

## Case Report

# Diaphragmatic hernia mimicking an atrial mass: a two-dimensional echocardiographic pitfall and a cause of postprandial syncope

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### Summary

A large hiatal hernia constitutes a form of posterior mediastinal mass that can encroach on the posterior aspects of the heart. During two-dimensional echocardiography this phenomenon may be confused with an intra-atrial mass or various other posterior mediastinal masses. Furthermore, such a large hiatal hernia encroaching on the heart may cause syncope. We present such a case and the various possible mechanisms of syncope, as well as review the two-dimensional echocardiographic pitfalls in these patients.

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We present a case of postprandial syncope in which a large diaphragmatic hernia produced the two-dimensional echocardiographic appearance of an obstructing left atrial mass. Surgical correction of the hernia completely prevented any further syncope episodes.

### Case Report

A 64-year-old man was admitted to hospital following an episode of postprandial syncope, accompanied by severe chest pain. The patient had a one-year history of postprandial syncope, accompanied by chest pain that increased progressively in intensity and frequency over this period. The only prior history was that of a left bundle branch block that was diagnosed 10 years previously. The patient was not taking any medication. Physical examination and blood and biochemical profiles, including troponin T levels, were all normal. The ECG showed left bundle branch block.

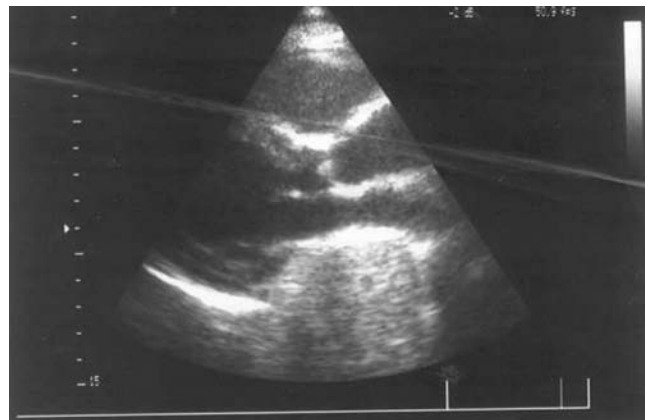
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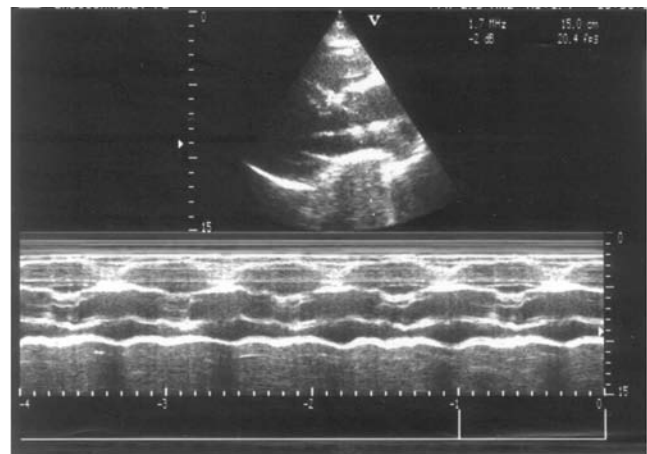
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Two-dimensional echocardiography was then performed. This revealed the presence of a large, amorphous mass impinging on the posterior left atrial wall (Fig. 1). An M-mode scan revealed an almost total obliteration of the left atrial cavity (Fig. 2).



**Fig. 1.** A long-axis view demonstrating a large mass that appears to fill the cavity of the left atrium. It is not possible to distinguish between an intra-atrial and an extra-atrial mass with extrinsic compression of the left atrium.



**Fig. 2.** An M-mode scan through the aorta and left atrium. This demonstrates almost total obliteration of the left atrial cavity, which is worse during diastole.

A chest roentgenogram demonstrated a massive hiatal hernia with a large portion of the stomach in the posterior mediastinum. A computed tomographic (CT) scan, following the oral administration of contrast, confirmed the posterior mediastinal mass to be the stomach. An endoscopic Nissen fundoplication was performed and no further episodes of postprandial syncope or chest pain occurred.

## Discussion

Two-dimensional echocardiography is a valuable diagnostic tool for the detection of various intra-atrial masses, such as thrombus and tumours.<sup>1</sup> However, various adjacent extracardiac structures may closely mimic intracardiac masses on a two-dimensional echocardiogram.<sup>2</sup> The echocardiographic appearances of various anomalies of these adjoining structures have been described and these include mediastinal spread of bronchogenic carcinoma, various other mediastinal tumours, descending thoracic aortic aneurysms and even oesophageal carcinoma.<sup>2,3</sup>

In 1985 Nishimura *et al.*<sup>2</sup> were the first to describe five cases of a previously unrecognised phenomenon of diaphragmatic hernias mimicking intra-atrial masses. Since then, a surprisingly small number of single case reports of this peculiar phenomenon have appeared.

'Swallow syncope' is not an unknown phenomenon<sup>4</sup> and may have an electrical or mechanical pathophysiology.<sup>5</sup> An oesophagocardiac reflex, selectively triggered by deglutition, may induce various cardiac dysrhythmias.<sup>5</sup> This abnormal reflex starts from tensoreceptors localised deep in the oesophageal wall and a distention of the oesophageal wall is necessary for their activation.<sup>4,6</sup> The afferent pathway of this reflex is unknown, whereas the efferent pathway is cholinergic and vagal, and able to cause sinus or nodal bradycardia, sinus arrest, or second-degree atrioventricular block.<sup>5</sup> In a report of three cases, it has also been proposed that stimulation of epicardial receptors by a hiatal hernia may cause bradycardia.<sup>7</sup>

Recently, Akdemir *et al.*<sup>8</sup> described a case of postprandial syncope where a hiatal hernia stimulated epicardial receptors and consequently triggered non-sustained ventricular tachycardia. A mechanical aetiology of postprandial syncope has also been proposed in patients with hiatal hernia – by compressing the heart from outside, a hiatal hernia may cause an obstructive cardiac lesion.<sup>8</sup>

Several features may help to distinguish between a large hiatal hernia and an atrial mass on two-dimensional

echocardiography.<sup>2</sup> The echo density of a hiatal hernia will extend beyond the margins of the atria. With angulation of the transducer, the mass will not be confined to one atrium, but may appear to be in either atrium because the hernia is a posterior structure separate from the heart. The swirling effect is a very useful feature. The echo reflections from a hiatal hernia that contains stomach contents and air will demonstrate changing echo densities within the mass. If the patient drinks a carbonated beverage during the examination this phenomenon will be augmented.

D'Cruz *et al.*<sup>3</sup> described a few useful features in a series of 20 patients with large hiatal hernias. In parasternal views there was respiratory fluctuation in the degree of encroachment of the mass on the left atrium due to motion of the hiatal hernia along with the diaphragm during the respiratory cycle. In the apical four-chamber and long-axis views the descending thoracic aorta was obscured by the large echogenic mass. The hiatal hernia mass could be visualised in the subcostal view superior to the liver and posterior to the atria.

In conclusion, we present a case of postprandial syncope in a patient with a large hiatal hernia that almost completely obliterated the left atrial cavity, thus causing an obstructive cardiac lesion with resultant syncope. The possibility of various brady- and tachydysrhythmias caused during meals by the stimulation of various epicardial receptors by the mass cannot be excluded, as we did not perform any electrocardiographic monitoring during meals.

## References

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