

Jejunal transection after blunt abdominal trauma

Priya D Dhandore¹, N N Hombalkar², P D Gurav³, A D Mantri^{4*}

¹Assistant Professor, ²Associate Professor, ³Professor and HOD, ⁴JR III, Department of Surgery, Government Medical College, Miraj-416410
 Email: kool_adi03@hotmail.com

Abstract

Small bowel injuries are uncommon after blunt abdominal trauma and are usually due to high-energy deceleration injury, often in relation to motor vehicle accidents. Reports of small intestinal perforation during low-energy impacts are extremely rare. Report of two such cases of jejunal transection that occurred after trivial blows to central abdomen has been presented here. Possibility of occult intestinal injury should be borne in mind when patients present with blunt abdominal trauma with minimal physical signs.

Keywords: Jejunal transection, Blunt trauma, Bowel rupture.

*Address for Correspondence:

Dr. A D Mantri, JR III, Department of Surgery, Government Medical College, Miraj-416410, Maharashtra, INDIA.

Email: kool_adi03@hotmail.com

Received Date: 11/05/2016 Revised Date: 14/06/2016 Accepted Date: 08/07/2016

Access this article online

Quick Response Code:



Website:

www.statperson.com

DOI: 12 July 2016

INTRODUCTION

Small bowel injuries are uncommon after blunt abdominal trauma and are usually due to high-energy deceleration injury, often in relation to motor vehicle accidents¹. Reports of small intestinal perforation during low-energy impacts are extremely rare^[2]. Report of two such cases of jejunal transection that occurred after trivial blows to central abdomen has been presented here. Possibility of occult intestinal injury should be borne in mind when patients present with blunt abdominal trauma with minimal physical signs.

CASE 1

A 24 years old man presented to casualty department with assault after interpersonal violence. He had suffered blow to his central abdomen. He presented with severe abdominal pain. There was no vomiting or hematemesis.

His vitals were stable. Palpation revealed abdominal tenderness and guarding and bowel sounds were absent on auscultation. No bruises or other external injuries were noted. Erect X ray abdomen did not show free gas under the diaphragm. On ultrasound there was no evidence of any solid organ injury but minimal free fluid was detected in the abdomen. Patient was managed conservatively initially. Despite the fact that his clinical picture was unaltered during first few hours of admission, decision to do a computed tomography was made due to persistent abdominal tenderness. Presence of free intraperitoneal air and fluid on CT prompted for exploration. Findings showed an almost complete transection of proximal jejunum 20 cm distal from the ligament of Treitz. Exploration of the rest of peritoneal cavity was unremarkable. There was no evidence of intestinal ischaemia and mesenteric vessels injury. Localized bowel resection and primary anastomosis was performed. Postoperative course was uneventful and patient was discharged on 7th post-operative day.

CASE 2

A 30 years old man had a fall from stairs and sustained a minor abrasion to the abdomen. He presented after 4 hours with severe abdominal pain and vomiting. He was febrile, hemodynamically stable and had generalized abdominal tenderness. On auscultation bowel sounds were audible. On initial radiographic examination there was no evidence of pneumoperitoneum. There were no associated injuries. Eight hours post admission abdominal

computed tomography was done, as there was persistence of abdominal pain and tenderness. CT scan showed pneumoperitoneum. He subsequently underwent laparotomy and was found to have complete transection of distal jejunum 70 cm from duodenojejunal flexure. Resection and anastomosis was performed. Postoperative course was uneventful except for a minor wound infection and he was discharged on 12th post-operative day.

DISCUSSION

Most cases of small bowel perforation after blunt trauma occur due to motor vehicle accidents and are often associated with multiple injuries [1]. The pathogenesis of small bowel rupture in blunt trauma is widely studied and these mechanisms are postulated: crushing, shearing, and bursting [2]. (Figure 1)

Crushing Injury

A violent force directly applied to the abdomen can crush intestine between the force and lumbosacral spine [3]. Experimental studies suggest that this mechanism requires such a large force to cause small bowel injury that extraintestinal injuries often coexist with mutilation of the mesentery and large gaping bowel rents [4]. This mechanism usually occurs when seat belts are worn loosely across the abdomen, allowing the belt to ride high at impact and crush the bowel and mesentery against the vertebral column. (Figure 1A and 1B)

