

The Clock is Ticking: Overcoming Time with Mechanical Thrombectomy for Middle Cerebral Artery Infarct

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Abstract

Coronary angiography is associated with several documented complications, and cardioembolic stroke following angiography is a rare occurrence. This letter to editor presents a case involving thrombotic occlusion of the left middle cerebral artery (MCA) during coronary angiography. A 36-year-old female patient, presenting to the emergency department with chest pain, underwent coronary angiography due to non-ST-segment elevation myocardial infarction. While the responsible lesion underwent revascularization, the patient experienced new-onset motor deficits and aphasia. DSA imaging was conducted on the patient, whose diffusion magnetic resonance imaging and clinical findings were indicative of MCA infarction. Thrombectomy was performed on the patient with a left MCA infarction. Proficient management of neurological complications underscores the potential positive impact of interventional treatment strategies on mortality and morbidity. In this letter to the editor, the significance of early diagnosis, appropriate treatment, and multidisciplinary approach is emphasized.

Keywords: Interventional cardiology, middle cerebral artery infarction, mca infarction, cardioembolic stroke, thrombectomy

Dear Editor,

Coronary angiography (CAG) is associated with various complications, with clinically significant incidents occurring at a frequency of 0.3-1%. Patient groups susceptible to complications encompass those with a history of female gender, advanced age, atherosclerosis, anticoagulant drug use, obesity, and hypertension. Complications not only extend patients' hospitalization periods but also contribute to elevated morbidity and mortality rates. While prevalent complications include bleeding, femoral artery pseudoaneurysm, hematoma, arteriovenous fistula, deep

vein thrombosis (DVT), and thromboembolism, neurological complications are encountered infrequently [1]. This article presents a case involving thrombotic occlusion of the left middle cerebral artery (MCA) during CAG.

Patient Information

A 36-year-old female patient with a medical history of diabetes, hypertension, and ten years of hemodialysis utilizing an arteriovenous fistula was admitted to the emergency department with a diagnosis of non-ST elevation myocardial infarction. Upon admission, her blood pressure measured 145/80 mmHg,

and the electrocardiogram showed sinus rhythm, t-negativity in the inferior leads, and 1 mm ST depression. The ejection fraction was determined to be 40%. Angiography was performed via the right femoral route, revealing a plaque in the left system. An 80% thrombosed lesion was identified in the mid-RCA region, classified as an acute lesion. The patient received 7000 IU of unfractionated heparin, followed by the implantation of a 3.5*40 mm drug-eluting stent (DES) into the RCA after predilatation with a 2.75*20 mm balloon. During the procedure, our patient manifested drowsiness and neurological deficits. In the neurological examination, a slight blurring of the right nasolabial sulcus, muscle strength of 2-3/5 on the right side, the left arm overcoming gravity with painful stimulation, the left lower extremity being able to pull, and the right-side showing Babinski positivity and aphasia were observed. The patient underwent cranial imaging, and diffusion magnetic resonance (MR) imaging revealed an infarct in the left middle cerebral artery (MCA) area (Fig. 1). Given the concordance between physical examination findings and diffusion MRI results indicative of MCA infarction, digital subtraction angiography (DSA) imaging was performed to assess potential thromboembolic complications. Thrombectomy was performed on the patient with a high HAS-BLEED score, whose left middle cerebral artery (MCA) was observed to be occluded on digital subtraction angiography (DSA) images (Figs. 2 and 3). In the control DSA images taken after the procedure, it was observed that the MCA flow was successfully restored (Fig. 2). During the follow-up after thrombectomy, the patient regained consciousness, and their neurological examination improved, leading to discharge with full recovery.

