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Original Research Article

Every Shortness of Breath is Not Asthma

Amit Bhushan Sharma[1], Richa Aggarwal[2], RR Dutta[3], Madhur Jain[4], Shalini Sharma[5], Sanjay Gupta[6]

[1]Head and Senior Consultant, Department of Cardiology, Paras Hospital, Gurgaon, IND
[2]Consultant, Department of Cardiology, Paras Hospital, Gurgaon, IND
[3]Consultant, Department of Internal Medicine, Paras Hospital, Gurgaon, IND
[4]Consultant, Department of Cardiology, Paras Hospital, Gurgaon, IND
[5]Consultant, Department of Radiology, Motherhood Hospital, Gurgaon, IND
[6]Consultant, Department of Internal Medicine, Paras Hospital, Gurgaon, IND
[7]Head and Senior Consultant, Department of Cardiology, Paras Hospital, Gurgaon, IND

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Corresponding author: Amit Bhushan Sharma
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Abstract:

Background: Shortness of breath is a common symptom in various cardiac and pulmonary conditions. Intracardiac tumors are a rare but well-known etiology of shortness of breath. Cardiac hemangiomas are a rare subtype of primary cardiac tumors, accounting for approximately 2-5% of all primary cardiac tumors. Diagnosis of cardiac hemangiomas can be challenging, and imaging plays a crucial role in the diagnosis. Treatment of cardiac hemangiomas depends on the size and location of the tumor and the presence or absence of symptoms. In this report, the importance of Two-dimensional echocardiography and cardiac MRI as useful tools for diagnosing cardiac hemangiomas is highlighted.

Case Summary: A 63-year-old woman presented with a 3-month history of shortness of breath and cough. Physical examination revealed a diastolic murmur and normal lung examination. Imaging studies, including echocardiography and cardiac MRI, confirmed a large vascular tumor attached to the right atrium. Percutaneous embolization was performed to reduce the risk of bleeding during surgery. The tumor was successfully resected, and histopathological examination confirmed a benign vascular tumor (hemangioma). The patient's symptoms improved, and follow-up examinations showed no evidence of tumor recurrence.

Conclusion: The cardiac hemangiomas are rare benign tumors that can present with a variety of symptoms. Two-dimensional echocardiography and cardiac MRI are useful tools for diagnosing these tumors. Surgical resection is the treatment of choice, but preoperative embolization can be considered in cases where surgery may be associated with a high risk of bleeding or other complications. The use of PVA particles for embolization is safe and effective in the treatment of cardiac tumors.

Keywords: Asthma, Shortness of Breath, Cardiac Tumours, Haemangiomas, Right Atrium.

Introduction

Shortness of breath is a common symptom of various cardiac and pulmonary conditions. Among cardiac causes, intracardiac tumors are a rare but well-recognized etiology. Cardiac tumors can be primary, originating from the heart, or secondary, originating from other organs and metastasizing to the heart. Primary cardiac tumors are rare, with an incidence of approximately 0.02% in the general population, and approximately 75% of primary cardiac tumors are benign, with myxomas being the most common type [1].

Cardiac hemangiomas are a rare subtype of primary cardiac tumors, accounting for approximately 2-5% of all primary cardiac tumors. Hemangiomas are benign vascular tumors that originate from the endothelial cells lining blood vessels. They can occur in any part of the body, including the heart, but are more commonly found in the skin, liver, and spleen. The majority of cardiac hemangiomas are located in the right atrium, with the left atrium and ventricles being less commonly affected. Cardiac hemangiomas can be solitary or multiple and are usually small, with a size ranging from a few millimeters to 5 cm in diameter. The clinical presentation of cardiac hemangiomas is similar to that of other primary cardiac tumors, with dyspnea being the most common symptom [2,3].

Diagnosis of cardiac hemangiomas can be challenging, and imaging plays a crucial role in the diagnosis. Echocardiography is the primary imaging

modality for the diagnosis of primary cardiac tumors, and it can provide information on the location, size, and characteristics of the tumor. Further imaging, such as CT or magnetic resonance imaging (MRI), may be required to provide additional information or to assess for metastatic disease. Histopathological examination of the excised tumor is required for a definitive diagnosis [4].

