

**Original Research Article****Surgical management of Intracardiac myxomas: A single centre experience**

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Introduction

Cardiac tumors are rare neoplasms. The most common being cardiac myxoma.^[1] It should be differentiated from a number of intracardiac masses such as thrombus, infective endocarditis, other cardiac tumors.

In this study, we present our clinical experience in the diagnosis and surgical treatment of cardiac myxomas over 10 years. We reviewed the preoperative, operative, and postoperative characteristics of patients with myxoma. Intracardiac masses of different etiologies were excluded.

Material and Methods

This is a retrospective observational study. We reviewed our hospital records over ten years duration from 2009 to 2019 for the collection of preoperative and operative data. Patients with a pathologic diagnosis other than myxoma were excluded from the study.

The average age of the patients was 39.35 ± 17.66 (range, 13–72 years). Sixteen patients were female

(80%) and the remaining four were male (20%). The preoperative functional status and the presenting symptoms of the patients are summarized in Table 1. Majority of the patients were in normal sinus rhythm.

Table 1: Patient Demographics

| | | | |
|----------------|---------------------|--------------|----------------|
| Total number | 17 | Total number | Percentage (%) |
| Gender | Male | 4 | 11.76 |
| | Female | 16 | 88.23 |
| Age (mean± SD) | | 39.35 | 17.66 |
| | | Total number | Percentage (%) |
| NYHA | I | 4 | 17.6 |
| | II | 10 | 52.9 |
| | III | 5 | 23.5 |
| | IV | 1 | 5.8 |
| Symptoms | | | |
| | Shortness of breath | 16 | 80 |
| | Chest Pain | 11 | 55 |
| | Syncope | 2 | 10 |
| | Palpitations | 3 | 15 |

All patients underwent routine investigations. They were diagnosed as having myxoma by echocardiography. Seventeen patients (80%) had left atrial myxoma, three patients (15%) had right atrial myxoma and one patient had biatrial myxoma.

Surgical Technique

All patients were operated upon through median sternotomy. Cardiopulmonary bypass was initiated using aortic and bi-caval cannulation, and moderate hypothermia (median 32°C ranged 29–34°C). Both the superior vena cava and the inferior vena cava were routinely cannulated separately through the right atrium regardless of the position of the myxoma.

After aortic cross-clamp, antegrade cold blood cardioplegia was infused in aortic root. Intraoperative trans-esophageal echocardiography was done routinely in all cases by anesthesiologists to evaluate the valve function after resection of the tumor and to exclude any residual lesion. Care was taken to not manipulate the heart until the aorta was cross clamped to avoid tumor fragmentation and systemic embolization.

Myxomas in the left atrium were excised through the right atrium and incision of the interatrial septum (transseptal approach) in 17 patients (85%), through a combined right and left atriotomy (biatrial approach) in one patient (5%). To avoid the recurrence of the tumor, the resection was complete with wide excision of the attachment of the base. The surgically repaired either with an autologous pericardial patch or woven dacron patch. After excision of the tumor, the related heart chambers were irrigated by cold saline to eliminate any loose tumor fragments that might have been dislodged during manipulation and removal. All the removed myxomas were underwent to histopathological examination.

Postoperative period

The gross appearance of the tumor was a soft, gelatinous, sessile or pedunculated mass with either a villous or smooth surface. Histopathological examination confirmed the diagnosis of myxoma in all patients.

Six patients (30%) had supraventricular tachycardia which was controlled medically. No patient required re-exploration and no perioperative deaths were reported.

