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**CASE REPORTS**

# Thrombolysis may be safely given in an acute stroke patient with Marfan's syndrome: A case report

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***Abstract***

Marfan's syndrome is a systemic disorder of connective tissue typically involving cardiovascular, musculoskeletal and ocular systems. Given the relative rarity of neurovascular complications in Marfan's syndrome, there is currently little published data on the use of thrombolysis in patients with Marfan's syndrome and acute ischaemic stroke. Of concern is the possibility of underlying cerebral artery dissection in patients with Marfan's syndrome presenting with stroke and the risk of haemorrhagic complications with thrombolysis. We report the third known case of a patient with Marfan's syndrome with an acute ischaemic stroke without evidence of cerebral artery dissection who received thrombolysis successfully with neurological improvement. A 47-year-old woman with a history of Marfan's syndrome and previous left middle cerebral artery (MCA) territory infarct presented to our emergency department with sudden onset of right facial, arm and leg weakness with a NIHSS score of 15 and clinical examination findings of a right upper motor neurone facial palsy and right hemiparesis. CT brain revealed a dense right MCA sign and no evidence of haemorrhage. She received 0.9mg/kg of alteplase without complications. There was a suspicion for cerebral artery dissection but this was not evident on both CT angiography and MRI angiogram with black blood sequences. She recovered well with a NIHSS score of 1 and mild residual dysphasia. This case demonstrates that thrombolysis may be given safely in a patient with Marfan's syndrome and acute ischaemic stroke and exclusion of underlying cerebral artery dissection should always be a consideration.

*Keywords:* Marfan's syndrome, ischaemic stroke, thrombolysis, dissection

## INTRODUCTION

Marfan's syndrome is a systemic disorder of connective tissue typically involving cardiovascular, musculoskeletal and ocular systems.[1] The associated neurovascular complications are rare with a reported incidence of 3.5% and these are mostly ischaemic.[2] There have been only two case reports of Marfan's syndrome patients with stroke receiving thrombolysis. We report a third patient with Marfan's syndrome who received thrombolysis successfully for an acute ischaemic stroke.

## CASE REPORT

A 47-year-old woman was admitted to the emergency department with sudden onset of dysarthria, right facial, arm and leg weakness that developed forty minutes before presentation. There was no preceding head or neck trauma. Her past medical history included Marfan's syndrome with a mitral valve repair for mitral regurgitation at the age of 14 years and bilateral ectopia lentis. She had a previous left middle cerebral artery (MCA) territory infarct in 2013 that did not receive thrombolysis but was complicated by haemorrhagic transformation and subsequent scar epilepsy. Since 2013, she had recovered full muscle power from this stroke.

She was a non-smoker and her medications included simvastatin, aspirin and sodium valproate.

On examination, she had expressive dysphasia, a right upper motor neurone facial palsy and right hemiparesis (Medical Research Council grade 2 strength in the right arm and leg). Her National

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Institute of Health Stroke Scale (NIHSS) score was 15. Blood pressure was 119/57 mmHg and heart rate was 89 beats per minute. Routine blood tests were unremarkable except for mild thrombocytopaenia of 150 x10^9/L.

Computer tomography (CT) of the brain one hour after symptom onset showed a hyperdense left MCA sign (Figure 1) and no haemorrhage. CT angiography revealed an abrupt cut off at the proximal M1 segment of the left MCA with poor distal arborisation (Figure 2).

One hour and 40 minutes after symptom onset, intravenous alteplase was administered at a standard dose of 0.9mg/kg. Endovascular mechanical thrombectomy was withheld as an intracranial left distal M1 dissection was suspected to be the cause of the stroke. There was concern of stentriever deployment damaging the left M1 vessel without successful recanalization.

Post-thrombolysis, the patient remained haemodynamically stable with no complications. Her NIHSS score improved from 15 to 12 after 1 hour post thrombolysis and further improved to 3 after 24 hours.

Magnetic Resonance Imaging (MRI) of the brain 24 hours post-thrombolysis revealed an acute non-haemorrhagic left MCA territory infarct at the left lentiform nucleus and corona radiata (Figure 3). MR angiography showed partial recanalisation of the left M1 vessel with severe residual stenosis of the left MCA bifurcation and paucity of its distal branches (Figure 4). The patient's previous stroke in 2013 was located at the left fronto-temporal lobe and insular region (Figure 5).

