

## Case Report

# A late complication from a self-inflicted stab wound

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Rupture of the diaphragm following penetrating injuries to the lower chest and upper abdomen is reported in as many as 10-15% of victims. The diagnosis may not be clinically apparent in the acute phase and routine investigations are often inadequate to identify any defect. Failure to detect the injury at the time of presentation may result in herniation of the abdominal contents into the chest cavity with significant associated morbidity and mortality. We report a case of large bowel obstruction presenting three years following the initial injury, and review the relevant literature.

**CASEREPORT** A 24-year old man was admitted as an emergency with a 48 hour history of increasing lower abdominal pain, distension, faeculent vomiting and absolute constipation. On examination he was dehydrated with signs of acute intestinal obstruction. Examination of all other systems was unremarkable.

The patient suffered from chronic schizophrenia and three years previously had been treated for a self-inflicted stab wound to the anterior aspect of his left chest at the level of the costal margin. As a consequence of this injury he developed a left sided pneumothorax which was successfully treated with a chest tube and underwater seal drain. Other relevant history included a positive family history of colorectal carcinoma in two first-degree relatives.

A plain abdominal film showed distended large bowel proximal to the splenic flexure consistent with an obstruction at this site (Fig 1). A left-sided pulmonary effusion was evident on chest x-ray (Fig 2). In an attempt to confirm the nature and site of the obstruction an urgent gastrograffin enema was performed (Fig 3). This demonstrated a complete obstruction at the level of the splenic flexure and subsequently he underwent a laparotomy. A segment of transverse colon had herniated through the diaphragm and become incarcerated within the thoracic cavity. The bowel

was reduced and the defect repaired. His post-operative recovery was uncomplicated.



*Fig 1.* Supine abdominal x-ray showing distended large bowel proximal to the splenic flexure, consistent with obstruction at this site.

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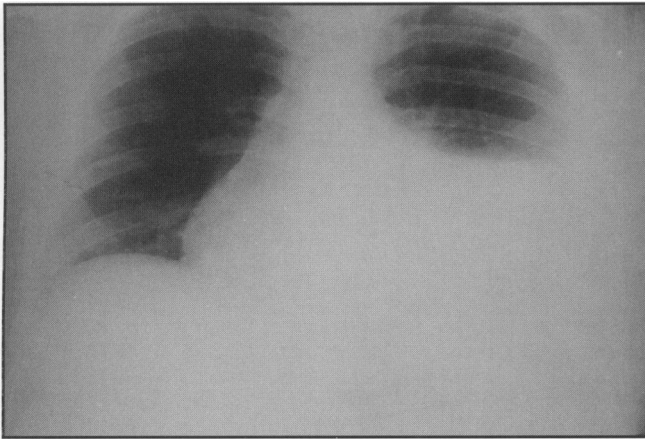


Fig 2. Erect chest film reveals an opacified left basal pulmonary zone with a 'meniscus sign' suggesting a left sided pleural effusion.

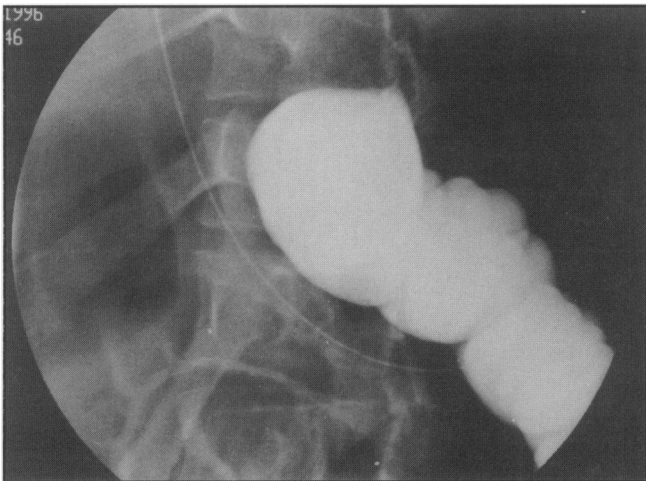


Fig 3. Gastrograffin enema, showing complete obstruction at the site of the hernia.

## DISCUSSION

In contrast with stab wounds of the upper thorax, plain radiography is a significantly less sensitive method of detecting intrathoracic pathology. In two series where patients sustained diaphragmatic penetration following stab wounds radiographic anomalies were only present in 33 and 60% of cases.<sup>1,2</sup>

As is the case with blunt abdominal trauma diaphragmatic injuries are frequently occult and the diagnosis goes unrecognised until a complication such as intestinal obstruction, strangulation or haemorrhage occurs.<sup>3</sup> Consequently, the diagnosis is often delayed and mortality rates are high, ranging from 4.3%-66%.<sup>4</sup> The delay between incident and diagnosis ranges from several months to years with the longest reported delay being 20 years.<sup>5</sup>

There are two schools of thought on why the presentation is often delayed. The first relates to the pathophysiology of the condition whereby the pressure gradient between the abdominal and pleural cavity serves to draw adjacent abdominal viscera through the diaphragmatic defect converting it from a subclinical into a potentially life threatening condition as the defect enlarges. It has also been suggested that devitalised diaphragmatic tissue heals poorly and the hernia develops as an intermediate or late event. Secondly diagnostic delays may be the result of clinical deficiencies where there is a lack of awareness in the acute situation compounded by the low sensitivity of diagnostic tests presently available.

Diagnostic peritoneal lavage is employed in the management of abdominal trauma and has been advocated in patients with stab wounds to the lower chest; however false negative rates occur in between 25% and 34% of cases.<sup>4</sup> Laparotomy is not a panacea for diagnosing this condition and there are reports where the diaphragmatic injuries have been missed.<sup>6</sup>

This may reflect our priorities at laparotomy, namely to exclude acute life threatening injuries such as visceral haemorrhage at the expense of less obvious injuries. Laparoscopy is being employed increasingly in trauma centres with a high degree of sensitivity;<sup>7</sup> however in this situation creation of a pneumoperitoneum may cause respiratory depression as CO<sub>2</sub> moves through the diaphragmatic defect producing tension in the pleural cavity. Despite this concern laparoscopy appears to be an excellent modality in the recognition of diaphragmatic lesions following trauma.<sup>8</sup> Similarly, thoracoscopy has been utilised recently.<sup>9</sup> Early results are encouraging but few centres have the experience required to perform thoracoscopy in the acute situation.

Instillation of contrast medium or radiolabelled technetium into the peritoneal cavity has been employed successfully in this condition.<sup>10</sup> To date there has been little information available on the sensitivity of either CT scanning or magnetic resonance imaging.

The most important lesson illustrated by this case report and literature review is to be clinically aware of the diagnosis and have a high index of suspicion in situations where there has been a stab wound in the area bounded by the nipples and umbilicus. Until a more accurate method of

diagnosis is available we recommend a thorough inspection of the diaphragm in penetrating injuries of the lower thorax and upper abdomen. The decision to employ laparotomy, laparoscopy or thoracoscopy should be determined by the patients condition and the experience and facilities available.

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