

Multiple Left Ventricular Myxomas Arising from the Interventricular Septum and Ventricular Trabeculae: A Case Report

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ABSTRACT

Myxoma is the most common tumor of the heart, with an estimated incidence of 0.5 to 1 per million per year. The majority of these tumors arise from the left atrium, and 20% arise from the right atrium with the remaining 5% arising in either the right or left ventricle. We present a rare case of multiple myxomas of the left ventricle arising from the interventricular septum and nearby ventricular trabeculae that clinically presented with an occlusion of the left axillary artery. The patient was successfully treated using cardiopulmonary bypass, during which the tumor was completely removed using a transventricular approach.

CASE REPORT

A 32-year-old, nondiabetic man with a history of smoking and working as a constructor was admitted to our hospital for evaluation of left upper limb pain and weakness that was associated with numbness along the radial side of his hand. The problem dated back almost a year, when he was admitted to a district hospital with sudden weakness of the left side of his body. Diagnosis of cerebrovascular accident was confirmed by computed tomography scanning. He received intravenous heparin and was able to resume activity shortly afterward with no further investigations or follow-up.

Two months ago, he noticed that he was unable to carry heavy objects during work because of the weakness of his left arm. He decided to seek medical advice when his weakness worsened and he started to have shoulder pain. On admission, he was stable and afebrile, with a blood pressure of 120/70 mmHg and a regular pulse of 77 beats per minute. His examination was normal except for the left arm, which revealed 3/5 weakness with no other neurological findings and a weaker radial pulse in comparison to the right arm.

Laboratory investigations were all normal except for an ESR of 70 mm/hr. Both the electrocardiogram and the chest x-ray were normal. Magnetic resonance imaging of the brain and cervical spine showed right lacunar infarction and normal

cervical spine alignment. The patient underwent left upper limb angiography, which revealed a left axillary artery obstruction (Figure 1). Further evaluation of the source of emboli was performed by echocardiography, which showed a mass 3.7 × 2 cm attached to the apex of the left ventricle associated with apical hypokinesia (Figure 2). Coronary vessels were all normal as visualized by coronary angiography.

In view of the findings, the patient received intravenous heparin and a decision was made to explore the mass. Using standard cardiopulmonary bypass with moderate hypothermia of 32°C and cardioplegic arrest, the mass was directly exposed through the left ventricle. A globular brownish mass covered with thrombus was found attached by a short stalk to the interventricular septum just above the apex (Figure 3). A small tiny lesion was found completely separate from the main lesion attached to the nearby trabeculae of the left ventricular cavity. Both lesions were completely removed. The site of attachment of the main lesion was cauterized after removing part of the underlying muscle. The rest of the left ventricular cavity was inspected. The right ventricular cavity was exposed through a separate incision that revealed no masses. The patient had uneventful recovery with no inotropic support. Both specimens were histopathologically examined and proven to be myxomas (Figure 4).

DISCUSSION

Myxoma is the most common primary cardiac tumor in adults [Reynen 1996]. The vast majority occur sporadically. They are more common in women in the third and sixth decade of life [Reynen 1995]. Seventy-five percent of cases originate in the left atrium, but any chamber of the heart can be involved. Rare cases may arise from cardiac valves and the pulmonary artery, veins, and vena cava [Reynen 1995].

A myxoma arising from either ventricle is rare. Its incidence varies from 3% to 5% [Hall 1990]. They appear more often in women and children as a solitary tumor, but in rare cases may be multiple [Soma 1992]. Ventricular myxoma typically arises from the free wall of the right ventricle, and those arising from the left ventricle originate near the posterior papillary muscle [Kawano 2000]. In rare cases, it may arise from the inferior wall and interventricular septum [Milgater 1987].

The myxomatous mass in our patient arose from the left ventricle near the apex. It was attached by a short stalk to the interventricular septum. The tumor was not solitary, as it was associated with a separate lesion attached to the nearby ven-

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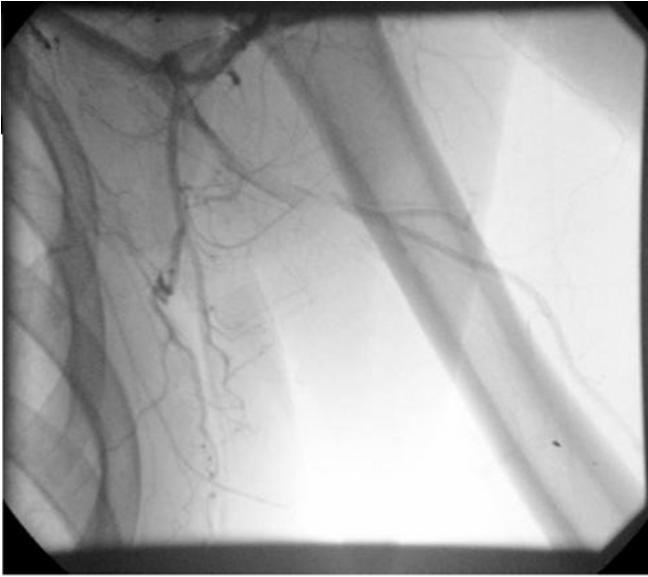


