

LETTER TO EDITOR

EDİTÖRE MEKTUP

**FRAGMENTATION OF CEREBRAL CALCIFIC EMBOLISM BY INTRAVENOUS ADMINISTRATION OF TISSUE
PLASMINOGEN ACTIVATOR: CASE VIGNETTE**

**İNTRAVENÖZ DOKU PLAZMİNOJEN AKTİVATÖRÜ UYGULAMASI İLE SEREBRAL KALSİFİK EMBOLİNİN
FRAGMANTASYONU: OLGU RESMİ**

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Dear Editor,

Calcified cerebral arterial embolism is a rare but well-known cause of acute stroke. Aortic valve or mitral annular calcification or artery-to-artery embolism originating from calcific atheromatous plaque in the aortic arch and cervicocranial main arteries are the main mechanisms. It usually develops spontaneously (86%), although it can be seen in association with left heart catheterization, carotid artery manipulation, and cardiopulmonary resuscitation (1). While it is thought that intravenous (IV) tissue plasminogen activator (tPA) may not be effective due to the nature of the embolic material, cases were published in which the embolus was liberated and fragmented and migrated distally with tPA (2-5).

A 63-year-old male patient, who had an implantable cardioverter defibrillator placed after the coronary artery bypass graft surgery, presented with acute dysarthria, left hemiparesis, and hypoesthesia complaints. Computerized

tomography (CT) and CT angiography revealed right M3 branch occlusion and a penumbral pattern on CT perfusion (Figure 1A,B, and Figure 2A). IV tPA was started at the 124th minute after symptom onset, and at the twenty-fourth hour, NIHSS ("National Institutes of Health Stroke Scale") decreased from 10 points to 4. No cardiovalvular calcification was detected in the patient on cardiac CT and transthoracic echocardiography. In the cranial CT obtained at the 24th hour, it was determined that the embolic material had shrunk into fragments and migrated distally. In addition, a calcific embolic piece could be visualized breaking off and moving more distally (Figure 1C and Figure 2B). The patient was discharged with aspirin and enoxaparin treatment and a modified Rankin score of 1. In a review of seventy calcified cerebral embolic strokes, it was determined that emboli were most frequently located in the middle cerebral artery (83%). Multiple embolism was 37% and bilateral location

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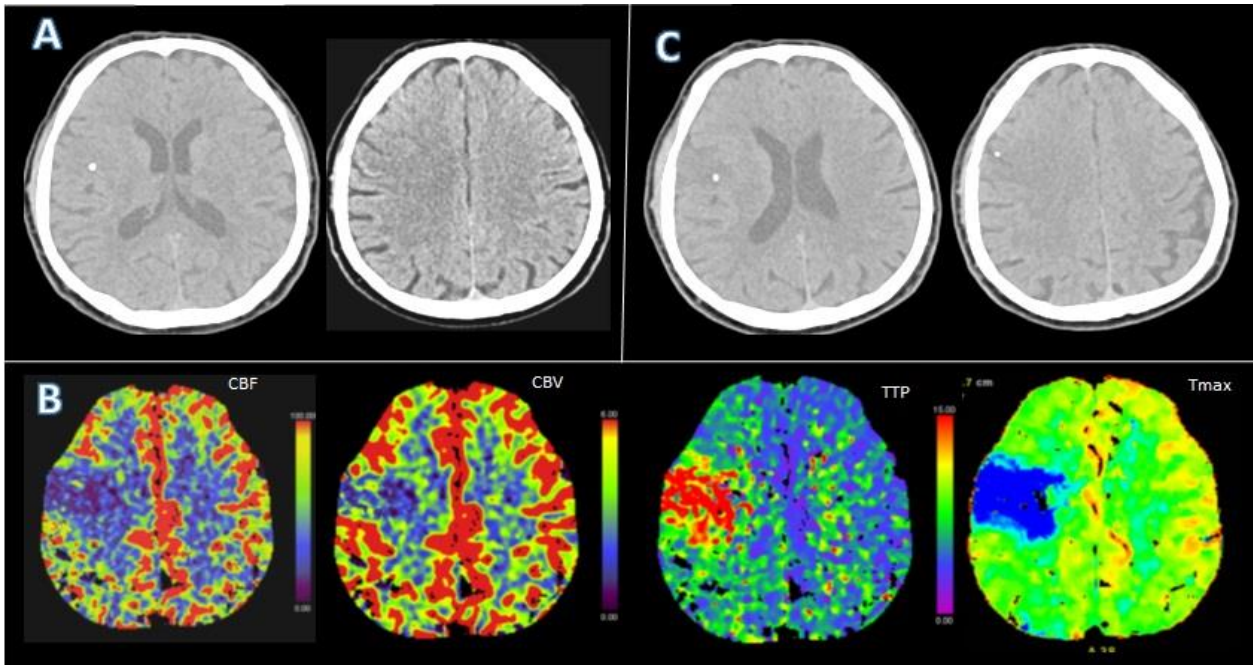


Figure 1. A: Calcified embolic material (arrow) on unenhanced CT B: Perfusion CT reveals a penumbral pattern [CBV<CBF<MMT]. C: After IV tPA, the cross-sectional area of calcified emboli appears to decrease. Additionally, a second, smaller piece was visualized distally and is consistent with embolic fragmentation.

