

Multiple Recurrent Acute Ischemic Strokes Treated by Thrombectomy in a Patient with Acute Pulmonary Embolism

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Abstract

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BACKGROUND: Thrombectomy is recommended to treat for an acute ischemic stroke (AIS) patient with anterior large vessel occlusion. However, there were neither detailed guidelines nor systematic reviews of acute ischemic stroke patients having multiple times or re-occluded arteries.

CASE REPORT: In our case report, we struggled a multiple (4-times) AIS patient underwent by one intravenous r-tPA and 3 remaining of endovascular treatment of thrombectomy. Especially, the finding of both pulmonary embolism and cerebral arteries occlusion in this patient made us difficult to decide the appropriate treatment plan. The patient was considered having multiple cardiac thrombi pumping out to the brain and pulmonary vessels even in treatment with NOAC (New Oral Anticoagulant). Our priority, normally, was to recanalize the brain vessels compared to the pulmonary arteries.

CONCLUSION: In conclusion, based on this noticed case study, we want to share our experiences on the diagnosis of ischemic stroke, the strategy in treatment and prevention with anticoagulant therapy.

Introduction

Up to now, thrombectomy in the patient with acute anterior large vessel occlusion (LVO) has been recommended as the first choice of treatment for a high rate of recanalization [1]. However, as far as our knowledge, there is about 2.3% patients suffered from recurrent LVO stroke even within the first 48 hours had a very poor clinical outcome [2]. In such a special case, the indication of repeated thrombectomy is considered to be a good choice with the better result [3], [4]. In clinical practice, there are few case reports of patients with other arteries occlusion like pulmonary arteries embolism in combination with cerebral vessels thrombus. Although it is a very rare situation, it is still challenging for doctors in making a right

decision. This case report aims to demonstrate our experiences in treatment of multiple recurrent acute ischemic stroke (AIS) due to occlusion of cerebral arteries associated with acute pulmonary embolism.

Case Report

A 53 years-old female patient came to our hospital at 8:45 am-75 minutes after the onset time (7:30 am), June 16th 2018 with the clinical symptoms of 3/5 left hemiplegia and dysarthria. The NIHSS (National Institutes of Health Stroke Scale) baseline was 5 and the blood pressure was 160/90 mmHg.

Taking the past medical history showed that she had neither smoked nor taken oral contraceptives. The after NCCT and CTA (Chloramphenicol Acetyl Transferase) indicated the ischemic lesions in the right insular with ASPECTS (Alberta Stroke Program Early CT Scan) baseline of 9 due to distal right M2 occlusion (Figure 1).

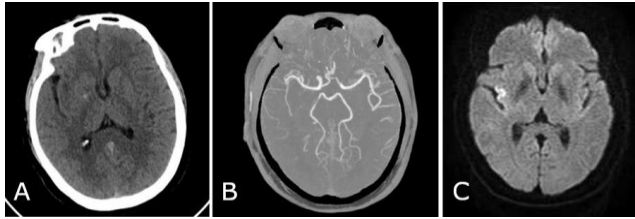


Figure 1: Imaging of the 1st stroke. A. NCCT; B. Distal R-M2 occlusion in CTA; C. MRI 24h post IV r-tPA

The patient was treated with intravenous (IV) r-tPA with a dosage of 0.9 mg/kg at 9:05 am (door to needle: 20 mins). 24 hours after treatment, she was stable with NIHSS (reduced to 2) and MRI follow-up (Figure 1) confirmed insular infarction with no extension or hemorrhage lesion. Transthoracic echocardiography and electrocardiogram (ECG) were performed without any abnormal indices. The glucose and lipid test resulted in a normal range. The patient was discharged 4 days after on June 20th 2018 with a prescription of Aspirin 100 mg/day and Lipitor 10 mg/day.

Four months later, on October 14th, the patient suddenly suffered from the same symptoms (1/5 left hemiplegia and dysarthria) at home. She was transferred to our center at 7:25 am 40 mins after onset, with a GCS (Glasgow Coma Scale) of 14 and NIHSS baseline of 12. The CT (Computed Tomography) Scan revealed right M1 occlusion in combination with ipsilateral A1 thrombus. ASPECTS baseline was 8. Patients then underwent endovascular treatment (EVT) with thrombectomy by experienced neuro-interventions. The right cerebral arteries were both TIC1 3 recanalization with one-time aspiration of Sofia plus 6F for M1 and one-time stent-retriever of Eric 4/24 for A1 (Microvention). All the images were illustrated in Figure 2. The clinical outcome after 24-hour follow-up was significantly improved with mild left hemiplegia 4/5 and reduction of NIHSS to 2. Peripheral Doppler ultrasound showed normal signs, but this time, using transesophageal echocardiography (TEE), we found a 3mm of foramen ovale with small right to left shunt, no thrombus found inside either left auricle atrium or pulmonary arteries. The patient was also indicated to take Xarelto (Rivaroxaban) 20 mg/day.

