CLINICAL IMAGES

Large-bowel obstruction as a result of traumatic diaphragmatic hernia

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The high incidence of penetrating thoraco-abdominal injuries and lack of widespread surgical endoscopy in South Africa results in numerous diaphragmatic injuries that are missed in the early post-traumatic period.

A 34-year-old man with no history of previous abdominal surgery or external hernias presented with a 7-day history of abdominal distension, peri-umbilical cramping pain, left-sided pleuritic chest pain and subsequent obstipation and vomiting. Tympanic distension of the abdomen was present with absent bowel sounds but without any peritonism. Normal gastric fluid drained via the nasogastric tube and a small amount of blood was present on rectal examination. The patient was undistressed with bronchial breathing posteriorly over the left lower zone. Surprisingly, there was no peritonism on examination. A scar from a previous stab over the left lower chest anteriorly was later noted. Plain radiographs displayed large-bowel obstruction with evidence of perforation and suspected diaphragmatic herniation of the large bowel (Figs 1 - 3). Laparotomy confirmed a diaphragmatic hernia of the transverse colon with necrosis. The hernia was reduced and the defect of the diaphragm sutured. Splenic injury during reduction necessitated a splenectomy. Because of a competent ileocaecal valve and the resultant closed loop obstruction, a perforation of the caecum had occurred accounting for the free peritoneal air on radiographs. A right hemicolectomy with an ileo-sigmoidocolostomy was performed. The postoperative course was complicated by pericarditis and tachyarrhythmias during the first 48 hours and subsequently by a left pyothorax.

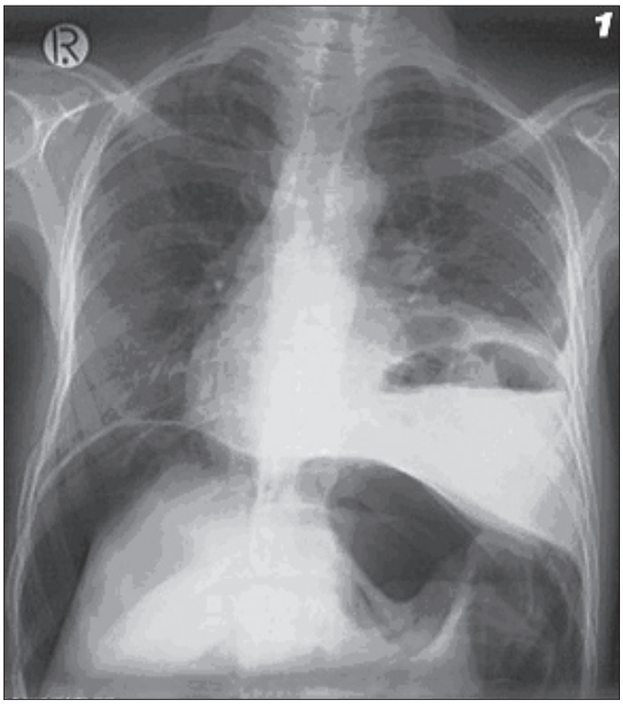

Fig. 1. Anteroposterior chest radiograph, showing cystic lucencies above the left hemidiaphragm and sub-diaphragmatic free air on the right.

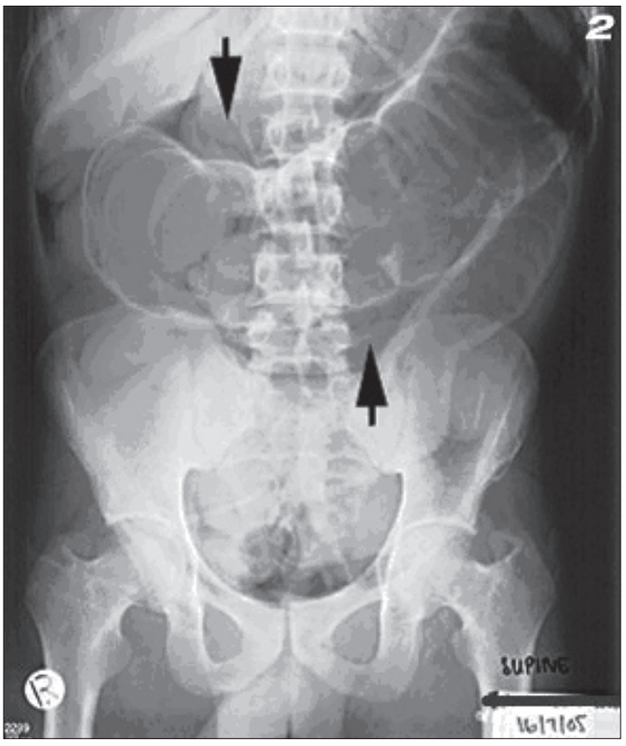

Fig. 2. Supine abdominal radiograph, showing distended air-filled transverse colon with accentuated bowel wall due to the free peritoneal air (arrowheads) and notable paucity of air in the small bowel.