Treatment of cardiac hemangiomas depends on the size and location of the tumor and the presence or absence of symptoms. Surgical resection is the mainstay of treatment for symptomatic or rapidly growing tumors, while observation and conservative management are recommended for asymptomatic, small tumors. The prognosis of cardiac hemangiomas is generally excellent, with a low incidence of recurrence. In this report, we present a case of shortness of breath due to the presence of a primary tumour attached to the right atrial free wall, highlighting the importance of Two-dimensional echocardiography and cardiac MRI as a useful tools for diagnosing these tumors, and appropriate management of complications.

Case Presentation

The patient was a 63-year-old woman who presented with a history of shortness of breath and cough since 3 months. She had no history of heart disease in her family and no anginal chest pain. Dyspnea increased on exertion, and physical examination revealed a diastolic murmur heard over the left sternal border. Her blood pressure was 124/76 mmHg, heart rate 90 beats per minute, respiratory rate 20 breaths per minute, temperature 98.20F, and oxygen saturation by pulse oximetry was 94% on room air. Lung examination was normal. ECG did not show any ST-T changes, and x-ray chest did not reveal any evidence of pneumonia or pleural effusion. Blood examination revealed haemoglobin 11 g/dl, total leucocyte count 14.8 x 10 3/uL, platelet count 320 x103/uL, creatinine 1.0 mg/dl, and troponin=0.02ng/ml.

Two-dimensional echocardiography showed a large pedunculated mass of 12x7 cm attached to the right atrial free wall (RA) (Figure 1). Cardiac MRI confirmed the mass as a vascular tumour attached to the right atrium (Figure 2). Coronary angiography revealed a large feeder artery vessel arising from the left circumflex artery (Lcx) and supplying the RA tumour (Video 1).

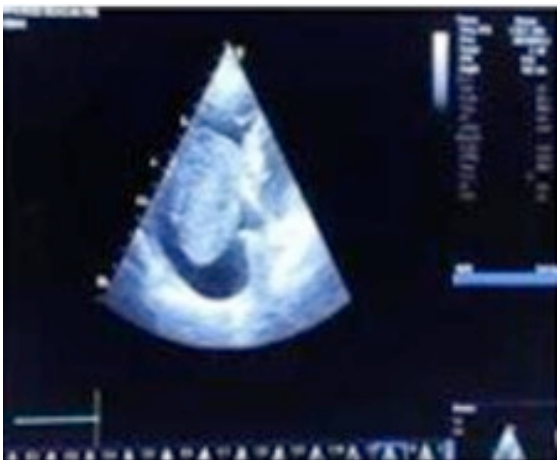
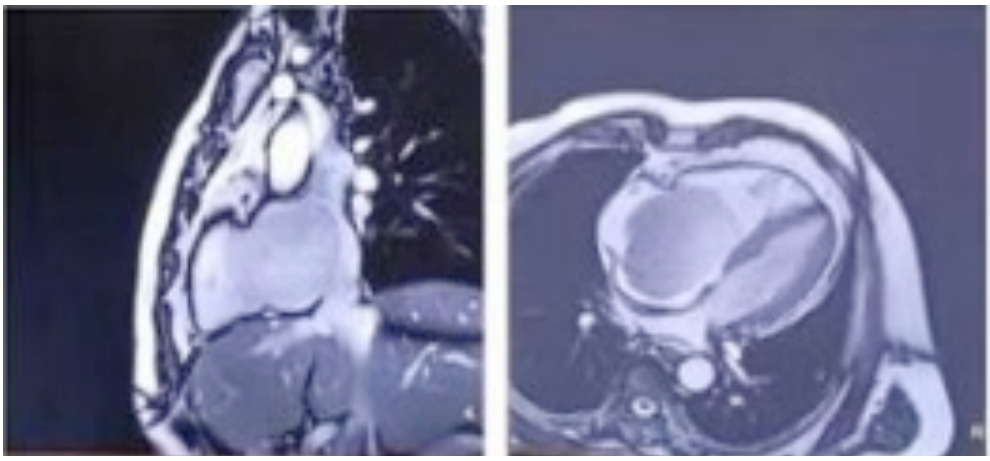


