



Colonic rupture following Blunt Abdominal Trauma: A diagnostic dilemma to the surgeon

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General Note



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ABSTRACT

Industrialization, changing life style, newer modes of recreational sports like jet ski, buggy rides, donut boating has added to the woes of trauma by increasing the morbidity and mortality. Abdominal injuries occur in approximately 41% of all trauma patients. Blunt Abdominal trauma (BAT) can occur as a part of polytrauma or in isolation. Injury to the hollow viscus is less common in blunt trauma when compared to penetrating abdominal trauma. BAT can be silent initially and as time progresses can cause fatal complications.

We present a case of a 21-year-old male who sustained trauma to the abdomen following hit by a donut boat. He had mild abdominal pain for 4 days. He presented to the hospital on the 5th day and computerised tomography (CT) of the abdomen was done which was suggestive of a Gastro intestinal stromal tumour (GIST)/ Hematoma. His condition worsened in the ward and a laparotomy was performed. Intraoperatively there was transection of the ascending colon near the hepatic flexure with faecal contamination surrounded by the small bowel and the mesentery. Right hemicolectomy with double barrel stoma was done. His post-operative recovery was uneventful.

Blunt abdominal trauma can have a delayed presentation. Isolated colonic rupture is very rare. CT is a very good investigative tool however a correct diagnosis of the extent of injury may not be possible. Laparotomy with one stage of two stage procedure is the treatment for such injuries

1. INTRODUCTION

Industrialization, changing Life style, newer modes of recreational sports like jet ski, buggy rides, donut boating has added of the woes of trauma by increasing the morbidity and mortality. Abdominal injuries occur in approximately 41% of all trauma patients (Rutledge Ret al., 1995). Blunt Abdominal trauma (BAT) can occur as a part of polytrauma or in isolation. Injury to hollow viscus is less common in blunt trauma when compared to penetrating abdominal trauma. BAT can be silent initially and as time progresses can cause fatal complications (Jain S et al., 2018). Identifying the intra-abdominal pathology in terms of organ injured whether solid or hollow viscus can be challenging. The reason for the delay between the traumatic episode and the discovery of the perforation as explained by Wescott and Smith is that an initial tear may involve the serosa and muscular layers, leaving the mucosa intact. Secondary ischaemia or infection further damages the mucosa to produce perforation (Westcott JL et al., 1975). Mechanism of injury in BAT is by deceleration, crushing, or external compression (Britt LD et al., 2013).

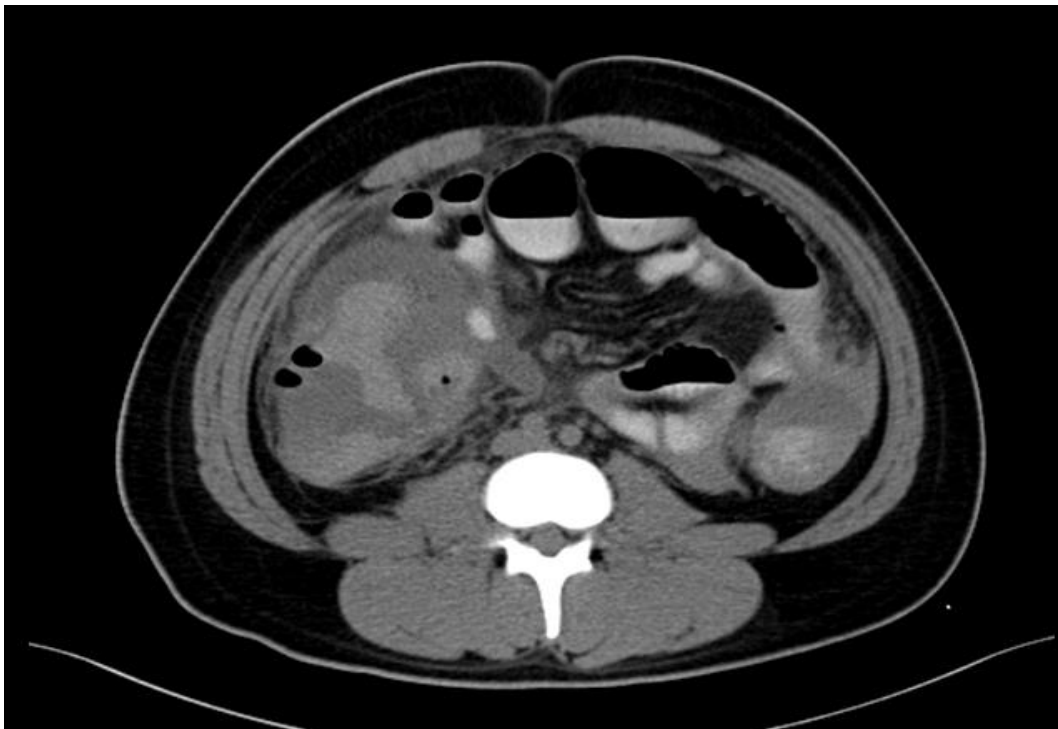


Figure 1 CT Scan showing the mass in the right side of the colon showing solid and fluid content

