Clinical Spotlight

Acute intrathoracic intestinal strangulation diagnosed by transthoracic echocardiography

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Transthoracic echocardiography plays a central role in diagnosing a variety of cardiac and pericardial disorders. However its use in identifying extra-cardiac thoracic pathology is less well recognised. We describe an unusual case of intrathoracic intestinal strangulation detected by transthoracic echocardiography. The recognition of bowel loops within the left hemithorax enabled rapid confirmatory computed tomographic imaging and subsequent life-saving surgery. This case demonstrates the utility of bedside echocardiography in the assessment of intrathoracic pathology and emphasises the need for cardiologists to be familiar with the echocardiographic appearance of these disorders.

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Introduction

Transthoracic echocardiography (TTE) is widely used to evaluate patients with suspected cardiac dysfunction. Not infrequently ancillary pathology may be detected, including pleural effusions, hepatic lesions or extra-cardiac masses. We describe a patient who developed symptoms of small bowel obstruction and a new pleural density on chest X-ray following temporary pacing wire insertion. Bedside TTE led to the detection of bowel and a large pleural effusion within the left thoracic cavity leading to the subsequent diagnosis of trans-diaphragmatic bowel herniation and strangulation.

Case Description

A 75 year-old man presented following an unwitnessed collapse, preceded by a two-week prodrome of episodic pre-syncope and increasing lethargy. He had a history of oesophageal carcinoma for which he had undergone surgical resection with adjuvant chemotherapy seven years previously. No evidence of local recurrence or distal metastasis was observed on routine expectant management. A small, asymptomatic hiatal hernia adjacent the surgically modified gastrodiaphragmatic junction was noted incidentally on postoperative CT scans. Visceral herniation via this defect was not noted.

On examination he was markedly bradycardic due to 3rd degree AV block (Fig. 1a and b). Atropine was administered with transient effect. An adrenaline infusion was commenced with titration to blood pressure goals. The patient developed nausea and vomiting. This was initially attributed to significant hypotension and emergency drug therapy. Treatment with metoclopramide 10 mg as an intravenous bolus was given.

Due to persistent bradycardia, a temporary pacing wire was subsequently inserted via a 7.5 French sheath in the right internal jugular vein under fluoroscopic guidance and positioned at the right ventricular apex. Ventricular capture was confirmed and the patient was paced at a rate of 75 beats per minute. A routine post procedure portable chest X-ray was performed (see Fig. 2).

Despite restoration of haemodynamic stability, nausea and vomiting persisted and therapy with metoclopramide, ondansetron and prochlorperazine was instituted with only moderate symptom relief. Diffuse abdominal pain gradually developed. Repeat clinical examination revealed the presence of a new left sided pleural effusion and the absence of abdominal tenderness. An urgent chest X-ray was performed, demonstrating a new left sided pleural density together with displacement of the cardiac silhouette (see Fig. 3). These findings had been notably absent on the chest X-ray performed following temporary pacing wire insertion.

Laboratory results revealed the presence of a lactic acidosis with a lactate of 7.6 mmol/L. An urgent transthoracic

