



Thrombectomy for ischemic stroke with large vessel occlusion and concomitant subarachnoid hemorrhage

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Accepted: 29 May 2021

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Abstract

To report our experience in treating one patient with nontraumatic subarachnoid hemorrhage (SAH) and concurrent acute ischemic stroke (AIS) due to large vessels occlusion (LVO). A man in his 50 s presented with acute right hemiparesis and aphasia. Brain CT showed a SAH in the left central sulcus; CT-angiography revealed a tandem occlusion of the left internal carotid artery and homolateral middle cerebral artery. He underwent an angiographic procedure with successful recanalization. Follow-up CT demonstrated a striatal-lenticular stroke without SAH progression. While the absolute contraindication to IVT during intracranial bleeding remains unquestionable, the potential injury/benefit from MT is still debatable. Such cases constitute a blind spot in the guidelines where physicians face the dilemma of choosing between an acute endovascular treatment with the risks of hemorrhage progression and a conservative treatment with the associated poor clinical outcome. We decided to treat our patient invasively, considering the young age, also given the absence of prognostic factors that generally predict post-procedural reperfusion injury. We believe that, in similar cases, MT should be considered—despite not free of risks and drawbacks—to avoid the detrimental consequences of untreated AIS from LVO.

Keywords Case report · Thrombectomy · Subarachnoid hemorrhage · Stroke

Highlights

- Management of acute ischemic stroke with concomitant subarachnoid hemorrhage.
- Reperfusion injury after mechanical thrombectomy.

Introduction

Nontraumatic subarachnoid hemorrhage can rarely occur in the acute phase of ischemic stroke (AIS), especially if due to large vessels subocclusion [1–3]. Intracranial bleeding

hinders AIS management especially for what concern the choice of the optimal revascularization approach.

Indeed, intravenous thrombolysis (IVT) is obviously contraindicated, while, on the other side, the role of mechanical thrombectomy (MT) has not been adequately investigated in patients with AIS with large vessel occlusion (LVO).

These cases constitute a blind spot in the guidelines where physicians face the dilemma of choosing between an acute endovascular treatment with the risks of hemorrhage progression and a conservative treatment with the associated poor clinical outcome.

Case summary

A 50 year-old man presented to our emergency room because of acute right hemiparesis and aphasia (NIHSS score of 10). Blood glucose level was 113 mg/dL, blood pressure was 150/80 mmHg. His past medical history was unremarkable. A brain computed tomography (CT) scan showed a convexity subarachnoid hemorrhage (cSAH) in the left central sulcus (Fig. 1a) with an Alberta stroke

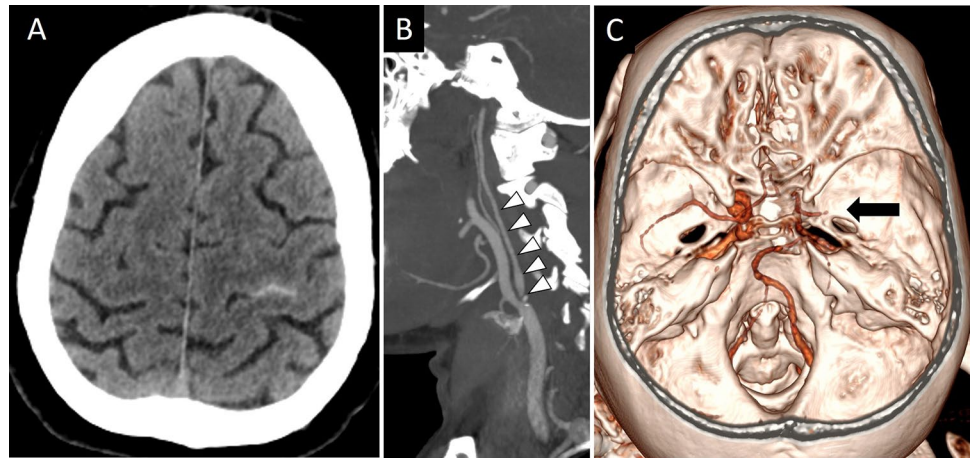
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Fig. 1 **a** Brain CT showing cSAH in the left central sulcus. **b** CT angiogram revealing severe stenosis of the left extracranial ICA (arrowheads). **c** 3D reconstruction with volume rendering: occlusion of the left MCA (black arrow)



