Delayed diagnosis of blunt traumatic diaphragmatic hernia

Introduction

A diaphragmatic hernia is an abnormal opening in the diaphragm, which may be congenital, iatrogenic or traumatic. Those arising from blunt or penetrating thoraco-abdominal trauma are predictors of serious associated injuries but are often missed at the time of initial injury, with diagnostic delay of up to 40 years (Meyers and McCabe, 1993).

Discussion

Although traumatic diaphragmatic hernias are not uncommon, their delayed presentation is unusual (Reber et al, 1998). Diagnosis is difficult because of the lack of signs and symptoms, with many diagnosed intraoperatively during exploratory laparotomy. Traumatic diaphragmatic hernia is associated with approximately 5% of all blunt thoraco-abdominal traumas, with up to 70% being left sided (Adegboye et al, 2002). Traumatic diaphragmatic hernia contents can include the stomach, transverse colon, spleen, small bowel or omentum (Reber et al, 1998).

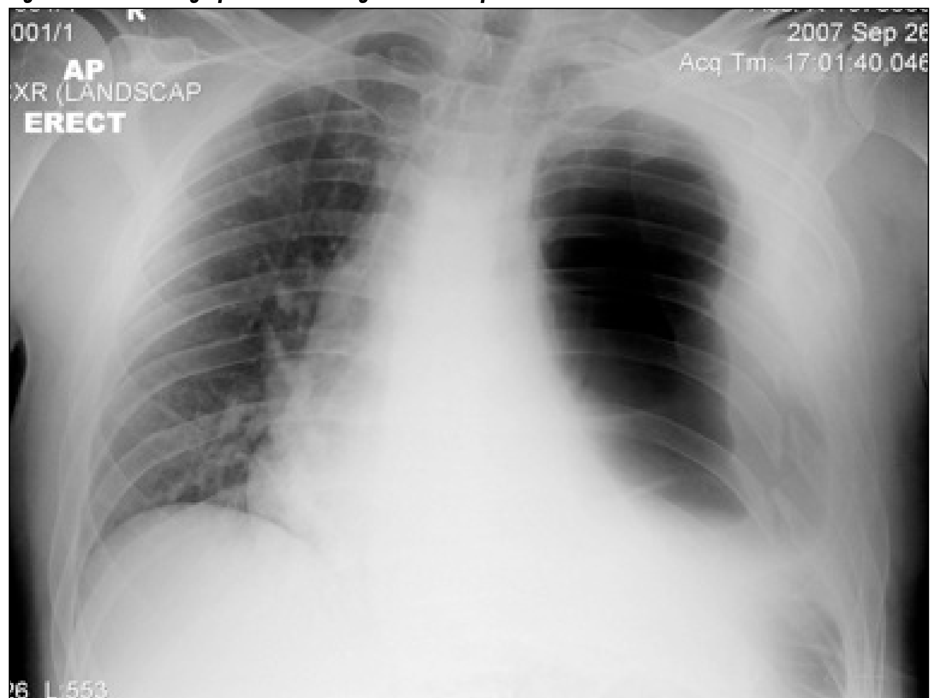
A three-phase model for the course of diaphragmatic injuries has been described (Carter et al, 1951). The acute phase is the first 14 days and if the hernia does not manifest itself, the second or interval phase is entered. The third or obstructive phase is entered when the patient presents with obstruction or incarceration. This is associated with higher morbidity and mortality rates than the acute or interval phases and 90% will present within 3 years of the initial trauma (Carter et al, 1951; Reber et al, 1998). The later presentation may be caused by an omental plug in the defect, which prevents initial healing. The negative intrathoracic pressure during inspiration then results in abdominal contents being drawn into the thorax.

The presenting spontaneous pneumothorax, as demonstrated in this case, should raise the suspicion of a communication with the peritoneal cavity (Ramdass et al, 2006). This delayed presentation highlights the importance of a comprehensive history. Patients presenting with abdominal pain and dyspnoea with previous thoracoabdominal trauma, supported by clinical findings, should be assessed for a missed diaphragmatic injury. Radiological findings include an abnormal left hemidiaphragmatic contour, pleural

Miss C Jones *is Specialist Registrar,* **Miss S Dawson** *is Specialist Registrar,* **Mr SA Badger** *is Specialist Registrar and* **Mr E Epanomeritakis** *is Consultant General Surgeon in the Department of Surgery, Craigavon Area Hospital, Craigavon, Northern Ireland*

Correspondence to: Miss C Jones, Specialist Registrar, Daisy Hill Hospital, Newry, Northern Ireland BT35 8DR

Figure 1. Chest radiograph demonstrating a left-sided pneumothorax.



Case Report

A 52-year-old man presented with a 3-day history of left shoulder-tip pain and shortness of breath, in the background of abdominal pain for 3 weeks. The patient had been admitted 4 months previously following a fall onto his left posterior chest wall, when he sustained a left-sided pneumothorax and fractures of the left 6th, 7th and 8th ribs posteriorly. At that time a computed tomography scan showed a left-sided pneumothorax with associated basal atelectasis and consolidation.

