

Intravenous thrombolysis in a patient with left atrial myxoma with acute ischemic stroke

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Abstract

Intravenous thrombolysis (IVT) is an accepted therapy in patients with acute ischemic stroke presenting within 3-4.5 hours of symptom onset. Selection of the patient for thrombolysis depends on the careful assessment for the risk of post thrombolysis symptomatic haemorrhage (6.2-8.9%) which may be fatal. Atrial myxomas which are the commonest tumors of the heart are associated with stroke due to tumor/clot embolism. There are very few case reports of IVT and its outcome in patients with atrial myxoma with stroke. Some have reported successful thrombolysis, while others have reported intracerebral bleeding. In this report we describe our experience of IVT in atrial myxoma patient with ischemic stroke and review the relevant literature.

Key Words

Cerebral hemorrhage, intravenous thrombolysis, left atrial myxoma, recombinant tissue plasminogen activator

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Introduction

Atrial myxomas are the most common tumors of the heart and may be associated with embolism to different organs.^[1] At least 25% of patients with left atrial myxoma present with ischemic neurologic events secondary to embolism.^[2,3] The embolic source may be composed of tumor tissue itself, blood clot or both.^[4,5] Intracerebral hemorrhages can also occur due to rupture of cerebral aneurysms associated with cardiac myxomas.^[6]

Intravenous thrombolytic therapy (IVT) with recombinant tissue plasminogen activator (rt-PA) is the recommended treatment for patients with acute ischemic stroke (AIS) who present within the window period. An exhaustive list of contraindications is to be checked before rt-PA is administered to reduce the chances of cranial and extra cranial bleeding. However, the guidelines do not discuss the treatment AIS in a patient with atrial myxoma.^[7-9] Only a small number of cases

of atrial myxoma with AIS treated with thrombolytic therapy have been reported. Some studies have reported good outcome whereas others have reported bleeding or no improvement.^[10-19] In addition, cardiac myxomas are rarely associated with intracranial aneurysms in which case the aneurysm may rupture.^[6] In this report, we share our experience of a patient with AIS associated with left atrial myxoma (LAM) in whom IVT was administered and review the relevant literature.

Case Report

A 69-year-old lady diabetic and hypertensive on treatment presented with sudden onset of vertigo followed by weakness of left upper and lower limbs of 1.5 hours duration. She had associated dysarthria and deviation of angle of mouth to the right side. There was no history of loss of consciousness, visual symptoms, seizures, headache, hiccoughs, and dysphagia. No previous history suggestive of transient ischemic attacks, stroke, intracerebral hemorrhage, neck pain, trauma. She was diagnosed to have left atrial myxoma (LAM; based on cardiac magnetic resonance imaging, MRI [Figure 1], and echocardiogram) 13 months prior to the presentation and was not on any therapy. She had declined the surgical treatment of the tumor when it was diagnosed. At presentation, her vitals were stable, all peripheral pulses were felt, and no bruits were heard. Auscultation over chest revealed no murmurs. Neurologically, the patient was conscious, oriented, had severe dysarthria, no nystagmus, pupils were 2-mm reactive to light; she had gaze preference to right, left upper motor neuron

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facial palsy with 0/5 power in left sided limbs. Sensory system and right-sided limbs (motor, cerebellar) were normal. Deep tendon reflexes were normal except ankle jerks, which were sluggish bilaterally. Right plantar reflex was flexor while left was extensor. National Institutes of Health Stroke Scale (NIHSS) score at admission was 14, and modified Rankin score (mRS) was 4.

Investigations revealed hemoglobin -10.9 gm/dl, total count -6000/cmm, platelet count -2,37,000/cmm, prothrombin time - normal, blood glucose -255 mg/dl, urea -39 mg/dl, creatinine -1.2 mg/dl, Na -141 meq/l. A non-contrast computerized tomographic (CT) scan done at presentation [Figure 2] was normal. A clinical diagnosis stroke was made; the site of lesion being on right side above the nucleus of the facial nerve, may be in subcortical or brainstem region with no additional localizing signs. Patient and relatives were explained about the treatment options available and the risk and benefit of thrombolysis, and consent was obtained for intravenous thrombolytic therapy (IVT). Patient was shifted to the stroke unit. As there were no contraindications for IVT and she being in the window period, 0.9 mg/kg of rt-PA was started according to the standard guidelines. About 15 minutes after starting the treatment, the patient started improving, and by the end of procedure, the patient had only minimal left-sided limb weakness, slight dysarthria, and facial weakness. The NIHSS score at the end of thrombolysis was 5, with mRS being 1. Patient was closely monitored during the procedure and later, in the stroke unit as per the protocol. There were no complications and the blood pressure was normal throughout the procedure.

