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Case report– *Special issue: Acute Ischemic Stroke*

A case of successful interventional treatment in acute basilar artery occlusion

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ABSTRACT

We describe a case of successful recanalization and favorite clinical outcome of a patient with acute basilar artery occlusion (BAO) and interventional treatment (IT). A 67-year-old patient presented in a comatose state, with quadriplegia, and decerebrate posturing. His initial Glasgow-Liege Coma Scale (GLCS) score was 11, Institutes of Health Stroke scale (NIHSS) 24, and modified Rankin scale (mRS) 5. Non-contrast CT was performed before IT. Due to suspicion of BAO, an immediate cerebral angiography was performed. It demonstrated BAO in the middle and distal segment. Intra-arterial catheter based treatment was performed including balloon angioplasty and thrombolysis with 20 mg Actilyse (within 4 h of symptoms onset). An optimal angiographic result was achieved. After the procedure the patient was treated in ICU with another 10 mg Actilyse infused over the next 3 h. Because of improvement in neurological condition, the patient was extubated 12 h later. On the first day, he regained consciousness, being able to speak, without new neurologic deficit. Control CT did not demonstrate new signs of ischemic stroke. CT angiography showed complete basilar artery recanalization in the distal part and a moderate residual stenosis in the middle segment. On the 7th day the patient was discharged with NIHSS 7, GLCS 20, and mRS 3. We believe that the success in our case was a result of the prompt clinical diagnosis, fast access to the cathlab and early mechanical–pharmacological recanalization.

Introduction

The prognosis of acute BAO is usually very poor if early recanalization is not achieved [1–3]. Recanalization strategies today include systemic (intravenous) and local (intra-arterial) thrombolysis with rt-PA or urokinase [4], as well as mechanical stent retriever thrombectomy or vacuum thrombaspiration [5–9]. The rate of recanalization depends on the site of BA occlusion, medication, and technology used [5,6,10]. The best technical approaches – MRI, DWI and vascular imaging – could additionally pinpoint the best candidates for IT [11–13].

Case description

We present a case of 67-year-old man with arterial hypertension, previous stroke history, and permanent atrial fibrillation

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(AF). The patient was brought to the emergency room (ER) in a comatose state, with tetraplegia and deviation of the eyes and head toward left. The symptoms occurred 3 h earlier, according to the relatives' history. He was discharged from another hospital on the same day, treated 3 days for a mild ischemic stroke (involving territory of the left middle cerebral artery). The patient had residual modified Rankin scale (mRS) of 3 and denied taking anticoagulant as secondary prevention. The arterial BP of the patient in the ER was 210/107 mmHg, and he was vomiting. His Glasgow-Liege Coma Scale score was 11 points, National Institutes of Health stroke scale was 24 points, and mRS 5. He presented decerebrate rigidity posturing on painful stimuli. Prominent trismus of the mandibula was observed. The right limbs were flaccid and plegic, while the left limbs were spastic and severely paretic as a sequel of previous stroke.

On admission, the vascular risk factors, neurological deficit graded by NIHSS, and radiological findings were recorded. Emergency non-contrast CT of the head was performed and intracerebral hemorrhage was excluded. The patient had permanent pacemaker that was a contraindication to perform MRT, DWI, and MR angiography. The laboratory examinations, including CBC, broad biochemistry panel, and coagulation, were unremarkable. The patient was sedated and intubated in the ER.

After discussion within multidisciplinary team – neurologist (M.K.), interventional cardiologist (I.P.), and anesthesiologist (S.H.), a decision to perform an immediate cerebral pan-angiography and interventional intra-arterial treatment was taken, because of clinical evidence of the acute basilar artery occlusion (BAO) [14] within the optimal time window. According to our interventional stroke protocol [15], we performed cerebral angiography and intra-arterial catheter based treatment.