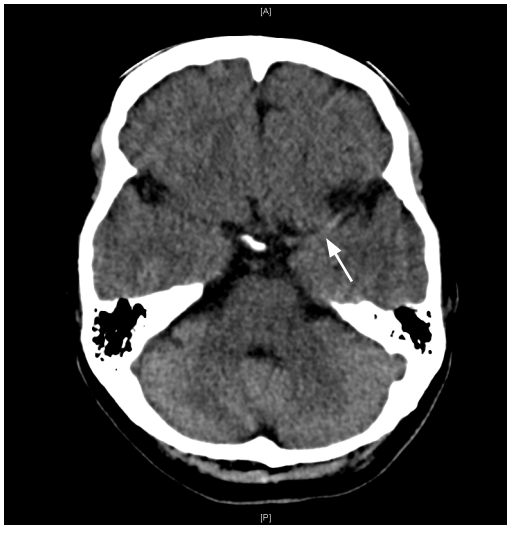


Figure 1: Computed Tomography Brain (non contrasted) showing a dense MCA sign (arrow)

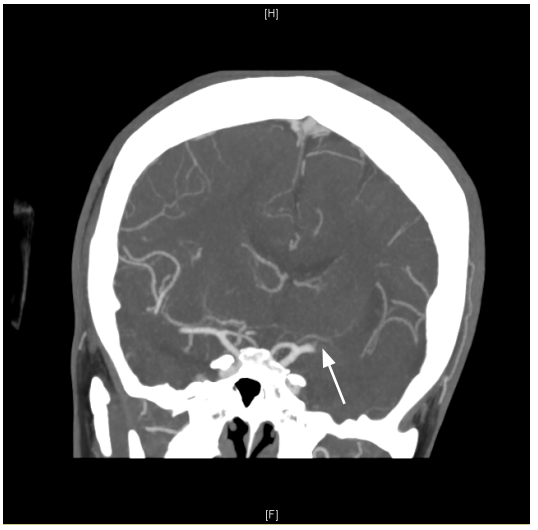


Figure 2: Computed Tomography Angiogram showing occlusion of proximal M1 segment of the left middle cerebral artery (arrow)

An echocardiogram showed a left ventricular ejection fraction of 55% without left ventricular hypertrophy or evidence of aortic dissection. Carotid artery ultrasound Doppler imaging showed no significant stenosis or plaque. Telemetry monitoring detected paroxysmal atrial flutter. A repeat MRI angiogram with black blood sequences to evaluate for the presence of intracranial arterial dissection demonstrated distal M1 segment

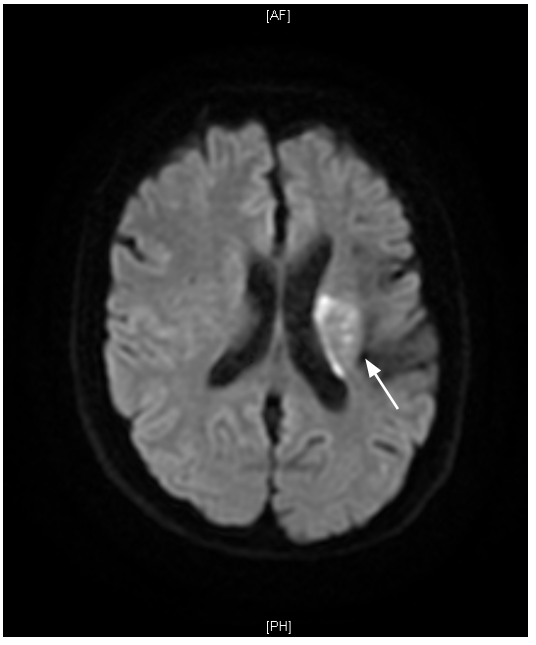


Figure 3: Magnetic resonance imaging DWI sequence showing restricted diffusion in the left corona radiata (arrow)

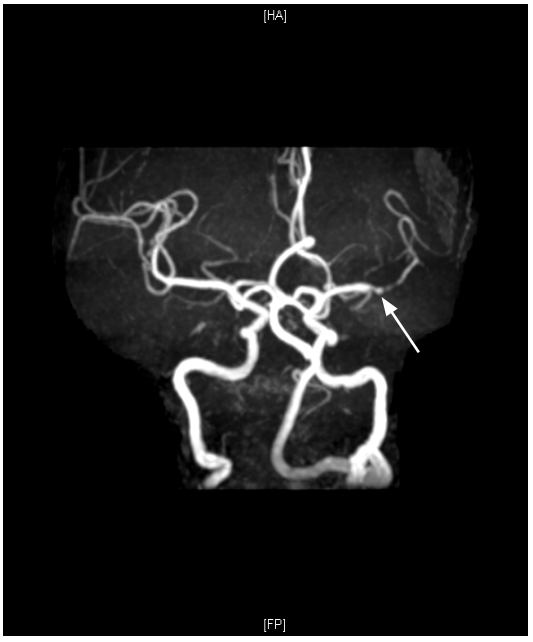


Figure 4: Magnetic resonance angiogram showing partial recanalization of the M1 segment of the left MCA with severe stenosis at the MCA bifurcation and paucity of its distal branches (arrow)

stenosis of the left MCA prior to its bifurcation without a dissection flap.