Five hours after the completion of the thrombolysis, she developed vomiting and became drowsy and then lapsed into altered sensorium. Examination revealed blood pressure of 184/100 mm of Hg, and pulse rate of 86/min. Neurologically, she was in altered sensorium, not opening eyes to stimuli, responding to commands, or verbalizing. Her right pupil was 3 mm not reacting, left 2 mm reacting to light. There was vertical dysconjugation (right eye lower than the left), and dolls eye movements restricted in vertical directions. She was moving her right upper and lower limb minimally to pain, not moving left upper and lower limb even to deep painful stimuli; NIHSS score was 31 and mRS was 5. She worsened in sensorium and developed respiratory difficulty so she was intubated and connected to mechanical ventilator. Clinical possibility of post IVT bleed was considered localizing to the right side above midbrain. Patient underwent plain CT scan which revealed [Figure 3] hemorrhage in the right thalamus and upper midbrain (right more than left) with intraventricular extension and mild hydrocephalus.

Patient was treated with anti-edema measures and other supportive measures as per the guidelines for the management of post thrombolysis bleed. Cardiac echocardiogram showed well-defined heterogeneous mobile mass in the left atrium measuring 2.3 × 2.7 × 1.8 cm, attached to the roof of left atrium and prolapsing across the mitral valve with attached thrombus suggestive of LAM with thrombus. Troponin I was negative, lipid profile — normal, serum homocysteine - normal, glycosylated hemoglobin was (HbA1C): 9.8% suggestive of poor control of her diabetes. Magnetic resonance imaging (MRI) and magnetic resonance angiography (MRA) of the brain

done 30 days after the event showed resolving late sub-acute hematoma in right thalamus with extension to right upper midbrain with hypointense rim with vessels being normal [Figure 4].

She was on ventilator for 25 days, then gradually improved in neurological status and was weaned off from the ventilator. At the time of discharge (70 days post stroke), the patient has residual deficits in the form of moderate weakness of left upper limb and mild weakness of left lower limb, with pupil of 3 mm, bilateral equal and reactive to light. The NIHSS score was 8, and mRS was 4. Subsequently, she has been on regular follow-up from last two years. Except for mild distal left hand

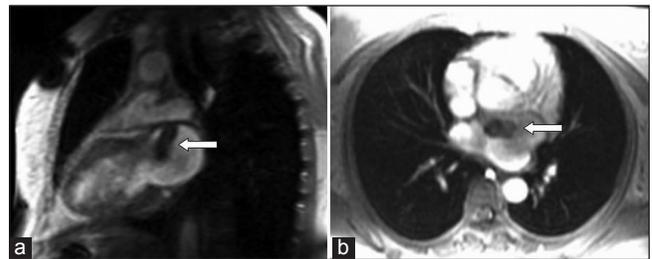


Figure 1: Magnetic resonance imaging of the heart (a, b) showing left atrial myxoma (arrow)

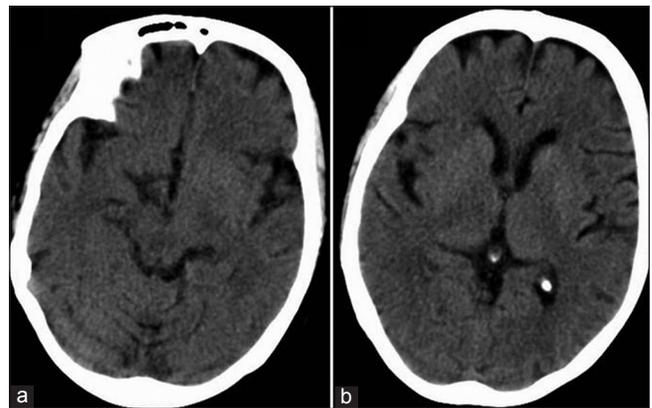


Figure 2: Computerized tomographic scan (a, b) of the patient at presentation being normal

