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Case Report

Two mechanical thrombectomies in acute ischemic stroke within 48 hours: A case report on a patient with atrial fibrillation ☆☆☆

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ABSTRACT

Mechanical thrombectomy is the gold standard in treating acute ischemic stroke complicated by large vessel occlusion. However, there are limited studies on repeated mechanical thrombectomy in acute ischemic stroke. In this case, we report a 68-year-old male with atrial fibrillation who developed sudden left limb weakness and motor aphasia for 6 hours, and his National Institutes of Health Stroke Scale (NIHSS) score was 10. Computed tomography angiography (CTA) showed occlusion of the right internal carotid artery; and mechanical thrombectomy was performed immediately. The patient's neurologic disability was utterly relieved, and the NIHSS score returned to 0. At 30 hours postoperatively, he again developed left limb weakness with motor aphasia. The NIHSS Score was 11, and the CTA showed that the right internal carotid artery was re-occluded. After computed tomography perfusion evaluation, the patient underwent mechanical thrombectomy again, and the etiological examination confirmed Cardioembolism. Anticoagulation therapy was commenced 1 week post-thrombectomy. The prognosis of the patients was good.

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Introduction

Acute ischemic stroke with large vessel occlusion is the most severe type of stroke and represents a high risk of stroke mortality [1]. The effectiveness of mechanical thrombectomy for

treating large acute artery occlusion ischemic stroke has been well studied [2–4]. However, there are few studies on repeated mechanical thrombectomy in acute ischemic stroke. We report a cardiogenic ischemic stroke that underwent 2 mechanical thrombectomies of the same artery within 48 hours. It's a rare case of a common disease.

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Case report

A 68-year-old Chinese with atrial fibrillation developed left limb weakness with motor aphasia and has not received anticoagulant therapy for a long time. The last normal time was 6 hours ago when he was taken to the emergency department of our hospital. The electrocardiogram showed atrial fibrillation rhythm. Using the National Institutes of Health Stroke Scale (NIHSS) score of 10, computed tomography (CT) showed no low-density lesions. The Alberta Stroke Program Early CT Score (ASPECTS) was 10, and computed tomography angiography (CTA) showed complete occlusion of the right internal

carotid artery (ICA) with good collateral circulation (Figs. 1A and B). Mechanical thrombectomy was performed immediately at our center, and postoperative blood flow was restored (Figs. 1C and D). Intraoperative angiography showed no ICA stenosis and the modified Thrombolysis In Cerebral Infarction (mTICI) scale score was 3. The patient's neurologic disability was utterly relieved, and the NIHSS score returned to 0. Unfortunately, about 30 hours after surgery, the patient again developed left limb weakness with motor aphasia. The NIHSS score was 11 again. At the request of the patient's family, we transferred the patient to a cooperative hospital. One-stop-CT (CT perfusion with CTA) examination showed re-occlusion of the right ICA, no large core infarct size, and perfusion mis-

