

“Missing clot” during mechanical thrombectomy in acute stroke using Solitaire stent retrieval system

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Abstract

Stent retrieval system is an established treatment modality in acute ischemic stroke with large vessel occlusion. Here, we describe a complication which occurred during mechanical thrombectomy in three cases where the clot dislodged during retrieval. There was a possibility of the clot getting reinjected into the artery with possible dire consequences.

Key Words

Acute stroke, mechanical thrombectomy, solitaire

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Introduction

Mechanical thrombectomy using stent retrievers is an established treatment modality in patients with acute ischemic stroke with a proximal large vessel occlusion. Recent trials have shown shorter recanalization time, better recanalization rates, and reduced mortality with newer generation stent retrievers making them the most preferred of the available options in the management of acute ischemic stroke due to large vessel occlusions.^[1-3] However, there may be unexpected complications and technical challenges as well.

In this case, of a series of three patients, we describe the technical difficulty we encountered while attempting clot retrieval using a stent retrieval device. We hope that awareness about such technical problems will help to prevent unexpected procedural complications.

Case Report

From January 2010 to June 2015, 73 patients of acute ischemic stroke were treated with endovascular treatment with or

without intravenous recombinant tissue plasminogen activator (rTPA) at our institution. In three patients we met with technical difficulties while performing thrombus aspiration and retrieval, which we describe as the “missing clot” in mechanical thrombectomy. All three patients had cardioembolic stroke with carotid “T” or M1 occlusion.

Procedure

After inserting 9 French Femoral sheath and 8 French Corail guiding catheter with balloon, a Rebar 18/27 microcatheter was passed beyond the thrombus. Solitaire stent of 4 × 20 or 6 × 30 was used for retrieval. A temporary deployment of the stent for 5 min showed forward filling in the arteries, after which the stent was retrieved. This was done while simultaneous aspiration was done by an assistant using a 50 cc syringe, through the “Y” connector that is attached to the Corail guiding catheter. This negative aspiration is continued till the stent is out of the sheath. Usually we expect the thrombus and debris to be caught in the stent or in the syringe in case it is dislodged from the stent struts.

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Figure 1: Large thrombus seen at the valve sheath

In these three patients, the thrombus was missing from stent struts and in the syringe aspirate and there was not much aspirate in the guiding catheter as well, after retrieval. The possibility of the “missing clot” being caught somewhere in the guide catheter was considered so the guide catheter was slowly pulled out maintaining continuous aspiration. To our surprise, there was a large clot at the tip of the guiding catheter, stuck in the femoral sheath valve. We had to remove the cap of the sheath with the valve, where we found a large chunk of rubbery fibrous thrombus stuck in the valve opening [Figure 1]. All three patients achieved thrombolysis in cerebral infarction (TICI) 3 recanalization. The clinical outcome was good (mRS0-1) in two patients and poor (mRS 3-6) in the third patient at 1 week post ictus.

Discussion

Stent retrieval systems are the preferred mechanical thrombectomy devices in the recent times. The main mechanism of clot retrieval by a stent retriever is the initial thrust by the stent on the vessel wall that allows separation of the clot and entrapment of the body of the clot into stent struts. The safety and efficacy of stent retrievers in acute stroke is documented in several studies; nevertheless, complications may occur.^[4] The dislodgement of thrombus distal to the site of occlusion and embolization to uninvolved vessel is described in 1.7% of patients in a randomized trial. Other major adverse events reported are: Subarachnoid hemorrhage, permanent stent deployment, stent entrapment, and rupture of the vessel.^[4,5]

The peculiar technical problem that we encountered was in a series of cardioembolic strokes. There have been several case reports from single centers describing their experiences and the complications they encountered using stent retrievers.^[5-8]

If the missing clot that we describe here is detected early, we can avoid distal embolization during reinjection into the

catheter. Suspicion should arise when there is no aspirate in the guiding catheter after retrieving the stent. In the present cohort of patients, there was associated chronic atrial fibrillation secondary to mitral valve disease indicating that the well-organized left atrial thrombus was the cause. The other technical fact to be considered is that in the present instance, even after the guiding catheter was pulled out, the clot got trapped at the sheath outlet due to its size and fibrous nature. If the sheath was flushed, it could have led to unexpected embolization with possible disastrous consequences.

Stent retrieval systems are becoming popular for endovascular treatment of acute ischemic strokes. It is important to remember that if there is no clot found in the stent retriever or in the aspiration syringe, there is a possibility that the clot has been dislodged somewhere in the system that could include the guiding catheter or even the sheath. Thus, caution should be exercised before flushing of the sheath or the guiding catheter.

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Conflicts of interest

There are no conflicts of interest.

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