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Delayed Small Bowel Perforation Following Blunt Abdominal Trauma as a Rare Cause of Acute Abdomen: A Case Report

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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Case Study

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ABSTRACT

We present a case of delayed small bowel perforation occurring 3 months after a blunt abdominal trauma. A 36 year old male sustained a steering wheel injury 3 months back. Computed tomography of the abdomen done after the trauma revealed only a mild peritoneal collection with a small non expanding mesenteric hematoma. He was managed conservatively. He now presented with features of acute abdomen since 2 days. Clinical and radiological investigations revealed a perforated viscous. He underwent exploratory laparotomy to reveal a phlegmon with multiple adhesions in the ileal loops with an underlying ileal perforation. The pathophysiological mechanism of such injuries causing a delayed presentation is unclear with only a few cases reported in the literature. We propose that delayed small bowel perforation following blunt abdominal trauma should be considered as a rare cause of acute abdomen.

Keywords: Small bowel perforation; blunt abdominal trauma; pathophysiological; radiological investigations.

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1. INTRODUCTION

Though small bowel injury is the third most common injury in patients with blunt abdominal trauma, isolated small bowel perforation following blunt trauma to the abdomen is an uncommon entity with an incidence of 0.3% [1]. Delayed presentation of small bowel perforation following blunt abdominal trauma is even rare, making the diagnosis and subsequent management difficult. The exact pathophysiological mechanism behind the delayed presentation is obscure with only a few cases mentioned in the literature [2]. Outlined here is a rare cause of delayed ileal perforation following a blunt abdominal trauma caused by a road traffic accident, explaining the probable pathophysiologic mechanism with an emphasis on its management.

2. CASE REPORT

A 36 year old male with a 3 month (96 days) history of steering wheel injury to the abdomen presented to SCB Medical College and Hospital, Cuttack with acute abdomen. Following the blunt trauma to the abdomen 3 months back, computed tomography (CT) revealed mild peritoneal collection with a small non expanding mesenteric hematoma. He was managed conservatively then and discharged. On follow up visits after, he complained of dull aching pain in the right lower abdomen which subsided on analgesics with ultrasonography of the abdomen revealing no abnormalities. Now he presented with acute abdominal pain of severe intensity since 2 days. On examination, the patient was in shock with signs of peritonitis. Abdominal radiograph was suggestive of a perforated viscous as shown in Fig. 1. A bedside ultrasonographic evaluation revealed moderate peritoneal collection with internal floating echoes with mild circumferential symmetrical wall thickening of small bowel loops. With a probable diagnosis of small bowel perforation, patient underwent emergency laparotomy. Intra-operatively around 800ml of feculent peritoneal collection was drained, a phlegmon with interloop ileo-jejunal adhesions noted along with ileal adhesions to the ascending colon. Adhesiolysis was done revealing a perforation on the thickened lateral border of the ileum as shown in Fig. 2. Resection of ileal segment along with the perforation was done. Both ends were brought out as an ileostomy with mucous fistula. Patient recovered with no post-operative complications. Histopathological examination of the resected ileal segment showed numerous hemosiderin laden macrophages (as shown in Fig. 3) suggestive of an old hemorrhage with chronic inflammatory changes.

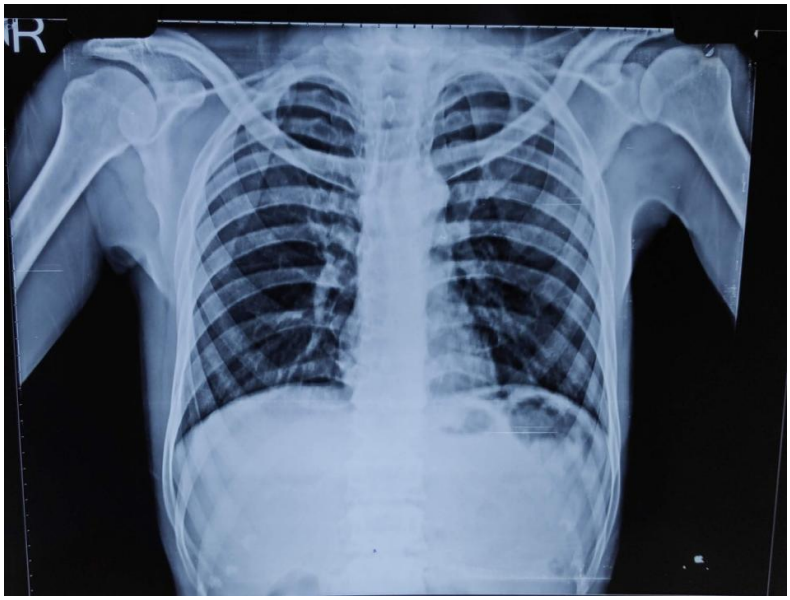

Fig. 1. Erect chest radiograph showing air under the diaphragm suggestive of hollow viscous perforation

