

# Diagnosing obstructive shock: Echocardiography is the third eye of a vigilant intensivist

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## Abstract

Training in echocardiography is essential for an intensivist. We present a rapidly fatal case of obstructive shock where a vigilant intensivist could diagnose left atrial mass obstructing the mitral inflow as the etiology of shock.

**Keywords:** Atrial mass, echocardiography, obstructive shock

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## Introduction

The appropriate management of circulatory shock is always based on a thorough understanding of the underlying pathophysiologic mechanism. Perhaps, the handiest tool to establish the etiology at the bedside by an intensivist is a point-of-care echocardiography. We report a fatal case of a young female who presented in the middle of the night with refractory shock. A diagnosis of a left atrial mass prolapsing into the left ventricular cavity as the etiology of shock could be established antemortem.

## Case Report

A 21-year-old female was admitted to the intensive care unit at midnight with worsening breathlessness of 2 h duration. She was having an intermittent fever with cough for the past 3 months; however, she was attending her college regularly. She also had some retrosternal heaviness with “burning sensation” for the same duration. An upper gastrointestinal endoscopy performed a day before was apparently normal. On

admission, she was restless, diaphoretic with cold clammy and cyanotic extremities, heart rate 120/min, and blood pressure 40 mmHg (by palpation). Systemic examination was unremarkable.

Prompt resuscitation was initiated with a fluid bolus of 1000 ml normal saline, noradrenaline infusion, rapid sequence intubation, and mechanical ventilation. Meropenem was given empirically. Electrocardiogram showed sinus tachycardia. Arterial blood gas showed - pH 6.76,  $PCO_2$ -75.9 mmHg,  $PO_2$ -42 mmHg,  $HCO_3$ -10.3 mmol/L, and lactate - 11.9 mmol/L. Transthoracic echocardiography was done which showed a lobulated mass in the left atrium with a stalk attached to the lateral wall of atrial [Figure 1], which was moving to and fro across the mitral valve [Figure 2]. Chamber sizes appeared slightly dilated on the right side with no regional wall motion abnormality, no apparent valvular pathology, and left ventricular ejection fraction

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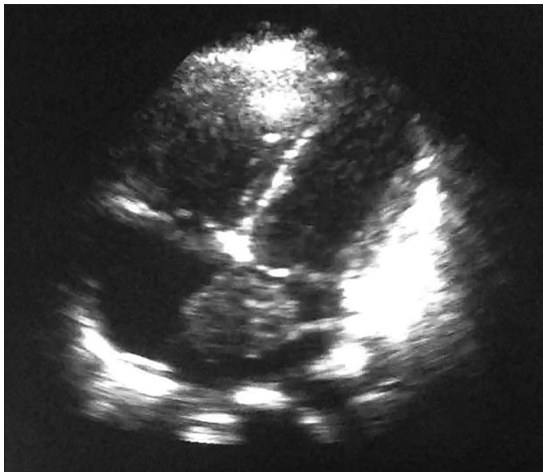
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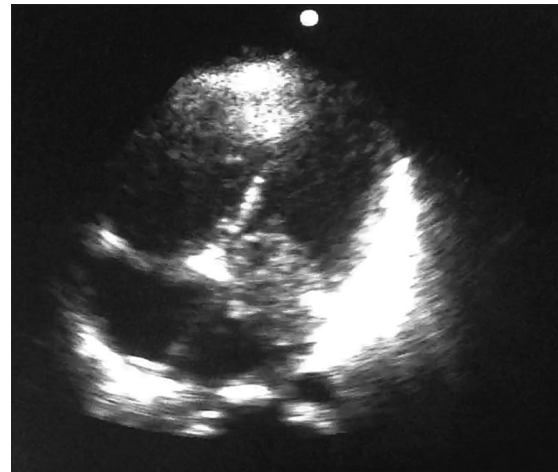
**Figure 1:** Left atrial mass with stalk

of 50%–60%. A provisional diagnosis of cardiac tumor, possibly left atrial myxoma with obstructive shock was made, and the cardiothoracic surgeon was consulted; however, the patient had a cardiac arrest and expired before any definite surgical intervention could be executed.

## Discussion

Cardiac tumors are rare with the reported incidence of 0.0017%–0.19%. Three-fourth of them are typically benign, myxoma being the most common of these benign tumors.<sup>[1]</sup> Myxomas are usually left atrial in origin, however right atrial, ventricular myxomas, and biatrial myxomas are also reported in literature.<sup>[2,3]</sup> Cardiac myxomas can present with symptoms secondary to obstruction of blood flow, nonspecific constitutional symptoms such as fever, malaise, arthralgias, rash, or thromboembolic phenomena such as stroke or transient ischemic attack.<sup>[4,5]</sup> Sudden cardiac death has been reported in literature, the incidence being only 0.01%–0.005%. Syncope is reported as the most common symptoms in patients with sudden cardiac death, and the cause is obstruction of blood flow either due to ball valve mechanism or due to embolization of tumor to coronary circulation.<sup>[6]</sup>

Atrial thrombi can masquerade as myxomas. They are usually associated with a valvular disease or atrial fibrillation.<sup>[7]</sup> However, atrial thrombi have been reported in patients with sinus rhythm.<sup>[8]</sup> An atrial thrombus may present with refractory shock but is usually associated with a valvular pathology or atrial fibrillation.<sup>[7]</sup> Echocardiography helps in distinguishing cardiac myxomas from atrial thrombus. A thrombus usually arises from the posterior wall of the atrium and is generally immobile and does not have the characteristic stalk.<sup>[5]</sup>



**Figure 2:** Mass prolapsing through the mitral valve

In our patient, the cardiac mass was pedunculated with a stalk arising from the lateral atrial wall instead of the interatrial septum which is the common site of origin of an atrial myxoma. Atypical origin of atrial myxomas from the atrial wall and multiple myxomas have been documented.<sup>[9]</sup> Atypical myxomas are known to occur as a part of a familial syndrome known as Carney syndrome.<sup>[10]</sup> Family history taken retrospectively could not confirm familial myxoma syndromes, although we agree history alone may not suffice, and echocardiography could not be done to definitely rule out any familial syndrome. Our patient had no valvular pathology and was in sinus rhythm. Based on the highly mobile nature of the mass with a characteristic stalk, we diagnosed it as an atrial myxoma; however, we could not do any histopathological test for confirmation.

## Conclusion

Cardiac mass presenting with shock is rare. They need to be diagnosed at the earliest, so as to initiate timely interventions. Echocardiography remains the only modality capable of making a point of care diagnosis in cases of cardiac masses and makes an invaluable tool in the armament of an intensivist. Gaining this skill has become imperative for an intensivist, when making an early diagnosis may streamline the treatment and prevent costly and, sometimes, futile investigations.

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## Conflicts of interest

There are no conflicts of interest.

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