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Case Report

Repeated intravenous thrombolysis in early recurrent stroke secondary to carotid web: Case report [☆]

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ABSTRACT

Intravenous thrombolysis with recombinant tissue plasminogen activator (rt-PA) is the first effective approved treatment for reducing ischemic stroke disability, and having a stroke within 3 months is usually a contraindication to thrombolysis. In this paper, we describe the case of a 58-year-old patient who received repeated intravenous thrombolysis at 10 days interval for a recurrent ischemic stroke, with dramatic improvement. The carotid diaphragm was behind this recurrent stroke and it was treated by stenting.

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Introduction

For a long time, history of stroke within 90 days had been considered an absolute contraindication to intravenous thrombolysis (IVT). However, some observational studies have shown the efficiency and safety of repeated thrombolysis in patients with early recurrent ischemic strokes.

Case report

A 58-year-old man with active smoking history presented with sudden-onset left-sided weakness, numbness, and speech difficulty for 90 minutes from his last known well. Neurological examination revealed a left central facial paralysis and left hemiplegia with dysarthria. The patient's NIHSS was 13,

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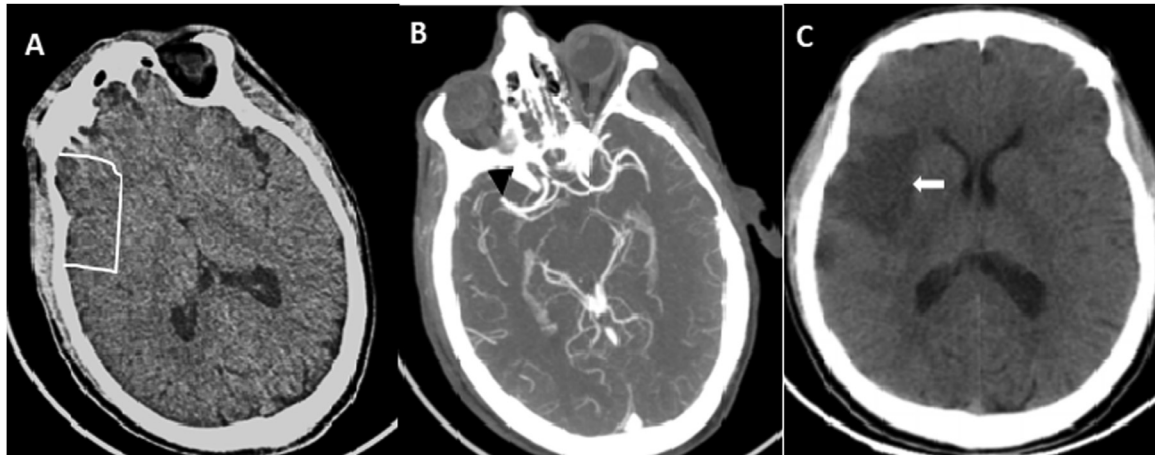


Fig. 1 – (A) Non-enhanced CT scan demonstrating spontaneous hyperdensity regarding left transverse sinus (white arrow). (B) Enhanced CT scan showing thrombosis of the left transverse and sigmoid sinus (white arrow) extended to the jugular vein (arrowhead).

