

# An unusual echocardiographic image of a hiatal hernia

Nietypowy echokardiograficzny obraz przepukliny rozworu przełykowego przepony

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## Abstract

Diagnosis of a hiatal hernia (HH) is typically made using an upper gastro-intestinal barium X-ray. A complementary test is gastroscopy or upper-intestinal endoscopy. There are reports in which HH has been diagnosed by echocardiography. We here describe a case of a HH visible on an echocardiogram in a female with palpitations.

**Key words:** hiatal hernia, echocardiography

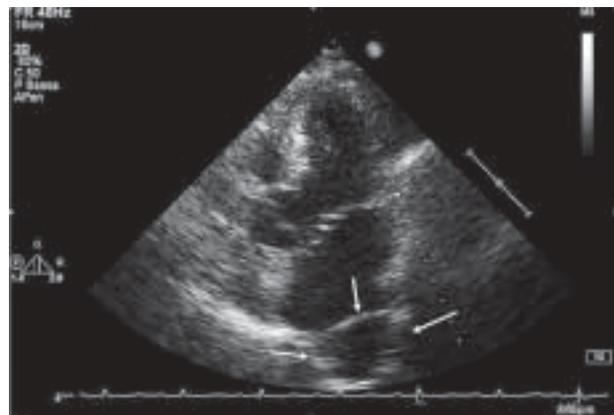
Kardiol Pol 2011; 69, 4: 398–399

## INTRODUCTION

A 47 year-old woman with a history of recurrent episodes of rhythmic palpitations, not stress related, was referred for evaluation to our Department. She was a smoker (5–6 cigarettes/day), on pharmacological treatment for hypertension. Her cardiologic history was unremarkable. She had been in physiological menopause for at least one year, and had not been in receipt of any hormone replacement therapy. In blood tests taken a few days previously: Hb 13.7 g/dL, red corpuscles 4,800,000/ $\mu$ L, white corpuscles 6,700/ $\mu$ L, glycaemia 89 mg/dL, Na<sup>+</sup> 141 mmol/L, K<sup>+</sup> 3.8 mmol/L, fT4 and TSH were normal. She was given an electrocardiogram (ECG) that showed sinus tachycardia, normal atrio-ventricular (AV) conduction, and aspecific alterations of ventricular repolarisation (Fig. 1). We submitted her to transthoracic (TTE)/transoesophageal (TEE) and tridimensional echocardiography. Those showed a large amorphous mass impinging on the posterior left atrial (LA) wall. By analysis of the echocardiographic findings, we suspected a hiatal hernia (HH) (Figs. 1, 2), which was confirmed by barium examination and computed tomography.

## DISCUSSION

Hiatal hernias may present with caustic epigastralgia and regurgitation due to concomitant gastroesophageal reflux, or it

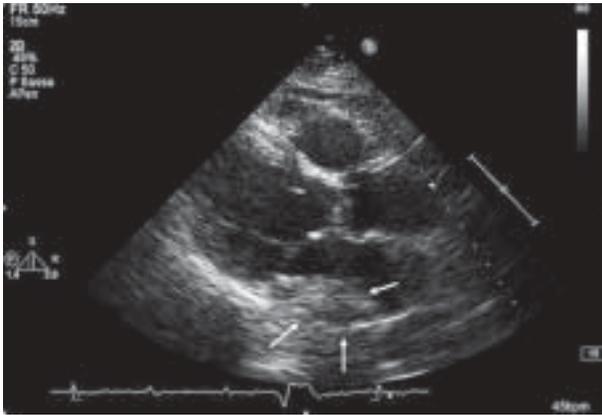


**Figure 1.** Two-dimensional transthoracic echocardiography in a patient with a hiatal hernia, parasternal view (arrow)

may be asymptomatic. It may also have a wide spectrum of manifestations mimicking acute cardiovascular events such as postprandial syncope and angina-like-chest pain. The ECG changes may result in a misdiagnosis of myocardial ischaemia [1]. The clinical presentation of HH-induced cardiac compression can range from dyspnea to impaired respiratory func-

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**Figure 2.** Two-dimensional transthoracic echocardiography in a patient with a hiatal hernia (arrow), long axis view

tion, recurrent acute heart failure, and ultimately haemodynamic collapse. Further cardiac complications include the formation of gastropericardial fistula, pericardial effusion and arrhythmia.

Diagnosis of a HH is typically made through an upper gastro-intestinal barium X-ray. A complementary test is gastroscopy, or upper-intestinal endoscopy. Literature has cases in which HH has been diagnosed via an echocardiogram. Probably the first report of the visualisation of a HH by TTE came from Nishimura et al. [2] more than 20 years ago. They noted a LA mass on two-dimensional (2D) sonographic imaging encroaching on the posterior aspect of the LA, and sometimes posterior to the left AV junction; it was of maximal size when the LA was imaged in a posterior plane, but smaller or absent as the LA was imaged in more anterior planes, where the mass progressively 'disappeared'. D'Cruz and Hancock [3] reported additional echocardiographic abnormalities. Firstly, respiratory fluctuation in degree of encroachment of the HH 'mass' on the LA could be seen on realtime 2D imaging as a respiratory cyclic widening and narrowing of the LA space between the aortic root and the anterior border of the HH as it abuts the LA posterior wall. Secondly, the

normal sonolucency of the descending thoracic aorta, postero-lateral to the LA or posterior to the left AV junction, was obscured by superimposition of the large ill-defined HH echogenicity. Various intracardiac or extrinsic lesions can resemble the echocardiographic appearance of HH. These include vascular formations, such as descending aorta aneurysm or dilation of the coronary sinus, and inflammatory conditions, as in the case of a mitral ring abscess. Several features may help to distinguish between a large HH and an atrial mass on 2D echocardiography. The echo density of a HH 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. This 'swirling effect' is a very useful feature in identifying HH. The echo reflections from a HH that contains stomach contents and air will demonstrate changing echo densities within the mass. The ingestion of carbonated beverages has been shown to be a method of differentiating a HH from a tumour in TTE diagnostics, where the structure goes from being echodense to an echo-free space because of the gas in the beverage [4, 5]. The use of TEE for correct diagnosis has been suggested previously [6] and it could be safe when normal TTE and echo-contrast are not available for diagnosis.

**Conflict of interest:** none declared

### References

1. Zanini G, Seresini G, Racheli M et al. Electrocardiographic changes in hiatal hernia: a case report. *Cases J*, 2009; 2: 8278.
2. Nishimura RA, Tajik AJ, Schattner TT et al. Diaphragmatic hernia mimicking an atrial mass: a two-dimensional echocardiographic pitfall. *J Am Coll Cardiol*, 1985; 5: 992.
3. D'Cruz IA, Hancock HL. Echocardiographic characteristics of diaphragmatic hiatus hernia. *Am J Cardiol*, 1995; 75: 308.
4. Yang SS, Wagner P, Dennis C. Images in cardiovascular medicine. Hiatal hernia masquerading as left atrial mass. *Circulation*, 1996; 93: 836.
5. Smelley M, Lang RM. Large mass impinging on the left atrium: diagnostic value of a new cocktail. *J Am Soc Echocardiogr*, 2007; 20: 1414.e5-7.
6. Movsowitz HD, Jacobs LE, Movsowitz C et al. Transesophageal echocardiographic evaluation of a transthoracic echocardiographic pitfall: a diaphragmatic hernia mimicking a left atrial mass. *J Am Soc Echocardiogr*, 1993; 6: 104-106.