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# Heart Failure Caused by Incidentally Discovered Right Atrial Myxoma: A Rare Case Report

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**ABSTRACT**

*Primary cardiac tumors, though uncommon, play a significant role in medical practice. Cardiac myxoma is the most common benign cardiac tumor, characterized by varying symptoms depending on the location and size of the tumor. We report the case of a 44-year-old woman with complaints of shortness of breath, upper abdominal pain, and leg oedema. Right atrial myxoma was incidentally found after an echocardiography examination, which is an essential tool for detecting and diagnosing cardiac tumors. The patient exhibited clinical improvement with inotropic therapy and antibiotics and was referred for surgical removal of the tumor. Cardiac myxoma surgical procedures generally have a favorable prognosis with a high survival rate. However, postoperative complications such as arrhythmias and infections require close monitoring. Thus, early diagnosis and appropriate management are essential in addressing cardiac myxoma.*

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## Introduction

Primary cardiac tumors are rare, with an overall incidence rate reported to be less than 0.1%, primarily consisting of benign neoplasms (Vroomen et al., 2015). Cardiac myxoma is the most common benign cardiac tumor, accounting for nearly 50% of cases, followed by lipomas and fibromas. Recent research conducted in Spain reported adjusted incidence rates of approximately 1.6 cases per million population when standardized to the global population and 2.1 cases per million when standardized to the European population (Pérez-Andreu et al., 2019).

Unique macroscopic and microscopic features characterize cardiac myxoma. Microscopically, myxoma consists of spindle-shaped cells of varying sizes, ranging from small to large. The nucleus of myxoma cells is typically round, oval, or elongated, and their cytoplasm tends to be eosinophilic, appearing pinkish. Moreover, myxoma cells often exhibit an excess in cell count. Macroscopically, myxoma can assume a round or oval shape, sometimes featuring a stalk. It has a gelatinous consistency with a soft texture

on palpation. The surface can be smooth with regular edges or villous with irregular borders, and it may even have multiple lobes, resembling fragile gelatine (Cianciulli et al., 2019; Hasan et al., 2020). The color of myxoma typically ranges from white to yellowish or brown, with varying sizes, averaging around 2 cm to 6 cm but occasionally growing conspicuously large, up to 15 cm. The weight of myxoma also varies, ranging from 15 grams to 180 grams (Mustafa et al., 2018).

Clinical manifestations of myxoma vary depending on factors such as size, location, shape, growth rate, stalk length, mobility, and degenerative changes within the tumor, such as hemorrhage or cell necrosis (Yuan et al., 2017). Myxoma can range from being asymptomatic (when the tumor size is less than 4 cm) to life-threatening symptoms, including vessel obstruction due to emboli (Aiello & Campos, 2016). While clinical presentations vary, the classical triad of myxoma, consisting of constitutional or systemic symptoms, obstructive symptoms, and embolic events, remains a distinct characteristic of the tumor (Alassal et al., 2019). Systemic symptoms include fever with high body temperature, weakness, myalgia (muscle pain), arthralgia (joint pain), weight loss, and loss of appetite (Yuan et al., 2017). Obstructive symptoms may involve dyspnea, recurrent pulmonary edema, and syncope. Symptoms related to embolic events encompass stroke, chest pain, limb ischemia, and the discovery of masses in distal extremities (Velez Torres et al., 2020).

Primary cardiac tumors are rare, with an incidence of less than 0.1%, predominantly consisting of benign neoplasms such as myxomas. Among these, right atrial myxomas are even less common, with the majority of cases involving the left atrium. While cardiac myxomas are well-documented, the occurrence of incidentally discovered right atrial myxomas presenting as heart failure remains underexplored. Previous studies have predominantly focused on left atrial myxomas, their clinical manifestations, and surgical outcomes (Oktaviono et al., 2024), leaving a gap in understanding the distinct characteristics, clinical presentation, and challenges associated with right atrial myxomas.