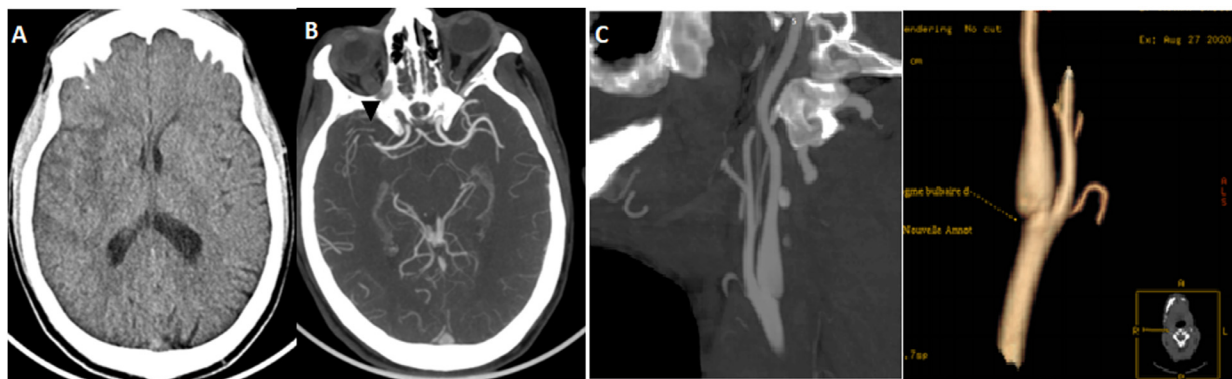


Fig. 2 – (A) Nonenhanced cerebral CT scan showed a left temporal hypodensity. (B) Contrast-enhanced CT scan of the brain showed a left temporal venous infarct (star) with thrombosis of left transverse and sigmoid sinus (arrows).

capillary glycaemia was normal, and blood pressure was 120/65 mm Hg. A cerebral computed tomography (CT) scan revealed attenuation (hypodensity) in the right insula and temporal lobe, indicating possible right middle cerebral artery (MCA) territory infarction with the Alberta Stroke Program Early CT score (ASPECTS) at 8. The CT angiography scan revealed an occlusion of the distal segment of M1 in the right middle cerebral artery (Figs. 1A and B). The intravenous tissue plasminogen activator Alteplase (0.9 mg/kg) was administered at 2 hours 15 minutes onset. The patient improved and his NIHSS was 3, five hours after thrombolysis.

Follow-up cerebral CT scan 24 hours later revealed the hypodense lesion compatible with partial right MCA infarction without any hemorrhagic transformation (Fig. 1C).

The CT angiography of the neck shows a small atheromatous plaque in the left common carotid artery without stenosis, and no abnormalities were observed in the right internal carotid artery at this time. Electrocardiogram, transthoracic echocardiography, and 24-hour Holter ECG were normal. The patient was discharged after four days, and was on daily antiplatelet agent (160 mg of aspirin) and statin (20 mg of atorvastatin).

Ten days after the first stroke, he was readmitted to the emergency department for the same non-epileptic neurological deficit after 1 hour from his last known well. The patient's NIHSS was 14, and a CT scan of the brain showed the first infarction with distal vessel M1 thrombus in the right MCA (Figs. 2A and B). Since thrombectomy was not available, thrombolysis was discussed, and a full dose of IV-tPA was administered repeatedly. Dramatic improvement was observed and his NIHSS score was 4 at 10 hours after IVT. The CT angiography of the neck shows the right internal carotid artery web, not diagnosed after first stroke (Fig. 2C).

A control cerebral CT, performed 1 day after the second IVT, revealed the hypodense lesion compatible with the partial right MCA infarction, and an asymptomatic hemorrhagic transformation (Fig. 3).

The patient was stented 2 days after the last stroke with no periprocedural complications. The patient was discharged on daily dual antiplatelet agents (aspirin 100 mg and clopidogrel 75 mg) and atorvastatin (20 mg daily).

Three months later, the patient's NIHSS score was 1, and his Modified Rankin Score was 0. He could manage all activities of daily living without assistance.