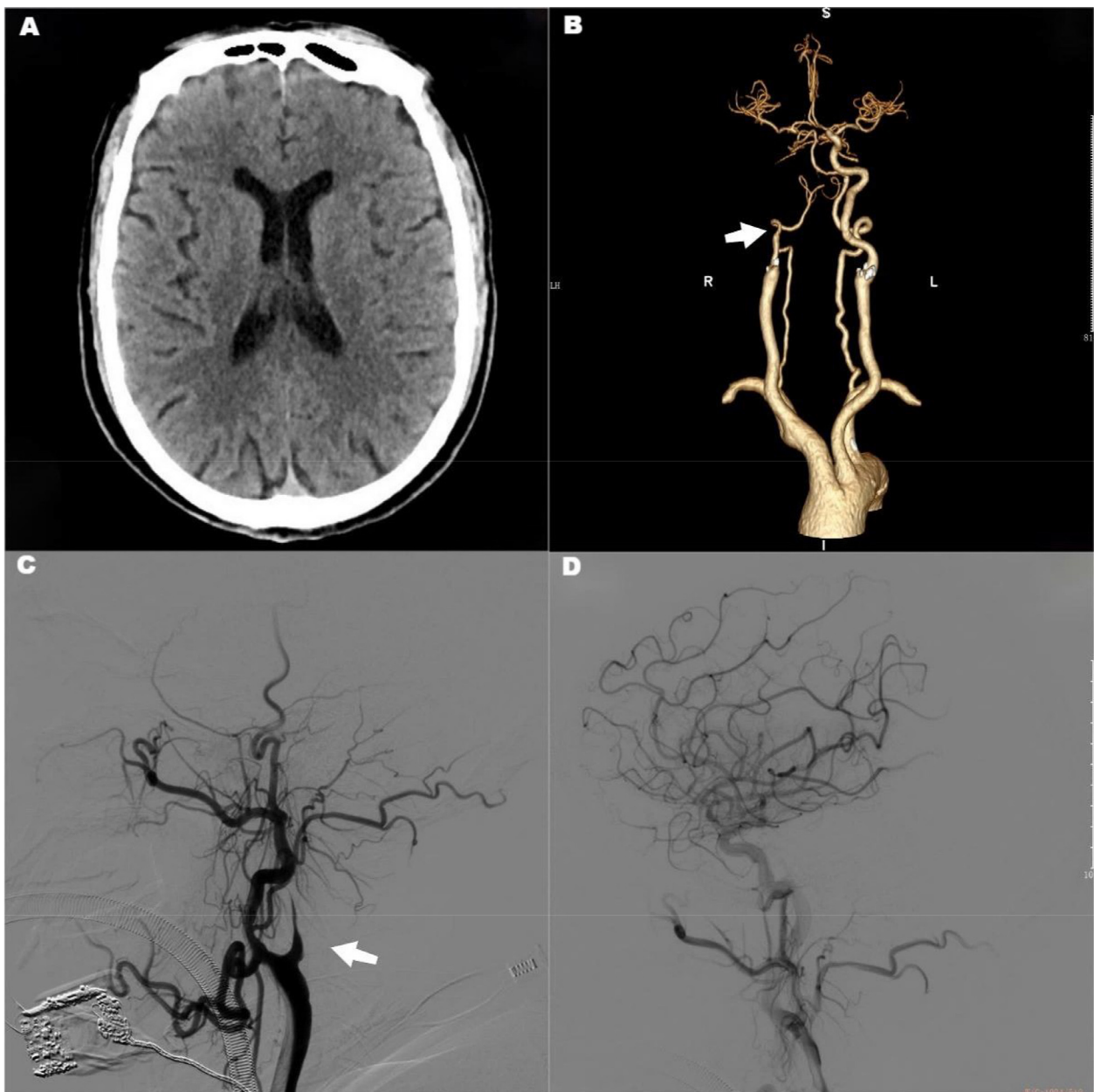


Fig. 1 – The first mechanical thrombectomy, from A–D, showed no low-density lesions on preoperative head CT, occlusion of the right internal carotid artery (arrow), complete recanalization of the blood vessels after surgery, and no internal carotid stenosis.