Table 2: Intraoperative Findings

| | | | Mean | | S.D. |
|--------------------------------|----------------------------|-----|------|-----|------|
| Myxoma location | | | | | |
| | LA myxoma | | 17 | | 85 |
| | RA myxoma | | 3 | | 15 |
| | Bilateral myxoma | | 1 | | 5 |
| Mitral Regurgitation | | | | | |
| | Mild | | 2 | | 10 |
| | Moderate | | 1 | | 5 |
| | Severe | nil | | nil | |
| Tricuspid Regurgitation | | | | | |
| | Mild | | 1 | | 5 |
| | Moderate | | 1 | | 5 |
| | Severe | nil | | nil | |
| CPB time | | | | | |
| Cross Clamp time | | | | | |
| Approach | Right atrial approach | | 17 | | 85 |
| | Left atrial approach | nil | | nil | |
| | Bilateral approach | | 1 | | 5 |
| Location | Fossa ovalis | | 14 | | 70 |
| | Base of interatrial septum | | 3 | | 15 |
| | Left atrial Roof | | 2 | | 10 |
| | Opening of IVC | | 1 | | 5 |

Table 3: Post-operative findings

| | | | |
|------------------------------|---------|-------|-----------------|
| Perioperative mortality | nil | | |
| | | Mean | Stand deviation |
| ICU stay (days) | | 2.375 | 1.258305739 |
| Hospital Stay (days) | | 8.3 | 2.65 |
| Perioperative Complications | | | |
| Supraventricular tachycardia | 6 (30%) | | |
| Reexploration | nil | | |
| Pulmonary complications | nil | | |
| Stroke/ TIA | nil | | |
| Death | nil | | |

Discussion

Primary cardiac tumors are quite uncommon and myxomas constitute the major proportion among these masses^[3]. Their incidence in cardiac surgery range, among different studies, between 0.0013% and 0.03%^[4,5]. Clinical presentation is usually in adulthood, generally between the fourth and the sixth decade, with a female gender prevalence. More than 75% of primary cardiac tumors are benign, and most of them are myxomas. Most myxomas (60%–88%) occur in the left atrium, with smaller percentages in the right atrium (4%–28%), left ventricle (8%), right ventricle (2.5%–6.1%), 2 or more locations (2.5%), and, in rare cases, in both atria of the same patient (<2.5%)^[6,7].

The symptoms of patients depend on the location, size and degree of invasiveness of the cardiac tumor. Echocardiography is a sensitive and non-invasive modality for assessing cardiac tumors, including cardiac MFH; however, it has a low specificity, which may lead to misdiagnosis^[8]. CT scans and MRI are also effective tools for assessing cardiac tumors, and facilitate the identification of more specific structures of tumors and adjacent invasions^[9]. An MRI is particularly useful when echocardiographic data are equivocal, when the lesion has an atypical location, or when there are doubts concerning diagnosis.

Surgical excision of cardiac myxomas must be done as soon as possible after the diagnosis is established because of the high risk of valvular obstruction or systemic embolization. Generally accepted routes of access to left atrial myxomas are the biatrial, the left atrial and transseptal

approaches. A review of the largest published series of surgical resection of intracardiac myxomas, Jones and colleagues^[10] reported that biatrial, left atrial, and transseptal approaches were used in 38%, 34%, and 28% of the patients. In our study, myxomas in the left atrium were excised through the right atrium and incision of the interatrial septum (transseptal approach) in 17 patients (85%), through a combined right and left atriotomy (biatrial approach) in one patient (5%). To avoid the recurrence of the tumor, the resection was complete with wide excision of the attachment of the base.

Overall survivors return to their preoperative level of daily activity within a short period after surgery. The incidence of tumor recurrence is virtually nonexistent in sporadic isolated myxomas. According to McCarthy and colleagues^[11] the risk of tumor recurrence is much higher in the familial variety (10%), in the syndrome of Carney complex (21%), and in the presence of multiple myxomas (33%). However, as sporadic recurrence has been documented previously, annual follow-up including echocardiography is recommended for all cases.

Study Limitations

Our study has a number of limitations. First, this is a retrospective study; however, this study design is appropriate to study rare diseases. Second, the number of cases is limited, and this is attributed to the rarity of the disease. Third, the comparison between the outcomes of the different surgical approaches were subjected to bias because most of the cases were subjected to right atrial trans-septal approach

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