

# An unusual cause of stroke in a 55-year-old woman

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A 55-year-old woman presented with acute onset ataxia and right-sided dysmetria. Magnetic resonance imaging (MRI) confirmed clinical suspicion of stroke. She was found to have middiastolic murmur which led to urgent echocardiogram demonstrating left atrial myxoma. She underwent prompt surgical resection. Cardiac myxoma is a very rare cause of stroke. The presentation can be varied and diagnosis can be often missed. Early surgical intervention is a definitive treatment. Our case is unique and underlines importance of eliciting accurate physical signs at bedside.

**KEYWORDS:** cardiac myxoma, stroke, murmur

## Case Report

A 55-year-old woman with no significant vascular risk factors presented to emergency room in early hours of morning with complaints of difficulty walking and clumsiness of right upper extremity. She was asymptomatic while going to sleep and noted balance problems after waking up. Her daughter noted a left-sided facial droop and brought her to emergency room for evaluation.

Her outpatient medications included aspirin 81 mg/day, citalopram 20 mg/day and multivitamins. She denied tobacco or alcohol use. Review of systems was negative, including for cardio-pulmonary symptoms (chest pain, shortness of breath, ankle swelling, etc.). Physical examination revealed an afebrile woman not in acute distress. Pulse was 76 and regular; Blood pressure was 126/70 mm of mercury in the right upper arm. On cardiovascular examination, she had a normal apex. First heart sound was loud and second heart sound was normal. She had faint, grade 2/6 middiastolic, rumbling murmur heard best at the apex, with the bell of stethoscope, in left lateral position with breath held in expiration. There were no stigmata of infective endocarditis. (Clubbing, Roth spots, skin lesions, splenomegaly, etc.) Neurological examination revealed mild dysarthria but no aphasia. There was left upper motor neuron facial

weakness but rest of the cranial nerve examination was normal. She had intention tremor and dysmetria on the right side. Gait was wide-based and ataxic. Motor, sensory examination and reflexes were intact.

Based on the assessment, she underwent an urgent computed tomogram (CT) scan of her brain which did not show any acute bleed. An urgent magnetic resonance imaging (MRI) scan in the emergency room revealed multiple areas of acute infarction in the right cerebellum and in the right side of pons. She underwent an extensive laboratory evaluation which was significant for anemia (hemoglobin of 9.6 g/dL), elevated erythrocyte sedimentation rate (60 mm at 1 h) as well as C-reactive protein (35 mg/L). A 12-lead electrocardiogram (EKG) was normal. Due to the finding of a middiastolic murmur, she underwent an urgent cardiac echocardiogram which revealed the presence of a large 4 cm by 3 cm, highly mobile mass in the left atrium, which was attached to the apical aspect of fossa ovalis and was partially prolapsing into the left ventricle at the end diastole. (Figure 1) She was taken to the operating room for surgical resection of the mass. Pathological examination showed mucinous soft tissue mass. Histopathological examination revealed stellate and spindle cells embedded in an abundant loose, mucopolysaccharide matrix. These cells were clustered along thin-walled small blood vessels as illustrated in Figure 2. A few scattered chronic inflammatory cells including foamy histiocytes and some hemosiderin-laden histiocytes were also noted. All these features were diagnostic of atrial myxoma.

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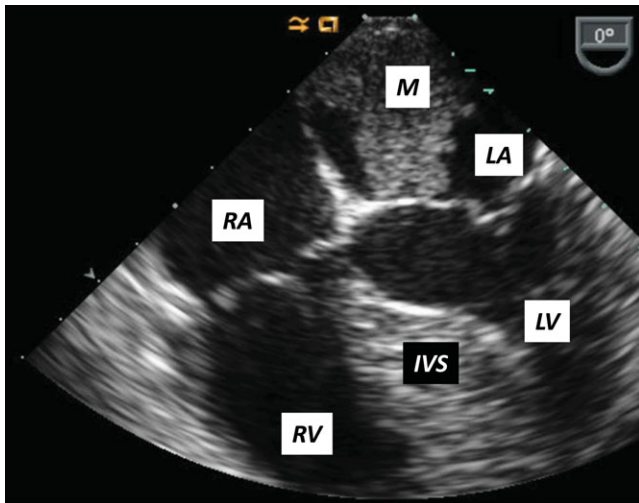


Figure 1. Two-dimensional TTE (2D TTE) with a four-chamber apical view of heart showing a mobile mass (M) in the left atrium. (M – Mobile mass in the left atrium abutting the mitral valve, LA – left atrium, LV – left ventricle, IVS – interventricular septum, RA – right atrium, RV – right ventricle).

## Discussion

Cardiac myxoma is a rare cause of stroke, accounting for less than 0.5% of acute ischemic strokes [1]. Myxoma belongs to category of primary cardiac tumors, which are very rare with reported incidence of 0.0017% to 0.19% in unselected patients at autopsy [2]. The most common location is the left atrium with a slight female preponderance. The classic clinical scenario is a young individual (30-year-old to 60-year-old) presenting with a triad of constitutional symptoms (fatigue,

low-grade fever, etc.), cardiac symptoms (shortness of breath, orthopnea, pulmonary edema, etc.) and embolic symptoms such as stroke. Of these, cardiac and constitutional symptoms are more common than embolic symptoms [3].

