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Original Research Article

SURGICAL OUTCOME OF CARDIAC MYXOMA CASES: A SINGLE UNIT ANALYSIS IN A TERTIARY CARE CENTER OF NORTH INDIA

Narendra Nath Das[1], Ratnesh Kumar[1], Siddharth Lakhotia[1]

[1]Department of CTVS, Institute of Medical Sciences, BHU, Varanasi, India

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Corresponding Author:
Dr. Narendra Nath Das,
Email: narendradas@bhu.ac.in

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Abstract

Background: Tumors of the heart are rare. Primary cardiac tumors are uncommon with incidence of 0.0017% to 0.02%. Cardiac myxoma is the most common benign tumor of heart and it accounts for 50% of all primary cardiac tumors. Life threatening complications due to myxomas can be prevented by early recognition and early surgery. Among all the cardiac tumors myxoma has an excellent survival rate after surgery. The objective is to study the intervention, complications and outcome of myxoma cases in a tertiary care institute of north India. **Materials and Methods:** This is a retrospective study. Consecutive 30 patients with cardiac myxoma operated between January 2015 and December 2022 were reviewed. The demographic profile and clinical characteristics, pre-operative investigations, intra operative findings, post-operative course, complications and follow up were reviewed. **Result:** Among 30 patients, 21 were female and 9 male. All the patients were symptomatic with dyspnea being the most common presenting symptom. Left atrium was the most common site of involvement. Villous morphology was more common than polypoid surface. There was neither any mortality nor recurrence in the study group. **Conclusion:** Surgical resection is the treatment of choice and should be done as soon as the diagnosis is made. Surgical outcome in our study group is excellent without any mortality and recurrence.

INTRODUCTION

Tumors of the heart are rare. Those can be primary or metastatic. Metastatic tumors usually arise from the lung, breast, melanoma and hematological malignancies such as lymphoma.[1] Among these, melanoma has the highest propensity of cardiac metastasis.[2] Primary cardiac tumors are uncommon with incidence of 0.0017% to 0.02%.[3] More than 80% of primary cardiac tumors are benign. Cardiac myxoma is the most common benign tumor of heart and it accounts for 50% of all primary cardiac tumors.[4] The estimated population incidence is 0.5-1 case per million per year.[5] The average age of diagnosis is between 4th and 6th decade of life. There is a female pre ponderance with female to male ratio of 2:1 is observed in case of myxomas.[5,6] The clinical presentation of cardiac myxomas is highly variable as it depends on the size, location and mobility of the tumor. Usually it presents with constitutional symptoms, obstructive cardiac symptoms and embolic symptoms.[5-7] About 30% of patients are asymptomatic.[6,8,9]

Life threatening complications of cardiac myxoma are arrhythmia, valve obstruction, heart failure, systemic embolization and stroke which can be prevented by early recognition and early surgery. And among all the cardiac tumors myxoma has an excellent survival rate after surgery.[10]

This study is a review of cases of myxomas in a tertiary care referral hospital of north India. Our objective is to study the intervention, complications and outcome of myxoma cases in our institute.

MATERIALS AND METHODS

This is a retrospective study. Consecutive 30 patients with cardiac myxoma operated between January 2015 and December 2022 were reviewed. The demographic profile and clinical characteristics were taken into account [Table 1]. Pre-operative investigations, intra operative findings, post-operative course, complications and follow up were reviewed. [Table 2, 3, 4]

Pre-operative diagnosis was usually established by Trans-thoracic echocardiography. Site, size, shape, relation with the intra cardiac structures are well established by this modality. Trans esophageal echo was done in selected cases (5 cases) where trans thoracic echo was not conclusive regarding the relation with intra cardiac structures. Pre-operative coronary angiography was done in 2 patients with complain of chest pain. Both of them had a normal coronary angiogram.