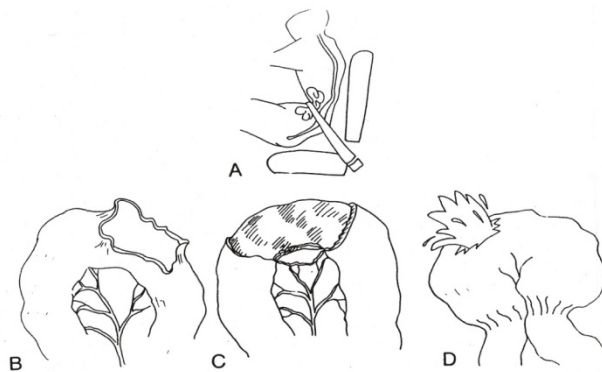


Figure 1: Mechanism of Traumatic bowel injury

Shearing Injury

Shearing injuries occur with sudden deceleration. Avulsion of the small bowel from fixed points of attachment follows (Figure 1C). With this mechanism, tears or transections are common near points of fixation, including the ligament of Treitz and ileo-cecal valve, where the foreshortened mesentery serves as a tethering point [5]. Reports have demonstrated vertical decelerations, by falls or jumps from heights, cause shearing intestinal injuries. Case studies cite small

intestinal injuries at points of fixation, including hernias, adhesions, and inflammatory bowel disease. Other investigators debate this mechanism, reporting that small bowel injuries occur evenly distributed throughout the length of the small intestine.

Bursting Injury

This often-debated theory presumes small bowel injuries to occur when fluid-filled loops of small intestine burst following a sudden increase in abdominal pressure [4]. The mechanism requires a fluid-filled segment of small bowel that forms a temporary closed loop when the ends are compressed between an externally applied force and a firm, fixed anatomic structure. (Figure 1D). This theory explains how small bowel rupture can occur from only a minimal amount of applied force. Injuries caused by a bursting mechanism were noted at the point where the vasa recta traverse the small bowel submucosa and create a weak point in the intestinal bulkhead [4]. This theory is contested by investigators, who demonstrated that kinetic energy applied to a loop of small intestine is dissipated without injury to adjacent small bowel [6].

Therefore, gaping small bowel disruptions with mesenteric mutilation are likely caused by crushing mechanisms; isolated small bowel injuries with punctate or slit like rents are likely caused by bursting mechanisms; and stripping injuries or tears near the ligament of Treitz, caecum, or other points of fixation are probably due to shearing mechanisms. In the presented cases, isolated rupture of small bowel occurred due to application of localized blunt force to central abdomen, which resulted in jejunal transection, presumably by compression of bowel against lumbar spine. Whatever be the mechanism, the early recognition of these lesions can be difficult. Owing to the rarity of small bowel injury after trivial blunt abdominal trauma, absence of peritoneal signs and insensitivity of radiological imaging, the diagnosis is often delayed [7]. An overlooked bowel injury is perhaps the most dangerous of all abdominal injuries because of tremendous infection potential. Repeated studies have shown increased mortality rates to be directly related to delay in diagnosis [8]. The presented cases have highlighted the importance of history, paying particular attention to nature of injury, mechanism of injury and site of the applied force. Patients with apparently minor injury to central abdomen may be at risk of small bowel perforation. Such patients should undergo prompt surgical intervention at the earliest sign of clinical deterioration.

REFERENCES

1. Neugebauer H, Wallenbock E Hengergord MS eventy cases of injuries of small intestine caused by blunt abdominal trauma: a retrospective study from 1970 to 1994. J Trauma 1999, 46; 116-121 pg.

2. Stevens SL, Maul KI small bowel injuries. Surgery clinics North America 1990, vol 70, 541-560 pg.
3. Dauterive AH, Flore baurn L, COEXF Blunt intestinal trauma. Ann surg 201, 1985, 198-203pg,.
4. Geoghegan J, Brush BE. The mechanism of intestinal perforation from non penetrating abdominal trauma. AMA Arch surg 73, 1956; 455-464pg.
5. Ferra JJ, Currsi PW, Gastrointestinal trauma JA: Trauma surgery; Philadelphia, IB Lipincott 1988.
6. Willions RD, Sargent FT, The mechanism of intestinal injury in trauma. J of trauma 3: 1963, 288-294pg.
7. Rakhry SM, Brownstein M Watts et al. Relatively short diagnostic delays (<8 hours) produce morbidity and mortality in blunt small bowel injury: an analysis of time to operative intervention in 198 patients from multicenter experience. J TRAUMA 2004; 48, 408-411pg.
8. Bojworth BM. Perforation of small intestine from non penetrating abdominal trauma. AMJ surgery 1984, 76; 472-479pg.

Source of Support: None Declared
Conflict of Interest: None Declared