

Successful Mechanical Thrombectomy of Middle Cerebral Artery Occlusion 14 Hours after Stroke Onset

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Abstract: A 45-year-old patient with no significant past medical history presented to out-patient department with aphasia and right hand weakness with a National Institutes of Health Stroke Scale (NIHSS) of 10 and occlusion of the left middle cerebral artery (MCA) in the M1 segment. Last known normal time was 14hrs (wake up stroke). Immediate endovascular thrombectomy was performed 14 hours after symptom onset with complete recanalization and complete clinical recovery. Although mechanical thrombectomy is generally considered an effective alternative strategy up to 8 hours after stroke onset, selected patients with a large diffusion/perfusion mismatch and small infarct cores may benefit from an expanded therapeutic window.

Key words: Aphasia, Endovascular, Ischemic Stroke, Thrombectomy, Weakness

Acute ischemic stroke is a common cause of disability and death in developed countries. The standard treatment is intravenous thrombolysis for patients presenting within 4.5 hours from the onset of symptoms if the contraindications such as oral anticoagulants, cancer or recent surgery are excluded.¹⁻³ In addition, mechanical recanalization is a promising new treatment option for patients with occlusion of major cerebral arteries as a cause of ischemic stroke. It is often used in addition to intravenous thrombolysis ("bridging concept").⁴⁻⁶

For two decades, intravenous thrombolysis (IVT) has been the most important treatment for patients with acute ischemic stroke.⁷ However, due to the narrow time window of 4.5 hours after the onset of symptoms, the rapid decline of curative effect, and various contraindications, such as comorbidity, oral anticoagulation or recent surgery, the qualification of IVT is limited. In addition, the recanalization rate and prognosis of patients with large

thrombosis and proximal vascular occlusion after IVT are poor.⁸

Recently, data from several randomized clinical trials show that endovascular therapy has obvious benefits for patients with acute ischemic stroke caused by proximal anterior circulation occlusion.⁹ In all these trials, imaging based patient selection, especially for diffusion / perfusion mismatch and exclusion of patients with large infarct core, has been proved to be successful in avoiding ineffective interventions.¹⁰

At present, the time window of good curative effect after endovascular treatment is not clear. It is suggested that endovascular retriever thrombectomy should be performed within 8 hours after symptom onset.¹¹

Here, we describe a patient with a Left hemispheric ischemic syndrome who presented late for systemic thrombolysis. He was then treated with mechanical recanalization.

2. Case Presentation

A 45-year old, right-handed previously healthy male patient presented with an acute right sided weakness and facial palsy to a peripheral hospital (NIHSS on admission: 2). Computed tomography (CT) angiography 12 hours and 20 minutes after symptom onset showed an occlusion of the left MCA in the M1 segment with a large perfusion deficit in the complete MCA territory. He was transferred immediately to the Angio-suite for Digital subtraction angiography (DSA). 4-vessel DSA was performed. The subsequent cerebral distraction angiography (DSA) confirmed the complete occlusion of left MCA in the M1 segment (**Figure 1**).

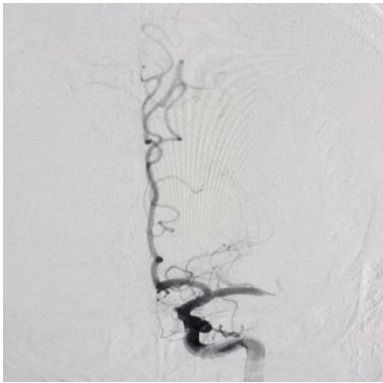


Figure 1: Digital subtraction angiography showing occlusion of M1 segment of Left middle cerebral artery

After consent of the family we performed mechanical thrombectomy in conscious sedation. Complete recanalization was achieved with the ACE 68 aspiration catheter and micro catheter in two attempt 14 hours after stroke onset. We also administered intra-arterial Tenecteplase. Angiography at the end of the intervention showed a complete reperfusion of the former occluded left MCA territory (TICI classification 3) (**Figure 2**).

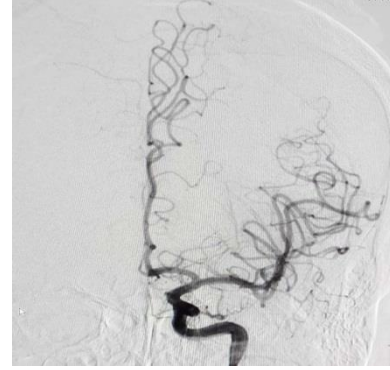


Figure 2: Digital subtraction angiography showing complete recanalization of M1 segment of Left middle cerebral artery

NIHSS immediately after the intervention was 4, and on the following day 2 with a mild dysarthria. The patient was transferred to HDU and was kept in observation for 24hrs and was transferred to Neuro ward (**Figure 3**). One week after symptom onset the patient reported to have completely recovered.

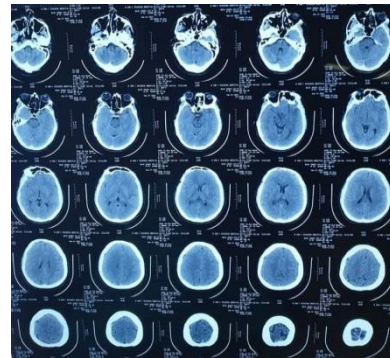


Figure 2: Computed Tomography 8 hours post procedure.

3. Discussion

Endovascular therapy can improve the functional outcome of patients with acute stroke with large vessel occlusion in anterior circulation.¹² Recanalization is associated with better prognosis, and the recanalization rate of mechanical technique has been proved to be better than that of drug therapy alone.¹² Patients with mild or rapidly improving symptoms, but proximal vascular occlusion, if not treated, the prognosis is very poor.¹² In early studies, especially proximal vascular occlusion and NIHSS ≥ 10 were predictors of poor prognosis in stroke patients with mild or rapidly improving symptoms.¹³ Therefore, rapid identification and treatment of these patients is of

great significance. In case of large vessel occlusion and low NIHSS with decision against treatment in the acute phase, it is strongly recommended to transfer the patient to stroke centers with endovascular treatment facilities for further monitoring.

However, the time window for good results after endovascular therapy is not clear. At the third European Stroke Organization Conference in Prague, the first results of the dawn study have just been presented, but not yet fully published. The results show that the removal of thrombus by endovascular thrombectomy within 24 hours after the appearance of symptoms and signs can reduce the disability of some stroke patients, such as wake-up stroke.¹⁴ As demonstrated by flint et al and earlier by Jovin et al, endovascular treatment with stent retriever thrombectomy within 8 hours after symptom onset is safe and can reduce the severity of post-stroke disability.^{11, 15}

Multimodal MRI imaging techniques has been shown to better identify patients who may benefit from endovascular reperfusion therapy. Especially in patients with obvious perfusion / diffusion mismatch on MRI, there are large areas of salvable brain tissues, which can be recovered from ischemia after reperfusion by endovascular treatment, showing better long-term clinical results.¹⁰

Conclusion:

Although mechanical thrombus extraction is usually an alternative strategy for acute revascularization within 8 hours after stroke onset^{11, 15}, selected patients may benefit from an expanded treatment window.

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