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Surgery

All patients were operated via median sternotomy. Cardio pulmonary bypass was used. Aortic and bicaval canulation performed. Mild hypothermia induced. Cross clamp was applied. Diastolic arrest of heart was done by administering root St. Thomas cardioplegic solution. Care was taken not to manipulate the heart or tumor prior to application of cross clamp on aorta. Right atrial approach was used in 20 patients. Bi-atrial approach was used in 10 patients. Complete excision of myxoma along with its attachment is done in every case. Attached part of inter atrial septum was excised in every case. The inter-atrial septum was repaired with autologous pericardial patch in all the cases. Care was taken not to spill the tumor fragments in the left atrium, opening of pulmonary veins and left ventricle. After removing the mass, thorough irrigation and suction of the cardiac cavity was done to prevent post-operative embolism. Closure of the cardiac cavity was performed. Then gradual deairing and weaning from cardio pulmonary bypass was done. After haemostasis mediastinal drain was placed in every case and routine closure was done. In one case mitral valve leaflets were damaged and severe mitral regurgitation was there. So we went ahead with mitral valve replacement with mechanical prosthesis with posterior chordal preservation along with the excision of myxoma. 28 cases were left atrial myxoma and 2 cases were right atrial myxoma.

Statistical Analysis

Continuous variables are presented as mean± standard deviation and categorical variables as number and percentage.

RESULTS

In this study total study population was 30. All the patients were operated for cardiac myxoma. Among them 21(70%) were female and 9(30%) were male. The mean age at surgery was 48.0 ±10.2 years. Average duration of symptoms was 3 months. All the patients were symptomatic with dyspnea being the most common presenting symptom. Dyspnea was present in 23 cases (76.66%). Four patients (13.33%) presented with palpitation. Two patients (6.66%) had atypical angina and one patient (3.33%) presented with constitutional symptoms like fever, malaise and anorexia. Four patients (13.33%) had a history of heart failure requiring admission pre operatively for optimization.

Trans thoracic echocardiography [Figure 1] was done in all patients. In selected 5 cases Trans esophageal echocardiography was also done. 28 patients (93.33%) had left atrial myxoma and only 2 patients (6.66%) had right atrial myxoma. The average size of the myxoma was 41.2 ±10.4mm. All the myxomas were attached to the inter-atrial septum. ECG was performed in all patients pre operatively. LA enlargement or hypertrophy was the most common finding in ECG. It was found in 8 patients (26.66%). Atrial fibrillation was found in 5 cases (16.66%). ST-T abnormality was found in one case (3.33%).

All the patients were operated successfully. Right atrial approach [Figure 2] was adapted in 20 cases (66.66%) and bi atrial approach was adapted in 10 cases (33.33%). 26 cases of myxoma (86.66%) had a villous surface [Figure 4] and 4 cases (13.33%) had a smooth polypoidal surface [Figure 3]. All the myxomas were attached to the inter-atrial septum and in all cases part of inter atrial septum was excised circumferentially along with the myxoma. One of the case (3.33%) showed mitral valve prolapse leading to severe mitral regurgitation. In that case mitral valve replacement was done along with the excision of myxoma.