2. CASE REPORT

A 21-year-old male sustained trauma to the abdomen following hit by a donut boat. He had mild abdominal pain for 4 days. The pain worsened on the 5th day with difficulty in passing motions and vomiting once. He also complained of lethargy, palpitation and giddiness. He had an Ultrasonography and CT scan done at a private Hospital. The findings on CT scan were large intraabdominal mass measuring 8.5x10.6x7.5 cm with pressure effect, (Fig. 1) Fluid in the peritoneal cavity. Differential diagnosis of Colonic GIST, Haematoma, Lymphoma was suggested. He was shifted to the government hospital for further management. In the emergency Department the pulse rate was 105 beats/min, temperature 37.9, Blood pressure and respiratory rate were normal. He was pale, not jaundiced. The abdomen was soft, tender mass at the right lumbar region measuring 5x5cms. His WBC was 18.66 /mm³. Haemoglobin level 7.6 g/dL. He was admitted, transfused blood and started on antibiotics. He showed improvement during admission however on the third day after admission he complained of passing fresh blood per rectum. His heart rate was 123 beats

per minute. Repeat CT scan was done and the findings were as in the earlier examination. Patient underwent laparotomy. Intraoperatively there was transection of the ascending colon near the hepatic flexure with faecal contamination surrounded by the small bowel and the mesentery. 500cc of old blood in the peritoneal cavity. In view of the oedematous bowel wall a right hemicolectomy (Fig. 2) along with double barrel stoma was done. Post operatively patient recovered well and was discharged without any complication. Six months later he underwent closure of the stoma and end to end anastomosis with good postoperative recovery.