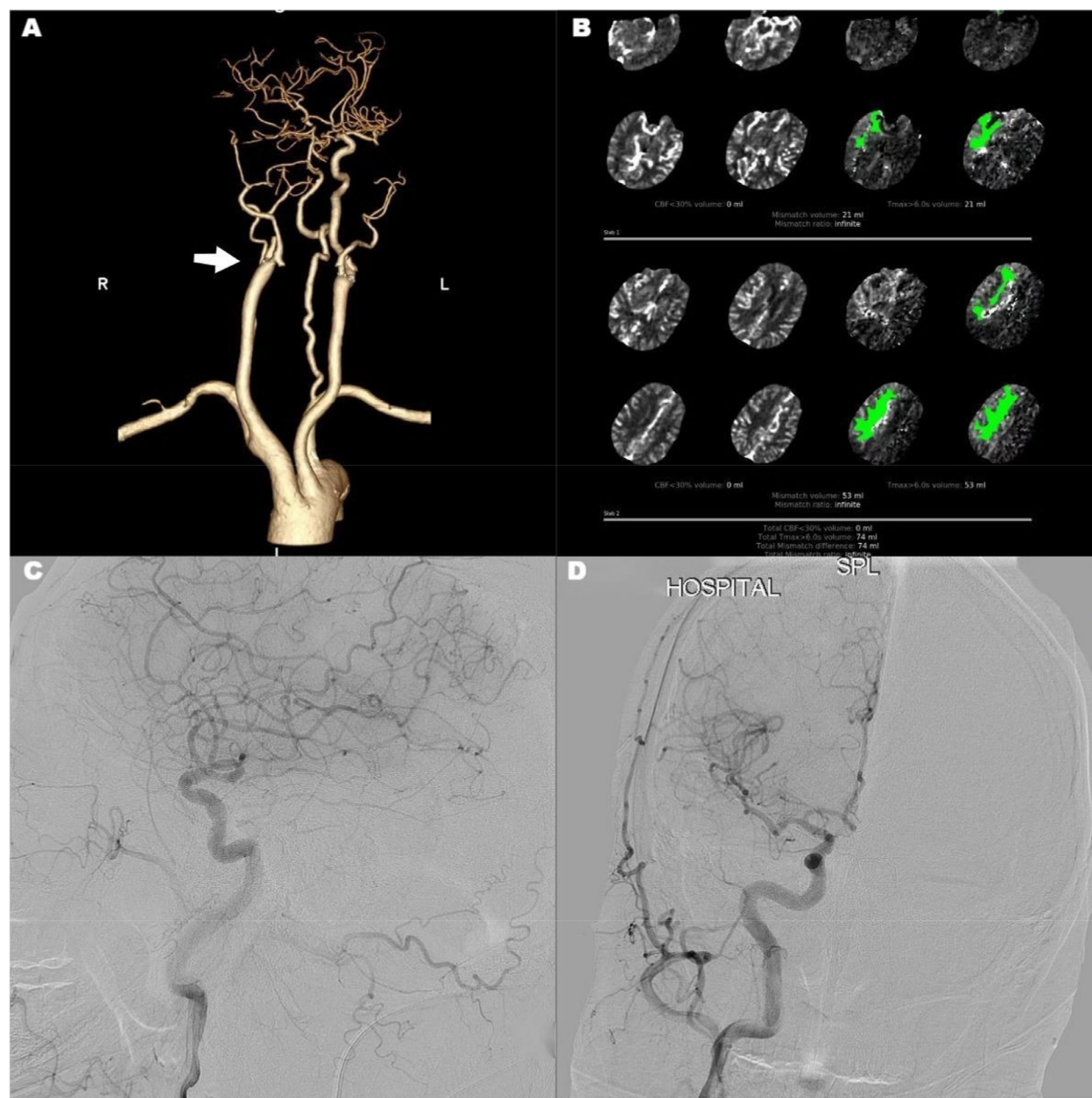


Fig. 2 – The second mechanical thrombectomy, from A–D, suggested a recurrence of right-side internal carotid artery (arrow) occlusion, a mismatch between CT perfusion ischemia and core infarct size, and blood flow was restored again.

match (Figs. 2A and B). The second mechanical thrombectomy was performed, and blood flow was restored, and the mTICI Score was 3 (Figs. 2C and D). The patient's neurologic disability improved again, with residual slight limb weakness. The NIHSS Score was 2. Brain MRI showed a small infarction in the right lateral ventricle and centrum semiovale (Figs. 3A and B). The detailed etiological examination also included angiography and ultrasound. Twice Intraoperative angiography did not find large vessel stenosis, and echocardiography showed significant enlargement of the left atrium (79 mm upper and lower diameter, 65 mm left and right diameter). Combining the Score for the targeting of atrial fibrillation (STAF) score ≥ 5 , Cardioembolism was finally confirmed. The patient received

rivaroxaban 15 mg once-daily oral anticoagulant treatment 1 week later. Follow-up visits after discharge indicated complete restoration of the patient's neurological disability, and he could perform all activities he had previously been able to do.

Discussion

We are the first to report a case of repeated mechanical thrombectomy of the same root artery due to cardioembolism in acute ischemic stroke within 48 hours. Atrial fibrillation with large vascular occlusion is predominantly cardiogenic,