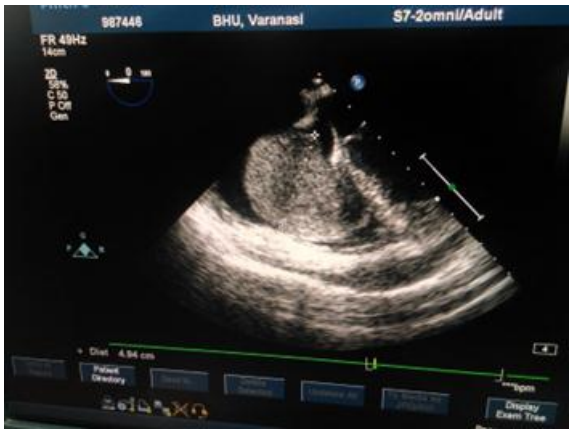

Figure 1: trans thoracic echo-cardiography showing right atrial myxoma

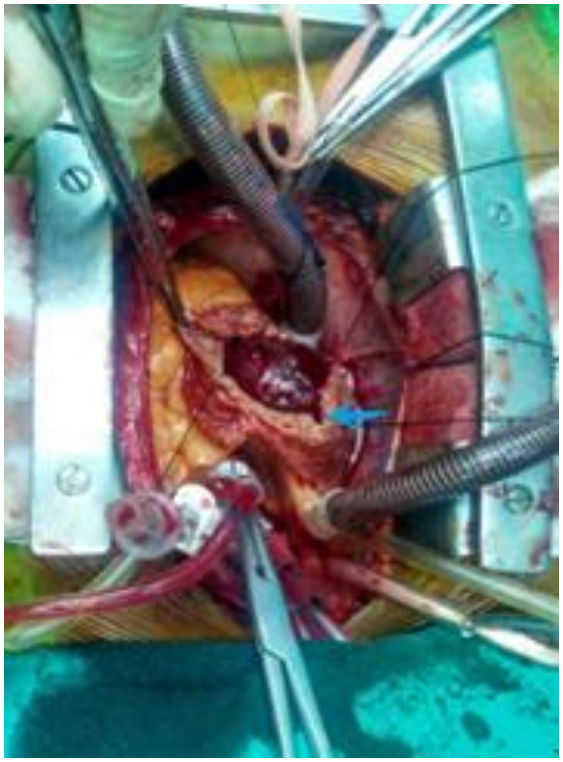

Figure 2: intra operative photograph of right atrial myxoma. Opened right atrium with visible myxoma in the right atrial cavity (blue arrow)

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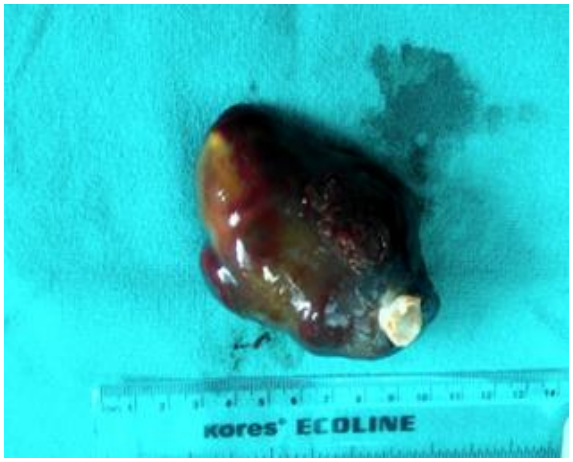

Figure 3: Myxoma with smooth polypoidal surface

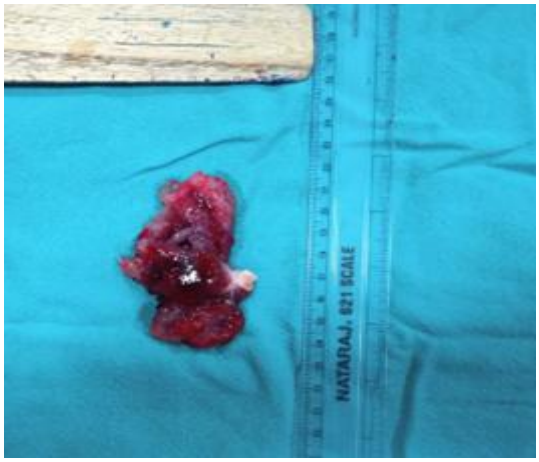

Figure 4: Myxoma with villous surface

Table 1: Demographic and clinical characteristics of patients (N=30)

Male	9 (30%)
Female	21 (70%)
Age(mean years± SD)	48.0 ±10.2
Average duration of symptoms (months)	3
Constitutional symptoms	1 (3.33%)
Dyspnea	23(76.66%)
Palpitation	4 (13.33%)
Chest pain	2 (6.66%)
History of Heart Failure requiring admission	4 (13.33%)