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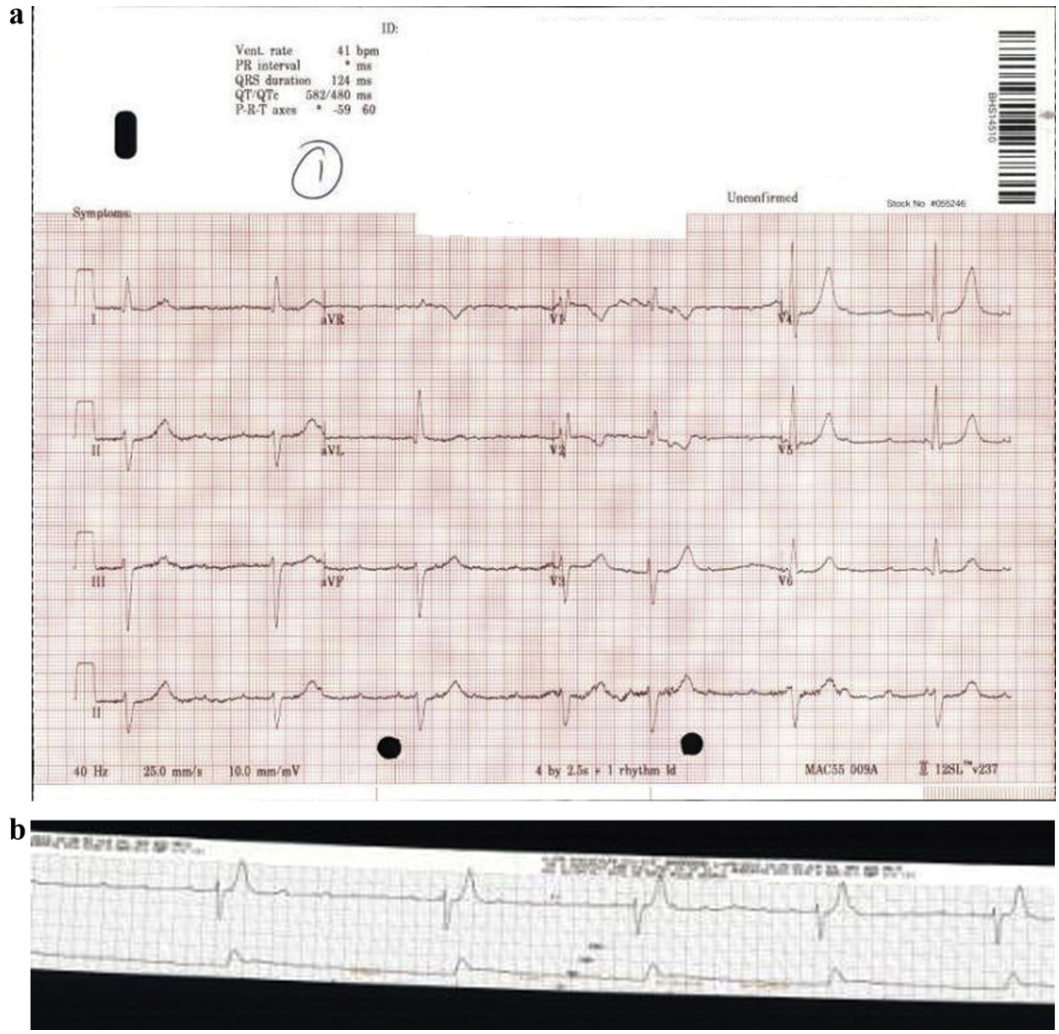

Figure 1. *(a) Initial 12 lead ECG demonstrating complete heart block with a slow escape rhythm. (b) Rhythm strip (leads V2 and II) demonstrating intermittent severe bradycardia (rate approx 20 bpm).*

echocardiogram was subsequently performed to investigate for possible temporary pacing wire associated perforation.

Transthoracic echocardiography in the left parasternal view demonstrated displacement of the heart posteromedially with loops of bowel clearly visible within the thoracic cavity (see Fig. 4a–c). An associated pleural effusion was also evident (see Fig. 4a). Due to gross displacement of the heart, standard views to rule out pericardial effusion and cardiac dysfunction could not be obtained.

A computed tomographic (CT) scan of the chest and abdomen was performed which confirmed the presence of multiple herniated loops of bowel with associated mesentery within the left thoracic cavity (Fig. 5). Possible bowel infarction was suspected due to poor enhancement with intravenous contrast.

The patient underwent emergent laparotomy where a large left diaphragmatic defect was discovered. The diaphragmatic defect was enlarged to facilitate retrieval of three metres of infarcted non-viable bowel. An en-bloc resection was performed and a primary anastomosis fashioned with the remaining jejunum and ileum. A defunctioning loop ileostomy was created and the diaphragmatic defect was left open.

On the third postoperative day, a dual chamber permanent pacemaker was inserted. The patient recovered uneventfully from both procedures and was discharged on the 12th postoperative day. At six-month follow-up, the patient reported a full clinical recovery with no residual abdominal or cardiac symptomatology.

Discussion

Whilst diaphragmatic herniation is a recognised rare complication of oesophagectomy, the acute herniation and subsequent strangulation of a large segment of small bowel into the left hemi-thorax seven years following this surgery has not previously been reported [1–3]. As oesophageal resection with gastric "pull-up" invariably involves dissection of the diaphragmatic oesophageal hiatus and anterolateral incision of the diaphragm, formation of post-operative hernias is relatively common (4%). In