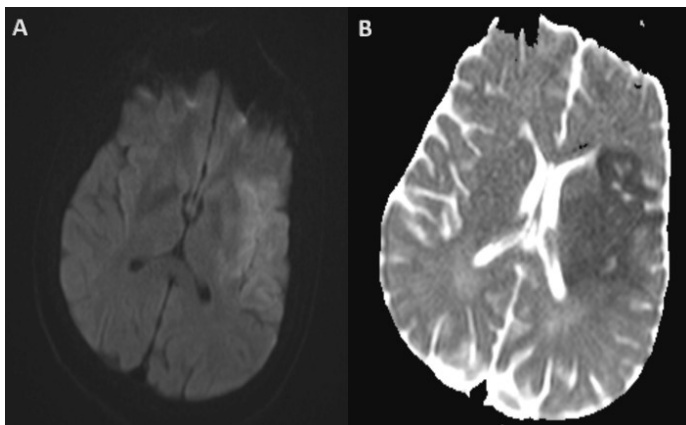


Figure 1. Appearance of infarction in the left Middle Cerebral Artery (MCA) area on diffusion MRI

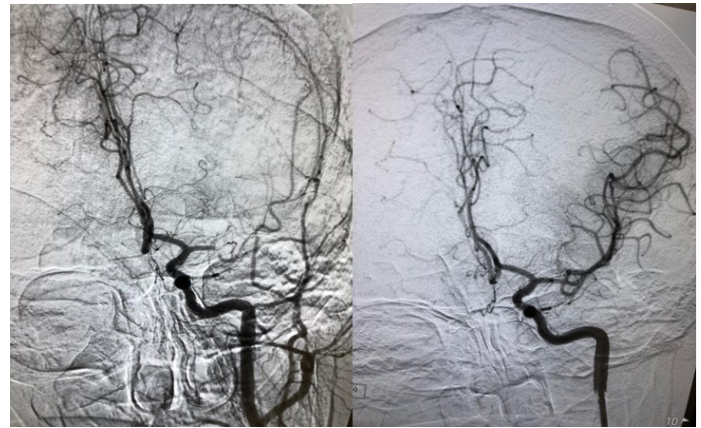


Figure 2.A. DSA image prior to thrombectomy, and **B:** DSA image post-thrombectomy



Figure 3. Material obtained through thrombus aspiration.

Discussion and Conclusion

Coronary artery disease (CAD) stands as the most prevalent cardiovascular ailment. Despite encountering fewer adverse outcomes with the increased prevalence of CAD and the advancements and heightened experience in interventional and medical treatments in this domain, complications persist as an inherent aspect of our practice. In addition to more commonplace complications such as bleeding, pseudoaneurysm, arrhythmias, coronary artery dissection, allergic reactions to contrast material, and acute renal failure, neurological complications, including contrast-related encephalopathy [2] and cardioembolic stroke, are observed rarely. Valve diseases, particularly atrial fibrillation, ischemic cardiovascular diseases, heart failure,

patent foramen ovale, and infective endocarditis, constitute the etiological factors for ischemic stroke, with iatrogenic stroke being an additional cause. Approximately 85% of strokes arise from ischemic origins, and of these, around one-fourth are attributed to cardioembolic causes [3]. The involvement of different vascular regions in cranial imaging serves as a potential indicator of cardioembolic stroke, with the left middle cerebral artery being a commonly affected site [4]. Similarly, in our case, diffusion MRI images reveal infarction consistent with the left middle cerebral artery (MCA) area, supporting the diagnosis of cardioembolic stroke. Instances of left MCA infarction secondary to infective endocarditis [5] and left ventricle thrombus [6] have been documented in the literature. Mirroring the progress in interventional treatments for cardiovascular diseases, significant advancements have occurred in the field of endovascular intervention, complementing thrombolytic approaches. For these patients, mechanical thrombectomy serves as a treatment option, offering an alternative to thrombolytic therapy, particularly in cases associated with a heightened risk of bleeding [7-9]. The proficient management of neurological complications underscores the potential positive impact of interventional treatment strategies on mortality and morbidity. This case report underscores the significance of early diagnosis, suitable treatment, and a multidisciplinary approach.

Yours sincerely,

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Ethical Statement: The authors stated that ethics committee approval was not required for this letter to editor and written informed consent was obtained from the patient.

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