CASE REPORT

Delayed complete small-bowel and mesenteric transection following seemingly minor blunt abdominal trauma

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A 63-year-old lady presented with bowel obstruction. There was no history of prior abdominal surgery and no hernia evident. She mentioned a seemingly minor fall from her bicycle 9 days prior to the beginning of her symptoms, with resultant right-sided abdominal bruising, but no further investigation had been performed at that time. As she failed to improve clinically, laparotomy was performed. Surprisingly, complete small-bowel and mesenteric transection was found, with both ends of ileum almost completely healed with scar tissue. Small-bowel transection following blunt abdominal trauma is a rare case that usually occurs immediately after significant high-energy trauma, and presents with generalised peritonitis, often with shock. This case illustrates that seemingly minor blunt abdominal trauma can lead to serious bowel injury. Unusually, in this case the process of bowel transection was insidious, resulting in a delayed presentation with bowel obstruction (figure 1).

BACKGROUND

Significant injury to the small bowel following blunt abdominal trauma is uncommon, and usually follows a high-energy impact, with significant deceleration.¹ This most commonly occurs in relation to motor vehicle accidents, but has been reported in cases of falls from height,^{1 2} and significant sports injury.³ The most common injuries are non-devascularising mesenteric injuries. Small-bowel perforation, transection and devascularising mesenteric injury are less common and almost always present with generalised abdominal tenderness, and often shock.⁴ Only rarely has intestinal perforation been reported in low-energy impacts such as a fall from a bicycle resulting in handle bar injury, and a blow to the abdomen from a collision during soccer.³ In both these cases, the patient presented with severe abdominal tenderness, prompting urgent imaging and laparotomy. We report a case of delayed small-bowel transection following seemingly minor abdominal trauma 9 days previously (figure 2).

CASE PRESENTATION

A 63-year-old lady presented to the surgical on-call team having been referred by her general practitioner (GP). She had returned from a holiday in Spain the previous day, with the main complaint of central colicky abdominal pain associated with bloating and vomiting for the previous 4 days. She

also described absolute constipation for the past 3 days, despite usually opening her bowels daily.

Her symptoms had begun while on a holiday, where she attended a local hospital and was tentatively diagnosed with gastroenteritis. An abdominal plain radiograph was performed, which was reportedly unremarkable, and she was admitted overnight for intravenous fluid therapy, analgesia and antiemetics. She returned from Spain but her abdominal pain and bilious vomiting persisted, prompting her to attend her GP, who duly referred her onwards to the surgical on-call team.

The patient gave a history of mild asthma, hypertension and ductal carcinoma in situ of her breast for which she had undergone successful wide local excision a year previously. She was a non-smoker with an alcohol intake within acceptable limits.

Upon examination, she was haemodynamically stable and afebrile. Her abdomen was soft with diffuse tenderness most marked in the central and lower abdomen, but no peritonism.

Upon returning to the patient's history sometime later into her admission, prompted by an unusual emerging clinical picture, she mentioned that she had fallen off her bicycle at slow speed some 9 days prior to the beginning of her abdominal pain. She later noted extensive bruising to the right side of her abdomen, although her main complaint at the time was of left elbow pain, for which she attended the emergency department and underwent radiographs. No definite fracture was identified although an elevated fat pad and haemarthrosis led to her being recalled for assessment in the fracture clinic.

INVESTIGATIONS

Inflammatory markers were elevated with a C reactive protein of 736 and a white cell count of 13. Liver function and amylase were within the normal limits. She exhibited a moderately elevated urea and creatine in concordance with clinical signs of dehydration.

An emergency CT scan was requested which showed small-bowel obstruction with abnormal air-fluid levels in the lower abdomen (figures 3 and 4).

DIFFERENTIAL DIAGNOSIS

The clinical picture of bowel obstruction was initially managed with a nasogastric tube and intravenous fluids. Empirical broad-spectrum antibiotics were included to cover a presumed intra-abdominal source of sepsis. Following the CT, three hypotheses were raised: extraluminal collections, necrotic

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Figure 1 Plain abdominal radiograph showing small-bowel dilatation.

bowel or small bowel volvulus. The aetiology of each in this particular case seemed difficult to explain, but given the patient's unimproved clinical picture, a laparotomy was thought appropriate management for each of these possible diagnoses.

TREATMENT

An emergency laparotomy was duly performed. A large cavity, walled off by small bowel loops, was discovered and found to contain a large amount of heavily blood-stained fluid. Upon further inspection, approximately 90 cm proximal to the

Figure 2 CT scan demonstrating dilated small bowel.

Figure 3 CT scan demonstrating fluid collection within the abdomen.

ileocaecal junction, the small bowel had completely auto-transected along with its mesentery, leaving both luminal ends healed by scar tissue (figure 4). The proximal end was completely sealed, while the distal end bore a tiny residual hole. The entire bowel was viable, with the proximal bowel distended. A side to side stapled anastomosis was performed.

OUTCOME AND FOLLOW-UP

The patient was managed in the intensive care unit postoperatively with parenteral nutrition, before starting free fluids on the third postoperative day and returning to the ward on the fourth postoperative day. She left the hospital 2 weeks later after a recovery marked by some minor postoperative wound complications.

DISCUSSION

We hypothesise that the patient may have sustained a bicycle handle bar injury to her abdomen, masked by the distracting injury to her left elbow. The blunt trauma may have caused a mesenteric injury, resulting in gradual ischaemic necrosis of a segment of small bowel. Eventually, this resulted in complete transection of the ileum and remarkably, almost complete sealing of both luminal edges by scar tissue.

Current evidence suggests that CT is the imaging of choice in the haemodynamically stable patient initially presenting to the

Figure 4 Intraoperative photograph demonstrating patient's small bowel transection.

emergency department with blunt abdominal trauma.⁵ Focused abdominal sonography for trauma and even formal abdominal ultrasonography may miss injuries not associated with intra-abdominal fluid and are therefore not useful in haemodynamically stable patients.^{6 7} However, given that the patient's abdomen was not examined in the emergency department, it seems the need for abdominal imaging was not considered.

Three elements of this case seem particularly unusual and worthy of reporting. First, this bowel transection occurred after such a seemingly minor injury that the patient's initial complaint was of elbow pain and not abdominal pain. Small-bowel transection after blunt abdominal trauma is recognised, but usually the trauma is of significantly high energy, such that the patient is symptomatic with pain, peritonism or haemodynamic instability.⁴

Second, the subsequent insidious process of ischaemic necrosis seems remarkable, only finally becoming symptomatic 9 days later. Testament to the quiescence of this process is the fact that the patient felt well enough to go abroad on a holiday.

Third and on a related note, it seems remarkable that the patient presented with the symptoms of bowel obstruction rather than fulminant peritonitis, due largely it would seem from the gradual sealing by scar tissue of the affected bowel edges.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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Learning points

- This case highlights the importance of a thorough history and examination, both in the emergency department to ensure that injuries are not missed, and later when the clinical picture appears unusual.
- This case should also lower our threshold for suspecting serious bowel injury, from cases of high-energy blunt abdominal trauma with readily apparent symptoms and signs, to lower energy or occult injury.
- Any history of recent abdominal trauma regardless of apparent triviality is relevant in diagnosing delayed bowel transection.
- CT imaging can be equivocal and the diagnosis may only be apparent at laparotomy.

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