Figure 1. Left upper limb angiography of the left axillary artery obstruction.

tricular trabeculae. These tumors commonly present with 1 or more of the triad of embolism, intracardiac obstruction, and constitutional symptoms. Asymptomatic cases are seen in small tumors. Sudden death has been reported among patients with mitral valve affection [Puff 1986]. Thirty to 40% of patients clinically present with embolization [Reynen 1996]. In half of the patients, the embolic episode affects the central nervous system, causing transient or permanent neurological deficit [De Sousa 1978]. Occlusion of peripheral arteries, visceral, renal, and coronary arteries have been reported [Hashimoto 1993].

Tumors arising from the left ventricle commonly present with syncopal episode due to obstruction of the outflow tract by the tumor [Thongcharoen 1997; Tisma 2001]. However, 50% of patients present with embolism [Thongcharoen 1997], either affecting distal vessels as reported by Gurlertop

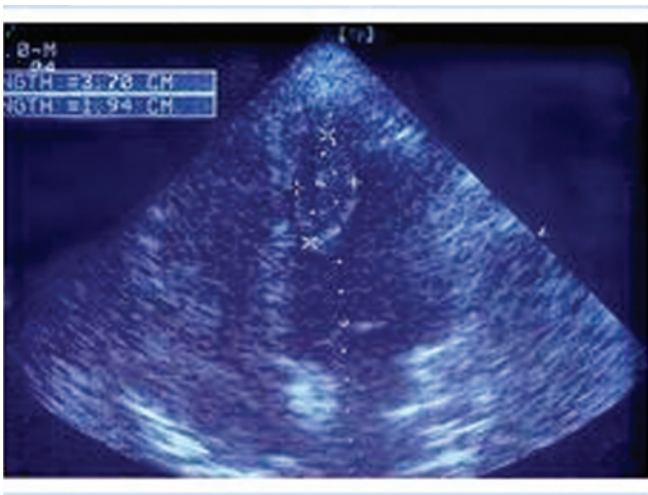


Figure 2. Echocardiography showing a mass 3.7 × 2 cm attached to the apex of the left ventricle associated with apical hypokinesia.



Figure 3. A globular brownish mass covered with thrombus was found attached by a short stalk to the interventricular septum just above the apex.

and coworkers [2003], or affecting retinal vessels causing sudden transient visual loss [Kawano 2000]. Embolization to the central nervous system or coronary vessels causing cerebral or myocardial infarction has been documented.

Our patient presented with occlusion of the left axillary artery, and it seems that the previous attack of cerebrovascular accident that the patient had 1 year ago came from the same source, but was misdiagnosed because the patient dramatically recovered with no residual effect.

Diagnosis of myxoma can be easily performed using transthoracic echocardiography, but accurate information regarding size, location, mobility, and attachment can be obtained by transesophageal echocardiography [Samdarshi 1992]. Identification of the mass in our case was done by transthoracic echocardiography, which was sufficient in visual-

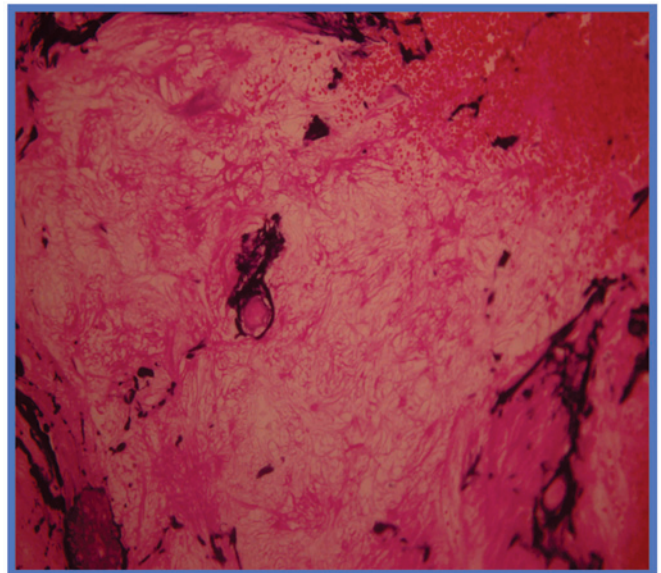


Figure 4. Histopathological examination of the myxoma.