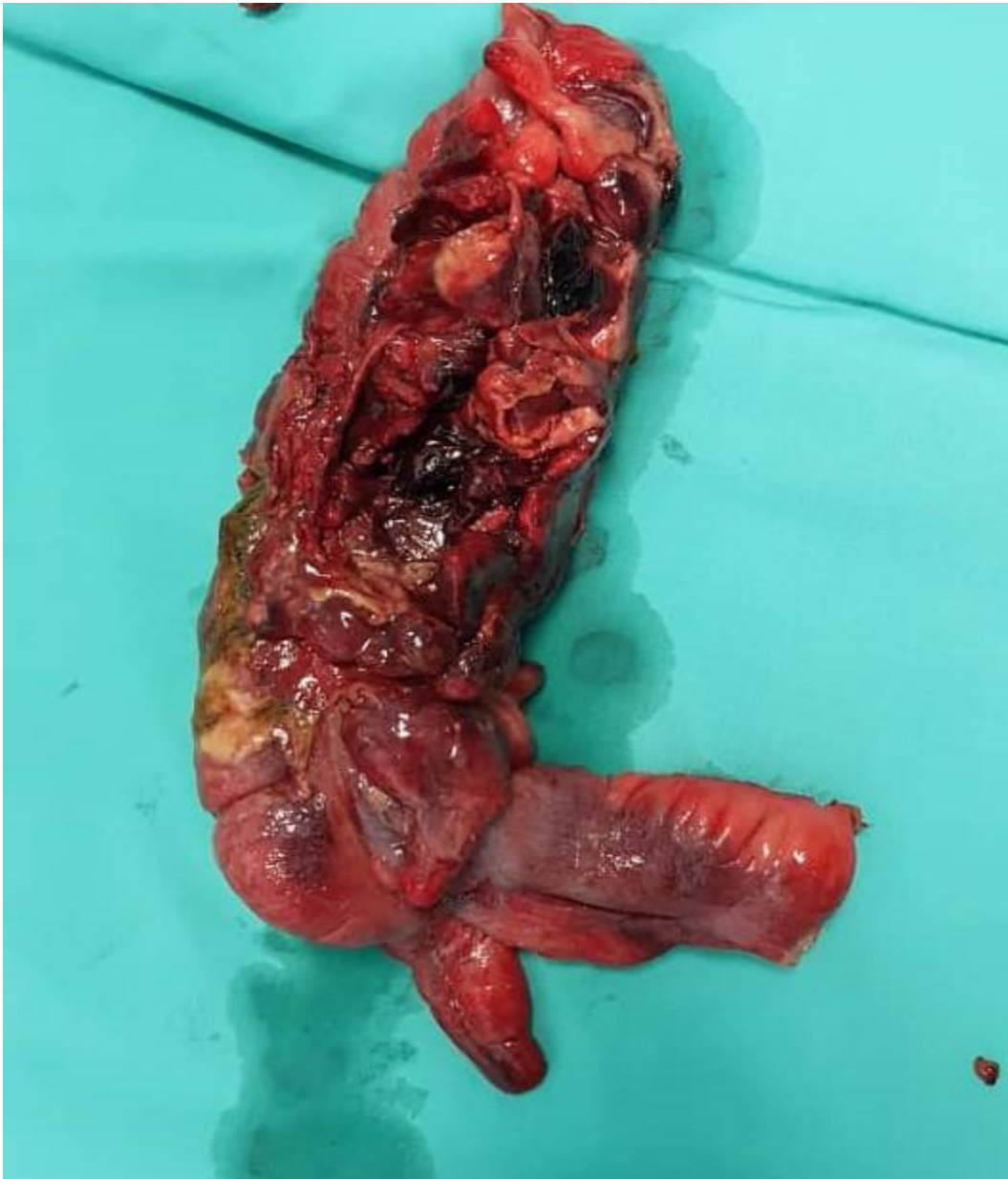


Figure 2 Right Hemicolectomy specimen showing colonic rupture

3. DISCUSSION

Abdominal trauma caused by blunt forces is a common presentation to the emergency department in all age groups. The presentation is varied and depends on the hemodynamic status of the patient. Usually patients present with abdominal pain and can have delayed presentation. Trauma can be to the solid organs or to the hollow viscus. Abdominal examination and other diagnostic modalities like plain radiograph, ultrasonography (USG). Computerised tomography (CT) and Diagnostic peritoneal lavage (DPL) are

important and useful but sometime can be non-conclusive leaving the surgeon in a dilemma. CT is an important and preferred diagnostic tool in bowel injury; however one should be aware of the false positive reports.

CT findings suggestive of bowel rupture include extravasation of contrast, thickening of the bowel wall, free fluid in the anterior pararenal space, and intraperitoneal blood (Mirvis SE et al., 1992). In some instances, meticulous attention to scanning technique, including reduction of artifacts, optimal bowel contrast, and appropriate review of images optimized for detection of minimal pneumoperitoneum will improve sensitivity of CT for diagnosis of bowel rupture (Mirvis SE et al., 1992).

The management of colonic injuries has changed significantly over the years from faecal diversion to primary repair (Cleary RK et al., 2006). The severity of colonic injury and faecal contamination are important in deciding one stage (primary repair) or two stage (faecal diversion). Severity of colon injury is graded according to the colon injury scale (CIS) (Moore EE et al., 1992). *Grade 1*: contusion and serosal tear without devascularization, *Grade 2*: laceration of less than 50% of the wall, *Grade 3*: laceration of 50% or greater of the wall, *Grade 4*: 100% transection of the wall, and *Grade 5*: complete transection with tissue loss and devascularization, an advanced grade for multiple injuries to the colon. The degree of faecal contamination is categorized as *mild*: stools contamination locally or one quadrant, *moderate*: stools contamination on 2 to 3 quadrants, and *severe*: stools contamination on all four quadrants (Xu SM et al., 2004). In our case it was grade 4 colonic injuries with mild contamination as the faecal matter was solid and localised on one quadrant.

The delayed presentation is explained based on Westcott and Smith's explanation and the patient having loaded colon with faecal matter the contamination was minimal. This also perhaps made the CT interpretations difficult. The patient could not have a one stage procedure and hence a right hemicolectomy with double barrel stoma was done.

4. CONCLUSION

Blunt trauma abdomen causing an isolated colonic rupture is very rare. Delayed presentation, advanced imaging modalities can make still pose a challenge to the surgeon in diagnosing the case. Decision to perform one stage or two stage procedure is dependent on the CIS and faecal contamination.

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Conflict of interest

There is no conflict of interest or financial support involved in this case report

Ethical approval

All ethical principles were respected. Publication of the article is approved by the secretariat National Institutes of health (NIH), number KKM.NIHSEC.800-4/4/1 Jid.66 (20).

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