



CASE REPORT

# Delayed small bowel perforation following blunt abdominal trauma: A case report and review of the literature



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small bowel

**Summary** We report a case of delayed presentation of a small bowel perforation following blunt abdominal trauma (BAT). An initial computed tomography (CT) scan revealed that the patient (a 32-year-old man) had a mesenteric hematoma, which was managed conservatively. Four weeks later, he returned to the hospital complaining of abdominal pain. A CT scan of the abdomen showed a thickened loop of the small bowel adjacent to the mesenteric hematoma at the level of the ileum. He was discharged home, but re-presented with acute abdomen 6 weeks post-trauma. An exploratory laparotomy was performed, which showed a perforated thickened loop of the ileum forming a phlegmon in the lower abdomen. In the English medical literature, only eight other reports of delayed post-traumatic presentation of ileal/jejunal perforation following BAT have been reported. We propose that post-traumatic intestinal perforation be considered in the differential diagnosis even in patients who experience a delayed small bowel perforation following BAT.

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## 1. Introduction

A small bowel perforation due to blunt abdominal trauma (BAT) is relatively uncommon,<sup>1–3</sup> and the exact mechanism remains controversial. Delayed presentation of small bowel perforation following BAT is extremely rare. The delayed onset of symptoms following the trauma often makes the diagnosis difficult. In the English-language medical literature, eight other reports (10 cases) of delayed post-traumatic presentation of ileum perforation (3 cases) or jejunum perforation (7 cases) following BAT have been reported.<sup>4–11</sup> The underlying pathophysiologic mechanism has not been described well. Characteristics of the patients from the previous reports who had a delayed presentation of small bowel perforation following BAT are summarized in Table 1.

This report presents a rare case of delayed bowel perforation in a patient who developed a mesenteric hematoma following BAT. We discuss the possible mechanism underlying this delayed presentation and propose that post-traumatic intestinal perforation be considered in the differential diagnosis of patients who experience a delayed presentation of small bowel perforation following BAT.

## 2. Case report

A 32-year-old male presented to our trauma center following a motorcycle accident. He was found to have a closed head injury, rib fractures, left shoulder dislocation, humerus fracture, and open fracture of the left tibia and

fibula. A computed tomography (CT) scan of the abdomen with contrast showed a  $7 \times 4$  cm<sup>2</sup> mesenteric hematoma (Fig. 1A). A closed reduction of the shoulder dislocation, and an open reduction and internal fixation of his tibia and fibula fractures were performed. He was discharged from the hospital after 1 week of observation. As the patient had open fractures on admission, he received a 10-day course of antibiotics (7 days during the hospital stay and 3 days after his discharge). At the time of discharge, the patient had no fever and was tolerating a regular diet. His abdomen was soft and nontender on examination. His complete blood count showed a normal white blood cell count of 9.03 k/ $\mu$ L (k/ $\mu$ L = thousands per cubic milliliter) (normal range = 4.0–11.0 k/ $\mu$ L). The patient returned to the hospital 4 weeks after discharge (5 weeks post-trauma), complaining of abdominal pain on sitting up and in a standing position. He did not have a fever, was tolerating regular food, and had normal bowel movements. There was no evidence of peritoneal signs on abdominal physical examination. A repeat CT scan of the abdomen with contrast was performed, which showed a thickened narrowed loop of the small bowel adjacent to a mesenteric hematoma at the level of the distal ileum (Fig. 1B). His white blood cell count was 7.59 k/ $\mu$ L (normal range = 4.0–11.0 k/ $\mu$ L). He was discharged home but re-presented 1 week later (6 weeks post-trauma) with signs of acute abdomen. His white blood cell count was measured at 18.94 k/ $\mu$ L (normal range 4.0–11.0 k/ $\mu$ L). An exploratory laparotomy was performed. Intraoperative findings included a phlegmon in the mid lower abdomen with a perforated thickened loop of the small bowel and about 300 mL of purulent material in the

**Table 1** Characteristics of the patients from the previous reports who had a delayed presentation of small bowel perforation following blunt abdominal trauma.

Age (y)	Sex	Reference	Mechanism of injury	Presentation delay (d)	Perforation site	Mesenteric injury <sup>a</sup>	Postoperative findings
28	M	How et al <sup>4</sup>	MVC	56	Ileum	NM	Mucosal necrosis, transmural edema in keeping with ischemic changes in the involved segment
37	M	Subramanian et al <sup>5</sup>	MVC	77	Jejunum	<b>MH (+)</b>	Mucosal necrosis, transmural congestion, hemorrhage, and serositis in the involved segment
32	M	Subramanian et al <sup>5</sup>	MVC	49	Jejunum	NM	Ulceration, transmural congestion, submucosal infiltration, and granulation tissue in the involved SB
36	M	Coats <sup>6</sup>	MVC	26	Ileum	<b>MT (+)</b>	Histological evidence of bowel ischemia in the involved segment
36	F	Mauil and Rozycki <sup>7</sup>	MVC	4	Jejunum	NM	Antimesenteric SB perforation
7	M	Winton et al <sup>8</sup>	MVC	6	Jejunum	<b>MH (+)</b>	Seromuscular tears proximal and distal to the SB perforation
29	M	Winton et al <sup>8</sup>	MVC	6	Jejunum	<b>MH (+)</b>	SB perforation and ischemic sigmoid colon
13	M	Ross and Bickerstaff <sup>9</sup>	Fall from bicycle	6	Jejunum	NM	SB perforation with necrotic area at the edge of perforation
32	M	Fleishman et al <sup>10</sup>	MVC	35	Ileum	NM	Total disruption of the terminal ileum associated with tissue loss
30	M	Burrell et al <sup>11</sup>	MVC	11	Jejunum	NM	SB perforation secondary to bowel infarction

F = female; M = male; MH = mesenteric hematoma; MT = mesenteric tear; MVC = motor vehicle crash; NM = not mentioned; SB = small bowel.

<sup>a</sup> Presence and type of the reported mesenteric injuries are in bold.

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