



ORIGINAL RESEARCH PAPER

General Surgery

JEJUNAL PERFORATION AFTER BLUNT ABDOMINAL TRAUMA: A SERIES OF 3 CASE

KEY WORDS:

Dr Nina M. Shah	Associate Professor & HOU, Department Of General Surgery, B.J. Medical College, Civil Hospital, Ahmedabad.
Dr Zoncy Darji*	3 rd Year Resident, Department Of General Surgery, B.J. Medical College, Civil Hospital, Ahmedabad. *Corresponding Author
Dr Hiral C Chauhan	Assistant Professor, Department Of General Surgery, B.J. Medical College, Civil Hospital, Ahmedabad.

INTRODUCTION

Jejunal perforation caused by blunt abdominal trauma is uncommon and mostly seen after road traffic accident due to high energy deceleration injury. And it is also seen after bicycle handle injury, fall from height, and assault. Solid organ injuries are very much common after blunt abdominal trauma. Isolated jejunal perforations are very rare after blunt abdominal trauma. Therefore, if not identified early, it increases morbidity and mortality. Jejunal perforation are mainly due to increased intraluminal pressure in air and fluid filled bowel loops mainly on antimesenteric border. These perforations are called "Blowout" injury, mucosa will be protruding from perforation site and surrounding tissue destruction is less. It is also caused by shearing forces and also due to compression between the abdominal wall and vertebral column. Deceleration mechanism can result in a shearing of the serosa and muscularis throughout a segment of small bowel. Blunt abdominal trauma causing gastrointestinal perforation is very rare ranging from less than 1% to 8.5%, out of which isolated jejunal perforation occurs in less than 1% of cases.

Case presentation

Case 1:

A 48-year-old male presented in emergency surgical department with complaint of abdominal pain and abdominal distension. Patient had road traffic accident while driving car collided with another car so steering injury occurs over abdomen two days back patient was admitted in private hospital and was stable. Otherwise no any other complaints or injury. On admission patient's pulse was 100/min and blood pressure 130/90 mmHg. Blood investigations were normal on admission. Abdominal examination it was distended and generalised tenderness and guarding present. The erect chest Xray suggestive of minimal free gas under right dome of diaphragm.



Fig 1.1: Chest Xray showing free gas under right dome of diaphragm

Exploratory Laparotomy done and 600 cc biliary peritonitis evacuated with pus flakes all over the bowel loops and approximately 100 cm distal to ligament of Treitz 1x1 cm sized

perforation was present on jejunum.



Fig1.2: Jejunal perforation with inflamed surrounding with pus flakes

As bowel loops were inflamed decision was made to exteriorise the loop of jejunum and loop jejunostomy was done. Stoma functional on postoperative day 2 and patient started orally and drain removed on postoperative day 3. And patient was discharged on postoperative day 11 with uneventful course.

Case 2:

A 14-year-old male patient presented with chief complaints of abdominal pain and distension and nonbilious vomiting following trauma by a bicycle handle before 4 hours. No other injury was there. On admission pulse rate was 102/min and blood pressure 110/70 mmHg and respiratory rate 20/min. Per abdomen examination revealed approximately 3x3 cm sized abdominal wall bulge with imprint abrasion of bicycle handle in right paraumbilical region with localized guarding and tenderness in the same region and cough impulse present in the same area. Blood investigations and chest and abdominal x-rays were normal. USG Abdomen and Pelvis suggestive of free fluid in peritoneal cavity. As patient was vitally stable CECT abdomen pelvis was done, which showed 27x25 mm sized defect involving right anterior abdominal wall at the level of umbilicus with herniation of small bowel loops with adjacent fat stranding. Minimal fluid collection area involving interbowel region as well as right paracolic gutter Hemoperitoneum. Small bowel perforation cannot be ruled out. no evidence of pneumoperitoneum.



Fig 2.1: Small jejunal perforation visible on mesenteric border.

Exploratory laparotomy was carried out and there was approximately 3x3 cm sized muscle defect was present with no bowel loop in that defect in right rectus muscle with pinpoint perforation of approximately 0.5 cm sized with gush of air was found approximately 15 cm from the ligament of Treitz on mesenteric border which was primarily repaired and primary repair of abdominal wall defect. On postoperative day 3 oral started and drain removed on postoperative day 5, patient was discharged on postoperative day 7 and all stitches were removed on postoperative day 14.

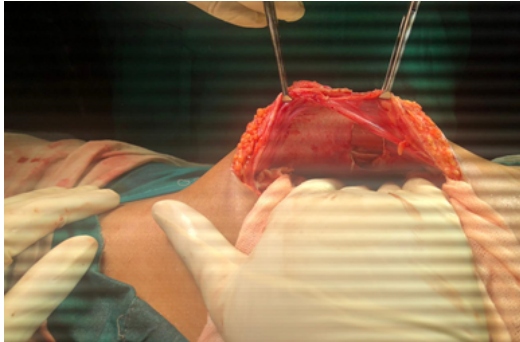


Fig 2.2: Muscle defect visible at injury site

Case 3:

A 65-year-old male admitted to the casualty with the chief complaints of abdominal pain and vomiting after having road traffic accident while patient was driving two-wheeler before 6 hours. On admission patient was having tachycardia and bp was 120/90 mmHg and per abdomen examination was tenderness with guarding present in epigastric as well as umbilicus region. Chest x-ray was suggesting of free gas under diaphragm and decision was made for exploration. On exploration approximately 300cc biliary peritonitis was evacuated and approximately 0.5x0.5cm sized perforation was present on antimesenteric border of jejunum with another 0.5x0.5cm perforation adjacent to it. Both were present 120 cm distal to ligament of Treitz, rest of the bowel and solid organ found to be normal.

