

## Distal Mechanical Thrombectomy with the Solitaire FR Stent in Acute Ischaemic Stroke

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### Abstract

Stent-retriever devices achieve high rates of recanalisation in acute ischaemic stroke with proximal arterial occlusion. In the setting of distal occlusion such as M2 middle cerebral artery occlusion, stent-retrievers seem safe and recanalisation may double the chances of achieving a favourable outcome. In posterior circulation, technical feasibility, efficacy and safety of stent-retrievers are poorly documented. A 61-year-old man presented with an ischaemic stroke secondary to acute basilar artery occlusion. Mechanical thrombectomy with the Solitaire device was performed and complete recanalisation of basilar artery was achieved; however, a right P2 posterior cerebral artery occlusion was observed due to clot fragmentation. A complete distal artery recanalisation was achieved rapidly after a second passage of the stent-retriever. MR imaging on day 1 revealed a similar volume ischaemic lesion without haemorrhagic event. This case illustrates the feasibility, efficacy and safety of distal P2 posterior circulation occlusion recanalisation with a stent-retriever.

**Keywords:** mechanical thrombectomy, acute stroke therapy, ischaemic stroke, MRI, rtPA

### Introduction

Early and complete recanalisation is the main treatment objective in acute ischaemic stroke with arterial occlusion [1]. Intravenous (IV) thrombolysis is still the only proven reperfusion therapy, but endovascular mechanical thrombectomy (EMT) with stent-retrievers such as the Solitaire FR device (Covidien, EV3 Neurovascular, Irvine, California, USA) increases recanalisation rates in cases of proximal acute arterial occlusion [2]. In the setting of distal occlusion such as M2 middle cerebral artery occlusion, EMT with stent-retrievers seems safe and recanalisation may double the chances of achieving a favourable outcome [3,4]. However, in posterior circulation, the technical feasibility, efficacy and safety of EMT with stent-retrievers are poorly documented.

We report a case of distal posterior cerebral artery occlusion mechanically recanalised successfully with the Solitaire FR device.

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## Technique

A 61-year-old man developed acute right hemiplegia, followed by sudden coma. MR imaging findings demonstrated small posterior infarct and basilar artery occlusion (Fig 1A). The patient was given IV fibrinolysis and transferred to our center for EMT. Initial angiogram demonstrated complete proximal basilar artery occlusion (Fig 1B). A Solitaire FR stent 4 x 20 mm was deployed (Fig 1C) and complete recanalisation of basilar artery was achieved (Fig 1D and 1E). Immediately following recanalisation, a distal right P2 posterior cerebral artery occlusion was noted. The Solitaire FR 4 x 20 mm was deployed again (Fig 1F), this time distally at the second occlusion site. Under continuous aspiration, the stent was retrieved and complete distal recanalisation was achieved (Fig 1G and 1H). On follow-up MR imaging performed a day later, an unchanged ischaemic lesion was observed in the right posterior cerebral artery territory (Fig 1I).

## Discussion

Although the only proven therapy for acute ischaemic stroke is IV thrombolysis, this therapy often fails to achieve rapid recanalisation in proximal intracranial artery occlusions. To date, all clinical trials have failed to demonstrate the advantage of EMT with the earlier generation device (Merci Retriever) over IV fibrinolysis [5]. However, compared with the Merci device, the Solitaire FR device achieves significantly higher recanalisation rates and also higher rates of favourable clinical outcomes at 3 months [6].

Recently, Flores et al. reported that recanalisation of M2 middle cerebral artery occlusions with stent-retrievers seems safe and may double the chances of achieving a favourable outcome [3]. Similar findings were reported by Sheth et al. [4]. As shown here, newer generation stent-retrievers can also achieve rapid and complete arterial recanalisation of distal thrombus in the posterior circulation preventing an increase in the ischaemic volume, which appears to directly affect the clinical prognosis [7]. To date, small stent-retrievers are now available for distal occlusion, but as far as we know, no results have been reported in the literature.

## Conflict of Interest

We declare that we have no conflict of interest.

## References

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## Figures

**Figure 1** - Initial diffusion-weighted imaging demonstrated a small infarct in the right posterior cerebral artery territory (arrow) (A). Initial angiogram showed basilar artery occlusion (B). Angiogram after placement of the Solitaire FR device showed immediate flow restoration (C). Angiogram after removal of the stent-retriever demonstrated a complete recanalisation of the basilar artery (D and E) and distal occlusion of right P2 posterior cerebral artery (arrow). The microcatheter was placed distally to the thrombus (F). Final angiogram showed a complete recanalisation of the artery (G and H). Diffusion-weighted imaging on day 1 showed similar ischaemic volume lesion (I).

