

# Small bowel and colon perforations following blunt abdominal trauma : a case report

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## ABSTRACT

*Small bowel and colon injuries are uncommon after blunt abdominal trauma. Repeated clinical assessment is important, especially when investigative imaging is negative. We report a case of 65-year-old male presented to the emergency department following a blunt abdominal trauma. No clinical or scanographic abnormality was found during his initial consultation. Four days later, he presented an increased abdominal pain with tachycardia; The x-ray of the abdomen showed a pneumoperitoneum and an emergent laparotomy was undertaken. Two perforations were found at the small bowel and sigmoid colon, repaired with sutures for the first and colostomy for the second. Patient was discharged home on day five. The diagnosis of small bowel and colon injuries is difficult and a low threshold of suspicion is crucial to reduce morbidity and mortality. Hemodynamic instability or abdominal tenderness after blunt abdominal trauma should be indications for immediate surgical exploration, despite negative imaging findings. Serial clinical assessment is the main decision tool to perform an abdominal exploration.*

**Keywords:** *small bowel, colon, surgery, perforation*

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## Introduction :

Small bowel injury is uncommon after blunt abdominal trauma occurring in 1% of the patients. Only 0,3% of all blunt abdominal traumas will have a small bowel perforation [1]. The diagnostic approach to small bowel injury is not yet well described and widely accepted because of its rarity and lack of imaging specific indicators [2]. Early diagnosis is of paramount importance to reduce morbidity and mortality [3]. There is an increasing acceptance of non-operative management in hemodynamically stable patients with blunt abdominal trauma and solid organ injury [4]. A laparoscopic approach in abdominal trauma can decrease the chance of a negative laparotomy and allow a diagnostic and therapeutic option with reduced morbidity [5]. However, in blunt abdominal trauma the formal indications for minimal invasive approach are not yet established, and several factors related to the patient and surgical team must be taken into account in decision-making process [6].

We present a case of a 65-year-old male with small bowel and colon perforations following a blunt abdominal trauma. He was submitted to emergent laparotomy based on the clinical evaluation, which was contrasting with a normal abdominal CT scan. The main purpose of this case report is to highlight the importance of a serial clinical assessment.

## Case report :

A 65-year-old male was brought to the emergency department of Ibn Sina hospital (Rabat, Morocco), 4 days after suffering a blunt abdominal trauma. The patient reported a fall from his horse with abdominal pain that set in immediately after this event, which prompted a consultation. The scan requested during this consultation was unremarkable and the patient was referred home. 4 days later, the abdominal pain became increased which motivated the patient to consult again in our department. Physical examination found hypotension, tachycardia (120 beats in minute) and abdominal contracture. Abdominal X-ray showed a pneumoperitoneum.

Emergent laparotomy through a midline incision was performed. A small amount of free hematic fluid was found, as well as adhesions. The small bowel was carefully inspected from the ligament of Treitz up to the ileocecal valve. One perforation at the ileum was found ; it was repaired with Lembert 3/0 absorbable sutures. A second perforation was found at the sigmoid colon (figure 1), turned into a colostomy. The peritoneal cavity was washed-out with warm saline solution, and two drains were placed in the peritoneal cavity. There was no significant abdominal post-operative pain. The drains were removed on the 3rd day, and the patient was discharged home on day five. After one-year follow-up the patient is asymptomatic and without complications.



**Figure-1** : Intraoperative image showing the perforation of the sigmoid colon

#### **Discussion :**

The time delay between the trauma and surgical management is of paramount importance: if greater than 24 h, mortality increases 4 times compared with less than 8 h. Since the rate of false negatives when using only CT can be as high as 15%, relying only in imaging findings can delay the diagnosis of small bowel injury [7]. Abdominal trauma with small bowel injury can occur due to compression or deceleration forces. A direct blow to the abdomen with external compression of the small bowel against a fixed object increases its intraluminal pressure, causing rupture. On the other hand, deceleration forces cause sheering of the small bowel near its fixing point, such as the ligament of Treitz, ileocecal valve, or the mesentery, which might cause a perforation. If a small bowel perforation is confined or temporarily covered, or only liquid is leaking, pneumoperitoneum may be absent.

Kahn et al. suggest that, in the presence of intra-abdominal fluid with no solid organ injury, there should be high suspicion of bowel or mesenteric injury. However, the authors state that the presence of free peritoneal fluid is not a specific finding of bowel injury [8]. Moreover, the absence of free gas under the diaphragm does not exclude the presence of small bowel perforation [9]. This fact highlights the importance of serial clinical surveillance of abdominal trauma patients as a major tool in diagnosis and treatment process, instead of relying only on imaging findings to make those decisions.

The laparoscopic approach should be considered in hemodynamically stable patients who suffered blunt abdominal trauma with suspected intra-abdominal organ injuries, and equivocal imaging findings. Furthermore, it has the advantage of avoiding negative laparotomies, allows diagnostic and therapeutic measures, reduces post-operative morbidity with shorter hospital stay and fastest recovery [5]. However, other factors must be taken into account, such as patient related factors, surgical team laparoscopy experience and occasional inadequate injury visualization and missed injury. A published overview focused on the practical

aspects of the potential complications of laparoscopy in abdominal trauma (ref to Kindel et al.) states that when laparoscopy exploration is performed following previous abdominal procedures, there is a 12% rate of failure to achieve pneumoperitoneum, and port placement is more difficult in such patients, with a conversion rate of up to 50% [5,6]. Additionally, they argue that the laparoscopic approach is less diagnostically reliable with sensitivity of only 18% and negative predictive value of 83%, where the diagnostic accuracy is dependent on the surgeon laparoscopy skills [6].

### Conclusion :

In conclusion, the diagnosis of small bowel and colon injuries injury can be difficult in the case of blunt trauma, therefore a low threshold of suspicion is crucial to reduce morbidity and mortality. The presence of hemodynamic instability, and/or abdominal tenderness and guarding after blunt abdominal trauma is classically accepted indications for emergent laparotomy. In this setting, even with negative imaging findings, serial clinical assessment is the main tool to decide whether the patient should undergo emergent exploratory laparotomy.

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