This case report addresses this gap by presenting a rare instance of heart failure caused by a right atrial myxoma discovered incidentally. Unlike typical cases where left atrial involvement dominates the discussion, this report highlights the unique diagnostic and management challenges posed by right atrial myxomas. The findings underscore the critical role of advanced imaging techniques, such as echocardiography, in early detection and management while also providing insights into the clinical course and outcomes of this unusual presentation. This contributes to the growing body of knowledge on the less commonly reported manifestations of cardiac myxomas.

**Case**

A 44-year-old woman presented with a chief complaint of upper abdominal pain radiating to the chest for one week before hospital admission. The patient also complained breathing difficulty, which worsened when lying flat but improved when bending forward. She experienced orthopnea and paroxysmal nocturnal dyspnea. Additionally, the

patient complained of edema in both lower extremities. There were no reports of presyncope or syncope.

Upon physical examination, the patient appeared unwell with increased respiratory effort, requiring up to 10 liters of oxygen per minute (lpm), while other vital signs were within normal limits. Heart sounds were normal, and the pulse was regular. The jugular venous pressure was elevated by 6 cm above the sternal angle, and a grade 2/6 diastolic murmur was audible at the apex.

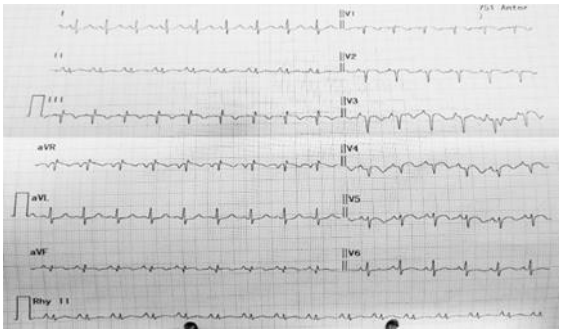



**Figure 1. a)** Patient's electrocardiography

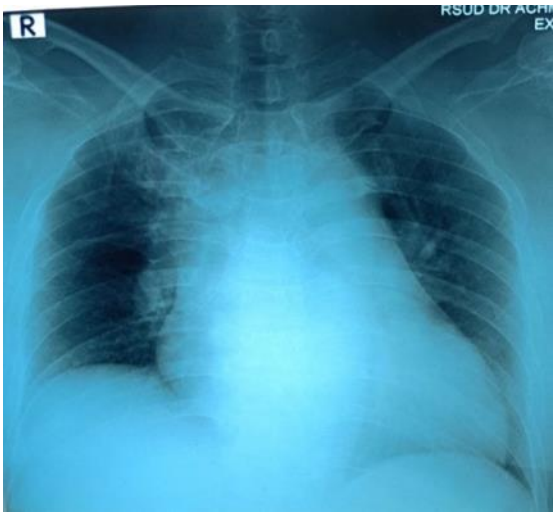



**Figure 1 b)** Chest x-ray of the patient with bronchopneumonia, cardiomegaly without pulmonary congestion, and elevation of the right diaphragm

The patient underwent transthoracic echocardiography (TTE), which revealed significant enlargement of the right atrium (RA) and right ventricle (RV), along with the presence of a mass in the RA (Video 1). The patient's left ventricular ejection fraction (LVEF) was 40%, with a D-shaped morphology. Valvular function assessment revealed mild aortic regurgitation (AR), mild mitral regurgitation (MR), and moderate tricuspid regurgitation (TR).