Myxoma can present with a variety of neurological symptoms. Left-sided tumors are more likely to present with neurological symptoms than right-sided tumors. The most common neurological manifestation is stroke. Acute ischemic stroke with middle cerebral artery embolism is most common. Rarely, posterior circulation emboli or small-vessel strokes are encountered [4]. Frequently, there are multiple emboli. These emboli are thought to be broken tumor and fibrin products occluding the cerebral vessels. It is unclear whether they respond to thrombolytic therapy. Intracranial fusiform aneurysms could be a potential complication of longstanding myxoma. The mechanism is thought to be frequent small emboli occluding distal branches of the circle of Willis; with myxomatous deposits in the vessel walls. These aneurysms can bleed causing subarachnoid hemorrhage or intracerebral bleed [5]. Other neurological manifestations of myxoma include psychiatric manifestations, headaches, seizures, coma and very rarely spinal cord embolism [6].

Early diagnosis is critical to minimize mortality and morbidity. Clinical suspicion and astute examination are essential. The definitive treatment of choice for cardiac myxoma is surgical resection [7,8]. Diuretics, angiotensin converting enzyme (ACE) inhibitors, beta blockers or antiarrhythmic drugs may be used for symptom management or complications such as heart failure or cardiac arrhythmias while patient is awaiting surgery [9].

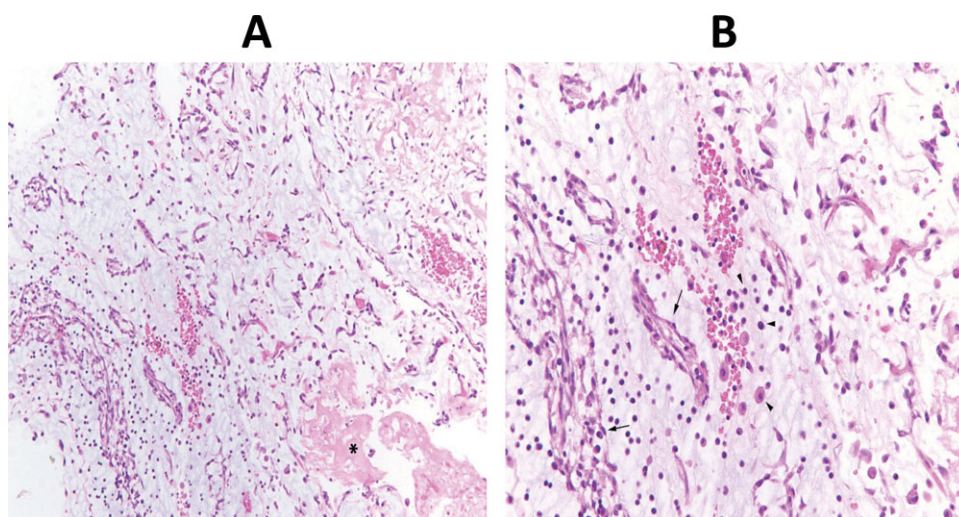


Figure 2. Characteristic finding of stellate and spindled cells embedded in an edematous, myxoid stroma along with areas of organizing fibrin (asterisk) (Hematoxylin & Eosin, 100 $\times$ ) (A). Higher magnification showing increased cell density around perivascular spaces (arrows) as well as intermixed chronic inflammatory cells (arrow heads) (B).

There are no definitive guidelines for anticoagulation in patients presenting with embolic complications of cardiac myxoma. The embolic fragments are thought to be composed of myxomatous tumor. Thus, both antiplatelets and antithrombotic agents are not effective in preventing the embolic manifestations [10]. There are some data to support the role of thrombolytic therapy as well as mechanical endovascular treatment in case of acute embolic large-vessel occlusion due to myxomatous emboli. However, the data are limited to isolated reports [11,12]. The preferred modality of treatment is still early surgery. The optimum timing of surgery is not clear but few studies indicate early surgical intervention may be the best approach, as in our case. Recurrence after surgery can be seen and frequent clinical and echocardiographic follow up is suggested [7,8].

Finally, our case is unique in several ways. First, the patient did not have any systemic or cardiac symptoms. Second, blood tests did not show any evidence of inflammatory process, with normal white cell count and normal interleukin levels. Third, she did not have fever, clubbing, chest X-ray or EKG abnormalities of cardiac myxoma. Fourth, identification of middiastolic murmur (suggestive of stenotic physiology of mitral or tricuspid valves) was critical, leading to an urgent transthoracic echocardiogram (TTE), early surgery and better prognosis for our patient.

## Conclusion

Cardiac myxoma is very rare but potentially fatal cause of stroke. The presentation can be varied and without clinical suspicion or accurate examination, diagnosis can be often missed. Early surgical intervention is a definitive treatment. Our case is unique in many ways and underlines importance of eliciting accurate physical signs at bedside.

## Declaration of Interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of this paper.

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