

## An Unusual Biatrial Cardiac Myxoma in a Young Patient

Ali Azari, M.D.<sup>1,2,3</sup>, Zahra Moravvej, M.D.<sup>2,4</sup>, Soheila Chamanian, M.D.<sup>5</sup>, Leila Bigdelu, M.D.<sup>2,3,6</sup>

This is a report of a biatrial cardiac myxoma in a young man with a 10-month history of exertional dyspnea and palpitation. The echocardiogram revealed biatrial myxoma prolapsing through the mitral and tricuspid valves during diastole. All cardiac chambers were enlarged and dysfunctional. The electrocardiogram revealed a rapid ventricular response with atrial flutter rhythm. The masses were resected and diagnosed as myxoma by a histological examination. The follow-up echocardiogram revealed significant improvement in ventricular function and reduction in the cardiac chambers' volume. There was no evidence of myxoma recurrence. The most probable cause of the patient's heart failure was considered to be tachycardia-induced cardiomyopathy.

Key words: 1. Cardiomyopathy  
2. Echocardiography  
3. Myxoma  
4. Regurgitation

### CASE REPORT

Cardiac myxomas have an incidence of 0.0017% among the general population. Myxoma occurs commonly in the left atrium (LA), but it can be found in any cardiac chamber. Myxoma is commonly seen in an isolated form and reported rarely in multiple locations [1]. It has various presentations, and this delays the diagnosis in some cases. This study reports a rare case of biatrial myxoma in a 28-year-old man who presented with left-sided heart failure symptoms.

A 28-year-old male patient, a farmer, presented with exertional dyspnea and palpitation that had begun 10 months earlier. His symptoms had been aggravated over the past ten days. He had never sought evaluation and treatment. On

physical examination, he had an irregular heart rate with normal blood pressure. Chest examination revealed a laterally displaced left ventricular (LV) apex. Cardiac auscultation demonstrated an S3, a variable S1, and a soft grade 2/6 systolic murmur over the left sternal border. Blood biochemistry tests were normal.

The 12-lead electrocardiogram demonstrated atrial flutter with variable atrioventricular conduction and the QRS complexes had an interventricular conduction delay. Chest X-ray showed pulmonary congestion and severe increase in the cardiothoracic ratio compatible with four-chamber enlargement. Transthoracic echocardiography (TTE) examination revealed the enlargement of all chambers and severe LV dysfunction. Findings were in favor of cardiomyopathy. On color Doppler

<sup>1</sup>Department of Cardiac Surgery, Ghaem Hospital, School of Medicine, <sup>2</sup>Cardiovascular Research Center, Ghaem Hospital, School of Medicine, <sup>3</sup>Atherosclerosis Prevention Research Center, Imam Reza Hospital, School of Medicine, <sup>4</sup>Students Research Committee, Faculty of Medicine, <sup>5</sup>Department of Cardiology, Imam Reza Hospital, School of Medicine, <sup>6</sup>Department of Cardiology, Ghaem Hospital, School of Medicine, Mashhad University of Medical Sciences

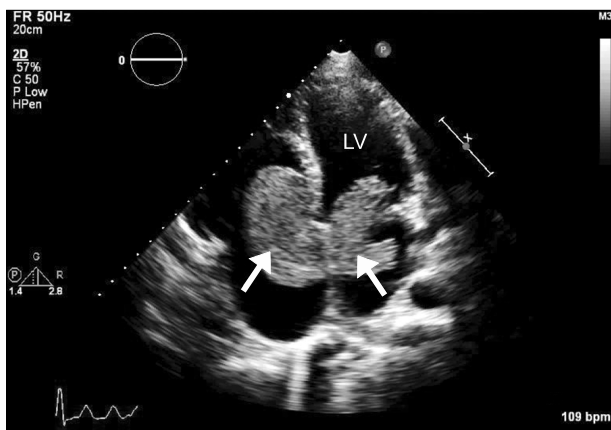
Received: January 27, 2014, Revised: August 4, 2014, Accepted: August 7, 2014, Published online: February 5, 2015

Corresponding author: Leila Bigdelu, Department of Cardiology, Ghaem Hospital, School of Medicine, Mashhad University of Medical Sciences, Mashhad 1365-91775, Iran