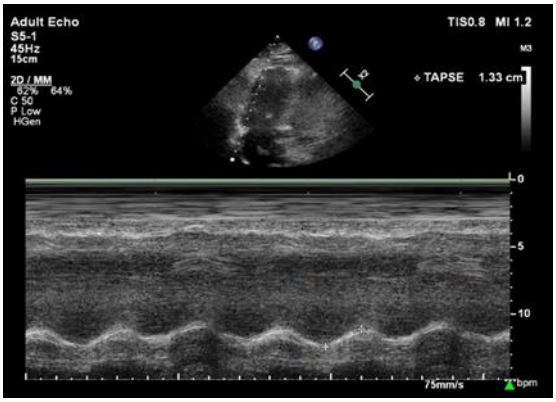
Based on the chest X-ray and echocardiography results, the patient was diagnosed with right atrial myxoma with accompanying bronchopneumonia. For the initial therapy, the patient received the following medications: cefotaxime 2x1 gram as per the microbial

pattern, furosemide 2x20 mg, atorvastatin 1x10 mg, carvedilol 1x6.25 mg, clopidogrel 1x75 mg, and acetylcysteine 3x200 mg. The patient also experienced cardiogenic shock on day 1 of treatment, and thus received inotropic therapy with dopamine at 10 mcg/kg/minute. During the subsequent days of treatment, the patient responded well to therapy. After eight days of close monitoring, the patient was discharged with the following outpatient medications: carvedilol 1x6.25 mg, clopidogrel 1x75 mg, atorvastatin 1x10 mg, acetylcysteine 3x200 mg, spironolactone 2x25 mg, and was referred for surgical intervention therapy.

**Result and Discussion**

Myxoma is the most common primary heart tumor which occurs in the adult population, with the left atrium often being the most frequently affected location (Saha et al., 2023). Myxoma of the right atrium has a more stable and compact characteristic compared to left atrial myxomas, with broader attachments to the septum or atrial wall (Saha et al., 2023). Left atrial myxomas produce symptoms similar to mitral stenosis, such as shortness of breath and hemoptysis, typically with a brief, episodic nature, which can lead to syncope and rapidly progress to heart failure. Right atrial myxomas can also obstruct the tricuspid valve, with manifestations possibly leading to heart failure (Agstam et al., 2020; Alamri et al., 2019) or even collapse (Agrawal et al., 2018). Right atrial myxomas can also exhibit episodic symptoms and may have a rapid progression.

In this paper, we present the case of a 44-year-old woman with the chief complaint of worsening shortness of breath over the week before hospital admission. Electrocardiogram (ECG) findings often do not yield specific results, and signs of right atrial hypertrophy were observed in the patient. Radiographic examination typically shows a picture of cardiomegaly, as seen in this patient, which represents heart enlargement. However, cardiomegaly is nonspecific for myxomas and can be observed in various heart conditions (Hasan et al., 2020).