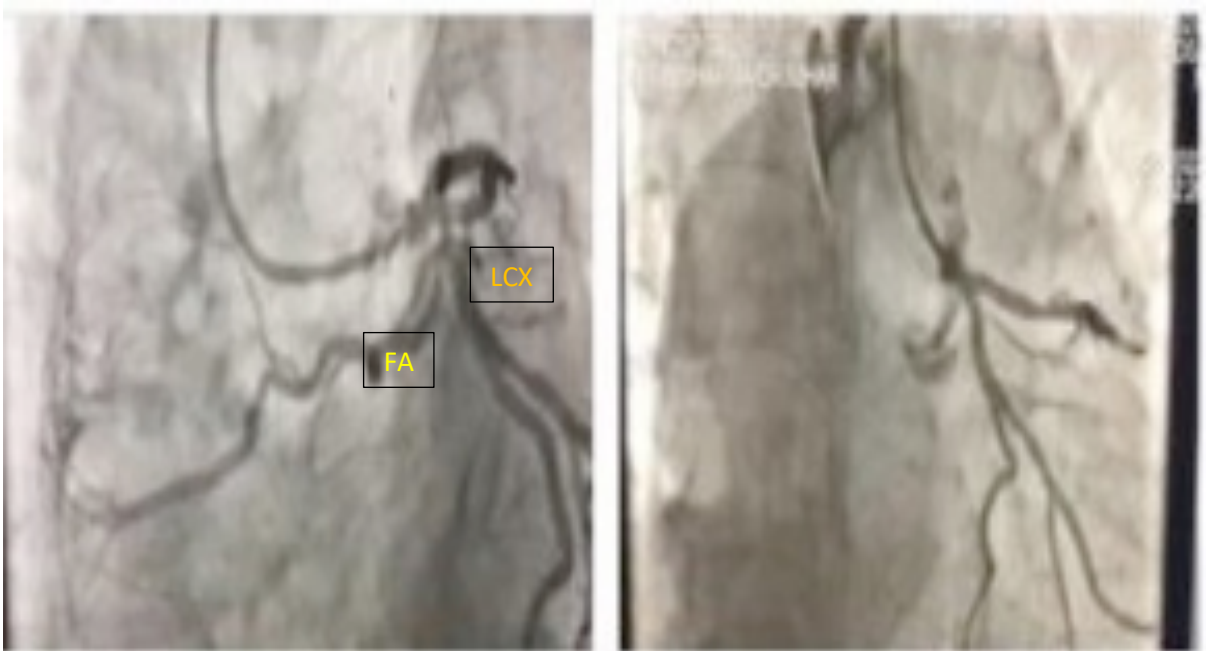
Figure 1: A huge pedunculated mass attached to RA free wall on Two-dimensional echocardiography



(A) (B)

Figure 2: (A and B) Cardiac MRI showing large vascular tumour (T) in Right atrium (RA)

To prevent uncontrolled hemorrhage during surgery, it was planned to do debulking of the tumour by percutaneous embolization. A 7 F Extra backup support (EBU) guiding catheter was taken, and a 2.5 5f microcatheter was passed through it up to the feeder artery in the Lcx (Figure 3 A and Video 2). Polyvinyl alcohol (PVA) particles 255-350 and 350-500 were injected in the feeder artery through the microcatheter (Figure 3 B and Video 3). Post-embolization coronary angiography showed that the feeder artery was completely obliterated by the PVA particles (Video 4). The electrocardiography during the procedure did not show any ST segment changes. The debulked tumour was surgically resected successfully on the next day without much blood loss (Figure 4).