Abbreviations; CBF: Cerebral blood flow; CBV: Cerebral blood volume; CT: “Computerized Tomography”; IV tPA: Intravenous tissue plasminogen activator; MTT: “Mean transient time”.

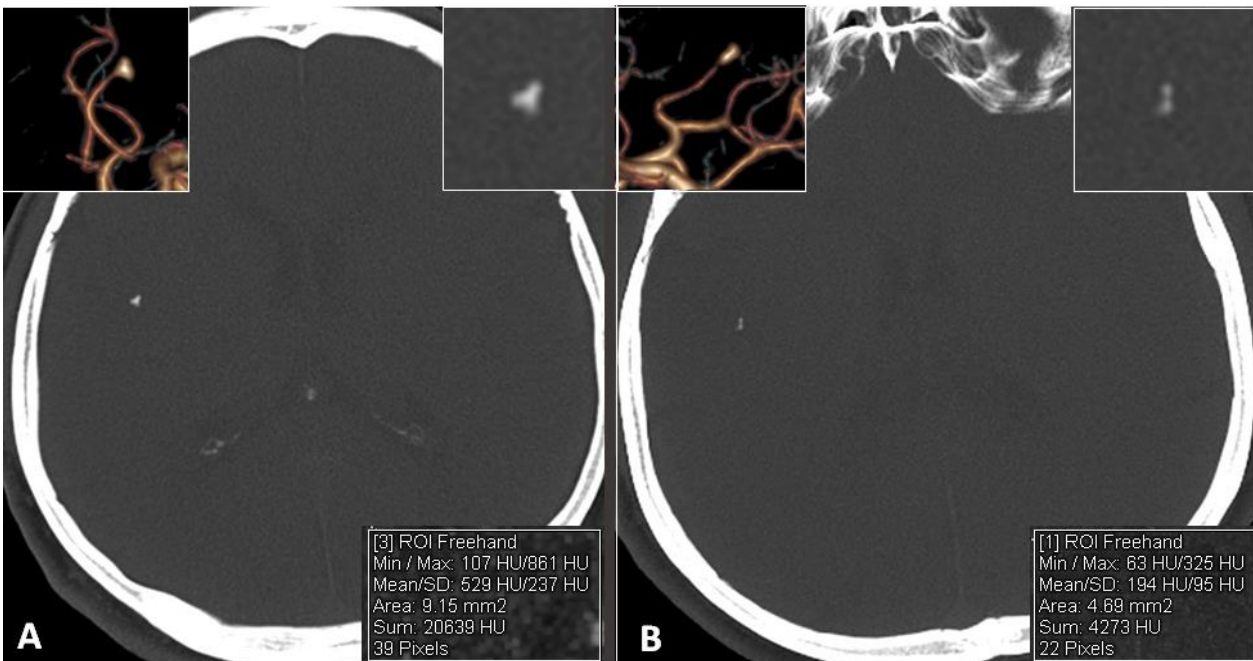


Figure 2. A: On unenhanced CT images with 12 mm thick MIP reformat at 30 F (bone filter), it is seen that the calcific emboli are in the shape of a starfish, and its total area is 9.15 mm². B: After IV tPA, the configuration of the calcified embolism changes and its area decreases to 4.69 mm². Images in the upper right corner represent magnified MIP images, and images in the upper left corner represent three-dimensional volume rendering images of calcified emboli.

Abbreviations; CT: “Computerized Tomography”; IV tPA: Intravenous tissue plasminogen activator; MIP: “maximum intensity projection”.

was 13%. According to our nonsystematic review, IV tPA was administered to at least 12 patients and five of them (42%) had improvement in symptoms (2-9). Disintegration of calcified material and major emboli and distal migration of fragments after IV tPA were also documented in at least five cases (3-7). 3-7 Acute calcified re-embolism was also described with thrombolytic therapy (3,5). Positive results were also reported with embolectomy in calcified major cerebral embolism (10,11). However, in cases with follow-up imaging, spontaneous distal migration of emboli is not uncommon, and it is at the level of 14%. (1).

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Ethics

Ethics Committee Approval: Since this paper is a letter to the editor, ethics committee approval is not required.

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