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Cardiac myxoma: A surgical experience of 38 patients over 9 years, at SSKM hospital Kolkata, India

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Abstract

Background: Cardiac myxoma is the most common benign intracardiac tumor. We studied its clinical presentation, morbidity, mortality and recurrence following surgery over a period of 9 years. **Materials and Methods:** This study was performed at cardiothoracic and vascular surgery department of a tertiary level hospital of eastern India, Seth Sukhlal Karnani Memorial hospital, Institute of Post Graduate Medical Education and Research Kolkata. Near 6000 cardiac cases were operated at our center over this period. Preoperative diagnosis was made with clinical presentation and preoperative echocardiography. Complete tumor excision was done and all patients were followed up for recurrence and complications. **Result:** A total of 38 cases of cardiac myxoma were operated over a period from October 2002 to October 2011. Cardiac myxoma constituted about 0.6% of all cardiac cases operated at our institute. This most commonly presented at fifth decade of life. Of these, 35 cases were left atrial and 2 cases were right atrial, and 1 case was having both atrial involvements. The left atrial myxoma mostly presented as mitral stenosis and very few presented with embolic and constitutional symptoms. No death or recurrence was observed during the follow up period. **Conclusion:** Cardiac myxomas form a very small percentage of the cardiac cases. A high index of suspicion is essential for diagnosis. Echocardiography is the ideal diagnostic tool as also for follow-up. Immediate surgical treatment is indicated in all patients. Cardiac myxomas can be excised with a low rate of mortality and morbidity.

Key words: Atrial myxoma, cardiac tumour, biatrial myxoma

Introduction

Cardiac myxomas are rare benign tumors, which account for nearly 50% of all adult primary cardiac tumors. Approximately 75-80% of myxomas are located in the left atrium, 10-20% are located in the right atrium, and 5-10% are in both atria or either ventricles.[1] These are typically solitary, pedunculated, and arising in the vicinity of the fossa ovalis, they may on occasion be multicentric, sessile, or attached to other areas of endocardium. Clinically they present with symptoms of hemodynamic obstruction, embolization, or constitutional changes. Diagnosis at present is established most appropriately with two dimensional echocardiography.[2] Prompt excision using cardiopulmonary bypass (CPB), first carried out by Crafoord in 1954,[3] has been established as the only acceptable mode of treatment for these tumors. The surgeon must try to prevent fragmentation and intraoperative embolization of the tumor and the missing of an occasional multicentric lesion. This paper reviews the clinical experience and surgical management of cardiac myxomas at a prime teaching institution at Kolkata over a 9-year period.

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Materials and Methods

This study was conducted at the cardiothoracic and vascular surgery department of SSKM hospital, IPGMER, Kolkata, India, from October 2002 to October 2011. All patients who underwent excision of primary or recurrent intracardiac myxomas were reviewed. A historical longitudinal study was conducted to study the clinical presentation, surgical findings, mortality, morbidity and recurrence of these tumors. Pre-operative diagnosis was established in all patients by echocardiography. Wherever transthoracic echocardiography (TTE) was equivocal, transesophageal echocardiography (TEE) was performed to confirm the diagnosis [Figure 1]. Cardiac catheterization was not done for diagnosis. Coronary angiography was carried out in patients with history of chest pain or those older than 40 years. Operation was undertaken in all patients soon after the diagnosis of cardiac myxoma was made. The standard surgical approach was through a median sternotomy. CPB with aortic and bicaval cannulation and moderate hypothermia was used. Myocardial protection was achieved by cold antegrade blood cardioplegia. Heart was not manipulated until the aorta had been cross clamped to avoid tumor fragmentation and systemic embolization. The surgical approach for left atrial (LA) myxomas was right atrial trans-septal or biatrial. The objectives of resection were complete tumor resection with full thickness removal

of the attachment base and a cuff of interatrial septum to prevent recurrence. All four cardiac chambers were thoroughly explored for additional myxomas. The surgically created defect was repaired with Dacron patch. Copious irrigation of the atria and ventricles with cold saline was done to eliminate any loose tumor fragments that might have been dislodged during removal of the tumor. All the resected myxomas [Figure 2] were subjected to routine histopathological examination. All the patients were followed up on an outpatient basis at regular intervals. They underwent clinical examination, chest X-ray, electrocardiography, and echocardiography.

