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Basilar Artery Occlusion Treated with Mechanical Thrombectomy beyond Eight Hours with Successful Recanalization and Good Functional Outcomes

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There is a growing interest in mechanical endovascular therapy for stroke patients who are ineligible for, or do not respond to, intravenous thrombolytic therapy. The effect of such interventions on functional outcome is yet to be proven. However, a narrow time window has limited wider use of these techniques, especially in the context of randomized trials. We illustrate 2 patients who underwent late but successful mechanical thrombectomy following acute basilar artery occlusion (BAO), with good functional outcomes.

Patient 1

A 67-year-old man with hypertension and hypercholesterolemia developed sudden right hemiparesis, dysarthria and lethargy. He presented to our institution 10 h following symptom onset. During the previous 3 weeks, he had had 2 episodes of transient leg weakness and headache. Neurological examination revealed severe lethargy, right gaze palsy, right facial weakness, deviation of the tongue to the right and right hemiparesis. The National Institute of Health Stroke Scale score was 15. Brain magnetic resonance imaging showed acute infarcts in the left pontine tegmentum, medial occipital and parietal lobes and cerebellum. Digital subtraction angiography, performed 17 h after the stroke, revealed midbasilar occlusion. Mechanical thrombectomy, using the X6 Merci retriever, followed by balloon angioplasty of a midbasilar artery stenosis was successfully performed, without procedure-related complications. Heparin was administered for 24 h after this procedure. Aspirin had been started upon admission.

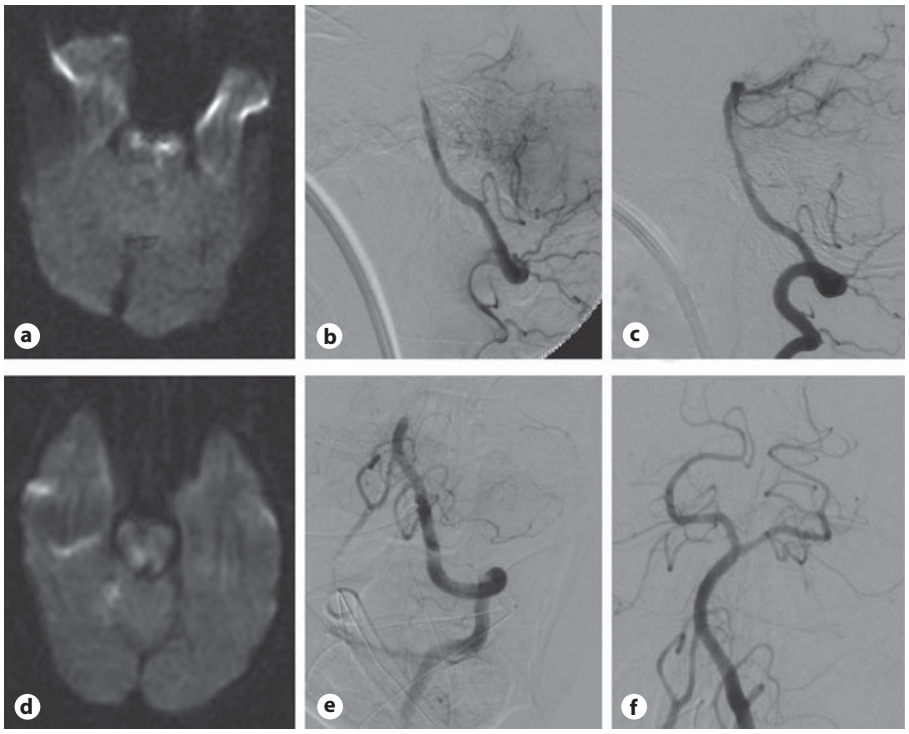

Fig. 1. Patient 1: DWI showing restricted diffusion in the pontine tegmentum (**a**), angiogram, right vertebral injection showing midbasilar occlusion (**b**) and post-thrombectomy angiogram showing recanalization of the basilar artery with atherosclerotic basilar artery stenosis (**c**). Patient 2: DWI showing restricted diffusion in the midbrain and cerebellum (**d**), angiogram, left vertebral injection showing midbasilar occlusion (**e**) and post-thrombectomy angiogram showing recanalization of the basilar artery with no stenosis (**f**).

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The patient's neurological exam gradually improved. He underwent inpatient rehabilitation, and 6 months after the stroke, his Modified Rankin Scale score was 0.

Patient 2

A 59-year-old man with hypertension suddenly lost consciousness. He arrived at the hospital 3 h later. Neurological examination revealed an intubated and mechanically ventilated, unresponsive patient with absent horizontal oculocephalic reflexes. The score on the National Institute of Health Stroke Scale was 24. Brain magnetic resonance imaging revealed acute infarcts in the dorsal midbrain, pons and right cerebellum. Digital subtraction angiography, performed 11 h after the stroke, revealed midbasilar artery occlusion. Mechanical thrombectomy, using the L5 Merci retriever, achieved complete vessel recanalization after 5 attempts. There were no procedure-related complications. The stroke etiology was believed to be cardioembolic. The neurological deficits gradually improved thereafter. The patient was discharged on aspirin/extended-release dipyridamole. He underwent inpatient rehabilitation, and 3 months after the stroke, his modified Rankin Scale score was 1.

Discussion

Most mechanical thrombectomy studies have excluded patients presenting beyond 8 h after the stroke. However, there are several reports of patients with BAO who had successful recanalization and good functional outcomes with thrombolysis up to 79 h after symptom onset [1–4], and with endovascular mechanical clot retraction up to 36 h after onset [5–7].

The poor prognosis in BAO treated with conventional therapy [2, 8, 9], coupled with the theoretical assumption and clinical observation that the brainstem is more tolerant to longer periods of ischemia than the cerebral hemispheres [10], has led some to justify extending the window for thrombolytic and endovascular therapy in these cases.

To our knowledge, this is the first report of late mechanical thrombectomy for BAO resulting in good functional outcomes in elderly patients. Previously described patients who benefited from late mechanical thrombectomy were children or young adults, not the typical stroke population.

Both patients had decreased consciousness, gaze abnormalities and lower cranial nerve palsies, findings associated with poor clinical outcome [11]. Neither had extensive brainstem infarction on diffusion-weighted imaging (DWI), but lower sensitivity of DWI in the first 12 h after brainstem infarction has been reported [12]. Conversely, recent studies showed that the brainstem DWI score is an independent predictor of clinical outcome in BAO patients treated with intra-arterial thrombolysis or other means of endovascular therapy. Lower scores were associated with better functional outcomes [13, 14] (fig. 1).

Because of the expected poor prognosis based on clinical grounds, we undertook an aggressive therapeutic approach to these patients despite late presentations. The ultimate good outcome in both cases may have reflected the small size of the brainstem infarcts on pretreatment DWI. Although the results achieved may have been atypical, our aim is to underscore that late successful recanalization of BAO using mechanical thrombectomy is possible, at least in some instances. Optimal application of this technique must, of course, be guided by properly conducted clinical trials.

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