

obstruction and strangulation. Thoracotomy is widely considered the most effective surgical approach in cases presenting late, owing to the increased likelihood of adhesions between herniated abdominal viscera and intrathoracic organs. Acute cases, because of the high probability of associated intra-abdominal injury, are best repaired via an abdominal approach.

The high morbidity of diaphragmatic rupture<sup>4</sup> relates mainly to pulmonary complications; reported mortality has been as high as 50%<sup>5</sup>. Not identifying the injury is both common and unsurprising since initial chest X-ray is normal in up to one-third of cases, and in others the basal opacity may be mistaken for consolidation or pleural fluid. 'Abnormal'<sup>6</sup> diaphragmatic shadows, as identified retrospectively in this case, may be suggestive of diaphragmatic injury.

A primary survey should not be considered to have excluded diaphragmatic injury. Managing clinicians should

keep in mind the nature and severity of the original traumatic forces involved and thoroughly re-examine each organ system as required.

## REFERENCES

- 1 Kearney PA, Rouhana SW, Burney RE. Blunt rupture of the diaphragm: mechanism, diagnosis and treatment. *Ann Emerg Med* 1989;18:1326-30
- 2 Lee WC, Chen RJ, Fang JF, *et al.* Rupture of the diaphragm after blunt trauma. *Eur J Surg* 1994;160:479-83
- 3 Smithers BM, O'Loughlin B, Strong RW. Diagnosis of ruptured diaphragm following blunt trauma: results from 85 cases. *Aust NZ J Surg* 1991;61:737-41
- 4 Pagliarello G, Carter J. Traumatic injury to the diaphragm: timely diagnosis and treatment. *J Trauma* 1992;33:194-7
- 5 Maddox PR, Mansel RE, Butchart EG. Traumatic rupture of the diaphragm—a difficult diagnosis. *Injury* 1991;22:299-302
- 6 Symbas PN, Vlasis SE, Hatcher C Jr. Blunt and penetrating diaphragmatic injuries with or without herniation of organs into the chest. *Ann Thorac Surg* 1986;42:158-62

## Small-bowel adhesions long after blast injury

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Recent wars and terrorist attacks have led to an improved understanding of the nature and outcome of abdominal injuries caused by explosive devices and high velocity weapons.

The components of blast are a shock wave of high over-pressure, followed by the flow of combustion products or blast wind. Primary blast injury is caused by transmission of the shock wave into the body. This causes blast lung, bowel contusion and rupture of the tympanic membrane. Secondary blast injury is caused by fragments. Tertiary blast injury is a result of displacement of the victim by the shock wave and blast wind<sup>1</sup>.

Extensive abdominal injuries and those causing limb amputation frequently result in death<sup>2,3</sup>. Lesser abdominal injuries can be complicated by delayed perforation of small or large bowel<sup>4,5</sup>. Data are lacking on late complications of abdominal blast injury.

## CASE HISTORIES

### Case 1

A man aged 76 with anaemia was found on colonoscopy to have a distal descending colonic carcinoma. At laparotomy the liver was densely adherent to the diaphragm, the spleen was encased in fibrous tissue and there were extensive small-bowel adhesions, particularly in the true pelvis. Left hemicolectomy was performed and the patient made an uncomplicated recovery. There was no history of abdominal surgery but the patient had been injured by a shell blast during the 'D' day offensive. On 25 June 1944, he had been in charge of a five-man anti-tank gun crew. This was being shelled from nearby German positions. One shell burst above the crew, killing four and leaving the patient with an amputated left arm, open left lower chest wound and shrapnel wounds to the forehead and left foot; there were no external wounds to the abdomen. He was in hospital until August 1945.

### Case 2

A 75-year-old male was referred with clinical and radiological evidence of small-bowel obstruction. At laparotomy he had a band adhesion obstructing the mid jejunum and multiple areas of jejunum that were densely adherent to each other. The band adhesion was divided but the areas of jejunum that appeared fused together were left as dissection caused bleeding. The patient made an unremarkable recovery. His only previous abdominal operation had been a laparoscopic extraperitoneal inguinal hernia repair three years previously; but he had been blown out of a tank during the North African campaign in World

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War 2. During 1942 he had been a lieutenant in charge of a tank which had been hit by a German Tiger tank 88 mm shell. The rest of the crew had been killed but he had been blown clear with shrapnel wounds to the legs. He was in hospital for four months.