Results

Thirty-eight patients of cardiac myxomas underwent operation at this institution during this 9-year period. Twenty (52.63%) patients were male and 18 (47.36%) were female. Twelve patients were in the age group 41-50 years. There were 35 LA myxomas (92.1%), 2 right atrial (RA) myxomas (5.26%), and 1 biatrial myxoma (2.36%). The duration of symptoms ranged from 2 to 6 months. Twenty- five patients (65.78%) were in New York Heart Association (NYHA) Class II, 13 patients (34.21%) were in NYHA Class III. Five patients (13.15%) presented with constitutional symptoms of fever, palpitations and weight loss. Most patients with LA myxomas mimicked mitral stenosis clinically while most patients with RA myxoma presented with features of right heart failure. A total of 21 patients (55.26%) required coronary angiography. None of them had significant coronary artery disease. Of the 35 LA myxomas, 34 (97.14%) were arising from the interatrial septum, and 1 (2.63%) near the annulus of the posterior leaflet of mitral valve. Of the two RA myxomas [Figure 3], both were arising from the interatrial septum. In biatrial myxoma, it was arising from the interatrial septum on both the sides. All the myxomas were completely resected with a cuff of normal tissue. The surgically created defect was closed with pericardial patch in all patients. Associated procedures included mitral valve replacement with TTK Chitra valve (Sree Chitra Institute, India) in 1 patient of LA myxoma. The tumors ranged in size from 2 × 3 cm to 6 × 10 cm. Of the 35 patients of LA myxomas [Figure 4], all had a pedunculated tumor except for 2, which were sessile.

