

## Recurrent Embolization of a Left Atrial Myxoma Resulting in Acute Cerebral Ischemia

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### Introduction

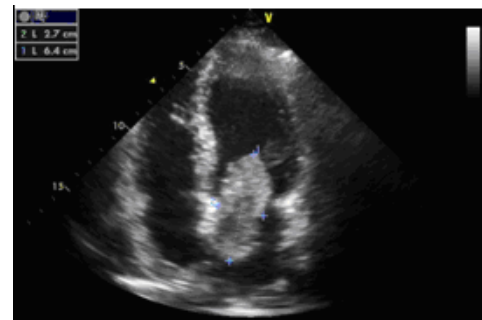
Stroke is the major healthcare problem with higher mortality and morbidity rates. Cardiogenic embolism is the cause of approximately 20% of ischemic stroke. Cryptogenic strokes frequently have embolic features suggesting a cardiogenic origin. Atrial fibrillation is responsible for over 50 % of the cardiogenic emboli, while congenital cardiac diseases such as patent foramen ovale and atrial septal defect, prosthetic cardiac valves, rheumatic valvular heart disease, dilated cardiomyopathy, and endocarditis are other predisposing factors for cardiogenic emboli [1]. Cardiac tumors are uncommon and account for a very small minority of embolic events [2]. We presented a rare case of stroke caused by embolization of left atrial myxoma diagnosed by echocardiography.

### Case Report

A 45-year-old male admitted to emergency room with suddenly occurred confusion and left-sided weakness. The patient had a history of right lower extremity artery embolism two years ago. He had no previous history of hypertension, diabetes mellitus; and no family history cardiovascular disorder. On admission he had a blood pressure of 120/75 mmHg, a regular pulse of 96 per minute, a breath rate of 19 per minute and the body temperature was normal. Laboratory findings including CRP, glucose level at admission were within normal limits except for a raised concentration of D-dimer of 650 mg/L (normal range 0-400). Neurological examination revealed that he was confused and left-sided hemiparesis with right-sided ocular deviation. He had 2/5 motor strength on the left side and 5/5 motor strength on the right side. The deep tendon reflexes were 2+ bilaterally. The Babinski and Hoffman signs were negative. On cardiac examination there was 2/6 mid diastolic murmur with normal S1 and S2 heart sounds. The carotid impulse was bilaterally normal without a bruit. The electrocardiogram revealed a normal sinus rhythm. Chest X-ray showed a normal cardiac silhouette with no signs of pulmonary edema.

The computed tomography scan of the brain revealed multiple low density areas in the right temporoparietal region without hemorrhage. He interned to the stroke unit; low molecular weight heparin and aseltisalisilic acid administered to the patient. The following day transthoracic echocardiography (TTE) performed that showed a 6.4 x 2.7 cm lobulated mass in the left atrium (Figure 1). Transesophageal echocardiography (TEE) was also performed to confirm the result of TTE and analyse the mass detailed. TEE demonstrated a mass originated from the interatrial septum, obstructed the left ventricle inflow and composed relatively mitral stenosis in diastolic phase (Figure 2). Cranial MRI angiography showed that peripheral arteries of left MCA were not clearly visualized compared to right ones and peripheral flow of the artery must be diminished probably due to an occlusive lesion in the proximal portion (Figure 3A). Cerebral MRI showed a wide high intensity area in the right fronto-temporoparietal region at coronal FLAIR and axial T2W sequences, (Figure 3B,C). The patient underwent

surgergy urgently and the mass removed successfully. Macroscopic examination showed that the mass was gelatinous and covered by thrombus (Figure 4). The histopathological analysis confirmed the diagnosis of myxoma. He recovered with minimal neurological sequela after the rehabilitation programme at the 30<sup>th</sup> day of operation.



**Figure 1:** Four chamber view of two-dimensional transthoracic echocardiogram. A large mass in the left atrium which prolapses through the mitral into the left ventricle in diastole.



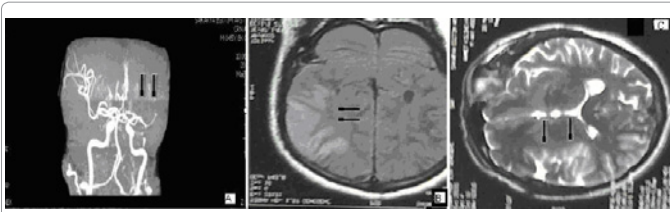
**Figure 2:** Transesophageal echocardiogram showed surface of the mass is lobulated. The tumor protrudes through the cusps of valve the mitral valve and composed relatively mitral stenosis in diastole.