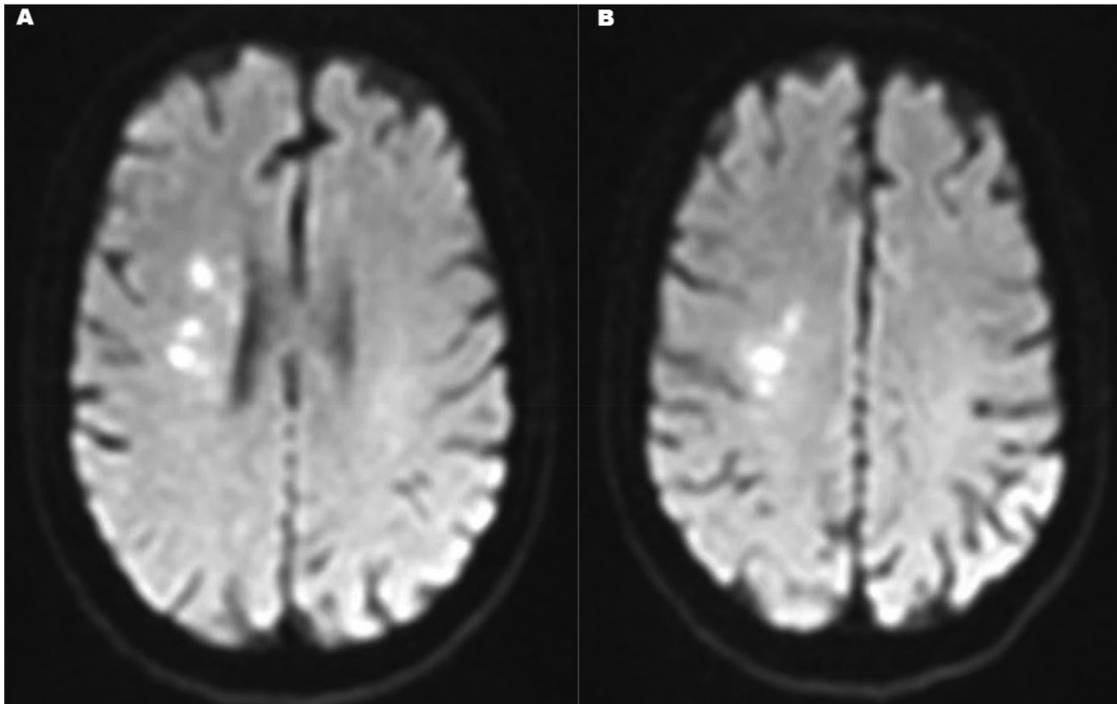


Fig. 3 – After repeated mechanical thrombectomy, diffusion-weighted imaging (DWI) shows a small infarct area.

but the possibility of recurrence within 2 weeks is low. Previous randomized clinical trials have shown a recurrence rate of only about 3%-5% [5,6]. The probability of blockage of the same artery is even lower, but as our case demonstrates, it can still occur.

In 2 multicenter studies, a total of 10,903 patients underwent mechanical thrombectomy, and 86 patients underwent repeated mechanical thrombectomy. The incidence of recurrent large vessel occlusion is low, and approximately 0.4%-1.8% of patients experiencing repeated mechanical thrombectomy. Cardioembolism was the most common etiology of recurrent large vessel occlusion, and repeated mechanical thrombectomy appeared safe and effective [7,8]. A meta-analysis has shown that mechanical thrombectomy does not increase mortality at 90 days or the risk of symptomatic intracranial hemorrhage [9]. However, 1 case report demonstrated an adverse outcome associated with the underlying disease [10]. Intimal injury after stent retriever thrombectomy has also been reported [11,12]. The benefits and risks must be carefully considered, and further studies are necessary to confirm these findings, despite the positive outcome in our case. More data and evidence-based medicine are needed to support these observations.

The importance of anticoagulation in patients with atrial fibrillation, which significantly reduces the risk of major stroke, decreases infarct size, reduces recurrence, and lowers mortality, is consistent with previous studies [13–15]. In our case, the patient experienced 2 episodes of large vascular occlusion due to the lack of anticoagulant therapy. However, the timing of initiation or resumption of anticoagulation for secondary stroke prevention must be carefully weighed against the risk of hemorrhagic conversion [16].

Conclusion

There are few studies on early re-occlusion after successful mechanical thrombectomy. Repeated mechanical thrombectomy may be safe and effective, but additional data and evidence are needed.

Authors' contribution

Hui Wu drafted the manuscript and literature review; Xianhong Wu collected the data and follow-up outcomes; Shiqin Chen revised the manuscript, literature review, and mentorship. All authors contributed to data analysis and interpretation, and the manuscript was revised, read, and approved in the submitted version.

Patient consent

Written informed patient's son's consent to publish this case report has been obtained.

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