International Summit on Science Technology and Humanity
ISETH 2024
ISSN: 2615-1588 (online)

Massive Right Ventricular Myxoma Presenting as Right Heart Failure with Systemic Congestive: A Rare Case Report

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Abstract

Introduction: *Cardiac myxomas are the most common primary cardiac tumors, predominantly located in the left atrium, with only 3–4% occurring in the right ventricle.* ***Case description***: *This report presents a rare case of a massive right ventricular myxoma in a 47-year-old woman, manifesting as right-sided heart failure and systemic congestion. The patient experienced progressive shortness of breath, palpitations, and fatigue over three months. Clinical examination revealed a systolic murmur, while imaging studies, including transthoracic echocardiography (TTE), identified a large mobile mass in the right ventricle obstructing the tricuspid valve. Definitive diagnosis was confirmed through histopathological analysis following successful surgical resection.*

Conclusion: *This case underscores the diagnostic challenges posed by atypical presentations of cardiac myxomas, particularly in the right ventricle. Differentiating myxomas from other cardiac masses requires advanced imaging techniques and clinical precision. Early surgical intervention is critical for favorable outcomes. The report highlights the importance of comprehensive diagnostic approaches and timely management to address severe complications associated with ventricular myxomas.*

Introduction

Cardiac myxomas are the most common cardiac tumors, accounting for 58% to 80% of all cardiac tumors. They usually occur in people between the ages of 30 and 60 years, more frequently in women (male/female ratio 2:1) (Torres et al., 2020). Most myxomas occur in the left atrium (75% to 80%), with only 3%–4% of patients presenting in the right ventricle. These tumors are formed from multipotential mesenchymal cells that undergo neoplastic transformation, and despite their benign nature, their presence can have a significant hemodynamic impact. In a clinical context, there are no specific signs and symptoms of cardiac myxoma, ranging from asymptomatic, shortness of breath, palpitations to syncope secondary to heart failure or ventricular obstruction, requiring careful evaluation through supporting examinations (Lang et al., 2021).

Pathophysiologically, these tumors develop from the endocardium and have the potential to disrupt blood flow through the heart valves if the tumor mass moves and causes obstruction. The variability in size, location and mobility of myxoma adds to the complexity of diagnosis. In addition to the mechanical effect on blood flow, myxoma also has the potential to cause embolization which can lead to infarction or neurological disorders if tumor fragments are released into the systemic circulation(Chojdak-Lukasiewicz et al., 2022).

The main diagnostic examination used in assessing the presence and characteristics of myxoma is echocardiography. This allows the doctor to identify the location, morphology and mobility of the tumor mass which is usually attached to the interatrial septum. Advanced techniques such as Transesophageal Echocardiography (TEE), CT scan, and cardiac MRI are also often utilized to obtain a more detailed picture of the tumor's relationship with other cardiac structures, which is crucial in planning surgical intervention tumors (Abbas, et al., 2015).

Management of cardiac myxoma in patients with significant symptoms generally involves a surgical approach with the use of cardiopulmonary bypass. Complete resection of the tumour, including potentially infected surrounding

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tissue, is the main goal of this procedure to prevent embolization and restore optimal hemodynamic function. This surgical procedure, despite having a relatively low risk of complications, requires a comprehensive pre-operative evaluation to identify the presence of structural heart disease or other comorbidities that may affect the surgical outcome (Lang et al., 2021).

Case Description

A 47-year-old woman was presented unusually as right-sided heart failure, these appeared suddenly for three months and be worsen. The patient complained of shortness of breath along with palpitations and fatigue after strenuous exertion. Otherwise, her past medical history was unremarkable.

On admission the patient reported swelling in her legs and face, while her vital signs including heart rate, blood pressure, blood oxygen saturation, and temperature were all within normal ranges. A physical examination indicated a systolic murmur associated with the pulmonary and tricuspid valves. Laboratory tests and electrocardiograms showed no significant abnormalities

The main symptoms observed were right heart failure and systemic congestion resulting from an obstruction in the right outflow tract. No other notable symptomps were identified. A chest X-ray revealed an enlarged heart (Fig.1), Transthoracic echocardiography (TTE) revealed an enormous mobile mass attached to right ventricular and protruded into the right atrium outflow tract and caused obstruction to the tricuspid valve (Figure2).

