

# SURGICAL EXPERIENCE WITH INTRACARDIAC MYXOMAS

N. Safaei, N. Maghamipour\* and E. Karimian

Department of General Surgery, Shahed Madani Hearth Center, School of Medicine, Tabriz University of Medical Sciences, Tabriz, Iran

**Abstract-** Cardiac myxoma is generally considered to be a surgical emergency. Surgical excision must be done as soon as possible after diagnosis because of the high risk of valve obstruction or systemic embolization. In this study we report the result of operation in patient with benign cardiac myxoma. From 2001 to 2006, 35 patients (15 men and 20 women) between the ages of 26 and 82 years (mean of  $52 \pm 14$  years) were operated on for cardiac myxoma. In all of them cardiac myxoma was excised with large cuff of atrial septum. The postoperative mortality was 2.9% (1 patient). No patient was lost in 5 years follow up. Emergency operation was performed in 80% of the patients; in the remaining (20%) of the patients, condition was stable and the clinical presentation was less worrying, so elective operation was done. Now as echocardiography can reveal smaller tumors in generally elderly patients, most cases of cardiac myxoma correspond to stable forms. With early diagnosis and surgical excision of atrial myxoma, 97.1% of patients survived post operatively and had an excellent short-term and long-term results leading to eventual cure of nonfamilial myxomas. However, familial myxomas retain a strong tendency to recur after excision.

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**Key words:** Cardiac myxoma, fossa ovalis, atrial septum

## INTRODUCTION

Primary cardiac tumors are rarely found and have an incidence of 0.3% of all open-heart operations. Among those, about 70% are myxomas, most of them in the left atrium.

Cardiac myxoma is a life threatening disease and tumor embolism has been clearly demonstrated in 30% to 40% of patients with cardiac myxoma. Myxoma is most common in the third through the fifth decade of life and is more common in women. The most common preoperative symptom is dyspnea (1). Only in small percentage of cases the diagnosis of myxoma could be made clinically. Most of the cases were initially diagnosed as having mitral valve

disease, tricuspid valve disease, ischemic heart disease or cardiomyopathy. Noninvasive diagnostic tests, such as echocardiography and computed tomography, are widely available and can diagnose the disease. Early diagnosis and complete surgical resection of the tumor can prevent embolic complications, valve destruction, atrial fibrillation, or cardiac death. In 1954, Clarence Crafoord performed the first successful resection of a cardiac myxoma. In this study we report the result of operation on patients with cardiac myxoma.

## MATERIALS AND METHODS

In this study performed from 1999 to 2004 in Madani Heart Center, Tabriz University of Medical Science, 35 patients undergoing surgical resection of cardiac myxomas were evaluated. The mean age of the patients was  $52 \pm 14$ , ranged from 26 to 81 years. Two patients had familial myxoma.

Among these patients 74.3% had dyspnea on admission, 74.3% palpitation, 34.3% angina and 8.6% neurological symptoms caused by peripheral emboli (Table 1).

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**\* Corresponding Author:**

N. Maghamipour, Department of Cardiac Surgery, Madani Hospital, Tabriz University of Medical Science, Tabriz Iran.  
Tel: +98 411 3309329, 09121208341  
Fax: +98 411 3309329  
E-mail: safaei@yahoo.com

**Table 1.** Preoperative signs and symptoms of patients

Sings and symptoms	Number (Percent)
Dyspnea	26 (74.3)
Palpitation	26 (74.3)
Chest pain	12 (34.3)
Weight loss	9 (25.7)
Fever	26 (74.3)

Fever was present in 26 (74.3%) systolic murmur in 20 (58%) and atrial fibrillation in (17.4%). One patient developed myocardial infarction and two patients pulmonary hypertension. High erythrocyte sedimentation rate was the most common laboratory finding with a mean of  $44 \pm 24$ .

All patients were diagnosed with echocardiography or computed tomography. In preoperative echocardiography the mean size of the tumors was  $4.05 \pm 2.28$ ; 31 (88.6%) of myxomas were located in the left atrium, 2 (5.8%) in the right atrium, 1 (2.9%) occurred in the left ventricle and 1 (2.9%) in the right ventricle. Complications of atrial myxoma in our patients are shown in table 2.

Patients underwent surgery with femoral cannulation for right heart myxoma and bicaval cannulation for left side tumor. The interatrial approach was made from the right upper pulmonary vein. Optimal overlook and minimally risk of embolism by tumor material was guaranteed. The tumor was excised with a large cuff of atrial septum. In 13 (37.1 %) patients valve replacement or repair was done. The valve function was controlled with transesophageal echocardiography during the operation which showed no valve dysfunction.

## RESULTS

Thirty five patients were operated, 20 (57.1%) were female, 15 (42.9%) were men.

