-risk carotid plaques in our cohort.

Materials and methods

We enrolled 76 patients who were admitted to our Stroke Center due to IS under DOAC treatment for NVAF from 2016 to 2023. For each patient we collected demographic, clinical and neuroimaging data. Stroke etiology was defined according to TOAST classification by two vascular neurologists. Ultrasound studies were reviewed to assess for presence and degree of carotid stenosis ipsilateral to the index stroke; for 30-50% degree stenosis, the presence of simple indicators of **high-risk plaque** - as defined by a single reviewer by means of *plaque hypoechoogenicity, disomogeneity and irregular margins* - was noted.

Results

A total of 76 patients, 32 females (42.1%) and 44 males (57.9%) were enrolled in the study. Median age was 78.5 years (IQR=10.50). As for **stroke etiology**, cardioembolism was the most common (62 patients, 81.6%), followed by large artery atherosclerosis in 7 patients (9.2%), other determined etiology in one patient (1.3%) and undetermined etiology in 6 patients (7.9%). Among 59 patients presenting with an ischemic stroke in the anterior circulation, 43 underwent a full carotid ultrasound study. 22 (51.2%) had a 30-50% degree ipsilateral carotid stenosis and 6 (27.3%) had a **high-risk non-stenosing plaque** as previously defined. In all six patients stroke etiology was deemed to be cardioembolic. Upon reviewing prior medications, there was an underutilization of lipid-lowering therapy in these patients and only one was on a low-dose statin at admission.

Graphical summary

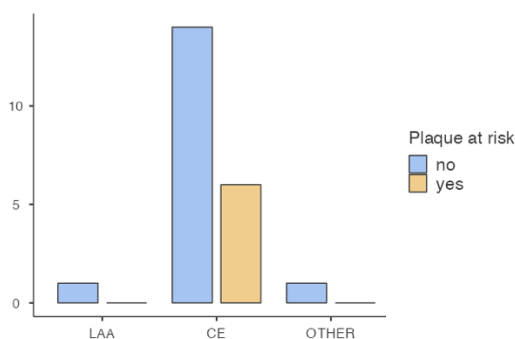


Figure 1. Presence of high-risk plaques according to ischemic stroke subtype in patients who underwent a full carotid ultrasound study.

Discussion and conclusions

In the setting of ischemic stroke despite oral anticoagulation, carotid disease imaging and risk stratification have an underappreciated impact on secondary prevention. As current guidelines remain centered on the degree of stenosis, ultrasound assessment is a powerful tool offering precious insights into the biological complexity of atherosclerosis. Further studies are needed to define the role of non-stenosing carotid plaques and to assess the clinical relevance of concomitant medical management of cardiovascular risk factors on stroke recurrence in this subset of patients.

Ultrasound findings

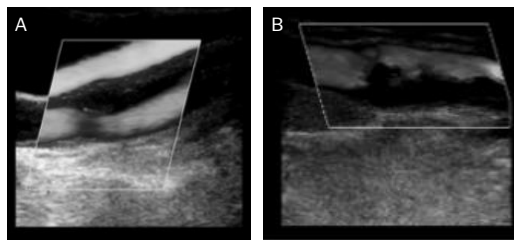


Figure 2. Ultrasound features of high-risk plaques. A) Hypoechoogenicity B) Plaque irregularity