A total occlusion (acute thrombosis) of the basilar artery was found in the middle and distal segments (Fig. 1). Posterior cerebral arteries were not visible. With right femoral approach, a guiding catheter Simmons 2 was positioned in the middle left vertebral artery. The BAO was recanalized with a ''014 Runthrough wire'' support of a low profile Sprinter 1.25/15 mm balloon. After three Sprinter NC balloon inflations with incremental sizes, from 1.25 to 3.5 mm, a full recanalization of the basilar artery and flow restoration in the left PCA was achieved. Additionally, 20 mg Actilyse were administered through the guiding catheter. The catheter based intra-arterial treatment was performed 4 h after the onset of acute BAO stroke (symptom onset to treatment time was <240 min) with an excellent angiographic result of TICI 3 (Fig. 2a–d). After the procedure the patient was treated in the intensive care unit, being intubated and on artificial ventilation, where another 10 mg Actilyse were infused. His general and neurological condition were stabilized and he was extubated after 12 h. On the first day, the patient regained consciousness, being adequate and able to speak, with no new deficit in the right limbs, except for mild arm ataxia. On the control brain CT, there were no any new signs of ischemic stroke or symptomatic intracerebral hemorrhage, as well as other complications. Cerebral CT angiography (Fig. 3) showed complete basilar artery recanalization in the distal part, a moderate residual stenosis in the middle segment, and aplasia of the left posterior communication artery. The patient started rehabilitation program and on day 7 he was discharged home with NIHSS 7, GLCS 20, and mRS 3.

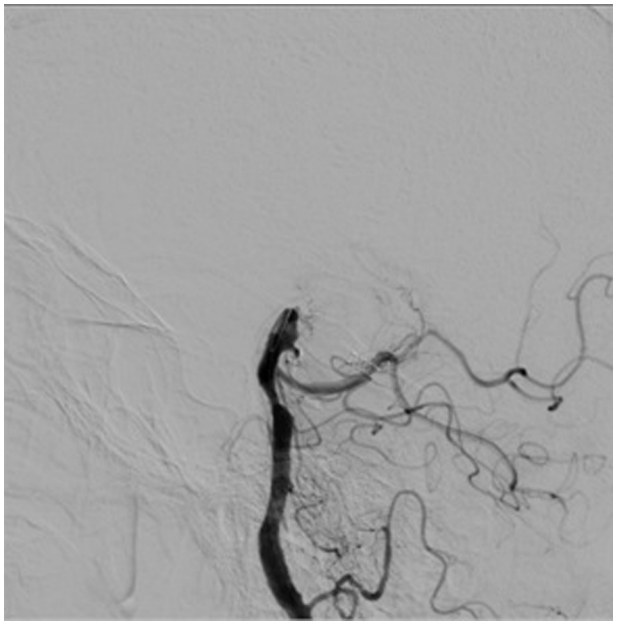

Fig. 1 – Basilar artery occlusion in the middle and distal segment.

Discussion

According to Arnold et al. [16], low NIHSS score on admission and early vessel recanalization were independent predictors of favorable outcome. Recanalization was successful more often with treatment within 6 h of symptom onset and when admission CT showed a hyperdense BA sign [16]. There are reported cases of successfully treated BAO up to 48 h, even though the time of intervention is also very important factor in BAO prognosis [17]. Authors demonstrated that quadriplegia and coma were associated with poor outcome or death. Despite the patient was presented in a severe comatose state with quadriplegia and high NIHSS, he had a favorable clinical course. According to some authors the Glasgow coma scale does not predict outcome after intra-arterial treatment for BAO [18].

With initial plain CT of the brain we excluded intracerebral hemorrhage. The patient had no anticoagulant treatment for his permanent AF, so we assumed that an embolic occlusion of the basilar artery at the site of atherosclerotic plaque was the most probable etiology. We decided not to perform CT angiography because we had clinical evidence of BAO in accordance to Caplan [14], and proceeded directly to cerebral pan-angiography. Thus, we had spared the double contrast media dosing to the patient and proceeding with the gold-standard angiography and we could better localize occluded vessel segment. The symptoms onset occurred within 3 h of presentation to our ER, and since there were no contra-indications for intervention, we proceeded with immediate