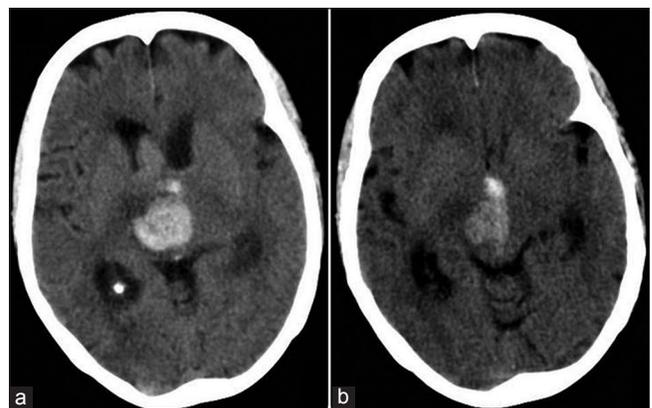


Figure 3: Computerized tomographic scan (a, b) of the patient six hours after thrombolysis showing brainstem and thalamic hematoma with mild hydrocephalus

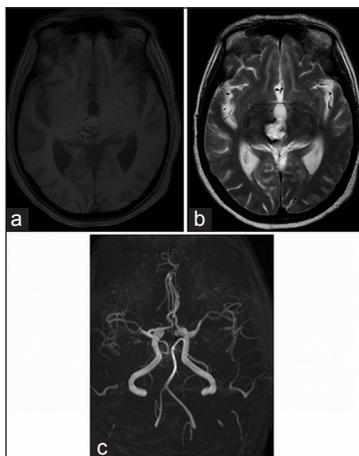


Figure 4: Magnetic resonance imaging of brain done after about one month showing T1 (a), T2 (b) resolving hematoma. Magnetic resonance angiogram (c) showing no abnormality in vertebral and basilar arteries

weakness, she is leading a normal life. She has been under care of a cardiologist for LAM and has declined surgery.

Discussion

A 69-year-old hypertensive and diabetic female with associated left atrial myxoma presented with symptoms and signs suggestive of stroke within 1.5 hours of onset. A CT scan done at presentation was normal; after obtaining informed consent, the patient was given intravenous thrombolysis. The initial anatomical localization of the ischemic lesion was on the right side above facial nucleus but the exact location whether it was in brainstem or subcortical white matter was difficult to localize clinically. At presentation before thrombolysis, CT scan was normal and MRI/MRA was not done. During thrombolysis, the patient has made significant improvement at the end of one hour. After five hours, the patient had developed right rostral midbrain bleed with dramatic clinical deterioration. Subsequently, MRI/MRA done 30 days later confirmed CT findings. It is possible that the bleed is at the area of infarct per se and because of larger area of involvement with bleed other localizing signs developed. Prior MRI at presentation might have confirmed our hypothesis. There was no evidence of aneurysms in MRA.

Atrial myxomas are the most common cardiac tumors (3rd to 6th decade), and 75% of them are located in the left atrium.^[1] Patients can present with embolic events or sudden death and are estimated to responsible for 0.5% of all ischemic strokes if they are located in the left atrium.^[2,3] The causes of stroke, as previously stated, in a case of LAM can be ischemic due to tumor, thromboembolism, both, or rarely hemorrhagic stroke due to intracerebral and subarachnoid hemorrhage caused by rupture of intracranial aneurysm.^[4-6] In our patient, sudden onset of deficits with peaking of the weakness at onset and improving post-thrombolysis with normal CT suggest thromboembolism rather than ruptured aneurysm. It is supported by echocardiogram, which showed LAM with thrombus and also favoring embolic origin from the tumor rather than lacunar infarct in the brain stem. These tumors may

be asymptomatic prior to the event, and whenever detected, surgical removal is the treatment of choice. Our patient had refused to undergo surgery when it was detected during routine evaluation prior to this event.

There are reports of only 10 cases of LAM with ischemic stroke, who have undergone thrombolysis^[10-19] in the literature. Compared to others, our patient was an elderly woman who was already a known case of LAM with associated hypertension and diabetes. Out of 10 patients, six of them have undergone IVT and four of them improved, one did not improve and one developed intracranial hemorrhage. Among four patients who underwent intra-arterial thrombolysis (IA), three of them improved and one did not improve. Pre-thrombolysis MRI was not available in all the patients.

One author has suggested intra-arterial thrombolysis with super selective catheterization, which will help in reducing the total drug infused and theoretically identify associated aneurysms, if any.^[10] The availability of an experienced person for the procedure and round the clock functioning of the cath lab in a given hospital are major hurdles.

Conclusion

Cerebral infarction associated with myxoma is rare, and the number of cases reported is very small for detailed analysis of the effectiveness and safety of IV thrombolysis with rt-PA in such patients. IVT may be considered for relatively young patients with left atrial myxoma who present with an ischemic stroke within three hours of onset. In elderly patients, especially 65 years or older with other risk factors, caution must be exercised due to associated risk of hemorrhage.

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