Table 2: Pre-operative investigation (N=30)

LA hypertrophy in ECG	8 (26.66%)
Atrial fibrillation in ECG	5(16.66%)
ST-T changes in ECG	1(3.33%)
Size of myxoma in 2D echo in mm (mean ± SD)	41.2 ±10.4
Left atrial myxoma	28 (93.33%)
Right atrial myxoma	2 (6.66%)
Myxoma attached to inter atrial septum	30 (100%)

Table 3: Intra-operative findings

Left atrial myxoma	28(93.3%)
Right atrial myxoma	2 (6.66%)
Right atrial approach	20(66.66%)
Bi atrial approach	10(33.33%)
Villous morphology of myxoma	26(86.66%)
Smooth polypoidal surface	4(13.33%)
Mitral valve prolapse leading to severe mitral regurgitation	1(3.33%)
Need of mitral valve replacement along with excision of myxoma	1(3.33%)
Myxoma attached to inter atrial septum	30(100%)
Inter atrial septum excision along with myxoma	30(100%)

Table 4: Post-operative course and follow up

Post-operative hospital stay in days (mean ± SD)	10.0± 3.6
Post-operative arrhythmia	5(16.66%)
Surgical Site Infection (SSI)	2(6.66%)
Residual shunt across the repaired inter atrial septum	0
Average follow up duration in years	3.0 ± 1.2
Mortality	0
Recurrence	0

Post operatively mean duration of hospital stay was 10.0± 3.6 days. Atrial fibrillation was seen in 5 cases (16.66%) post operatively. Surgical site infection (SSI) was there in 2 cases (6.66%). No patients had residual shunt across the repaired inter atrial septum. Average follow up duration of patients was 3.0 ± 1.2 years. There was no mortality and no recurrence in our study group.

DISCUSSION

Myxoma is the most common benign tumor of heart.[4,11] Eight year experience of a tertiary care institute of north India is presented here. More and more cases were diagnosed now-a-days because of the extensive use of the echocardiography for various indications.

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Cardiac myxoma is more common in females than males in our study. Usually the female to male ratio of cardiac myxoma is 2:1,[5,6] and in some studies it is 3:1.[12,13] In our study it is about 2.3:1. Mean age of the myxoma cases at our institute is 48 year. Previous studies also showed involvement of similar age groups.[5,6,14] According to a study by Sarjeant JM et al myxomas commonly occur in the middle aged and elderly population.[15] Average duration of symptoms of the patients is 3 months [ranging from 1 month to 12 months]. According to previous studies clinical presentation of cardiac myxomas can be obstructive cardiac, embolic and constitutional symptoms.[5-7] In our group dyspnea was the most common presenting symptom (76.6%) which is similar to other studies.[6,9,16] According to Theodoropoulos KC et al mitral valve pseudo obstruction is the typical presentation in cases of left atrial myxoma.[17] Agstam S et al and Alamri Y et al published case reports of congestive heart failure due to obstruction of tricuspid valve by right atrial myxomas.[18,19] In our study group there are features of heart failure in 4(13.33%) cases that required pre-operative hospitalization for optimization. In a study congestive heart failure, dyspnea and pulmonary edema are present in 52% cases of cardiac myxomas.[6] Most common constitutional symptoms in these patients are malaise, anorexia, fever, arthralgia and weight loss.[20] These symptoms are due to release of the cytokine IL-6.[21,22] Constitutional symptoms are found only in one patient (3.33%) in our study which is similar to a study by Kacar P et al,[23] where these symptoms present only in 5% of cases. Other studies showed a higher prevalence of constitutional symptoms.[6,24] Multiple studies showed that embolic symptoms occur in 25-35% cases of cardiac myxoma.[6,7,16,25] Contrary to these studies in our study only 2 patients (6.66%) presented with chest pain.