(Tel) 98-5118012739 (Fax) 98-5118544504 (E-mail) Bigdelul@mums.ac.ir; bigdelul@gmail.com

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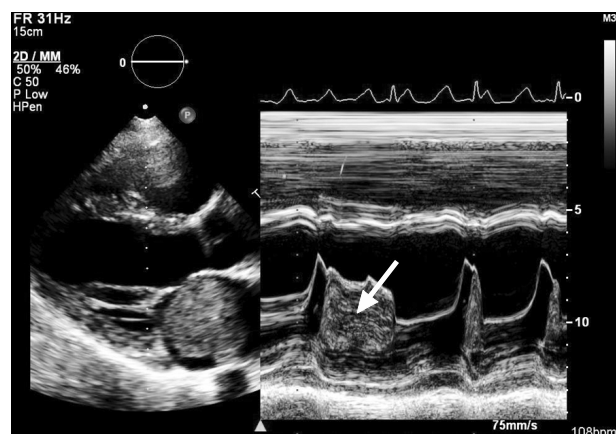
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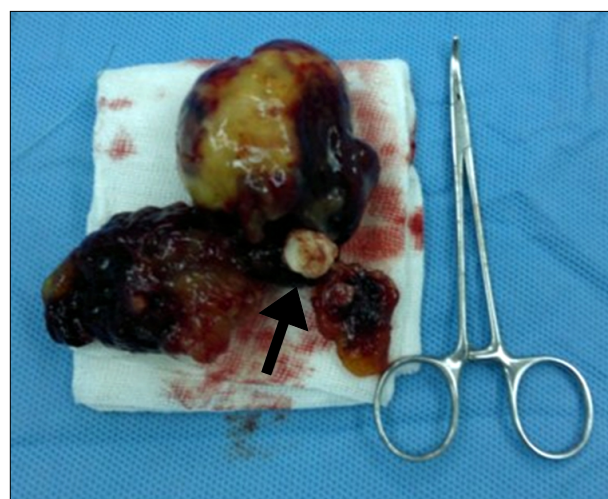
**Fig. 1.** Four-chamber transthoracic view demonstrates biatrial tumors (arrows), protruding through the mitral/tricuspid valve during diastole. LV, left ventricular.

imaging, there was moderate tricuspid regurgitation and mild mitral regurgitation. It also demonstrated two lobulated hyper mobile masses in the atria, a larger one in the right atrium (RA) and a relatively small one in the LA. Both of them were attached to the atrial septum in the fossa ovalis region opposing each other with a small stalk in between. The masses prolapsed through the mitral/tricuspid valve during diastole (Figs. 1, 2).

In order to rule out secondary or metastatic tumors, computed tomography of the lung and abdomen were performed, which did not show any mass. For his severe LV dysfunction, the patient underwent coronary angiography, which was normal. According to the findings, the patient underwent cardiac surgery with cardiopulmonary bypass. Both masses and a small part of the interatrial septum (IAS) were resected (Fig. 3). The IAS was reconstructed with an autologous pericardial patch. Histological examination confirmed the diagnosis of myxoma. The patient was medically treated for heart failure and atrial arrhythmia. The echocardiogram performed in the 6-month follow-up revealed significant improvement of the right and left ventricular function and reduction in the volume of the cardiac chambers. There was no evidence of myxoma recurrence, and the patient showed a normal sinus rhythm. He had long-term follow-up for the management of heart failure symptoms. Serial echocardiography was performed to assess tumor recurrence and the volume and function of cardiac chambers.



**Fig. 2.** Parasternal long-axis view of the myxoma. The M-mode echo shows the movement of the tumor mass into the mitral inflow just after mitral valve opening (arrow).



**Fig. 3.** Macroscopic view of the surgical specimen. Two gelatinous masses attached in the interatrial septum region (arrow).

## DISCUSSION

Myxoma is the most common type of primary cardiac tumor, and the age at onset is usually between 30 and 50 years. Up to 65% of the myxomas occur in the female gender. The left atrium is the most common site of origin (83%), followed by the right atrium (12.7%); 1.3% are biatrial. Only 1.7% and 0.6% of the myxomas occur in the LV and the right ventricle, respectively [1]. Most cases occur sporadically, but in 7% of the cases, myxoma has a genetic origin presenting as the familial Carney syndrome. Cardiac

myxoma associated with the Carney syndrome can occur as a single mass or multiple masses at any age, in any gender, and at any intracardiac location [2]. The best available and non-invasive diagnostic tool for myxoma is TTE. The technique confirms the location and extension of the tumor [3]. Once the diagnosis is established, the patient should undergo prompt surgical resection. Although the rate of recurrence is less than 5% after complete resection, patients should be evaluated on follow-up with serial echocardiography [4].