### COMMENT

These cases support Hull's findings of abdominal injuries following explosive blast<sup>2</sup>. Soldiers and civilians who in World War 2 and subsequent conflicts sustained blast injuries may be at risk of abdominal complications. These may present directly as in the second case with small-bowel obstruction or complicate routine surgery as in the first case. The surgeon should be aware of this in undertaking a

laparotomy in a patient with a history of blast injury, and remember blast as a possible cause of intestinal obstruction.

### REFERENCES

- 1 Hull JB. Traumatic amputation by explosive blast: pattern of injury in survivors. *Br J Surg* 1992;**79**:1303–6
- 2 Hull JB, Bowyer GW, Cooper GJ, Crane J. Pattern of injury in those dying from traumatic amputation caused by bomb blast. *Br J Surg* 1994;**81**:1132–5
- 3 Coupland R. Abdominal wounds in war. *Br J Surg* 1996;**83**:1505–11
- 4 Cripps NPJ, Cooper GJ. Intestinal injury mechanisms after blunt abdominal impact. *Ann R Coll Surg Engl* 1997;**79**:115–20
- 5 Cripps NPJ, Cooper GJ. Risk of late perforation in intestinal contusions caused by explosive blast. *Br J Surg* 1997;**84**:1298–303

## Lymphoedema and Crohn's disease

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Crohn's disease may affect any part of the gastrointestinal tract from the lips to the anus. Oral involvement, seen in 6–9% of cases<sup>1</sup>, is occasionally the first manifestation, with swelling of the lips, buccal mucosa and floor of the mouth; oral ulceration and angular cheilitis with fissuring also occur. The skin is often affected<sup>2</sup>—by direct extension of sinuses and fistulae, by metastatic Crohn's disease, by cutaneous manifestations of underlying disease (e.g. erythema nodosum or pyoderma gangrenosum) or by the cutaneous effects of malabsorption. We report a case of facial lymphoedema in a man with extensive Crohn's disease.

### CASE HISTORY

A 49-year-old man was referred with a history of two episodes of facial cellulitis in the preceding two months. The face had become acutely tender and red with fever and constitutional upset, settling rapidly with oral antibiotics prescribed by the general practitioner. Over the subsequent months further episodes of facial swelling occurred which gradually became persistent despite courses of antibiotics.

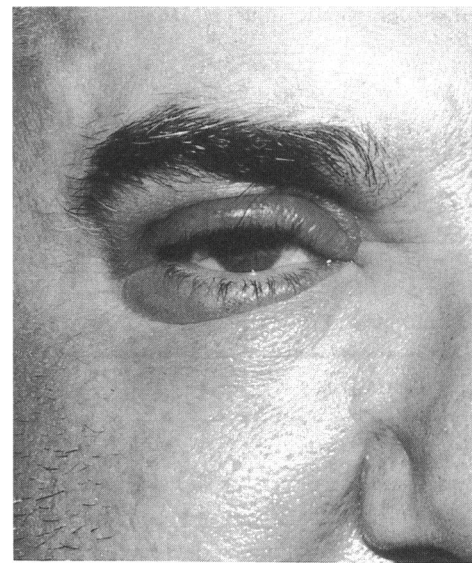


Figure 1 Lymphoedema of the face, especially involving cheeks and eyelids

He gave a 10-year history of Crohn's disease of the large bowel, and 3 years previously he had undergone partial colectomy for perforation of the descending colon. He also gave a 4–5-year history of swelling and ulceration of the tongue and mouth. Two biopsies from the tongue had shown changes of Crohn's disease.

On examination there was brawny oedema of the cheeks and pronounced oedema of the upper and lower eyelids (Figure 1). The oedema tended to worsen overnight and to improve during the course of the day, when he was upright, but never cleared completely. He had a deeply fissured scrotal tongue, and buccal mucosa swollen with a cobblestone pattern.

All routine blood tests were normal, and there was no abnormality on chest X-ray or magnetic resonance imaging

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