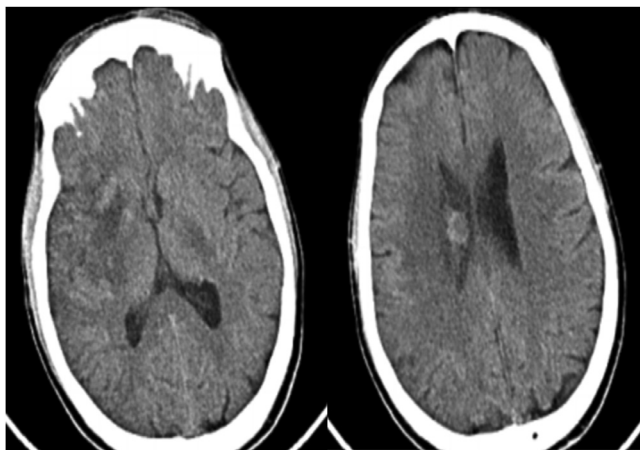


Fig. 3

Discussion

Stroke is one of the most common health problems in the world, the third leading cause of death, and among the main causes of disability in the world, because of their frequency and severity. Ischemic stroke represents about 80% of all strokes [1]. Restoring blood flow, IVT with Alteplase was the first therapy to change the prognosis of ischemic stroke. Unfortunately, the percentage of patients who can benefit from this treatment is very low because it has numerous exclusion criteria. Nonetheless, in the real-world clinical practice, many stroke neurologists consider some of these contraindications to be “relative” and many patients receive off-label thrombolysis [2,3].

Most recently, thrombectomy has become the second method of reperfusion strategy to be approved [1]. Endovascular thrombectomy is the solution in situations where the use of intravenous alteplase is contraindicated, or insufficient. However, thrombectomy is not available in all emergency departments.

According to the European license, having a previous stroke within 3 months is one of exclusion criteria of IVT, because of the presumed higher risk of symptomatic intracranial hemorrhage (sICH). Some reviews and observational studies have re-examined this contraindication and concluded that IVT seems to be effective, and not as dangerous as previously believed [4].

The analysis of Stroke International Registry of Thrombolysis in Stroke (SITS) data between 2003 and 2010, indicates 1919 off-label thrombolysis. Around 2.7% of these violation criteria were previous stroke in the last 3-months [5]. According to the data of this multinational study, there is no evidence that a previous stroke within 3 months significantly increases the risk of sICH [5].

Recent reviews criticize the exclusion of patients with previous stroke within 3 months, and they have shown the effectiveness and the safety of thrombolysis in patients with early recurrent ischemic stroke, especially patients with the small infarction [4,6]. IVT for stroke recurring within 2 days from the

previous event was described [4,7,8]. Adverse outcomes of repeated IVT are unknown, but theoretically, the rt-PA is cleared rapidly from the circulating blood and will not lead to toxic plasma levels. Repeated IVT twice and 3 times is performed in some cases with good outcomes [8,9].

It is necessary to discuss these exclusion criteria because the risk of early stroke recurrence is common [10]. Stroke recurrence has been associated with increased mortality and disability [10,11].

Identifying the cause of acute ischemic stroke is important to choose the appropriate secondary prevention of recurrence [12]. The Carotid web is an under-recognized cause for ischemic stroke, particularly in younger patients with no typical risk factors [12]. Its prevalence is between 10% and 37% in patients under 60 years of age with cryptogenic stroke [13]. It is associated with high risk of ischemic stroke recurrence, as demonstrated in our case, and in many other publications [13]. Antiplatelet monotherapy may be insufficient to prevent the recurrence of stroke secondary to carotid web. Endovascular therapy by stenting is potentially effective and technically safe [13].

Conclusion

Repeating IVT in early recurrence of stroke is safe, and potentially beneficial. History of previous stroke in the last 3 months, especially if thrombectomy is not available, should not be considered an absolute contraindication for IVT. Decision-making should take into consideration the supposed benefit and the potential risk.

Large clinical trials are needed to define the safe period for IV thrombolysis in early recurrent stroke, and to determine the appropriate dosage for repeated intravenous thrombolysis.

Ethics declarations

Ethics approval and consent to participate

The ethics committee of the UNIVERSITY HOSPITAL CENTRE HASSAN II FEZ MOROCCO has approved this report.

Consent for publication

Written informed consent was obtained from the patient's legal guardian(s). A copy of the written consent is available for review by the Editor-in-Chief of this journal.

Availability of data and materials

All data generated or analyzed during this study are included in this article

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