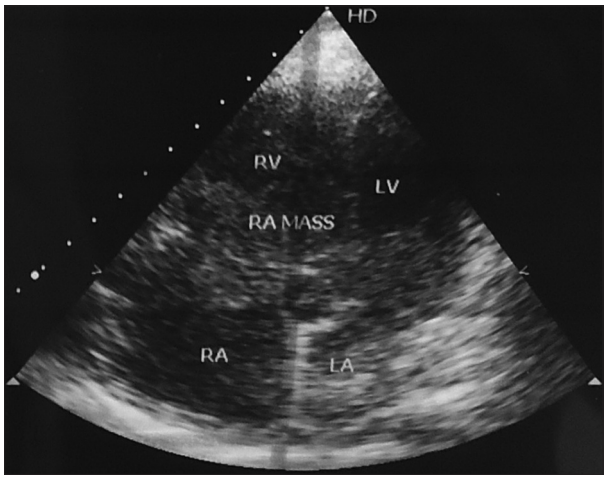

Figure 1: Right atrial myxoma seen in transesophageal echocardiography

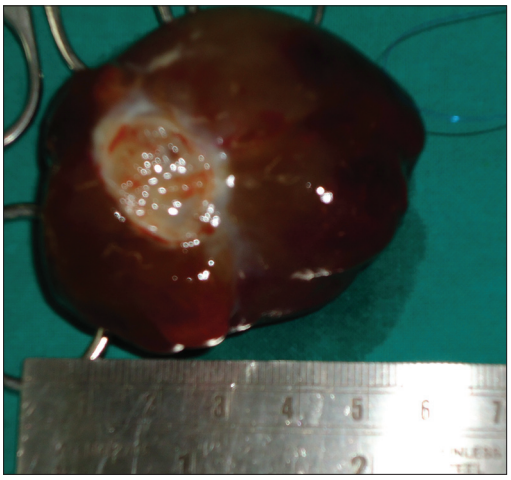

Figure 2: Myxoma seen after removal

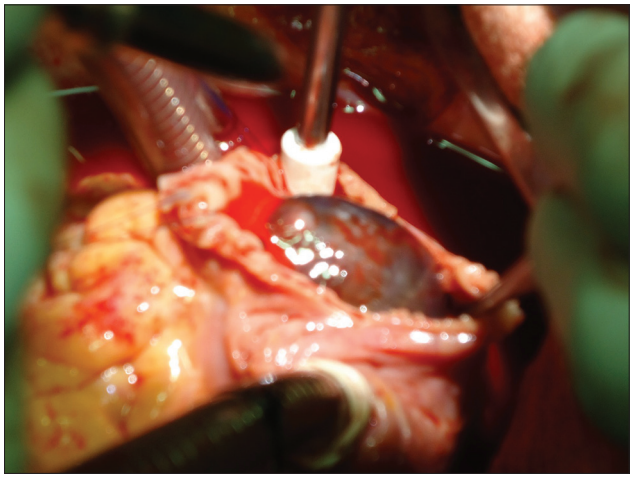

Figure 3: Peroperative picture, showing right atrial myxoma

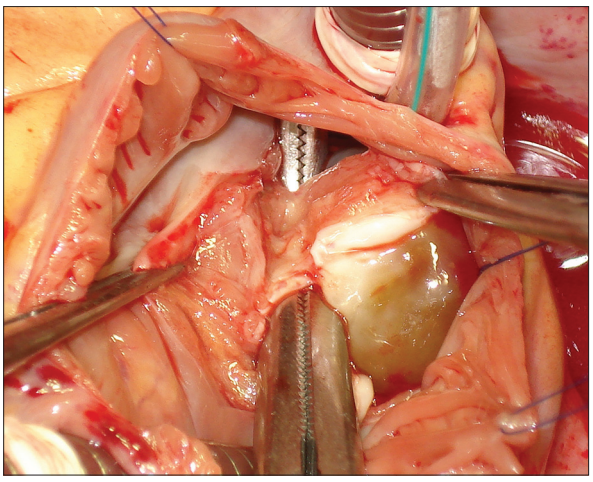

Figure 4: Left atrial myxoma seen after incising interatrial septum

Of the two RA myxomas, both were pedunculated. The gross appearance of the tumor was usually that of a soft, gelatinous, sessile or pedunculated mass with either a villous or smooth surface. Microscopic examination confirmed the diagnosis of myxoma in every patient. Histologically the tumors were composed of polygonal and stellate cells in a vascular, acid mucopolysaccharide stroma. Intramural hemorrhage and calcification were occasionally present. Among 34 patients who underwent operations at our institution for cardiac myxomas, there were 2 (5.88%) early deaths (death occurring within 30 days of operation). Postoperative complications occurred in seven patients. Three patients (7.89%) had episodes of supraventricular arrhythmias which were controlled medically, and two patients (5.26%) had a transitory atrioventricular block requiring temporary pacing. Complete follow up is available for 32 of the operative survivors. Six patients were lost to follow up. There were no late deaths (death occurring after 30 days of operation). Most patients were asymptomatic or in NYHA class I at follow up.

Discussion

Myxomas are the most common primary tumor of the heart with an estimated incidence of 0.5 per million populations.[4] Cardiac myxomas constituted 0.63% of the total (6000) cardiac operations during this period at our institution. This figure was slightly higher than that reported in the literature (approximately 0.3%).[5] In our study there was a higher incidence in male sex (52.63%) contrary to the female predominance reported in other studies (almost 75% of the myxomas occur in female).[6] Our patients confirm to the age distribution and the relative tumour occurrence in the left and right atria as evident in other series.[7] The location, size, and mobility of cardiac myxomas determine their clinical features. Most patients present with one or more of the triad of embolism, intracardiac obstruction, and constitutional symptoms. A higher frequency of embolization up to 30-40% was reported in the Western series.[8] Echocardiography is non-invasive and allows preoperative diagnosis with fair degree of accuracy. It can rule out tumor in other chambers and there is no risk of tumor embolization. TTE can generally be used to determine the location, size, shape, attachment, and mobility of the tumor. The transesophageal approach is particularly helpful in detecting the site of insertion and morphological features of atrial and ventricular myxomas.[9] If coronary artery disease is suspected, or patient's age is greater than 40 years, coronary arteriography is advised to evaluate the coronary arteries. Once the diagnosis of cardiac myxoma is made, the operation should be carried out without delay. Complete resection is best performed through a median sternotomy with total CPB and cardiac arrest. The ideal surgical approach to achieve complete excision of intracardiac myxoma is still controversial. Jones *et al.* believe that a surgical approach to atrial myxomas should allow minimal manipulation of the tumor, provide adequate exposure for complete resection of tumor, allow inspection of four heart chambers, minimize recurrence, and be safe and efficacious. They use biatrial approach to myxoma.[10] Others consider the exposure of the left atriotomy approach to be adequate and have demonstrated the low recurrence rates and the safety of the technique.[11] The trans-septal approach through right atriotomy suggested by Chitwood, gives good access to the myxoma with minimum handling and allows inspection of all cardiac chambers. The RA and RV myxomas are approached through right atrium. RA myxomas demand more care during cannulation. However, all surgeons described an adequate exposure in their reports. There is general agreement about the necessity to proceed to a full thickness resection with clear margins to minimize the risk of recurrence.[1] Recurrence of a sporadic myxoma is unusual, occurring in 1-3% of cases.[12,13] The risk of recurrence after surgery is correlated with young age, family history of myxoma[14,15] inadequate resection, intraoperative implantation, or multicentre growth. Recently, interleukin-6 and endothelial growth factor have been identified as markers of these tumors. The average recurrence occurs about 30 months after removal of the first myxoma.[16] In retrospect the friable nature of the tumor could produce 'seeding' at the time of operation, but growth from a new focus in the septum seems the more likely cause. A regular follow up of all patients by non-invasive method is mandatory because the recurrence of myxoma has been documented at various intervals and is not clearly predictable.[17] A high incidence of arrythmias and conduction disturbances, both early and late, has been reported. Although the pathophysiology of this was unclear, they were thought to be related to a possible surgical injury to the conduction pathways (biatrial approach) or excessive retraction of the heart (atrial approach). In this study three patients had episodes of supraventricular arrhythmias which were controlled medically and two patients had transitory atrioventricular block requiring temporary pacing. Operative mortality and morbidity in this series was low and comparable with that reported by others.[5,6] The present study has several limitations. Retrospective studies are susceptible to selection and recall bias. However, considering the rarity of the disease, a prospective randomized study is impractical.

Conclusion

Cardiac myxomas form a very small percentage of the cardiac cases. Immediate surgical treatment is indicated in all patients. These tumors can be excised with a low rate of morbidity and mortality. The prognosis for patients after surgical resection is excellent.

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