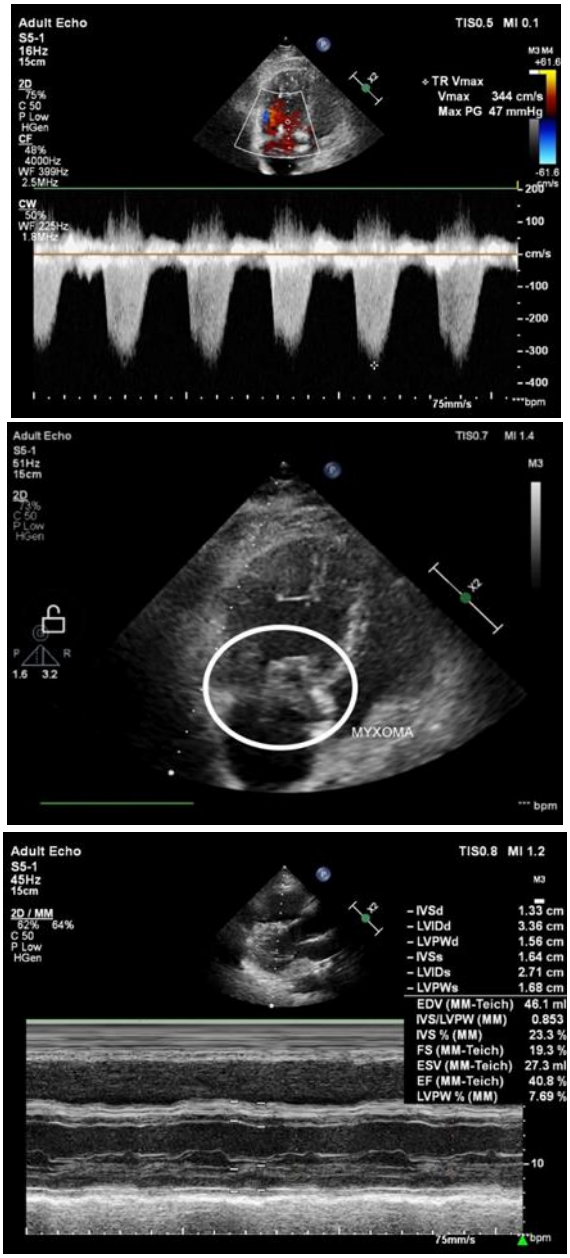



**Figure 2. Patient's echocardiography**

The patient also underwent echocardiography. Echocardiography, including transthoracic echocardiography (TTE) and transesophageal echocardiography (TEE), is a commonly used and highly useful imaging method for diagnosing heart myxomas (Alassal et al., 2019). Echocardiography can detect the presence of masses in the heart, and TEE is generally more sensitive than TTE (Hasan et al., 2020). Echocardiography can also provide information on the size, morphology, site of attachment of the tumor, and its impact on blood flow in the heart. Echocardiography should be used to confirm the diagnosis of heart myxoma if there are; 1) a diastolic murmur at the apex that changes with posture and no history of rheumatic heart disease; 2) recurrent arterial emboli; 3)

syncopal episodes influenced by postural changes; 4) prolonged subfebrile fever; 5) anemia without rheumatic heart disease or infective endocarditis, and; 6) refractory heart failure with a poor response.

The patient underwent general condition improvement and treatment for bronchopneumonia infection, after which she was referred for outpatient surgery. Surgical intervention is the primary choice for addressing heart myxoma. The prognosis for patients after surgery is generally good, both in the short and long term (Alassal et al., 2019; Kusumoto et al., 2019). The risk of mortality during surgery is low, with approximately 0.5% mortality rate, and the postoperative mortality rate is around 2% (Hasan et al., 2020). Even in elderly patients, survival rates after surgery are reported to be favourable (Cianciulli et al., 2019). One common technique used is the approach through the right atrium and transeptal approach, where the left atrial tumor is removed through the atrial septum and followed by simple closure (Cianciulli et al., 2019). Currently, this technique is typically performed via sternotomy using cardiopulmonary bypass, as it is considered safe and has a low mortality rate (Hasan et al., 2020). Although heart myxoma surgery is generally successful, some postoperative complications can occur. Arrhythmia is the most common complication (33.3%), followed by infection (19.0%), vasoplegic syndrome (19.0%), pericardial effusion (14.2%), acute kidney injury (9.5%), atrial septal defect (ASD) (9.5%), stroke (4.8%), and pulmonary embolism (4.8%) (Cianciulli et al., 2019).

**Limitations of the Case Report**

Despite its contributions, this case report has several limitations. First, it focuses on a single patient, limiting the generalizability of findings to broader populations. Second, follow-up details post-surgery, such as long-term clinical outcomes and quality of life, were unavailable, which could have provided further insights into the prognosis and recovery process. Additionally, the case lacks a comprehensive genetic or molecular analysis of the myxoma, which could contribute to understanding the tumor's etiology and potential hereditary factors. Future studies with larger sample sizes and a multidisciplinary approach are necessary to better elucidate the unique characteristics and management of right atrial myxomas.

**Conclusion**

The incidental discovery of cardiac myxomas, as demonstrated in this case, highlights the significance of thorough cardiac evaluation in patients with unexplained cardiovascular symptoms. Echocardiography remains a valuable diagnostic tool for early detection and appropriate management of cardiac myxomas, preventing life-threatening complications such as heart failure. Early diagnosis and timely surgical intervention are crucial in managing cardiac myxomas successfully.

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