

## High Speed Mechanical Thrombectomy: Complete Arterial Recanalisation before the End of rt-PA Thrombolysis

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Benjamin Gory, Roberto Riva, Rotem Sivan-Hoffman, Islam Eldesouky, Francis Turjman

### Abstract

Early and complete recanalisation is the main goal to achieve in acute ischaemic stroke from arterial occlusion. Although intravenous (IV) thrombolysis is the standard therapy, its efficacy is limited in the setting of proximal arterial occlusion; however, systemic thrombolysis and endovascular therapy presents similar safety outcomes. Mechanical thrombectomy with the latest generation stent-retrievers allows a fast and a complete arterial recanalisation. We report a case of a patient with an acute basilar artery occlusion treated by a combined therapy (IV thrombolysis and mechanical thrombectomy). A complete recanalisation was rapidly obtained during the mechanical thrombectomy procedure, prior to termination of the IV thrombolysis. Early and complete recanalisation is the main goal to achieve in acute ischaemic stroke with arterial occlusion [1]. Intravenous (IV) thrombolysis is the standard therapy; however endovascular mechanical thrombectomy using stent-retrievers has been recently shown to provide fast, complete recanalisation [2]. We report here a case of a patient with an acute basilar artery occlusion, treated by a combined therapy (IV thrombolysis and mechanical thrombectomy). Complete recanalisation had been rapidly obtained during the mechanical thrombectomy procedure, prior to termination of the IV thrombolysis. A 56-year-old man developed an acute right hemiplegia and anarthria during a stenting procedure of a post-radiotherapy left extracranial internal carotid stenosis. Time of onset of symptoms was 16:15, and the patient was admitted to our stroke center at 18:20. NIH Stroke Scale (NIHSS) score on admission was 19 (right hemiplegia, anaesthesia, ophthalmoparesis and anarthria). An MRI was performed at 18:38 revealing a left latero-pontine infarct distal to an acute basilar artery occlusion. Due to the location of the occlusion, a combined therapy was initiated. First bolus dose of rt-PA (10 % dose, 5 mg) was administrated at 19:00 (165 min after the deficit onset). The femoral artery was punctured at 19:15 under local anaesthesia. Angiogram proved the persistence of a complete occlusion, 15 min after the first bolus of IV thrombolysis. The microcatheter was navigated and positioned in the right P1 posterior cerebral artery at 19:26. A Solitaire FR stent 4 x 20 mm was deployed at 19:40 and a complete recanalisation was observed at 19:46 (211 min after stroke onset, 31 min after femoral puncture and 46 min after initiation of rt-PA infusion). The IV thrombolysis ended at 20:00. The NIHSS score was 4 at 20:00 and 1 the next day.

**Benjamin Gory, MD MSc** (Corresponding Author) – Department of Interventional Neuroradiology, Hôpital Neurologique Pierre Wertheimer, Hospices Civils de Lyon, 59 Bd Pinel, 69677 Bron, France  
Tel: +33 4 72 68 12 63 Fax: +33 4 72 11 89 13 Email: benjamin.gory@chu-lyon.fr

**Roberto Riva, MD** – Department of Interventional Neuroradiology, Hôpital Neurologique Pierre Wertheimer, Hospices Civils de Lyon, Lyon, France

**Rotem Sivan-Hoffman, MD** – Department of Interventional Neuroradiology, Hôpital Neurologique Pierre Wertheimer, Hospices Civils de Lyon, Lyon, France

**Islam Eldesouky, MD** – Department of Interventional Neuroradiology, Hôpital Neurologique Pierre Wertheimer, Hospices Civils de Lyon, Lyon, France

**Francis Turjman, MD PhD** – Department of Interventional Neuroradiology, Hôpital Neurologique Pierre Wertheimer, Hospices Civils de Lyon, Lyon, France

## Discussion

Arterial recanalisation is the main goal to achieve, but time to recanalisation directly impacts the prognosis in patients with anterior and posterior acute ischaemic stroke [3-4]. Although BASICS registry results do not support unequivocal superiority of endovascular therapy over IV thrombolysis [5], it is considered that the longer the time to recanalisation, the poorer the outcome of patients [4]. The importance of a rapid reperfusion was also recently confirmed by IMS III trial [6], in which delays in time to angiographic reperfusion lead to a decreased likelihood of good clinical outcome.

The efficacy of IV thrombolysis is limited in the setting of proximal arterial occlusion. Recanalisation rates of 8.7 % for occlusions of the internal carotid artery and 35.3 % for occlusions of the M1 segment of the middle cerebral artery have been reported [7]. Additionally, similar safety outcomes with endovascular therapy and IV rt-PA were recently reported. The mortality rates at 90 days were 19.1 % and 21.6 % ( $P=0.52$ ) in the endovascular therapy and IV rt-PA groups, respectively; the proportion of patients with symptomatic intracerebral hemorrhage within 30 h was 6.2 % and 5.9 %, respectively ( $P=0.83$ ) [8].

Mechanical thrombectomy with last generation stent-retrievers allows fast and complete arterial recanalisation [9], as shown in this case. The recent results of STAR study are consistent with these findings [10]. A successful revascularisation was achieved in 79.2 % of cases with a mean procedural time of 20 min. A high rate of favourable neurological outcome at 3 months was observed (57.9 %) [10]. In high-volume stroke centers with multidisciplinary teams, rapid management and brain revascularisation can be obtained, as demonstrated in this observation.

In this context, although efficacy of mechanical thrombectomy on functional outcome is still under evaluation, it seems appropriate, in the presence of large vessel occlusion, to initiate mechanical thrombectomy without further delay, regardless of the IV rt-PA infusion timing.

## Conflict of interest

We declare that we have no conflict of interest.

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