Nine days after admission, she had regained full power in upper and lower limbs. Prior to discharge, warfarin was initiated in view of atrial flutter. At follow-up 3 months post discharge, her NIHSS score was 1 with a residual deficit of mild dysphasia.

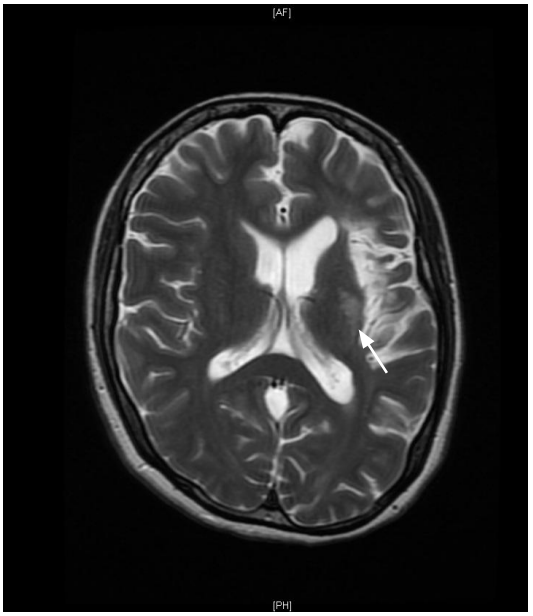


Figure 5: Magnetic resonance imaging T2 sequence showing old infarct in the left fronto-temporal lobe and insular region (arrow)

## DISCUSSION

To date, there have been two case reports of thrombolysis in Marfan's syndrome patients with ischaemic stroke. The first case was a 34-year-old patient with a left middle cerebellar peduncle infarction. CT angiography showed tight kinking of both internal carotid arteries and torturous vertebral arteries but no evidence of intracranial dissection. The patient received thrombolysis and recovered with no residual symptoms or haemorrhagic complications.[3]

In the second case report, a 57-year-old patient underwent thrombolysis for a left MCA territory infarction.[4] On admission, his NIHSS score was 12. Twenty hours post-thrombolysis, the NIHSS score worsened to 18 and a repeat CT brain showed an established left MCA territory infarct with haemorrhagic transformation. Nine days after stroke onset, his NIHSS score was 7 with word finding difficulty, partial right hemianopia, right visual neglect and mild right hemiparesis. CT angiography was not performed and the presence or absence of intracranial arterial dissection was unknown.

Our patient with Marfan's syndrome and acute ischaemic stroke was thrombolysed successfully without haemorrhagic complications. At three months after thrombolysis, the patient recovered with a Modified Rankin Scale score of 1 and NIHSS score of 1. The suspicion of cerebral artery dissection was high due to the recurrence of stroke in the same vessel but this was not conclusive on the available imaging studies.

Of concern to stroke physicians is the presence of dissection in these patients with Marfan's syndrome who have suffered a stroke, who may have greater risk for haemorrhagic complications and mortality. Of the 3 cases described, there were no confirmed instances of dissection. In fact, neurovascular complications that occur in Marfan's syndrome are mostly due to cardiac embolism. Wityk *et al*. described that cardiac source of embolism was present in 77% of patients with Marfan's syndrome that had either a transient ischaemic attack or stroke. Cardiac embolism was present in 10 out of 13 Marfan's patients with cerebral ischaemia though 9 had prosthetic heart valves and 1 had atrial fibrillation. Of the remaining 3 patients, 2 had mitral valve

prolapse and 1 had no identifiable source of embolism. Among these 13 Marfan's patients with cerebral ischaemia, 11 patients (85%) had a history of ascending aortic aneurysm confirmed with echocardiography.[2]

Currently, there is limited data on thrombolysis in Marfan's syndrome patients with stroke given its relative rarity and literature does not suggest that dissection is a common cause. The existing case reports suggest that thrombolysis may be given safely for acute ischaemic strokes in Marfan's syndrome and exclusion of cerebral artery dissection should be a consideration.

## DISCLOSURE

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Conflict of interest: None

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