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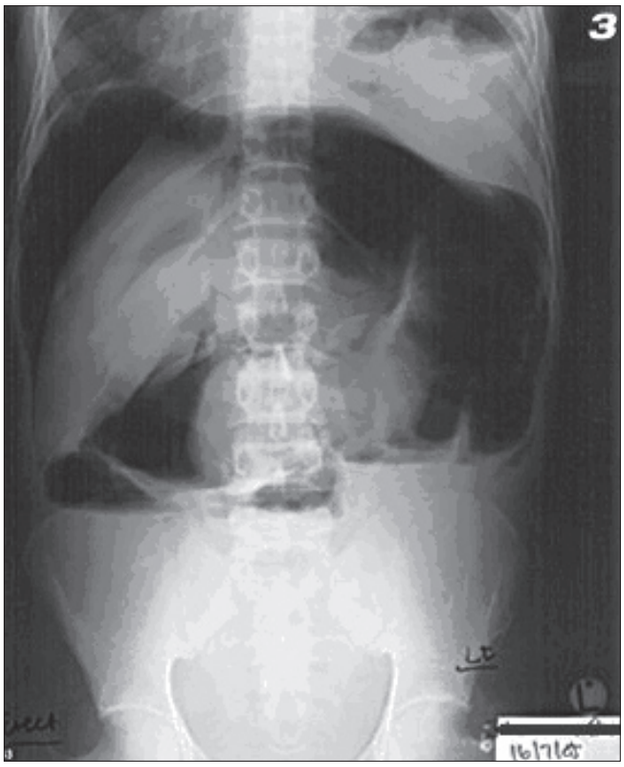

Fig. 3. Erect abdominal radiograph, demonstrating gross volumes of free air.

Discussion

The commonest causes of mechanical large-bowel obstruction in adults are diverticular disease, colon carcinoma, faecal impaction and sigmoid volvulus. In South Africa, with our high level of penetrating thoraco-abdominal injuries, it is important to consider a traumatic diaphragmatic hernia, especially in young patients, although they have been recorded up to 45 years after injury.[1]

A traumatic diaphragmatic hernia may occur after blunt or penetrating injury. The incidence is expected to increase as the non-operative management of solid organ injury (especially splenic injury) resulting from blunt trauma becomes more popular. Right-sided diaphragmatic perforations are less common clinically since the liver generally absorbs much of the energy in right-sided impacts, preventing herniation of bowel but resulting in a high incidence of pre-hospital deaths.

The presentation of this form of large-bowel obstruction is similar to other causes, but there may be decreased breath sounds on the affected side and, rarely, bowel sounds may be audible in the chest. The scar from previous stab wounds should be looked for – any previous stab between the nipples and the costal margin is a risk.[2] The patient may also present with pleuritic chest pain, pericarditis, and rarely even a tension fecopneumothorax should intrathoracic perforation occur.[3]

Plain radiographs may be diagnostic. On chest radiographs abnormalities described include asymmetry, elevation or loss of definition of the hemidiaphragm, a pleural effusion and cystic lucencies above the diaphragmatic contour. Abdominal radiographs vary from normal findings to dilatation of the gas-filled colon.[4]

Large-bowel obstruction may be confirmed by contrast enema if the diagnosis is in doubt and bowel necrosis or perforation is not suspected. If the patient is stable without a clear diagnosis or another indication for exploration, spiral computed tomography (CT) or magnetic resonance imaging (MRI) may be the diagnostic test of choice.[5,6]

Diaphragmatic hernia must be managed surgically. There is controversy as to whether a laparotomy or thoracotomy should be done.[7-9] Thoracotomy enables the division of the adhesions between thoracic and herniated abdominal viscera while with laparotomy bowel resection and anastomosis, if needed, is easily performed. Sometimes a combined approach may be necessary.

To prevent the late complications of missed diaphragmatic injuries, early detection is necessary. Acute diaphragmatic injuries are seldom symptomatic by themselves. Conventional radiographs, contrast studies, diagnostic peritoneal lavage, ultrasound and induction of pneumoperitoneum are notoriously unreliable at detecting acute diaphragmatic injuries.[10,11] All patients with stabs of the left lower chest without indication for open exploration should ideally have thoracoscopy or laparoscopy during the early post-traumatic period.[12,13] Until this is achieved, clinicians must maintain a high level of suspicion for the complications of unrecognised diaphragmatic hernias.

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