Intestinal strangulation and sub-acute bowel obstruction in direct inguinal hernia

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Abstract

Strangulation, secondary to reduced blood flow, is a well-known complication of herniae. Signs of bowel activity do not rule out the possibility of vascular compromise. Raised inflammatory markers and a positive computed tomography scan can lead to a preoperative diagnosis, but the mortality rate remains high.

Keywords
Strangulated hernia; hernia repair; sub-acute bowel obstruction; obstruction.

Case report

An 89-year-old man presented with a 4-day history of vague abdominal discomfort and nausea, together with a few episodes of non-bloody diarrhea. His past medical history revealed long-standing bilateral inguinal herniae, and a background of ischemic heart disease and chronic obstructive pulmonary disease. On examination, his abdomen was distended but soft and bowel sounds were present. A firm, tender, 5 x 3 cm lump was noticeable in his left groin, whereas a completely reducible groin hernia was present on the right. Plain abdominal X-ray films revealed a few dilated small bowel loops with a reduced large bowel gas pattern (Fig. 1). The preoperative white cell count (WCC) was 10.67 x 10^9/l, and the C-reactive protein (CRP) level was 57 mg/l. An initial diagnosis of an incarcerated left inguinal hernia, with potential bowel incarceration, was reached. The diagnosis was explained to the patient, consent taken for urgent surgery, the surgical site marked and the patient transferred to theatre following effective fluid resuscitation (Fig. 2).

An emergency left inguinal hernia repair was performed, under general anesthetic, via a left skin crease groin incision. Necrosis of the small bowel was noted, within a direct inguinal hernia sac. A small bowel resection was performed with a side to side, single layer, hand sewn anastomosis; then a Shouldice hernia repair was performed. Postoperative photograph clearly illustrates bowel wall ischemia secondary to a constricting ring (Fig. 3), and histological analysis of the small bowel resected confirms circumferential bowel wall necrosis.

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Postoperatively, the patient’s abdominal distension resolved and he tolerated enteral nutrition. The postoperative period was complicated with pneumonia, congestive cardiac failure and delirium. Fifteen days postoperatively he had a myocardial infarction and died suddenly.

**Diagnosis**

The clinical examination has a major role in the decision making of the acutely ill surgical patient. The sudden onset of a groin lump raises the concern of incarceration. Vague abdominal pain and a lack of complete obstructive symptoms can mislead the clinician. Careful resuscitation takes priority over surgical intervention, as fluid deficits and biochemical abnormalities, combined with existing co-morbidities, make general anesthesia and operative intervention hazardous. The key intra-operatively is to assess the viability of the bowel wall and the critical area is the constricting ring at the point of entrapment. Evidence of a black, green or purple color, with no sheen or pulsation in the mesenteric vessels makes the diagnosis obvious and necessitates bowel resection, as performed in our case. More commonly, the bowel is congested, bluish and still has sheen but vascular pulsation is not felt; in this instance covering the bowel with a warm moist pack for a few minutes is suggested prior to re-assessment of its viability. The absence of peristalsis does not exclude viability, as it can occur via reflex sympathetic activity.

Fig. 1. Plain abdominal X-ray films revealed a few dilated small bowel loops with a reduced large bowel gas pattern.
Clinical evidence and unusual features

The clinical signs of strangulation and hernia incarceration often overlap. Sudden onset of abdominal pain and distension, together with a lack of signs of bowel movement are the most important features. In this case intermittent diarrhea excluded the presence of complete bowel...
obstruction (incarceration), but local clinical signs, such as elevated inflammatory markers (WBC and CRP), led to a decision for surgical intervention. Differentiating between simple and strangulated small bowel obstruction remains difficult, despite careful history taking, examination, laboratory and radiological studies\textsuperscript{[11]}. The classic signs of strangulation are continuous abdominal pain, tachycardia, fever and lack of bowel sounds, according to large studies\textsuperscript{[2,3]}, but as our case illustrates, the presence of bowel activity does not rule out the possibility of vascular compromise. A prospective study reviewed 161 patients admitted to hospital with small bowel obstruction and found that strangulated bowel occurred in 15 patients (9.3%), most of them secondary to herniae\textsuperscript{[4]}. A further recent study reviewed 192 patients with small bowel obstruction and following multivariate regression analysis, it was found that the most independent predictor of bowel strangulation was computer tomography (CT) findings of reduced wall enhancement (likelihood ratio [LR] 9.3)\textsuperscript{[5]}, which was significantly superior to elevated white blood count (LR 1.7) and signs of peritoneal inflammation (LR 2.8). There is a wide range of publications describing the overall diagnostic accuracy of CT, but most articles conclude that reduced wall enhancement on CT scan is virtually diagnostic of strangulation. The mortality rate for simple small bowel obstruction is 8% following satisfactory management, but in cases of strangulation it remains 20–30%\textsuperscript{[1]}.

### Teaching points

Early diagnosis remains the most important and challenging aspect of managing patients with small bowel obstruction. A high index of suspicion is crucial to diagnose strangulation preoperatively, as typical symptoms of obstruction could be absent, mimicking other common conditions such as gastroenteritis. This case highlights the importance of accurate interpretation of clinical signs.

### References