Figure 5. Follow-up echocardiography at 6 months; there is no evidence of recurrence.

izing the site and size of the tumor. However, the exact attachment of the tumor to the interventricular septum and the small lesion that was found during surgery were easily missed.

Patients with myxoma are managed by surgical excision. Using cardiopulmonary bypass with moderate hypothermia or drifting temperature and cardioplegic arrest are the standard approaches in dealing with these tumors. The site of incision depends on the location of these tumors. Those arising from the ventricles are usually approached through the atrioventricular valves. Small tumors in the outflow tract can be removed through outflow valves [Kawano 2000]. Our approach was directly through the left ventricle. Visualizing the tumor was easy. Complete excision through the stalk with a safety margin was performed to avoid recurrence. The tumor was removed without any fragmentation. This direct transventricular approach allowed removal of the tumor in 1 piece, contrary to the work of Li and coworkers [1996], who mobilized the anterior leaflet of the mitral valve to remove deep-seated left ventricular tumors; this treatment was difficult and associated with recurrence. Our patient had follow-up for 6 months after surgery by echocardiography (Figure 5), which showed no evidence of recurrence.

Left ventricular myxoma is a rare tumor. Excision can be easily performed using cardiopulmonary bypass. A direct

transventricular approach allows direct exposure and inspection of the rest of the left ventricular cavity. Removal of the tumor from its stalk with partial excision of the underlying tissue and cauterization of the base may prevent recurrence.

REFERENCES

- De Sousa AL, Muller J, Campbell RL, Batnitzky S, Rankin L. 1978. Atrial myxoma: a review of the neurological complications, metastases and recurrences. *J Neurol Neurosurg Psychiatry* 41:1119-24.
- Gurlertop Y, Yilmaz M, Erdogan F, Acikel M, Kose N. 2003. Left ventricular outflow tract myxoma. *Eur J Echocardiogr* 4:339-41.
- Hall RJ, McAllister HA Jr, Frazier OH. 1990. Neoplastic heart disease. In: Hurst JW ed. *The Heart, Arteries and Veins*. 7th ed. New York, NY: McGraw-Hill: 1382-403.
- Hashimoto H, Tikahashi H, Fukiward Y, Joh T, Tomino T. 1993. Acute myocardial infarction due to coronary embolization from left atrial myxoma. *Jpn Circ J* 57:1016-20.
- Kawano H, Tayama K, Akasu K, Komesu I, Fukunaga S, Aoyagi S. 2000. Left ventricular myxoma: report of a case. *Surg Today* 30:1112-4.
- Li JY, Lin FY, Hsu RB, Chu SH. 1996. Video-assisted cardioscopic resection of recurrent left ventricular myxoma. *J Thorac Cardiovasc Surg* 112:1673-4.
- Milgalter E, Lotan H, Schuger L, et al. 1987. Cardiac myxomas—surgical experience with a multi-faceted tumor. *Thorac Cardiovasc Surg* 35: 115-8.
- Puff M, Taff ML, Spitz WV, Eckert WG. 1986. Syncope and sudden death caused by mitral valve myxoma. *Am J Forensic Med Pathol* 7:84-6.
- Reynen K. 1995. Cardiac myxomas. *N Engl J Med* 333:1610-7.
- Reynen K. 1996. Frequency of primary tumors of the heart. *Am J Cardiol* 77:107.
- Samdarshi TE, Mahau EF 3rd, Nauda NC, Guthrie FW Jr, Bernstein IJ, Kirklin JW. 1992. Transesophageal echocardiographic diagnosis of multicentric left ventricular myxoma mimicking a left atrial tumor. *J Thorac Cardiovasc Surg* 103:471-4.
- Soma Y, Ogawa S, Iwanaga S, et al. 1992. Multiple primary left ventricular myxoma with multiple intraventricular recurrences. *J Cardiovasc Surg (Torino)* 33:765-7.
- Thongcharoen P, Laksahabunsong P, Thongtang V. 1997. Left ventricular outflow tract obstruction due to a left ventricular myxoma: a case report and review of literature. *J Med Assoc Thai* 80:799-806.
- Tisma S, Todoric M, Ilic R, et al. 2001. Successful surgical removal of a cardiac myxoma from the left ventricular outflow tract [in Serbian]. *Vojnosanit Pregl* 58:195-8.