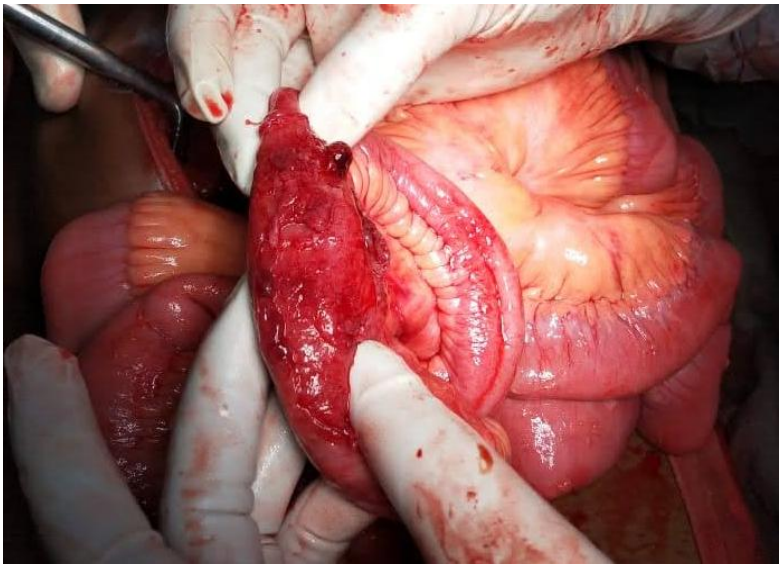

Fig. 2. Intra-operative picture showing ileal perforation with inflamed and thickened portion of bowel

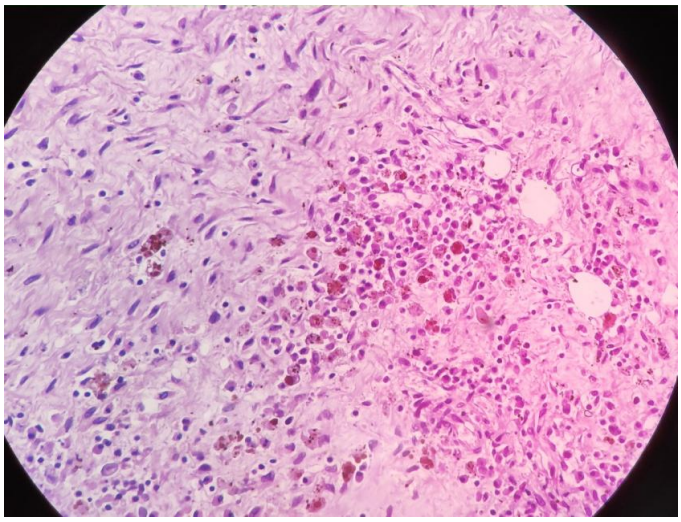

Fig. 3. Microscopy of resected ileal specimen showing numerous hemosiderin laden macrophages

3. DISCUSSION

Small bowel injury presenting soon after the blunt abdominal trauma is well documented with many pathophysiological mechanisms put forth to explain it. Vertruyen M, et al [3] explained the mechanism of deceleration, crushing and rupture phenomenon causing isolated small bowel injury presenting soon after the event. Nonetheless this does not explain the delayed presentation of small bowel perforation developing weeks after the initial trauma. These isolated injuries of small bowel should be particularly looked for in patients having steering wheel injury [4].

Injury to the small bowel following blunt abdominal trauma can comprise a bowel wall contusion, perforation or mesenteric injuries such as tear or haematoma. Not all these injuries require an emergency laparotomy for their management. Some partial and isolated mesenteric injuries may go unnoticed on initial

evaluation [5]. Few case reports published earlier present delayed intestinal stenosis resulting in small bowel obstruction after blunt abdominal trauma [6,7]. Such clinical presentations are the end result of an isolated mesenteric injury (tear or haematoma) which progresses causing compromised vascularity of the intestinal wall causing bowel wall ischemia, mucosal ulceration and submucosal inflammation [6].

The severity and time of presentation of these delayed small gut injuries greatly depends on the progression of ischemia [2]. The resultant consequence could either be a bowel ischemia causing ulceration, mucosal sloughing and perforation or a chronic inflammatory process leading to fibrosis and stricture. These two mechanisms can further have an additive effect where the fibrosis and stricture can cause a raised intraluminal pressure aiding in bowel perforation at predisposed sites [8]. Though these pathophysiologic mechanisms have been proposed by the authors, the exact etiology with the sequence of events remains unclear. These patients with suspected mesenteric injury must be followed up routinely. Contrast enhanced CT with intravenous and oral contrast or serial oral water soluble contrast study may facilitate in early detection.

How PD, et al. [9] presented a case of ileal perforation presenting 56 days after the abdominal trauma describing a similar pathophysiologic mechanism. We propose the cause of small gut perforation in the current case to be a consequence of blunt abdominal trauma 3 months back with a probable isolated mesenteric injury leading to a stricture and subsequent perforation. Management of such patients must be clinically guided. Most patients with perforation usually present with features of peritonitis and exploratory laparotomy becomes necessary.

4. CONCLUSION

Delayed small bowel perforation following blunt abdominal trauma should be considered as a cause for patients presenting as acute abdomen. With very few such cases reported in the literature, there have been some attempts at explaining the underlying pathophysiological mechanism but the exact cause still remains unclear. Although conservative management in a haemodynamically stable patient with isolated mesenteric injury is followed the probable occurrence of such delayed complications should be understood. Follow up of such patients with clinical and radiological methods is essential for early detection and management of such pathologies.

CONSENT

As per international standard or university standard, patients' written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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