On this, the second admission, initial observations were stable, apart from a mild tachypnoea. Abdominal examination was normal, but respiratory auscultation revealed bowel sounds in the left hemithorax. The chest radiograph showed a new left-sided pneumothorax and large bowel in the left chest (*Figure 1*). Abdominal radiography confirmed this, with some mildly dilated loops of bowel. A computed tomography scan demonstrated a left diaphragmatic rupture with associated intra-thoracic incarcerated large bowel, a left hydropneumothorax and mediastinal shift to the right (*Figures 2* and *3*). Subsequently, the patient underwent a transverse colectomy with colostomy formation, along with diaphragmatic repair through a left thoraco-abdominal approach. Gastrointestinal continuity was later restored electively.

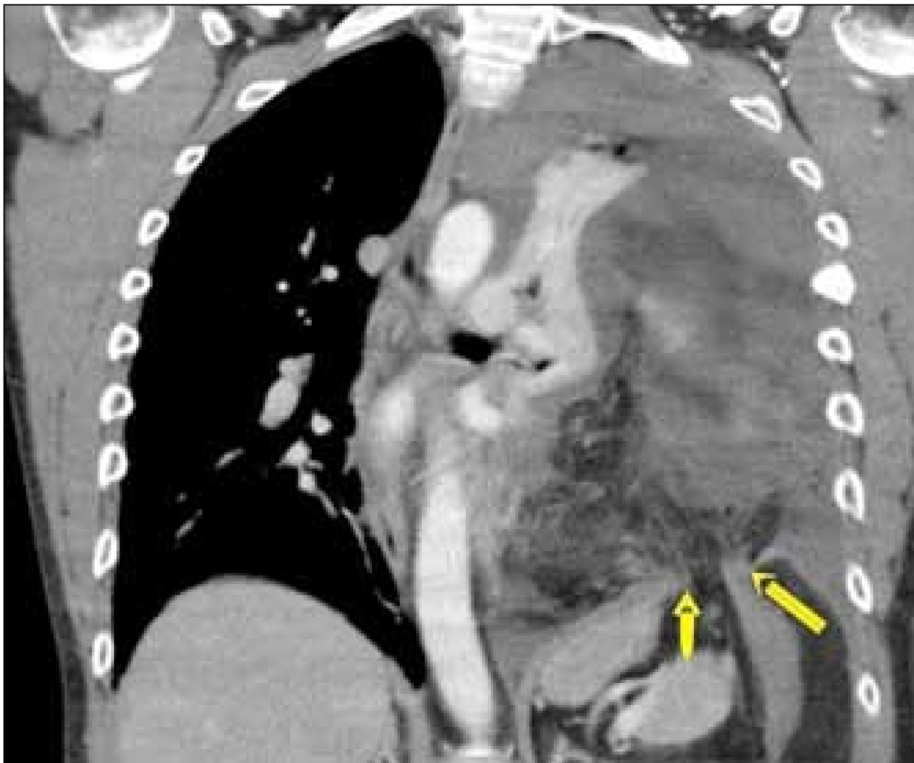


Figure 2. Computed tomography scan of chest demonstrating left diaphragmatic rupture (see arrows).

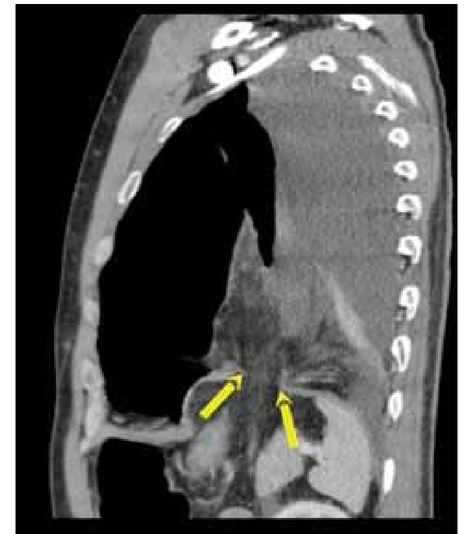


Figure 3. Computed tomography scan, lateral view demonstrating left diaphragmatic rupture (see arrows).

effusion, elevation of hemidiaphragm and atelectasis. When there is a high index of suspicion, serial plain X-rays will increase diagnostic yield. BJHM

Adegboye VO, Ladipo JK, Adebo OA, Brimmo AI (2002) Diaphragmatic injuries. *Afr J Med Med Sci* **31**: 149–53
Carter BN, Giuseffi J, Felson B (1951) Traumatic diaphragmatic hernia. *Am J Roentgenol Radium Ther* **65**: 56–72
Meyers BF, McCabe CJ (1993) Traumatic diaphragmatic hernia. Occult marker of serious injury. *Ann Surg* **218**: 783–90
Ramdass MJ, Kamal S, Paice A, Andrews B (2006) Traumatic diaphragmatic herniation presenting as a delayed tension faecopneumothorax. *Emerg Med J* **23**: e54
Reber PU, Schmied B, Seiler CA, Baer HU, Patel AG, Buchler MW (1998) Missed diaphragmatic injuries and their long-term sequelae. *J Trauma* **44**: 183–8