(A) **(B)**

Figure 3: A. Coronary angiography showed the feeding artery (FA) and hypervasculartumor stains. B. Post embolization by PVA particles angiography showed that the feeding vessel was occluded completely

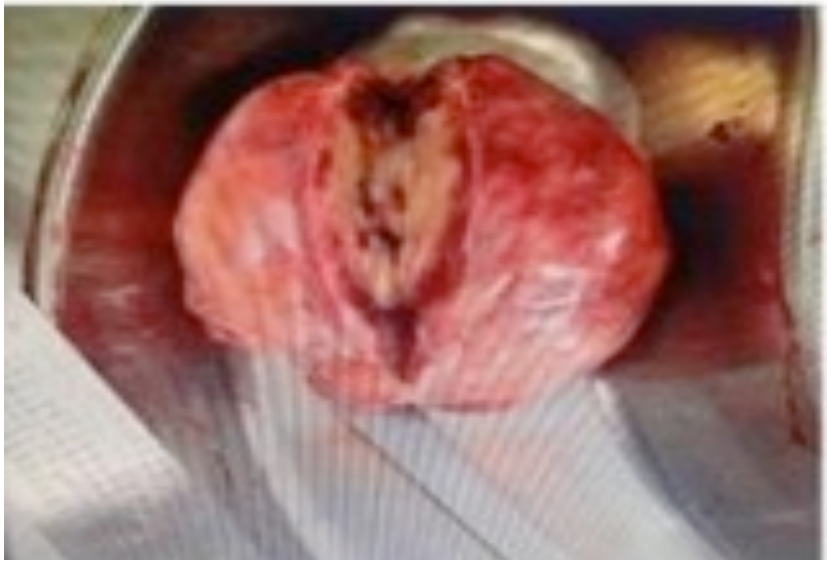


Figure 4: Tumour after surgical resection

Histopathological examination of the excised tumor revealed a benign vascular tumor, consistent with a hemangioma. The patient's symptoms improved following surgery, and she was discharged on postoperative day 6 without any complications. Follow-up TTE at 1 month and 6 months post-surgery showed no evidence of residual tumor or recurrence.

Discussion

Primary cardiac tumors are rare, with an estimated incidence of 0.001-0.3% in the general population [5]. Among these, benign tumors are more common than malignant ones, and approximately 75% of all cardiac tumors are myxomas [6]. Hemangiomas are rare, accounting for less than 2% of all cardiac

tumors[7]. In the present case, the patient had a large pedunculated vascular tumor arising from the right atrium, which was confirmed as a hemangioma on histopathological examination.

Cardiac hemangiomas are benign tumors that arise from blood vessels, and they can involve any part of the heart [8]. The symptoms of cardiac hemangiomas vary depending on their location and size. Small tumors may be asymptomatic and detected incidentally on imaging studies, while larger tumors may cause symptoms such as palpitations, dyspnea, chest pain, cough, and syncope [9]. In the present case, the patient had dyspnea and cough since 3 months, which were attributed to asthma until the diagnosis of the hemangioma was established.

Two-dimensional echocardiography is a useful tool for diagnosing cardiac tumors. It can provide information about the location, size, shape, and mobility of the tumor[10]. In the present case, echocardiography revealed a large pedunculated mass arising from the right atrium. Cardiac MRI is also a valuable imaging modality for characterizing cardiac tumors. It can provide information about the extent and relationship of the tumor to surrounding structures, as well as its tissue characteristics [11]. In the present case, cardiac MRI confirmed the mass as a vascular tumor attached to the right atrium.

Surgical resection is the treatment of choice for most cardiac tumors, including hemangiomas[12]. However, in cases where surgery may be associated with a high risk of bleeding or other complications, preoperative embolization can be considered to reduce the size and vascularity of the tumor[13,14]. In the present case, percutaneous embolization of the feeder artery was performed to prevent uncontrolled hemorrhage during surgery. Polyvinyl alcohol (PVA) particles were used for embolization, which have been shown to be safe and effective in the treatment of cardiac tumors[15,16].

Conclusion

The cardiac hemangiomas are rare benign tumors that can present with a variety of symptoms depending on their size and location. Diagnostic imaging tools such as two-dimensional echocardiography and cardiac MRI are helpful in identifying the tumor and its characteristics. Surgical resection is the preferred treatment, but in cases where surgery is associated with high risk, preoperative embolization can be considered to reduce the size and vascularity of the tumor. In this case, percutaneous embolization was successfully performed with PVA particles, leading to successful surgical resection and resolution of the patient's symptoms without any complications.

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