Diagnosis and surgical treatment modalities in cardiac myxomas

Kardiyak miksomalarda tanı ve cerrahi tedavi yöntemleri

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Primary cardiac tumors are uncommon and observed in autopsies at a rate of 0.001-0.03% and 75% of this rate is benign and myxomas constitute nearly 50% of this group (1). Cardiac myxomas are frequently seen between the 3. and 6. decades of life and more commonly observed in female population. The first successful surgical resection of cardiac myxomas was performed by Clarence Crafoord in Stockholm on July 16, 1954 (2).

In a period of 15 years from January 1992 to November 2007, 17 patients were operated in our clinic who were diagnosed with cardiac myxoma. Nine patients (52.9 %) were female and 8 were (47.1%) male. Mean operational age was 54.64±13.02 years (range 27 years to 75 years). Fourteen myxomas were located in the left atrium (LA) (82.3%) and 3 - in the right atrium (RA) (17.7%) (Table 1). Echocardiography was performed in all patients. Coronary angiography was performed in males elder than 35 and females elder than 40 years of age. Two patients were detected as mitral stenosis and mitral regurgitation, one as mitral stenosis, mitral regurgitation and aortic regurgitation, three as tricuspid regurgitation and eleven as mitral stenosis preoperatively. Preoperative functional capacities of patients were classified according to NYHA and 8 patients were in class II, 6 - in class III, and 3 - in class IV.

None of the patients had any familial history of myxoma. Preoperative electrocardiographic examination (ECG) detected atrial fibrillation (AF) in 4 patients (23.5%). A case with LA myxoma was determined to have coronary artery disease with a history of a transient cerebral ischemic attack one year before presentation to our clinic. A 75-year female patient with LA myxoma was initially presented to emergency room with clinical complaints resulting from acute femoral artery emboli, and following femoral embolectomy her essential pathology was determined postoperatively (Table 1). Histopathologic findings of the embolic material of this case were assessed to be an embolic material showing myxoid characteristics.

Overall, 16 (94.1%) of 17 myxomas originated from the interatrial septum and 1 (7.2%) from the posterior free wall of the LA. All myxomas were histopathologically investigated. There was no mortality in our patients during the time from the perioperative period up to the hospital discharge. In early postoperative follow-up, fifteen patients were classified as class I, two as class II according to NYHA. Preoperative AF of 4 patients continued despite the medical treatment. In 3 patients who developed postoperative AF sinus rhythm was resumed with a combination of digoxin and beta (β) blocker or amiodarone. A 75-year old patient with preoperative hypertension and AF died due to cerebrovascular event 3 years after the myxoma resection. Another two patients died from cardiac failure in the postoperative 7^{th} and 4^{th} years. (Table 1). Mean postoperative follow up period was 105 months (range 10 to 189 months)

Studies carried by Mayo Clinic identified the risk of a secondary myxoma risk to be 1-3% following the total resection of sporadic myxomas without any familial history (3). We did not determine any recurrence signs in long-term echocardiography follow-up. Myxomas can be the cause of emboli due to their intracardiac localization and fragile consistency. Myxomas located in the left cardiac cavities embolize into circulation and pass into cerebral, renal, femoral, coronary and visceral organ arteries producing symptoms of infarction and ischemic findings. Jones and colleagues have identified temporary ischemic attack at a rate of 17% in their series (4). In one of our cases with LA myxoma we identified a transient cerebral ischemic attack, and acute left popliteal arterial embolization in another. Hence, embolization rate in our series was found to be 11.7%.

Most of the myxoma cases are preoperatively in the sinus rhythm and AF is rare (5). Left atrium diameter, tumor diameter, tumor attachment site, and atrial incisions may play a role in the occurrence of pre- and post- operative arrhythmia (6). In our study, postoperative AF developed in 3 cases with LA myxoma following the myxoma excision and in 2 of them sinus rhythm was resumed with an early medical treatment. Subjective symptoms such as arthralgia, myalgia, fatigue, weight loss, malaise, and fever can be concomitantly identified. These symptoms generally mitigate following the surgical resection (7). We also observed that these symptoms terminated following the surgical intervention.