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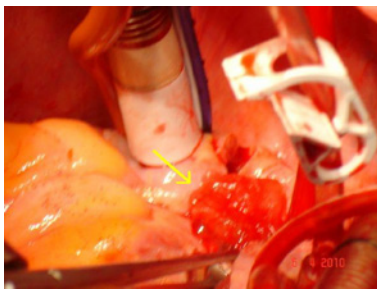
**Received** July 13, 2011; **Accepted** October 12, 2011; **Published** October 16, 2011

**Citation:** Vatan MB, Gunduz H, Atakay S, Cakar MA, Varlm P, et al. (2011) Recurrent Embolization of a Left Atrial Myxoma Resulting in Acute Cerebral Ischemia. J Clin Experiment Cardiol 2:159. doi:10.4172/2155-9880.1000159

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**Figure 3:** A. Cranial MRI angiography shows that peripheral arteries of left MCA are not clearly visualized compared to right ones and peripheral flow of the artery must be diminished probably due to an occlusive lesion in the proximal portion. B, C. Cerebral MRI shows a wide high intensity area in the right fronto-temporoparietal region (Coronal FLAIR and axial T2W sequences).



**Figure 4:** Macroscopic view of the left atrial myxoma: Gelatinous myxoid material covered by thrombus.

## Discussion

Atrial myxomas are the most common primary tumor of the heart that represent approximately 50% of all benign cardiac tumors. They originate from subendocardial mesenchymal cells mainly from the left atrium that normally differentiate into endothelial cells, smooth muscle cells and fibroblasts. Approximately 75% of the myxomas are present in the left atrium. Most of the others develop in the right atrium [2]. Atrial myxomas are generally asymptomatic until they obstruct left or right ventricle inflow, or the embolic complications occur. Syncope and sudden death can occur when the myxoma obstruct left and right ventricle inflow. The patients can complain constitutional symptoms such as fever, arthralgias, myalgias, and weight loss as a result of immun reaction to the tumor [3]. The symptoms related to the embolic events can occur before the onset of constitutional or obstructive symptoms. The embolization resulting from the tumor particles or thrombotic material covered with tumor cells occurs in 30-45% of patient with myxoma. Cerebral arteries are affected up to 50% of cases [2,3]. Pulmonary arteries, coronary arteries, retinal arteries, kidneys, spleen, intestine, and lower extremities are the other sites of embolization [4,5]. Emboli are most often multiple and myxomatous, but may also arise from thrombus adherent to the tumor [6]. Emboli from the atrial myxomas can cause multiple aneurysms especially in the cerebral arteries. The pathologic mechanism leading to aneurysm formation is weakening and dilatation of the arterial wall as a result of myxomatous emboli [7]. Recurrence of the embolic events before surgical removal are frequent. Therefore urgent surgical resection is mandatory to prevent embolic recurrence [8]. In our case the patient had a history of the left lower extremity artery embolism, but possible cardioembolic source has not investigated. So he presented with acute cerebral embolism caused by left atrial myxoma. Myxoma can be the possible etiologic source of the first embolic event.

The diagnostic method of choice is two-dimensional echocardiography. Transthoracic echocardiography (TTE) has

a sensitivity of around 90% in diagnosis of left atrial myxoma. The sensitivity of transesophageal echocardiography (TEE) is also higher [9]. TEE is useful for detailed examination of the shape, size, location, movement, and origin of the myxoma. Cardiac catheterization and peripheral angiography are rarely needed, but can be useful to diagnose the complications associated with myxomatous emboli. Cerebral imaging especially MRI of the brain is the most useful modality to demonstrate ischemic lesions at the early phase of stroke. The typical finding of MRI of the brain is multiple infarcts especially on the MCA territory [10].

In summary embolic complications remain frequent presentation of atrial myxomas. This case shows importance of investigating the possibility of cardiogenic source in the embolization to the peripheral arteries, and also stroke. In our case the patient had a history of emboli to the right lower extremity arteries two years ago, and investigation of the cardioembolic source was neglected, so he was admitted to the hospital with stroke recently. Routine echocardiographic examination is absolutely mandatory to detect the possible source of cardiogenic emboli and to prevent recurrent embolic event just as in our case. TEE is useful especially to confirm the TTE findings and detailed analysis of the surface of the myxoma. Once detected urgent surgical resection of the myxoma should be considered due to the recurrent embolic potential of this condition.

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