Pre operatively all patients were investigated by Trans thoracic echocardiography (TTE) in our study group. In selected cases Trans esophageal echocardiography (TEE) was performed. Trans esophageal echocardiography was done in 5 cases. According to some studies TTE is the first diagnostic method of choice in cardiac myxoma.[5,7,26] By TTE tumor size, location, morphology, mobility and association with neighboring structures can be determined. TEE provides superior image resolution and better visualization of cardiac myxoma.[27,28] In our study group myxoma was present in left atrium in 28 (93.33%) cases and in right atrium in 2 (6.66%) cases. Most of the previous studies showed similar findings. According to Sonia Jain et al most common site of myxoma is left atrium (75% cases) and 10% cases are found in right atrium14. According to other studies 75% myxoma found in left atrium, 23% in right atrium and 2% in ventricles.[29,30] The sporadic myxomas are usually single and arise most commonly from left atrium. But familial myxomas may be multiple, multicentric and arise from atypical sites.[31] Most common attachment of myxoma is fossa ovalis of inter atrial septum.[6,14,20] Similarly all the myxomas in our study group arise from the inter-atrial septum. Rarely these tumors arise from the heart valves.[32] According to Pinede L et al about two-thirds of the myxoma patients show abnormal ECG, left atrial hypertrophy or enlargement being the most common finding.[6] Similarly in our study group 14(46.66%) patients had abnormal ECG and LA hypertrophy was the most common finding. According to Reynen K et al in cardiac myxoma cases atrial fibrillation is less as compared to mitral valve disease.[11] In the present study atrial fibrillation was seen in 16.66% cases.

Surgical resection is the definitive treatment of cardiac myxomas.[33,34] For surgical resection we used right atrial approach in 20 patients (66.66%) and bi atrial approach in 10 cases (33.33%). According to a study by Hosain N et al left atrial approach was the most common approach.[10] In about two-third cases myxomas have smooth and polypoidal surface and in one-third they have friable and villous surface.[6,11,35] On contrary to this we observed 26 (86.66%) cases have villous surface and only 4 cases (13.33%) have smooth and polypoid surface. As previously discussed myxomas were attached to inter atrial septum part of septum was excised circumferentially along with the myxoma in all of our cases. After exision the septal defect was closed by autologous pericardial patch. In one case the mitral valve leaflets were damaged causing severe mitral regurgitation. So mitral valve replacement was done simultaneously. Previous studies also support the requirement of mitral valve repair or replacement in case of damaged valve.[36,37] Arrhythmias are the most common post-operative complication after excision of myxoma,[5,6] though it can arise in minority of cases. 16.66% cases of our study group showed post-operative atrial fibrillation. Surgical resection is the definitive treatment and mortality rate is very low. Recurrence rate is less than 5% in sporadic cases and 12-22% in familial cases.[33,34] According to Jones DR et al the 30 day mortality rate after cardiac myxoma excision ranges from 0% to 10%.[38] The recurrence rate is also less than 10%.[39] According to Elbardissi AW et al recurrence rate is approximately 10-15%. So patients need to be followed up for a minimum period of 4 years.[3] In a study by Kacar P et al there is neither mortality nor any recurrence.[23] Another study by Hosain N et al has no mortality and only one recurrence after 28 months of surgery.[10] In our study there was no mortality and no recurrences which are comparable to above mentioned studies.

Retrospective nature and small study population are the limitations of the study. Incidence of the cardiac myxoma is quiet low which reflects the low study population. Apart from that histopathology reports were not studied which adds to the limitation part. The average follow up period was also very less.

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CONCLUSION

Cardiac myxoma is the most common benign cardiac tumor. Most common site of the tumor is left atrium. In our study most of the myxomas were of villous morphology. Surgical resection is the treatment of choice and should be done as soon as the diagnosis is made. Surgical outcome in our study group is excellent without any mortality and recurrence. As the study population is very less, multicentric studies are required to validate these findings.

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