The duration of CPB was  $80 \pm 24$  minutes, clamp time was  $49 \pm 29$  minutes. 80% of the patients

**Table 2.** Complication of atrial myxoma in our patients

Complication	No (Percent)
Mitral insufficiency	12 (34.28)
Tricuspid insufficiency	1 (2.85)
Atrial fibrillation	6 (17.14)
Cerebral emboli	2 (5.71)

**Table 3.** Type of operation in patients under study

Type of operation	Number (Percent)
MyR alone	21 (59.85)
MyR + Mitral valve repair	9 (25.65)
MyR + Mitral valve replacement	3 (8.55)
MyR + Tricuspid valve repair	1 (2.85)
Myxoma resection + CABG	1 (2.85)

Abbreviation: MyR, myxoma resection; CABG, coronary artery bypass graft

underwent urgent operation and 20% were operated electively. The hospital stay was 7 days. One patient (2.9%), with preoperative decompensation, died after tumor resection, from progressive low cardiac output. 29 patients had normal sinus rhythm when discharging the hospital, and 6 patients had atrial fibrillation.

Fourteen patients required further cardiac surgery: three mitral valve replacements, nine mitral valve repair, one tricuspid valve repair, one coronary artery bypass graft.

During 5 years follow-up, there was no mortality or recurrence of the disease.

## DISCUSSION

Cardiac myxoma is a life threatening disease. Without appropriate treatment it can produce various complications. Constitutional symptoms such as weight loss, fever, and lethargy which are present in almost all patients with left atrial myxomas (2) are nonspecific, so a high index of clinical suspicion is important for its early and correct diagnosis. Other symptoms include dyspnea and palpitation. Among laboratory findings, high erythrocyte sedimentation rate was the most common in our patients.

Embolization is a common initial symptom of cardiac myxoma, occurring in almost half of the reported cases. The embolic material can be either myxomatous fragments of tumor or thrombi from the tumor surface. Atrial fibrillation seen in 17% of the patients could also produce peripheral emboli. Most of the embolic events have been reported as occurring in the central nervous system with cerebral artery occlusion and cerebral infarction (3). In the remaining cases, the location of the emboli is highly variable. In our patients 8.6% of the cases had cerebral emboli, which is lower than the reported

cases, possibly because they are not diagnosed as emboli from the heart myxoma.

The most useful noninvasive diagnostic tests is echocardiography, though large vegetations, an infected thrombus, or even mitral valve prolapse can produce patterns that are indistinguishable from myxoma. Transthoracic echocardiography is the most commonly used, but transesophageal echocardiography has better specificity and sensitivity.

Some myxomas are sufficiently mobile to move through the atrioventricular valves during diastole, exerting a “wrecking ball” effect that damages the valve leaflet. In a study on 56 patients, atrial fibrillation was seen in one (1.8%) patient and mitral insufficiency in two (3.7%) patients (5). But in our patients atrial fibrillation occurred in 6 (17.14%) and mitral insufficiency in 12 (34.28%) patients. This higher frequency of atrial fibrillation and valve damage shows that our patients are diagnosed at late stage of the disease.

In our patients, three mitral valve replacement, nine mitral repair and one tricuspid annuloplasty were done in addition to myxoma resection. Annuloplasty has a good result and it must be tried instead of replacement since with repair there is no need for anticoagulation (4). With early diagnosis and operation, this valve damaging effect can be prevented.

Surgical resection of a single myxoma is the most effective treatment, with low risk of recurrence and perioperative death and can prevent these complications. During the operation with resection of atrial septum we must be careful to ligate the sinoatrial nodal artery to prevent arterial fistula (6). In our cases we did not have this complication. Because of the risk of tumor fragmentation and embolization, vigorous palpation or manipulation should be performed only after cardioplegia.

In our patients the mean size of atrial myxomas was  $4.65 \pm 2.28$ . When the morphological characteristic of myxomas were studied and correlated with clinical features, large left atrial myxoma size was closely related with constitutional symptoms, congestive heart failure, with syncope and auscultatory findings suggestive of mitral valve disease, whereas smaller myxoma size and irregular

surface were associated with embolization. If Myxoma are observed in an early stage in more elderly and higher risk population, the classic approach of emergency surgery is not always appropriate in these stable forms, and preoperative assessment of these patients must be done (7).

In our cases 80% were operated in an urgent manner and the other 20% of the patients were operated electively. One patient underwent coronary artery bypass graft in addition to myxoma resection, so it is better to do an angiographic study in old patients with myxoma that are in a stable condition (8).

Considering good result of wide resection of cardiac myxoma in our patients and in other centers with no recurrence had been seen (9), we believe that the transeptal approach, in allowing total resection of the myxoma, prevents recurrence. In our study early post operative mortality was 2.9% which was due to heart failure. In another study two patients (2.5%), with preoperative decompensation, died after tumor resection (10).

As these patient died because of preoperative heart failure, earlier diagnosis and resection of the tumor can prevent these mortalities.

We conclude that our patients are mostly diagnosed at a late stage of the disease and refer with the complication of myxoma and needs a high index of clinical suspicion for its early and correct diagnosis.

As replacement of cardiac valves needs long term anticoagulation it is better to try to repair the valves. Wide surgical excision of atrial myxoma gives excellent short-term and long-term results and cure of nonfamilial myxomas. However, familial myxomas retain a strong tendency to recur even many years after excision.

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### Conflict of interests

The authors declare that they have no competing interests.

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