SURGICAL MANAGEMENT OF CARDIAC MASSES

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In GATA Haydarpaşa Training Hospital, a total of 12 cases, 1 secondary and 11 primary, were operated on for cardiac masses between 1990-2000. All the primary tumors were benign.

According to the NYHA classification, 1 patient was Class I, 3 patients were Class II, 2 patients were Class III, 1 patient was Class IV and the other 5 patients were asymptomatic. Five of the cases were diagnosed by echocardiography and the rest were diagnosed by catheterization, coronary angiography and thorax computed tomography accompanied by echocardiography.

The localization of the tumors: one on posterior leaflet of the mitral valve, one on the left ventricular outflow tract, six were in the left atrium, two were in the right atrium, one in the right ventricle and one was both in the right atrium and right ventricle.

All tumors were excised by cardiopulmonary bypass. In ten of the cases, tumors were totally excised, while in two of the cases the excision was partial. Perioperative mortality was 8.1% (1 case).

Key words: Primary cardiac tumors, cardiac mass

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Cardiac masses are very rare clinical entities in cardiac surgery. Their incidence is 1.7-10 per 100000 cases (1). The first cardiac mass was reported by Columbus (2) in 1959. Although it varies in the literature, 75% of cardiac tumors are primary tumors (1,3). The most common primary cardiac tumor is myxoma (4). Sarcoma, clinically diagnosed in a surviving patient, was first reported in 1934 by Barnes (5). Myxoma was first excised surgically by Crawford in 1954 (6). By advancing technology, the rate of early diagnosis increased; by this way, operations for cardiac masses began to be performed successfully in many cardiac surgery centers.

MATERIAL AND METHOD

In GATA Haydarpaşa Training Hospital, a total of 12 cases, 1 secondary and 11 primary, were operated on for cardiac masses between 1990-2000. Six of the patients were male and 6 were female. The youngest was 16 and the oldest was 58 years old. Five of the patients were suffering from dyspnea and fatigue, 4 were suffering from palpitations. Two patients had thromboembolism in their history.

Table 1. Patient data

Symptoms	Number of patients	Percentage
Asymptomatic	5	41.6
Dyspnea	5	41.6
Fatigue	5	41.6
Palpitation	4	33.3
Thromboembolism	2	16.6
Cardiogenic shock	1	8.3
Congestive heart failure	3	25
Weight loss	1	8.3

Table 2. Patient classification according to NYHA

NYHA	Number of patients	%
Asymptomatic	5	41.6
Class I	1	8.3
Class II	3	25
Class III	2	16.6
Class IV	1	8.3

In one patient, there was serious weight loss, while in three of them congestive heart failure was diagnosed. The patient with the diagnosis of osteosarcoma was in cardiogenic shock (Table 1). According to the NYHA classification, 1 patient was Class I, 3 patients were Class II, 2 patients were Class III, and 1 patient was Class IV and the other 5 patients were asymptomatic (Table 2).

Five of the cases were diagnosed by echocardiography and the rest of the cases were diagnosed by catheterization, coronary angiography and thorax computed tomography accompanied by echocardiography. All of the patients were operated on by cardiopulmonary bypass. During cannulation, maximum effort was made for using minimal manipulation in order not to cause an embolus. The localization of the tumors: one on anterior leaflet of the mitral valve, one on the left ventricular outflow tract, six were in the left atrium, two were in the right atrium, one in right ventricle and one was in both the right atrium and right ventricle. All of the left atrial myxomas were excised totally via a transverse incision through the interatrial groove; the left atrial wall was repaired by primary sutures. As for right atrial myxomas, we entered into the right atrial cavity through a longitudinal incision, excised the tumor and repaired the right atrial wall by primary sutures. As for two of left atrial and one right atrial myxomas, pedunculi have arisen from the interatrial septum, after partial septectomy, the interatrial septums were repaired by primary sutures. In one left atrial myxoma, myxoma had a deep attachment to the posterior leaflet of the mitral valve; after the excision of the tumor, we performed a mitral valve replacement by 25 M Sorin bileaflet prosthetic valve. As in one mitral valve the cyst has destructed the anterior leaflet we also performed a mitral valve replacement by 27 M St. Jude bileaflet prosthetic valve. As one of the rhabdomyomas

Table 3. Classification of tumors according to pathology, localization and surgical procedure

Age & sex	Pathologic diagnosis	Localization	Operation	Other operations
28/M	Myxoma	LA	Total excision	
23/F	Myxoma	LA	Total excision	
25/F	Myxoma	RA	Total excision	
38/F	Myxoma	RA	Total excision	
52/M	Mitral valve cyst	Mitral valve	Total excision	Mitral valve replacement
18/M	Osteosarcoma	RA and RV	Partial excision	
23/M	Rhabdomyoma	LVOT	Total excision	Aortic valve replacement
42/F	Myxoma	LA	Total excision	
16/M	Myxoma	LA	Total excision	
58/F	Myxoma	LA	Total excision	Mitral valve replacement
32/M	Rhabdomyoma	RV	Partial excision	
34/M	Myxoma	LA	Total excision	

was located on the interventricular septum, we excised this tumor via right ventriculotomy. After the excision of a rhabdomyoma on the LVOT, we performed an aortic valve replacement by 23 A Sorin bileaflet prosthetic valve. In only one right atrial and right ventricular osteosarcoma operated on as an emergency, we excised the tumor partially but the patient died at the postoperative 8th hour. Classification of humors according to pathology, localization, and surgical procedure, are shown in Table 3. All cardiac cavities were washed out with saline solution after excision of the tumors.