Unfortunately, just 1 day after hospitalization at 4:00 am on October 16th, the patient was discovered to have 2/5 left hemiplegia, and NIHSS was 10. Right M1 was re-occluded on CTA with a hyperdense sign on NCCT, and ASPECTS was 6.

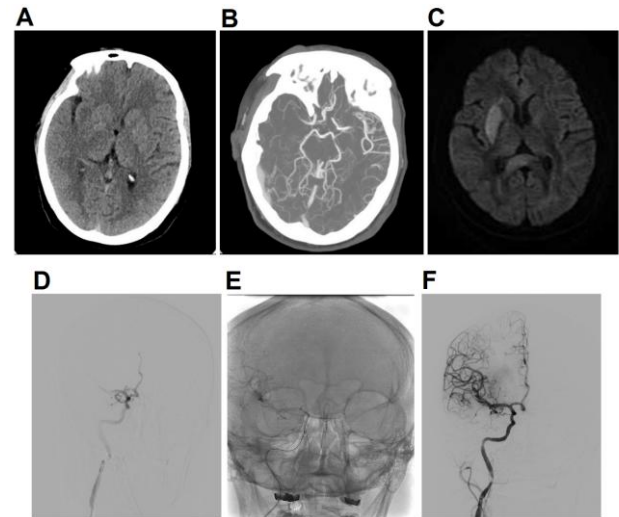


Figure 2: Imaging of the 2nd stroke. A. CT pre-procedure; B. CTA showed thrombus in both MCA and ACA; C. MRI 24h post thrombectomy; D. Angiography confirmed both MCA & ACA occlusion; E. Solubra technique in MCA and stent-retriever in ACA; F. TIC1 3 archived post thrombectomy

Figure 3 showed all the images and 2nd thrombectomy with TIC1 3 archived after 1 pass of aspiration. No autoimmune disorder was found with normal results of antinuclear, antiphospholipid and anticardiolipin antibodies. The sinus rhythm was also recorded in ECG. On October 28th 2018, the patient was discharged again after 2 weeks of treatment with mRS 1 and prescription of Xarelto 20 mg/day.

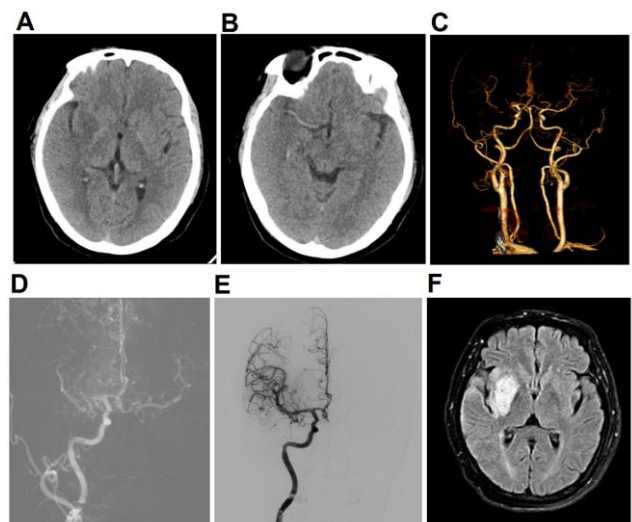


Figure 3: Imaging of the 3rd stroke. A. CT Scanner; B. R-MCA hyperdense; C. CTA confirmed R-M1 occlusion site; D. R-M1 re-occluded in DSA; E. 1 pass of Aspiration to archived TIC1 3; F. MRI 24h post 2nd thrombectomy

The 4th recurrent ischemic stroke came at 6.40 am on November 7th with dyspnea and unconsciousness. Her admission was at 7:25 am – 45 mins later the onset. This time, she had right hemiplegia with a respiratory rate of 30 times/min, and SpO₂ result was only 88%. Due to these severe conditions, we indicated both cerebral and pulmonary CT Angiography for the patient (Figure 4).