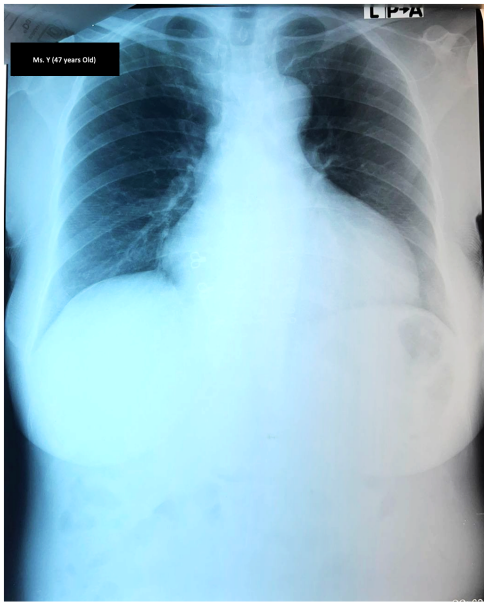

Figure 1. Measured PA chest x-ray 0.61 cardiothoracic ratio

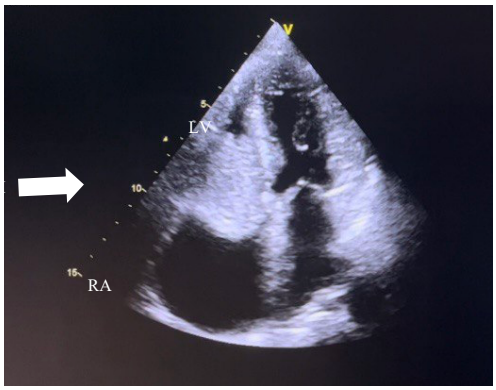

Figure 2. Transthoracic echocardiography shows a large right ventricular myxoma

The right atrium (RA) and right ventricle (RV) were markedly dilated, but the left atrium (LA) and left ventricle (LV) were normal in size. Systolic and diastolic functions of the left ventricle were normal except for reduced systolic

function of the right ventricle (Tapse 1,1cm). This study also found concentric left ventricular hypertrophy. Thrombus, vegetation and pericardial effusion were absent. The mitral, tricuspid, and pulmonary valves appeared normal, but the aortic valve showed moderate regurgitation without calcification. In summary, the diagnosis included a myxoma mass in the right ventricle, moderate aortic regurgitation, dilatation of the right atrium and right ventricle, and concentric hypertrophy in the left ventricle.
The patient referred to an advanced health center for resection of the tumour. The recovery phase after surgery went smoothly without any complications. Histopathological analysis confirmed the presence of a myxoma.

Discussion

Myxomas are the most frequently occurring benign tumors of the heart in adults. Their symptoms can vary in intensity, with severe cases potentially leading to heart failure and fainting as a result of ventricular obstruction. Embolic events, including stroke, are thought to arise from friable tumors and may act as thrombi. Characteristically, myxomas appear as mobile, lobular masses fixed to the interatrial septum of the pedicle in the left atrium, particularly around the fossa ovale. Although less common, myxomas can also occur in the right atrium or right ventricle and present the phenomenon's appearance depending on the location of the necrosis and hemorrhage. It is difficult to distinguish a myxoma from a thrombus when the myxoma does not move and is abnormal in the atrium (Lang et al., 2021).

Myxoma symptoms are diverse and nonspecific, ranging from asymptomatic cases to severe cases such as occlusion, embolism, and stroke (Chojdak-Lukasiewicz et al., 2022). Left atrial tumors pose a significant risk for embolism and can interfere with blood flow, such as mitral stenosis, which can lead to heart failure or sudden death if left untreated (Liu et al. et al., 2020). In this case, a large myxoma causes serious complications and requires emergency surgery.