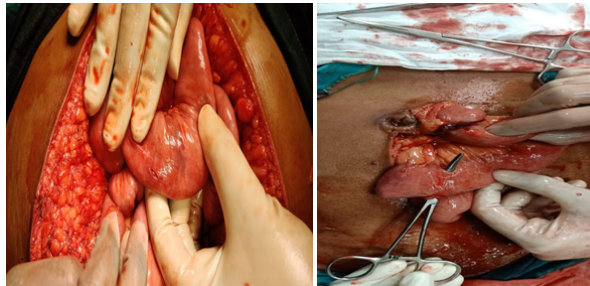


Fig 3.1: Two Simultaneous Jejunal Perforation

Perforation was primarily repaired with silk 2-0. Patient was started taking orally on post-operative day 4 and drain was removed on postoperative day 7 and patient was discharged on postoperative day 12 uneventfully and stitches were opened on follow up day 15.

DISCUSSION:

Motor vehicle accidents are responsible for approximately 75% of the blunt abdominal trauma, Small bowel injuries are third most common injury after blunt abdominal trauma. This would typically affect fixed segments such as the duodenum, duodeno-jejunal flexure, proximal jejunum and terminal ileum. Despite paucity of physical signs, one must keep in mind about the occult intestinal injuries. The diagnosis of hollow viscus injury due to blunt abdominal trauma should be based upon the mechanism of injury, history and serial physical examination. Diagnosis can be made by chest x-ray which is suggestive of free gas under diaphragm as in our first and last cases. But all jejunal perforation will not be appear on

x-ray, in those cases CT will be helpful suggestive of contrast leakage, crowding of bowel loops at one place or more loops with air fluid levels at one place is suspicious of small bowel perforation which may present from day 3 to 45. The gold standard for assessment of blunt abdominal trauma diagnosis is CT scanning, with a sensitivity of 92%, specificity of 94%. CT scan is having capacity to accurately diagnose blunt intestinal trauma, provided it has performed and interpreted with care. It has been proved to be an excellent imaging modality in diagnosis of intestinal injuries in case of blunt abdominal injuries and mortality and morbidity has reduced significantly. In the first and third case the cause of jejunal perforation is deceleration injury whereas in second scenario usually handlebar in low energy only causes mesenteric or serosal tear but in case of high energy injury it might cause injury to the bowel itself. Two mechanism responsible for the same:(1) a crushing force applied to the bowel against the spine and (2) shearing forces of the bowel and mesentery along its line of attachment, jejunal perforation is visible at mesenteric or antimesenteric border due to ischemia. Even though there was no any free gas under diaphragm there was a high level of clinical suspicion led for the further investigation by CT. Jejunal perforation missed initially but usually become apparent around 3 days after the injury like in our first case. Hypothesis which supports delayed appearance of jejunal perforation, the sequences of events could be (i) mesenteric or intramural contusions during injury or it can be due to bowel ischemia after mesenteric injury. (ii) which lead to stricture formation and bowel wall loose elasticity at those sites. (iii) later perforation ensues due to increased intraluminal pressure.

CONCLUSION:

Diagnosis of traumatic jejunal perforation is challenging but high index of clinical suspicion and physical examination and appropriate imaging modalities will help us to arrive at diagnosis to save the patient.

REFERENCES

1. Post traumatic jejunal perforation: A series of 3 cases and literature review. Dr. Honeypralish H Maharaul, Dr. Pavankumar Tungla and Dr. Ketul Shah. 2, 2019, International Journal of Surgery Science, Vol. 3, pp. 11-13.
2. Jejunal transection after blunt abdominal trauma: a report of two cases. N A Sandiford, R P Sutcliffe, H T Khawaja. 10, October 2006, Emergency Medicine Journal, Vol. 23.
3. Jejunal transection after blunt abdominal trauma: a case report. S., Deepak B. 4, 2016, International Surgery Journal, Vol. 3.
4. Isolated Jejunal Perforation and Mesentery Injury following a Kick on the Abdomen of a College Student: A Case Report from a District Hospital in Northern Ghana. Engelbert A. Nonterah, Solomon Atindama, Emmanuel Achumbowina, Michael B. Kaburise, Edwin Saanwie, Aziz Ewura, Majeedallahi Al-Hassan. MArch 2020, Case Reports in Critical Care.
5. Small bowel perforation and mesentery injury after an unusual blunt abdominal trauma—Case report. J. Pimenta de Castro, * G. Gomes, N. Mateus, R. Escrevente, L. Pereira, P. Jácome. 2015, International Journal of Surgery Case Reports, Vol. 7, pp. 51-53.
6. Isolated Small Bowel Perforation After Blunt Trauma Abdomen – A Rare Entity. Amarjit singh grover, Mohinder kumar Malhotra, Kunal Chowdhary, Muzafar Zaman*, Rahul Yadav, Ashish Chowdhary, Gurinder kaur, Aliya shah Zaheer Ahmed. 4, 2018, Chronicle of Medicine and Surgery, Vol. 2, pp. 202-205.
7. Isolated "Blow Out" Jejunal Perforation Following Blunt Abdominal Trauma- Experience of Two Cases. B.V. Goudar, Uday Ambi, Y. Lamani, Sunil Telkar. 5, January 2011, Journal of Clinical and Diagnostic Research, Vol. 5, pp. 1120-1122.