RESULTS

All of the excised materials were sent for pathologic investigation. Osteosarcoma case who was operated on as an emergency was taken to ICU by IABP support, as he was in low cardiac output state and died at the postoperative 8th hour. Overall mortality rate was 8.3 % (1 case). All of the patients were followed up at least 6 at the most 68 months. In this follow-up for period, no recurrence was detected. In the postoperative period, atrial fibrillation with low response was detected in a myxoma patient, while there was trigeminy ventricular extrasystole in a rhabdomyoma patient; both responded to medical therapy. In a patient whose mitral valve was replaced, gastrointestinal bleeding occurred and responded to medical therapy.

DISCUSSION

Metastatic cardiac masses are more common than primary cardiac masses (7). 8.3% of our series were metastatic tumors. Most of the primary tumors are benign (75%) and only 25% are malign. About 40% of benign tumors are myxomas and 75% of malign tumors are sarcomas (8). In our study, only one case was of malign character (8.3%).

Myxoma rate of our series was 66%. Cardiac myxomas are more common in the 3rd and 6th decades and most common in women (3). In our study, 37.5% of myxomas were in the second decade, while the rest were in various decades and 62% were in women. The left atrium is the most common location of myxomas with a rate of 75% and the right atrium is the second with 20% (3,9). In 6 of our cases, myxoma was in the left (75%) and in 2, it was in the right atrium (25%). In the literature, it was reported that myxomas could originate biatrially (10). In our series, we had no biatrial myxoma. In some series, a thromboembolism incidence of about 40% was reported (11). In our series, upper extremity thromboembolus was detected in only one case and this has led to the diagnosis of myxoma. Heredity can be observed in 5% of myxomas; it is autosomal dominant (3). In familial myxomas, male, female rates are similar and recurrences are more common after surgical resection (12). In familial myxomas, other clinical pathological entities can be detected as well and that is why they are called complex myxomas (3). We did not have such a case. Cardiac myxomas can cause symptoms by effecting the related cardiac valve; the result can be syncope or even sudden death. Fever, weight loss, high sedimentation rate, leukocytosis, hemolytic anemia, thrombocytopenia, high C-reactive protein levels can be common, but these findings have no relations with the localization of the myxoma (13). In our series, palpitation, dyspnea and fatigue were the most common symptoms. Therapy of the myxoma which is surgical resection, should be initiated as soon as it is diagnosed (3,4). The most important factor is the complete resection of the tumor without destruction at all tissue levels of the attached cardiac tissue. The defect after resection can be repaired either primarily or by a patch (3). We performed total resection in all of the myxomas. Only in one case, we used a pericardial patch and the others were repaired primarily.

In the literature, rhabdomyoma is the second common cardiac benign tumor. In childhood, it is the most common one. These tumors are generally multiple and mainly localized in the ventricles. They can usually cause obstruction and arrhythmia. They are generally encapsulated, multifocal, localized and deeply invaded the myocardium. That is the reason

why they cannot be totally excised (11). In one case, the tumor was in the LVOT and has destructed one of the cusps of the aortic valve; aortic valve replacement was necessary. In a localized tumor of the RV, we performed partial resection.

Valve cysts are very rare and generally asymptomatic, most commonly localized on the mitral and tricuspid valves. They are usually surrounded by an endothelial tissue layer, filled with blood inside (14). In our series, there were only one cyst localized on and destructed the anterior leaflet of the mitral valve; this cyst was excised and mitral valve replacement was performed.

Nowadays, as echocardiography has spreading clinical use, cardiac masses can be easily detected. Echocardiography is the method of first choice as it is non-invasive and can be easily found in any center. It is also very valuable as it has no risk like the destruction of the cardiac mass and has no other complications (15,16). That is why we preferred the echocardiography as the diagnosis method of first choice. Catheterization was performed in the cases with valve abnormalities, coronary angiography in the cases aged over 40 accompanied by echocardiography. On the other hand, we think that invasive diagnostic techniques must be kept as the last choice.

In 1967 Gerbode (17) reported the first left atrial myxoma recurrence. In many different series like Parry series (6.3%) (1), and Hall series (22%) (3), varying recurrence rates were reported. In diminishing recurrence rate, total resection is the most important factor. But, even in such cases recurrences were reported (18). We had no recurrence during 10-year follow-up time.

As a final word, we concluded that by widespread clinical use of echocardiography cardiac masses could be easily detected. Total resection is the method of choice since it has a low mortality rate. But, in order to detect recurrences long term follow-up is obligatory.

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