

# Post-Traumatic Long Segment Small Bowel Stricture

## —A Diagnostic Dilemma

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## Abstract

Delayed post-traumatic small bowel stricture is rare and differentiation from other more common causes of small intestinal stricture is difficult. Presentation may be delayed up to years after the injury. Very often the findings mimic those of other causes of long segment strictures such as tuberculosis, Crohn's disease, lymphoma etc. This study analyzes two cases of post-traumatic small bowel stricture, with different presentations and different therapeutic challenges. The literature on this condition is not well recognized and will be reviewed. Resection and reconstruction are diagnostic and therapeutic in patients who present with post-traumatic small bowel stricture, as inflammatory and neoplastic causes cannot be ruled out without histological diagnosis.

## Keywords

**Bowel Stricture, Post-Traumatic Bowel Pathology, Delayed Small Bowel Stricture**

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## 1. Introduction

Delayed post-traumatic small bowel stricture is a rare diagnosis and differentiation from other more common causes of small intestinal strictures is difficult. Delays in presentation from the time of blunt abdominal trauma to the time of presentation of obstructive symptoms have been documented to be as long as 26 years in European literature [1]. It is mostly low-energy trauma which has been shown to affect small bowel leading to chronic

ischemia, fibrosis and stricture-formation [2]. This study analyzes two such cases of post-traumatic small bowel pathology, with different presentations and different therapeutic challenges. The insult-diagnosis period for case one was four weeks and for case two was five months.

## 2. Case Description

### 2.1. Case One

A 14-year-old boy presented to the hospital with history of blunt trauma to the abdomen by a wooden rod two weeks prior to admission. The trauma was trivial and he was treated as an outpatient at a peripheral hospital with analgesics. At the time of presentation, the patient had complaints of intermittent, colicky lower abdominal pain, which increased on micturition and defecation. He had no history of vomiting, hematuria or bleeding per rectum.

On examination, the patient had a soft, non-distended, non-tender abdomen with no abnormality on clinical examination. Ultrasound examination of the abdomen showed what looked like a heterogeneous localized collection superior to the bladder. Progressive review ultrasounds showed no progression or regression of the lesion but symptoms continued to worsen. CECT abdomen showed evidence of focal, long segment, small bowel thickening from the level of the umbilicus to the dome of the urinary bladder. The thickened bowel loops appeared hypodense with mural stratification and inflamed adjacent mesentery with multiple enhancing mesenteric nodes (**Figure 1(a)**). With a suspicion of inflammatory bowel disease (Crohn's disease or tuberculosis) the patient was posted for exploratory laparotomy since diagnosis was not clear and the obstruction did not subside.

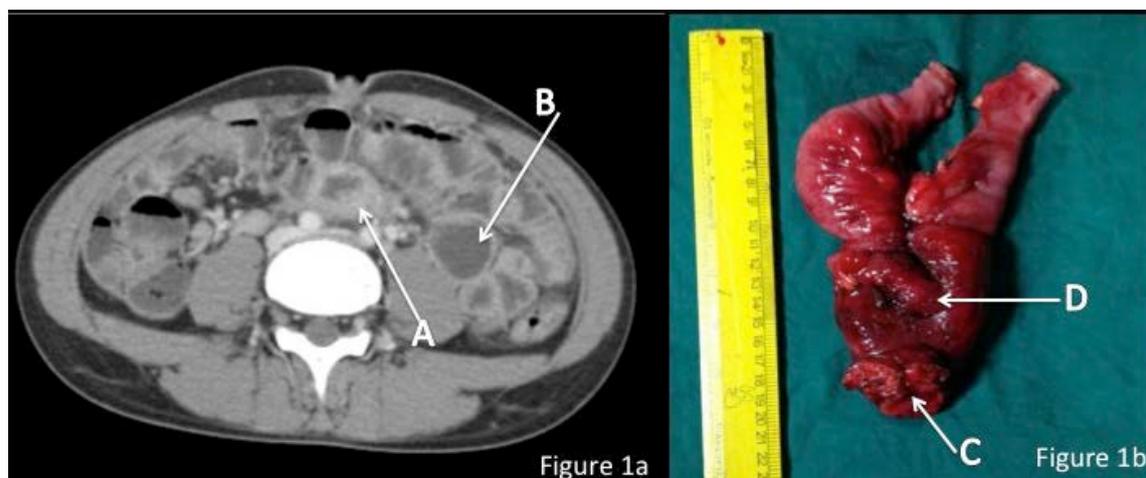
Intra-operatively, he was found to have a segment of thickened and inflamed ileum measuring approximately 15 - 18 cm, along with thickening of the mesentery. The loop was densely adherent to the dome of the urinary bladder and sigmoid colon. The tip of the appendix was found adherent to the thickened and inflamed mesentery (**Figure 1(b)**). The patient underwent an ileal resection along with wedge resection of the sigmoid colon, resection of the dome of the bladder and an appendectomy. The inflammatory mass was removed in toto as seen in **Figure 1(b)**. This was followed by an ileo-ileal anastomosis, two layer repair of the sigmoid colon with a diverting transverse loop colostomy and reconstruction of the bladder dome.

Histopathological examination of the resected ileum, bladder, sigmoid and appendix showed chronic inflammatory changes. The sections from the mesentery showed edema with increased fibrous tissue with reactive changes in the lymph nodes.