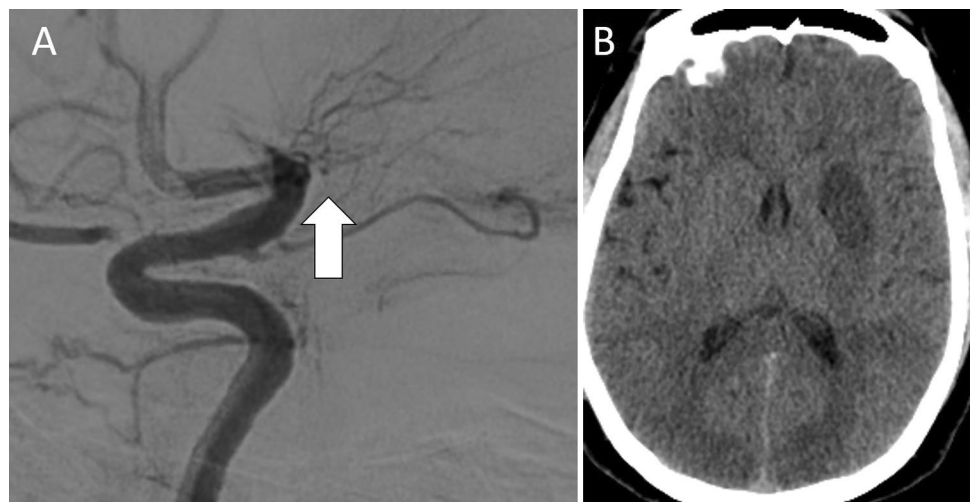
programme early CT (ASPECT) score of 10. CT angiography revealed a sub-occlusive stenosis of the left internal carotid artery (ICA, Fig. 1b) associated with an occlusion of the left M1-segment of the middle cerebral artery (MCA, Fig. 1c). At 105 min from symptoms onset, the patient underwent an emergent angiographic procedure with Wallstent placement across the sub-occluded segment of the ICA and MT with stent-retriever device plus thrombus-aspiration in the left M1-MCA (Fig. 2a). The embolus was successfully removed and Thrombolysis In Cerebral Infarction (TICI) score of 3 revascularization was achieved.

Follow-up CT, 24 h later, demonstrated an ischemic lesion in the striatal-lenticular region (Fig. 2b) without cSAH progression. Magnetic resonance imaging (MRI) of the head was otherwise unremarkable, failing to prove any sign of cerebral microbleeds or superficial siderosis. During the hospital stay the patient improved clinically to a NIHSS score of 1. Brain CT at discharge revealed complete resolution of the cSAH.

Discussion

While the absolute contraindication to IVT during intracranial bleeding associated with acute ischemic stroke remains unquestionable, the potential injury/benefit from MT is still a matter of debates. Regardless of a concomitant spontaneous intracranial hemorrhage, bleeding from a reperfusion injury can occur and complicate the post-procedural course, especially in the presence of certain risk factors (e.g. hyperglycemia, low ASPECT score, hypertension, old age, delayed onset-to-treatment time, high NIHSS score etc.) [4]. Normally the risk of such complications is far outweighed by the benefits from the successful recanalization. However, when bleeding is already present, it is reasonable to assume that reperfusion might lead to its progression. In the scientific literature only two cases have so far been reported: in one case the MT was performed after IVT leading to hemorrhagic transformation of an AIS with LVO [5]; while in the other case a spontaneous intracerebral hematoma concomitant to

Fig. 2 **a** Cerebral angiography confirming left M1-MCA occlusion before recanalization (white arrow). **b** 24-h CT scan revealing a hypodense ischemic lesion in the left striatal-lenticular region



the AIS was found in the contralateral hemisphere [6]. Both cases have been successfully treated with MT without any hemorrhagic progression.

Conclusion

We decided to treat our patient invasively, considering the relatively young age and the expected poor clinical outcome in case of conservative treatment of tandem occlusion, also given the absence of the prognostic factors that generally predict post-procedural reperfusion injury.

In the lack of any evidence that may guide physicians on the best therapeutic choice, we believe that MT should be considered in patients with concomitant intracranial bleeding—despite not free of risks and drawbacks—to avoid the detrimental consequences of untreated AIS from LVO.

Author contributions CZ design of the study, acquisition, analysis and interpretation of the data, drafting of the manuscript. AE design of the study, acquisition, analysis and interpretation of the data, revision of the manuscript for important intellectual content. RA analysis and interpretation of the data, revision of the manuscript for important intellectual content. MP analysis and interpretation of the data, revision of the manuscript for important intellectual content. NM analysis and interpretation of the data, revision of the manuscript for important intellectual content. GT analysis and interpretation of the data, revision of the manuscript for important intellectual content. BB analysis and interpretation of the data, revision of the manuscript for important intellectual content. MC design of the study, analysis and interpretation of the data, revision of the manuscript for important intellectual content, study supervision. All Authors read and approved the final version of the manuscript.

Funding None.

Declarations

Conflict of interest The authors report no disclosures relevant to the manuscript.

Informed consent Patient signed informed consent for disclosure.

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