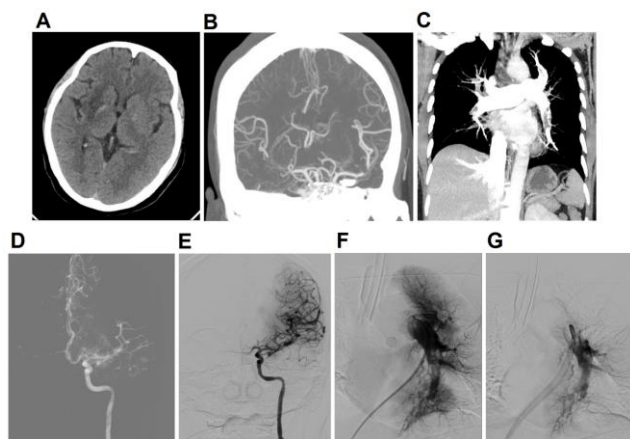


Figure 4: Imaging of the 4th stroke. A. 4th NCCT; B. CTA revealed L-MCA occlusion; C. Both pulmonary arteries thrombus identified with most one in the L side; D. Distal L-M1 occlusion in the DSA; E. TICl 3 revealed after aspiration; F. Angiography in the L-PA confirmed the diagnosis in CTA; G. L-PA after some aspirations

The results were distal left M1 occlusion in combination with pulmonary embolisms. The EVT was performed at 8:20 am with both femoral artery and femoral vein puncture by neuro-intervention team. After 1 pass of aspiration (Sofia Plus 6F – Microvention), the cerebral arteries was completely revascularized with TICl 3. Nextly, we used thrombectomy aspiration to take out most of the left pulmonary arteries embolism. The SpO₂ raised to 100% immediately thereafter. The patient then was intensively treated with a ventilator, Dobutamine and 24 hours of continuous Heparin infusion. Images following up after 1 day demonstrated no hemorrhagic lesion. Xarelto 15 mg was used twice a day. After 3 days, she became conscious without support from the ventilator and started to have rehabilitation. She then was discharged after 19 days, on November 26th, 2018. 1 month follow up showed good clinical outcome with mRS of 1.

Discussion

In this case, at the first stroke, the treatment with IV r-Tpa was successful because the occlusion just located at the small branches (distal site of right M2). The cardiac ultrasound at the first examination did not find the cardiac lesion so that we continued antiplatelet for prevention. In the 2nd stroke, she had the LVO of both right M1 and right A1. Even though the period between two strokes lasted more than 3 months meaning no indication for IV r-tPA, but we performed thrombectomy immediately without thrombolysis. As the result of the recurrent stroke, we still suspected the cause coming from a cardiac lesion. Therefore, TEE was done this time, and its results demonstrated a remnant foramen ovale. We decided to use Xarelto 20 mg/day for secondary

preventative treatment, however, after only 6 hours, the patient suffered the 3rd stroke during the hospitalization due to right M1 occlusion. Imagine analysis in the CTA still supported us to continue with the second consecutive thrombectomy. This decision was similar to the ones done by other authors [3], [4], [5]. After discharge, our patient was prescribed continuously Xarelto, but she changed into Aspirin by herself without any consultant with us. Therefore, it led to her 4th stroke, meaning the 3rd stroke within only a month. In this recurrent time, she came with more severe condition (unconsciousness and unstable SpO₂) than all previous strokes. In CTA (Computed Tomography Angiography) images, not only the left distal M1 was occluded but also both pulmonary arteries embolism was identified.

In this situation, we rushed in the DSA room with thrombectomy for all two targets but aimed for the brain first because of its importance in making outcome. It was also our very first experience in ischemic stroke patient who have thrombus involved both cerebral and pulmonary arteries. Even having a successful operation with good recanalization, the patient was still in the fatal condition. Thank to our intensive care of treatment with the ventilator in combination with Dobutamine and Heparin infusion, she recovered progressively. After becoming conscious, she could breathe without ventilator support and do the rehabilitation with help. We decided to use Xarelto 15 mg 2 times/day for 3 weeks, then maintain a treatment with a dosage of 20 mg/day after discharge.

In conclusion, thrombectomy procedure treated for an ischemic stroke patient who has cerebral large vessel occlusion in combination with pulmonary arteries embolism seemed to be reasonable with an acceptable outcome.

Ethical Approval

The research was approved by the Ethics Committee of Hanoi Medical University, No 187/HĐĐĐHYHN on February, 20th 2016.

Informed Consent

Informed consent was obtained from the patient included in the study. The patient and her husband agreed both to participate in the treatment with understanding and allow our research group to use their studying image, data, and information in writing/publishing scientific article

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