

# Congenital diaphragmatic eventration in an adult: a diagnostic dilemma

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## ABSTRACT

**Eventration of the diaphragm is a rare condition where the muscle is permanently elevated, but retains its continuity and attachments to the costal margins. It is seldom symptomatic and often requires no treatment, but may be confused with a traumatic rupture of the diaphragm. We present a 51-year-old man with previously-undiagnosed congenital eventration, mimicking traumatic rupture of the diaphragm. The role of clinical examination, imaging and diagnostic laparoscopy to differentiate between eventration and traumatic rupture of the diaphragm are discussed.**

**Keywords: congenital diaphragmatic eventration, diaphragmatic hernia, diaphragmatic rupture**

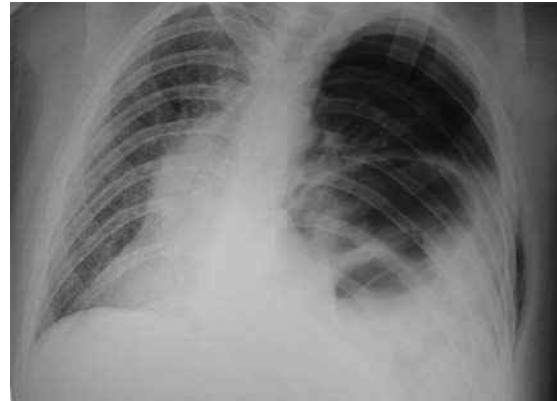
*Singapore Med J 2007; 48(5):e136–e137*

## INTRODUCTION

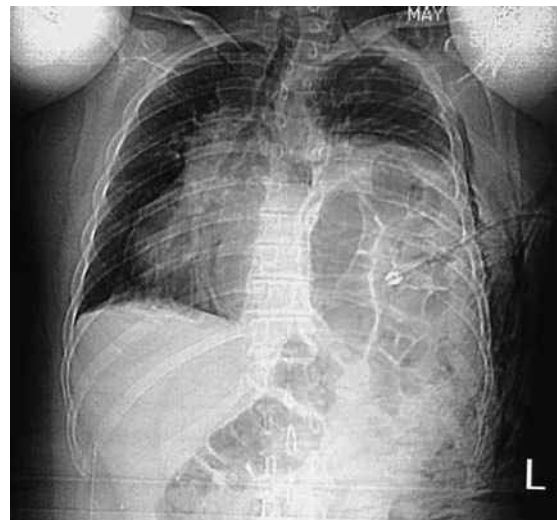
Eventration of the diaphragm is a condition where the muscle is permanently elevated, but retains its continuity and attachments to the costal margins.<sup>(1,2)</sup> It is rare, seldom symptomatic and often requires no treatment. However, this condition may be confused with a traumatic rupture of the diaphragm in a patient with trauma. Early recognition of traumatic rupture of the diaphragm is therefore of utmost importance.<sup>(3,4)</sup>

## CASE REPORT

A 51-year-old man was admitted to the Department of Surgery following a fall from his motorcycle. He had sustained blunt trauma over the left side of his chest. He complained of pain in the left side of the chest, and had difficulty in breathing. Examination in the emergency department revealed tenderness and bruising over the left lateral chest wall, with reduced breath sounds and a resonant percussion note. Chest radiograph showed fractures of the left third, fourth and fifth ribs, with suspicion of pneumothorax (Fig. 1). Left intercostal tube drainage in the fifth space was done



**Fig. 1** Anteroposterior chest radiograph shows a raised left hemidiaphragm.



**Fig. 2** CT scanogram image shows an intact left diaphragm with bowel loops lying high in the left chest.

by the open method. The patient was monitored and referred to the surgical department.

The radiographs were reviewed and the patient was re-examined; this time bowel sounds were heard higher up to the level of the nipple on the left side. A traumatic rupture of the diaphragm was suspected. Since the patient was haemodynamically stable, urgent computed tomography (CT) scans of the abdomen and thorax were done (Figs. 2–4). The diaphragm was

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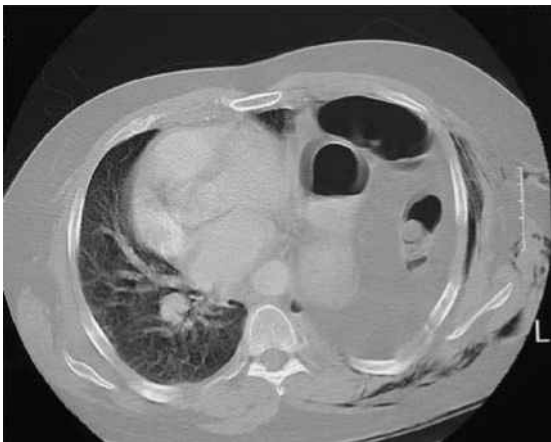
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**Fig. 3** Axial CT image taken at mid-chest level shows bowel loops in the left chest.



**Fig. 4** Axial CT image (lung window) taken at mid-chest level shows bowel loops in the left chest.

reported to be intact but bowel loops were found to be lying high up in the left chest. Radiographs and CT taken three years ago in another hospital were reviewed, which also confirmed the longstanding eventration of the left diaphragm. The patient was closely monitored. He recovered gradually and became asymptomatic. He is currently under follow-up.

## DISCUSSION

Diaphragmatic eventration is rare, seldom symptomatic and often requires no treatment.<sup>(1,2)</sup> It often presents in the neonatal period with respiratory distress but is

also diagnosed in asymptomatic adults undergoing investigations for other reasons, or may be confused with traumatic rupture of the diaphragm. On the other hand, early diagnosis and repair of the traumatic diaphragmatic hernia is important in order to avoid the potentially catastrophic risks of herniation, incarceration, and strangulation of the abdominal viscera.<sup>(3,4)</sup> A high index of suspicion, past history, previous and present imaging, and physical examination of the chest should aid in early and definitive diagnosis.

Multiple imaging modalities are available for the preoperative diagnosis of diaphragmatic injury. Chest radiographs are the initial and most commonly performed imaging study to evaluate the diaphragm after trauma. When chest radiographs are indeterminate, spiral CT with thin sections and reformatted images is the next study of choice. Magnetic resonance imaging is used to evaluate the diaphragm for patients with clinical suspicion but an indeterminate diagnosis after chest radiography and spiral CT.<sup>(5)</sup> Diagnostic laparoscopy should also be considered in difficult cases where imaging is not conclusive.<sup>(6)</sup> There is also a word of caution in our case, i.e. do not insert a chest tube without confirming the diagnosis, as it can be very dangerous for these patients.

We highlight the importance of a good physical examination, imaging and finally, a review of previous medical records in the management of these patients. Diagnostic laparoscopy can be an excellent tool in the evaluation of a stable patient with suspected diaphragmatic injury, which may be difficult to differentiate from diaphragmatic eventration on imaging.

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