Their location and morphology: (i) nonspecific systemic symptoms, (ii) embolization, (iii) intracardiac obstruction and (iv) secondary metastatic effects (Naser et al., 2021). Constitutional symptoms are seen in 34% of cases, and embolic symptoms were reported in 29%. Symptoms of intracardiac obstruction, including chest pain, shortness of breath, syncope, and angina, are present in about 67% of patients, with 28% developing acute decompensated heart failure (Naser et al., 2021).

Systemic embolization is frequently caused by left-sided myxomas, whereas pulmonary embolization is typically caused by right-sided tumors (Lee et al, 2024). During imaging studies, asymptomatic myxoma is frequently discovered by chance (Spartalis et al., 2017).

Table 1. Clinical manifestation in patients with cardiac myxoma (Samanidis, 2020)

Study	Patients, n	Dyspnea, %	Systematic embolization, %	Systematic or constitutional manifestations, %
Pinede *et al*	122	67	29	34
Tasoglou *et al*	67	76.1	17.9	17
Patil *et al*	62	62.9	10	23
Wu *et al*	112	50	13	27
Lee *et al*	59	62.7	22	16.9
Vaideeswar *et al*	84	84.4	15.6	4.7
Garrati *et al*	98	68	40	22
Bordalo *et al*	40	35	15	23
Obrenović-Kirćanski *et al*	74	79.3	20.2	8
Vroomen *et al*	82	70	15.9	–
He *et al*	162	48.8	–	–
Aval *et al*	42	88	7.1	21.4

Shah *et al*	194	–	–	–
Lin *et al*	68	57	25	33
Anvari *et al*	73	40	21.9	–
Yóksel *et al*	43	51.4	21.6	32.4
Bainchi *et al*	30	–	6.7	–
Abu Abeeleh *et al*	27	30	33	37
Lee *et al*	93	58	10.8	2.2
Karabinis *et al*	153	47.7	4.6	0.7
Nehaj *et al*	41	50	20	4.9
Gür *et al*	23	53	–	43.4
Cianciulli *et al*	53	56	24.5	26.4
Jiang *et al*	403	13.3	14.9 –	–

Our case describes a right ventricular cardiac myxoma which is rare due to its prevalence and location. The symptoms are also unfamiliar and uncharacteristic. Shortness of breath in right-sided heart failure must be differentiated from other obstructive heart diseases. Because of the non-specific laboratory results, the diagnosis in this case necessitates a high level of suspicion and precision, and echocardiography plays an essential role. Differentiate myxomas from other cardiac masses, like thrombi, can be challenging, despite echocardiography being the primary imaging technique for assessing cardiac tumors (Abbas, et al., 2015). Myxomas typically present as clearly defined, smooth, oval or lobular formations with a slender stalk, often found at the fossa ovalis. These tumors are generally quite mobile and may extend through the atrioventricular valves during diastole, resulting in brief interruptions in blood flow.

Even though myxoma are usually isolated entities, they might show multifactorial involvement in relatives syndromes. Although recurrence rates range from 2% to 5%, early surgical resection outcomes in positive results. This is frequently due to insufficient initial excision or undiagnosed secondary foci. This emphasizes that in order to guarantee total tumor removal, a comprehensive intraoperative transesophageal echocardiographic assessment is required (Lang et al., 2021).

In summary, this case highlights the challenges involved in diagnosing and managing ventricular myxomas, particularly when they exhibit severe symptoms that can resemble or obscure other cardiac issues. In this instance, significant tricuspid valve regurgitation was concealed by the presence of the myxoma. A solid grasp of fundamental medical science is crucial for accurate diagnosis. Additionally, advanced imaging techniques and timely surgical intervention are vital for achieving positive results.

Conclusion

Besides treating systemic congestive problems, finding the cause is really helpful in diagnosis. More comprehensive understanding of the symptoms is expected to help improve the diagnosis and treatment of right ventricular myxoma.

Consent Form

The researcher requested verbal consent from the patient. The researcher explained to the patient that the patient's experiences would be written up for the research, and the patient agreed to this.

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