Patients with cardiac myxoma have a variety of presentations, which are categorized into three groups: (1) constitutional and non-specific manifestations such as weight loss, fatigue, fever, and muscle weakness; (2) embolization of the tumor, which can involve either pulmonary or systemic circulation depending on the myxoma location [5]; and (3) obstructive symptoms including dizziness, dyspnea, and syncope, which are the most frequent presenting features [6]. Left-sided ventricular failure symptoms are seen in these patients and are commonly the result of the mechanical obstructive effect of the mitral valve by the tumor.

Electrocardiogram (ECG) abnormalities are seen in approximately 75% of the patients, demonstrating the evidence of LA or RA enlargement and, rarely, atrial arrhythmia such as atrial fibrillation or flutter [7]. Contrary to what we described for a typical presentation of cardiac myxoma, the present patient was a young man with biatrial myxoma with an unusual presentation of left-sided heart failure symptoms and atrial flutter on ECG. According to our examinations and laboratory evaluation, the most probable cause for his cardiomyopathy seemed to be tachycardia-induced cardiomyopathy (TIC) since the surgical removal of the mass and additional medical treatment improved the cardiac function dramatically.

TIC is a reversible cause of heart failure in the absence of prior history of structural heart disease. TIC is characterized by atrial/ventricular tachycardia which induces atrial/ventricular systolic and diastolic dysfunctions. The degree of cardiac dysfunction correlates with the duration and rate of tachyarrhythmia, and dysfunction presents earlier in higher cardiac rates. In many patients, once the heart rate or rhythm is controlled, the cardiac function and diameters normalize.

There are no diagnostic criteria. The diagnosis of TIC is based on excluding other causes of heart failure and improving the ventricular/atrial performance after controlling the heart rate or rhythm [8].

In summary, the typical presentation of cardiac myxoma is obstructive symptoms secondary to a single mass in the left atrium. It is usually found in middle-aged females. However, the present case describes a young male with biatrial cardiac myxoma causing TIC. TTE is a well-known non-invasive diagnostic modality for cardiac myxoma. The treatment of choice is the surgical removal of the mass.

## CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

## REFERENCES

1. Xiao Z, Meng W, Zhu D, Zhang E. *A typical bilateral atrial myxoma: a case report*. Case Rep Cardiol 2012;2012:460268.
2. Wilkes D, Charitakis K, Basson CT. *Inherited disposition to cardiac myxoma development*. Nat Rev Cancer 2006;6:157-65.
3. Shabestari MM, Fazlinezhad A, Moravvej Z, Tashnizi MA, Azari A, Bigdeli L. *A case of left atrial myxoma with unusual tumor vascularity*. Asian Cardiovasc Thorac Ann 2013 Nov 26 [Epub]. <http://dx.doi.org/10.1177/0218492313513776>.
4. Castells E, Ferran V, Octavio de Toledo MC, et al. *Cardiac myxomas: surgical treatment, long-term results and recurrence*. J Cardiovasc Surg (Torino) 1993;34:49-53.
5. Kim SH, Kim JW, Jang IS, Choi JY, Hwang JY, Seo BK. *Biatrial myxoma: a case report*. Korean J Thorac Cardiovasc Surg 1998;31:1094-6.
6. Jung J, Hong YS, Lee CJ, Lim SH, Choi H, Lee S. *Successful surgical treatment of a right atrial myxoma complicated by pulmonary embolism*. Korean J Thorac Cardiovasc Surg 2013;46:63-7.
7. Pinede L, Duhaut P, Loire R. *Clinical presentation of left atrial cardiac myxoma: a series of 112 consecutive cases*. Medicine (Baltimore) 2001;80:159-72.
8. Nerheim P, Birger-Botkin S, Piracha L, Olshansky B. *Heart failure and sudden death in patients with tachycardia-induced cardiomyopathy and recurrent tachycardia*. Circulation 2004;110:247-52.