Mechanical Thrombectomy for Cluster Transient Ischemic Attack. A Case Report

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Abstract

The use of MT has become the gold standard for LVO in the anterior circulation since the publication of 5 randomized trials in 2015. Nevertheless, the utility of this treatment remains unclear in some clinical situations. One of such is occlusion of LVO in patients with TIA or minor neurological symptoms. The case presented here shows that mechanical thrombectomy may be highly effectively in patients with cluster TIAs resulted from LVO occlusion. Further randomized trial should establish definitive treatment for this category of patients.

Introduction

Mechanical thrombectomy (MT) has become the reference treatment for large vessel occlusion (LVO) in patients with acute ischemic stroke of the anterior circulation with limited necrotic core. However, there are many clinical situations that are still uncovered by the randomized clinical trials and for which decision making is still case and operator based.

Case Presentation

Sixty-two years old male was admitted to the emergency room because of transient left hemiplegia lasted five minutes. Then, in the ER the second and third episodes of transient left hemiplegia occurred and lasted 45 and 15 minutes correspondently. All three episodes resolved spontaneously. A computed tomography (CT) of the head showed no intracranial bleeding. Alberta stroke program early CT score (ASPECT) was 10 and computed tomography perfusion (CTP) revealed a large area of a penumbra of right middle cerebral artery (MCA) territory (Figure 1). Computed tomography angiography (CTA), demonstrated a near occlusion in the right MCA (Figure 2). The near occlusion was interpreted as either an intracranial stenosis or a margined thrombus.

The patient medical history included paroxysmal atrial fibrillation, biological mitral valve replacement because of severe mitral regurgitation on a rheumatic mitral valve one year before the actual event. The patient was treated with warfarin and an International normalized ratio (INR) in the ER was 1.9.

Thus, an embolic origin of MCA near occlusion was suggestive because of patient's background. Intravenous tPA treatment was contraindicated because of INR of 1.9. Because of three relatively long-lasting stereotypic TIAs, the large area of

Figure 1: CTP summarized map showing a large area of prolonged mean transient time in the right MCA territory.

Figure 2: CTA showing the presence of right MCA narrowing (arrow) suggestive of intracranial stenosis or margined thrombus.
tissue in risk on CTP, and devastating consequences in case of stroke completion was decided to perform mechanical thrombectomy. The patient was put under general anesthesia. A right femoral 6 French sheath was inserted. Selective angiography of his right internal carotid artery (ICA) revealed a saddle-shaped thrombus (Figure 3) in the distal MCA bifurcation causing a very slow and delayed flow in all MCA territory. In the lower subdivision of the MCA, at the level of the supramarginal gyrus, a second saddle-shaped thrombus was seen at a bifurcation (Figure 4).

The proximal thrombus was clearly responsible for the clinical symptoms and was decided to retrieve it. Since the thrombus was short a direct aspiration first pass technique (ADAPT) was used. A 9 French (9F) balloon guiding catheter (BGC) was advanced into the right ICA, a Sophia 5F aspiration catheter was advanced proximally to the thrombus upon a Rebar 18 microcatheter mounted with a Traxess guide wire. Special attention was given to avoid crossing the thrombus with any device. As soon as the thrombus was approached the BGC was inflated and a gentle aspiration was performed from the 9F guiding catheter to create a reverse flow. Once the Sophia catheter was at the contact with the thrombus the clot aspiration was initiated and concurrently the microcatheter and wire were removed in order to improve aspiration efficacy. The proximal clot was fully retrieved after the first pass (Figure 5) with no evidence of distal embolization. The distal thrombus remained unchanged through the procedure. Since the thrombus was quite distal with probably no or minimal clinical effect it was decided not to remove it.

There were no further neurological episodes and no residual deficit after the intervention. The patient did not present any symptoms suggestive for endocarditis. Therefore, the retrieved material was not sent for histological analysis. Transesophageal echocardiography performed later revealed a mobile mass (less than a centimeter) on the atrial aspect of the prosthetic biological mitral valve, and a small thrombus in the left atrial appendage. Endocarditis work-up was negative. A conservative treatment was recommended with INR levels maintained...
on 3-4. At one month follow up the patient was good, without any neurological deficit.

Discussion
The use of MT has become the gold standard for LVO in the anterior circulation since the publication of 5 randomized trials in 2015 [1-5]. Nevertheless, the utility of this treatment remains unclear in some clinical situations. One of such is occlusion of LVO in patients with TIA or minor neurological symptoms. In such scenario, mechanical intervention is driven by the risk of possible deterioration and completion of a large infarction but is counter-balanced by the possible procedural complications. Bhogal and al [6] examined a cohort of patients with low NIHSS (<5) and confirmed M1 occlusion, and showed that MT achieved 75% of good clinical outcome (mRs 0-2) with 87.8% revascularization rate. To prove the benefit of mechanical intervention in such clinical scenario one should know the natural history, of a TIA or minor stroke caused by LVO. To the best of our knowledge, no randomized trial had addressed this clinical situation. Despite the lack of randomized studies, some data may be found in the literature. Diogo et al [7] compared patients with LVO and NIHSS≤5 treated conservatively or by MT. Forty-one percent of patients in the medical arm had clinical deterioration. A shift towards a lower NIHSS in patients who underwent primary thrombectomy as compared with those who received best medical therapy alone was demonstrated. And finally, 23% of patients primarily given medical treatment did not achieve independence at 90 days, whereas all patients in the thrombectomy group achieved mRs ≤ 2.

In our case the patient presented three episodes of complete left hemiplegia that resolved spontaneously. Thus, it was high concern about imminent permanent deficit, when the pharmacological treatment options were absent. During the procedure, we were mainly worried about the risk of distal embolization. To minimize this risk, we used a BGC with reverse flow technique and carefully avoided crossing the thrombus with any of devices. The use of BGC has been proven to significantly reduce the risk of distal embolization, and reduce the number of pass needed to achieve revascularization [8,9]. In conclusion, the presented case shows that MT may be highly effective in patients with cluster TIAs resulted from LVO occlusion. Further randomized trial should establish definitive treatment for this category of patients [10,11].

Conflict of Interest
The authors certify that there is no conflict of interest with any financial or other organization regarding the material discussed in the manuscript.

References