The surgical resection of myxoma is a selective treatment method. Due to sudden death and embolic complications,

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patients should be urgently operated once the myxoma is diagnosed. Jones et al. (4) defined the biatrial approach to be a safe and efficacious technique. Some surgeons on the other hand claimed the left atriotomy to be a safe method (8). Kabbani et al. (9) stressed that the transseptal approach was not sufficient to inspect all the cardiac cavities neither to mark the site of tumor attachment. We used biatrial approach in cases with LA atrial myxoma and achieved thorough visualization (Fig. 1). Biatrial approach made the resection of myxoma rather easy. So, it became possible to inspect all the cardiac cavities, atrioventricular valves, other tumoral formations, tumor fragments and atrioventricular valve abnormalities. We used right atrial approach in two of three cases with RA myxoma. We used biatrial approach in the last case with RA myxoma, who had aortic and mitral stenosis and mitral regurgitation. This patient underwent aortic and mitral valve replacement surgery. None of our patients postoperatively suffered excessive bleeding. Surgical resection of cardiac myxomas yield good results and the rate of early mortality is less than 5% (10). No mortality was observed in our cases in the early period.

In conclusion, it is possible to state that myxomas are slow growing intracardiac masses and long- term prognosis is good in adults who are operated for their benign tumors. We find it also beneficial to express that the biatrial approach to surgical excision of atrial myxomas is a successful, efficacious and safe method in long-term follow-up, which has also been the case in our series. We also believe that annual echocardiographic examinations beginning on the postoperative sixth months are crucial for the optimal follow up.

Table 1. Demographic characteristics, operational modalities and results

Characteristics	Number
Gender	
Female	9/17
Male	8/17
Location	
Left atrium	14/17
Right atrium	3/17
Symptoms (nonspecific)	
Dyspnea	12/17
Palpitation and dyspnea	5/17
Typical angina showing ischemic	1/17
change in electrocardiography	
Subjective complaints	
Fatigue	9/17
Weight loss	1/17
History of previous emboli	
Cerebral	1/17
Peripheral	1/17 (femoral)
Diagnostic methods	
Echocardiography	17/17
Coronary angiography	14/17
Operation	
Full thickness excision	17/17
Additional CABG	1/17
Additional AVR+MVR	1/17
Additional MVR	1/17
Additional mitral annuloplasty	1/17
Additional tricuspid annuloplasty	2/17
Early morbidity	
Atrial fibrillation	3/17
Early mortality	none
Late morbidity	
Atrial fibrillation	1/17
Recurrence	none

AVR - aortic valve replacement, CABG - coronary artery bypass grafting, MVR - mitral valve replacement

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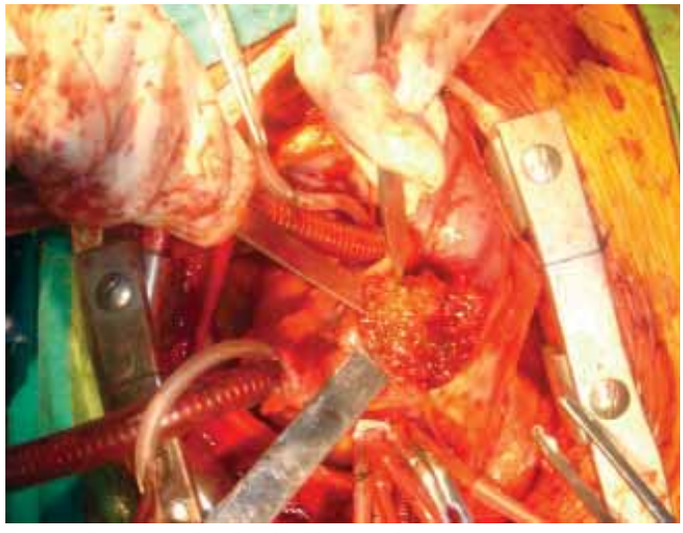

Figure 1. Intraoperative detailed image of a myxoma case