CASE REPORT

Abdominal wall disruption with evisceration after blunt trauma

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SUMMARY

Abdominal evisceration after blunt trauma is rare. We report a case in a 65-year-old man who was crushed by a lorry. Management of this uncommon condition is reviewed.

BACKGROUND

Abdominal evisceration after blunt trauma is rare. Only 11 cases of blunt traumatic evisceration have been published in the world literature. To the best of our knowledge, this is the 12th case of evisceration after blunt abdominal trauma.

CASE PRESENTATION

A 65-year-old man was lying under the cargo bed of a lorry, inspecting the undercarriage. Unaware of this, the lorry driver started his journey and the rear wheel rolled over the patient's lower abdomen and pelvis.

Bystanders who witnessed the accident transported him to the nearest hospital within 30 min of sustaining injury. Apart from covering the abdominal wound with an article of clothing, no prehospital resuscitative measures were instituted.

Despite being haemodynamically stable, this patient was markedly distressed due to pain. There was a large laceration approximately 20 cm in length at the left side of the abdomen from which small and large bowel eviscerated and a superficial paramedian laceration in the upper left abdomen (figure 1). A healed upper midline scar was also present after exploratory laparotomy for perforated peptic ulcer disease more than 10 years prior to this presentation.

Resuscitation was started by securing intravenous access and infusing isotonic crystalloids. We administered opioid analgesia, proton pump inhibitors and broad-spectrum antibiotics (metronidazole and ceftriaxone) in the emergency room. The exposed viscera were washed with 1 L of normal saline and then wrapped in a moist towel.

This patient met an indication for exploratory laparotomy to reduce the viscera, repair the abdominal wound and address any additional injuries encountered. However, since he was stable, we opted to take him to the radiology department first to exclude orthopaedic injuries that may have required operative intervention.

INVESTIGATIONS

Plain radiographs revealed the presence of a linear inverted 'y-shaped' fracture. One end of the 'y' was at the outer quarter of the right iliac crest and ran

Figure 1 A 20 cm laceration is noted at the left side of the abdomen, corresponding to the surface marking for the linea semicircularis, from which small bowel has eviscerated.

to the iliopectic line with minimal displacement at this point. The other limb of the 'y' approached to the acetabular dome (figure 2). A second fracture was noted at the inferior border of the anterior superior iliac spine with minimal displacement posteroinferiorly. Both fractures were stable and did not require operative intervention.

TREATMENT

Under general anaesthesia, the abdominal laceration was extended medially to enter the abdomen. A thorough inspection of the intra-abdominal viscera and retroperitoneum was performed. The eviscerated bowel was viable but there were two small areas of perforation (rupture) at the jejunum. The bowel edges were debrided and primarily repaired. There were no additional intra-abdominal injuries noted. The viscera were lavaged with 3 L of normal saline and reduced into the abdomen. The abdomen was then closed in layers. No drains were used in this case.

OUTCOME AND FOLLOW-UP

The patient was discharged to the high dependency unit for continued care. The postoperative period was complicated by a prolonged ileus but this resolved on day 7 with bowel rest, nasogastric drainage and infusions of maintenance intravenous fluid and electrolytes. Thereafter, there was an uneventful recovery, with no signs of intra-abdominal

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Figure 2 Plain radiographs demonstrate a linear inverted 'y'-shaped fracture. One end of the 'y' is at the outer quarter of the right iliac crest (A) and runs to the iliopubic line with minimal displacement (B). The other limb of the 'y' approaches the acetabular dome (C). A second fracture is present at the inferior border of the anterior superior iliac spine with minimal displacement postero-inferiorly (D).

collections. The patient was eventually discharged from hospital 12 days after admission.

One year postinjury, there was complete healing of the abdominal wounds (figure 3) without evidence of an incisional hernia. The iliac and acetabular fractures have united, although there is a pincher deformity of the acetabular rim remaining (figure 4).

DISCUSSION

Abdominal evisceration after blunt trauma is exceedingly rare. Eleven cases are reported in the world literature to date.¹⁻⁹ Several injury mechanisms have been reported including a horse falling onto a rider's abdomen,⁹ two cases of riders falling onto bicycle handlebars,^{2 8} three abdominal crush injuries in road traffic accidents,^{1 4 5} three pedestrians in vehicle collisions⁶ and uncontrolled descent on a waterslide.³ There has been one case

Figure 3 Surface of the abdomen 1-year post-injury. There is complete healing without evidence of an incisional hernia.

Figure 4 Pelvic radiographs 1-year post-injury. The acetabular floor has rotated inward in the pelvis and there is a pincher deformity of the superior acetabular rim (red arrow). Iliac wing fractures have united.

reported with a similar injury mechanism where a 5-year-old boy was crushed under the wheel of a cargo truck.⁷ In that case, the patient sustained a trans-anal evisceration.⁷

The injury mechanism is not well understood, but it is believed that the external blunt force weakens the abdominal wall by shearing the musculofascial layers¹⁰ and simultaneously raises intra-abdominal pressure.⁷ This leads to an acute traumatic hernia where there is fascial disruption but intact skin.^{10 11} With sufficient injury force, the skin can also be disrupted to allow evisceration.

The eviscerations tend to occur more commonly at anatomic weak points, such as the lateral border of rectus,⁷ lower abdomen,⁸ inguinal region¹¹ or natural orifices.^{3 7} In our case, the abdominal wall defect was located transversely over the lower abdomen, in the region of the linea semicircularis—an area of weakness where the posterior rectus sheath is deficient.

Traumatic eviscerations are dramatic injuries that may dominate clinicians' attention in the emergency room. But there are often associated injuries due to the significant force that is imparted. Associated injuries may be present in up to 30% of cases.¹²

These injuries require prompt surgical attention. While resuscitation proceeds, a rapid secondary survey should be performed to identify polytrauma injuries. After stabilisation, these patients should be taken to the operating room.

A careful search should be carried out for associated injuries at exploratory laparotomy. The abdominal wall laceration should be debrided and then repaired in layers. However, when there is marked oedema, significant tissue injury and/or an unstable patient, abdominal wall closure becomes less important and a staged closure would be more appropriate.^{10 13} We did not believe that this was required in the index case as there was little tissue loss after debridement and the abdominal wall tissues were healthy. Therefore, we could achieve a tension-free fascial closure and the skin closed primarily.

Patient's perspective

This injury mechanism serves as a reminder to avoid going beneath the undercarriage of vehicles unless another individual is present to supervise this activity.

Learning points

- ▶ Abdominal evisceration after blunt trauma is rare.
- ▶ Exploratory laparotomy is mandatory, but a brief period of resuscitation is appropriate in patients who are clinically stable. This may facilitate thorough preoperative investigations to be completed.
- ▶ An aggressive search for associated intra-abdominal injuries is mandatory.
- ▶ In unstable patients or those with significant tissue disruption, staged abdominal wall closure should be considered.

Competing interests None.

Patient consent Obtained.

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