Post-operatively, the patient was relieved of his symptoms and on follow-up after three months, underwent closure of the transverse loop colostomy. He is asymptomatic at one-year follow-up.

### 2.2. Case Two

A 45-year-old male patient, presented with complaints of intermittent, colicky lower abdominal pain for three months associated with non-bilious vomiting an hour or two after food intake for two weeks. The patient had no



**Figure 1.** (a) CECT abdomen showing thickened bowel wall (A) with proximal dilated bowel loop (B); (b) Resected ileum with dome of bladder (C), thickened appendix (D).

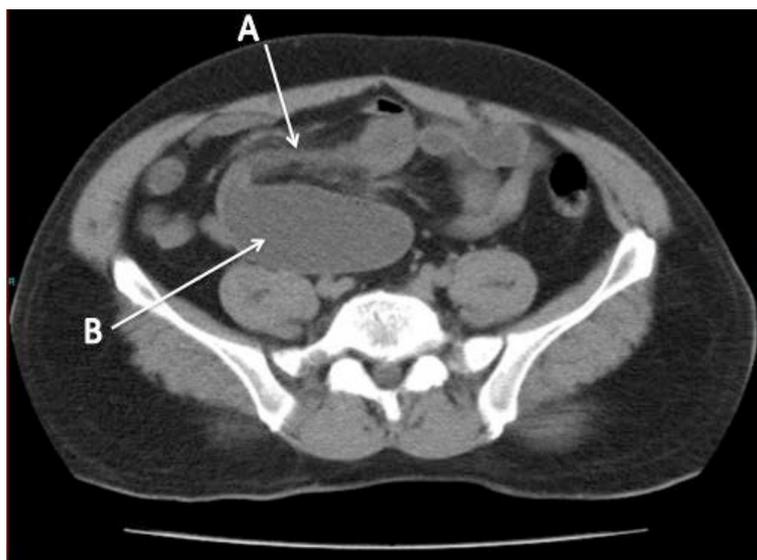
complaints of difficulty in defecation or micturition.

Five months prior to the time of presentation, the patient gives a history of fall from height at his work place. The patient had sustained three broken ribs on the left side of his chest with pleural effusion and blunt trauma to the abdomen. He was admitted at this hospital for the same. At the time of injury, ultrasound abdomen and CECT abdomen were normal. Patient was treated conservatively for his chest trauma and discharged.

A repeat CECT of the abdomen done on re-admission, showed a long segment stricture of small bowel with inflamed mesentery (**Figure 2**). Since the diagnosis was not definitive, the patient was posted for exploratory laparotomy.

Intra-operatively, a strictured segment of bowel loop of about 15 cm, with thickened and inflamed mesentery was observed. The proximal bowel was dilated and the distal bowel collapsed (**Figure 3**). Approximately 20 cm of the involved bowel segment was resected and an end-to-end anastomosis was done. Post-operative period was uneventful.

Histopathologically, non-specific chronic inflammatory changes were seen in the serosa, muscularis mucosa and mucosa of the resected segment of small bowel (**Figure 3**).



**Figure 2.** CECT addomen showing a “S” shape stricture (A) with proximal dilated bowel loop (B).



**Figure 3.** Resected ileum and histopathological slide showing chronic non-specific inflammatory changes (Hematoxylin and eosin stained slide with magnification of 40×).

### 3. Discussion

Small bowel stenosis following abdominal trauma is rare and comprises less than 1% of admissions due to non-penetrating trauma [3]. Post-traumatic small bowel injury is commonly seen in the proximal jejunum and terminal ileum as they are relatively fixed sites of the small bowel [4] [5]. It is said that, mesenteric ischemia of the involved segment or direct injury to the small bowel leading to hematoma formation with subsequent fibrosis and stenosis is the usual pathological cause [6]. Clinical and histological observations have been described to aid in the diagnosis of post-traumatic small bowel obstruction. These include 1) definitive history of blunt abdominal trauma, 2) no apparent illness prior to trauma, 3) onset of intestinal symptoms after trauma, 4) confirmation of intestinal stenosis by imaging, and 5) no specific inflammatory or neoplastic changes in the resected specimen [3].

The various pathological causes of small bowel obstruction following blunt abdominal trauma are adhesions, sub-clinical bowel perforation, mesenteric defects, intramural hemorrhage and localized ischemia [1] [3]. CT studies of the abdomen are reliable in detecting small bowel and mesenteric injury in post-trauma cases. Brody *et al.* have described CT signs in cases of acute and chronic small bowel and mesenteric injury that may aid in diagnosis of small bowel trauma. These include bowel discontinuity, bowel wall thickening and enhancement, extra-luminal oral contrast, extra-luminal air, intra-luminal air and mesenteric infiltration [7]. However these findings are not specific to trauma and may mimic inflammatory diseases involving the small bowel. Small bowel barium and CT studies in post-traumatic patients may show findings which resemble those seen in Crohn's disease or tuberculosis and differentiation by imaging may be impossible [6]. This leaves only resection and reconstruction of the diseased bowel as the only choice for diagnosis and treatment.

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### Abbreviations and Acronyms

CECT: Contrast Enhanced Computerized Tomography

CT: Computerized Tomography

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