



Small Bowel Obstruction Secondary to Traumatic Incarceration Between Vertebral Fracture: A Case Report in a Tertiary Care Hospital in Central India

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Abstract

Bowel injury secondary to blunt trauma abdomen is a commonly encountered entity. However, small bowel obstruction secondary to traumatic incarceration of bowel loops between two translated vertebrae in a case of road traffic accident is seldom reported. We report a case of small bowel obstruction in a patient who had suffered spondyloptosis at the L1–L2 level after a motor vehicle accident. We also discuss the diagnostic work up and interventions done to manage the patient. The report also reviews pertinent published literature on the incarceration of the bowel associated with vertebral fractures.

Keywords

- ▶ spondyloptosis
- ▶ hyperextension injury
- ▶ jejunum
- ▶ tethering

Introduction

Traumatic spondyloptosis is defined as 100% or greater subluxation of a superior vertebral body on an inferior one in the coronal or sagittal plane secondary to an injury.¹ It is the most severe of translation spine injuries and results in severe biomechanical instability caused by complete disruption of structural elements of the vertebral column and the adjacent paravertebral soft tissues.² It should be borne in mind that patients with hyperextension or flexion–distraction injury of the lumbar spine could show symptoms of intestinal obstruction and bowel incarceration.

Case Report

A 33-year-old male patient was brought to the surgery casualty with paraparesis following a road traffic accident.

Radiographs of the chest, dorsolumbar spine, pelvis with both hip (PBH), and right lower extremity revealed fracture of the proximal one-third of the shaft of the right femur and spondyloptosis at L1–L2 level. Focused assessment with sonography for trauma (FAST) revealed mild perisplenic fluid with dense internal echoes. The next day, open reduction of the femur fracture was done. Subsequently, the patient developed abdominal distension, vomiting, guarding and rigidity on day 4 of RTA.

CECT of the abdomen and pelvis was immediately done that revealed spondyloptosis at the L1–L2 level (▶ Fig. 1) with tethering of proximal jejunal loops between the interface of translated L1–L2 vertebra (▶ Fig. 2) and resultant proximal dilatation of the stomach and duodenum (▶ Fig. 3) with normal bowel wall enhancement. AAST grade II splenic injury with mild hemoperitoneum was noted. There were multiple, peripherally enhancing infected collections

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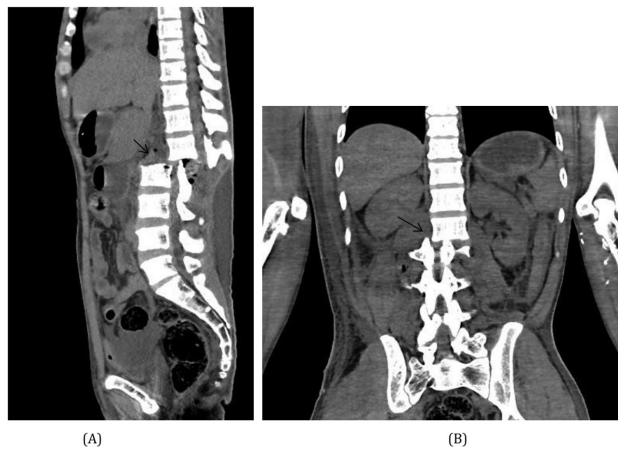


Fig. 1 Sagittal (A) and coronal (B) section of the abdomen showing spondyloptosis at the level of L1–L2 vertebra (arrow).

approximately 50 to 60 mL in the prevertebral region, with extension into the right psoas muscle (►Fig. 4). There were a few other smaller collections noted in and around the paraspinal muscles bilaterally from L1 to L3 levels.

Exploratory laparotomy done on day 5 of RTA revealed incarceration of jejunal loops 5 cm from the ligament of Treitz between the L1 and L2 vertebral bodies (►Fig. 5).



Fig. 2 CECT abdomen showing the incarcerated jejunal loop just above the L2 vertebra (arrow).



Fig. 3 CECT abdomen showing significant dilatation of the stomach and duodenum.

The distal collapsed loop was found emerging from the same point. The tethered jejunal loops were successfully freed with optimum spinal traction from the orthopaedic team; these, however, resulted in a small rent in the jejunal loops while maneuvering (►Fig. 6), which was managed with resection and anastomosis of the involved segment (►Fig. 7). The patient showed worsening of symptoms with fever over the next 3 days. Re-exploration on day 8 revealed anastomotic leak that was managed with re-resection and anastomosis. The patient needed ventilatory support due to septic shock with ARDS and eventually succumbed to it on day 14.

Discussion

It is extremely rare to encounter bowel entrapment between vertebral bodies as a complication in patients with lumbar fracture or dislocation. These patients usually develop gradual symptoms of intestinal obstruction and are not definitely diagnosed until laparotomy. Only 12 cases were reported between 1979 and 2016. Most commonly, it was caused by trauma such as vehicular accident in nine cases,^{3–12} fall from height in one case¹³ and crashing of hard objects on the back in one case.¹⁴ In one case, no history of trauma was reported, so lumbar degenerative changes were considered to be the possible cause.¹⁵

Four patients who sustained a hyperextension injury of the lumbar spine had jejunal incarceration between lumbar spine fracture fragments.^{3,4,8,10,14} The suggested mechanism of injury was hyperextension injury of the lumbar spine with tear of the anterior longitudinal ligament and posterior peritoneum. The simultaneous increase in the intra-

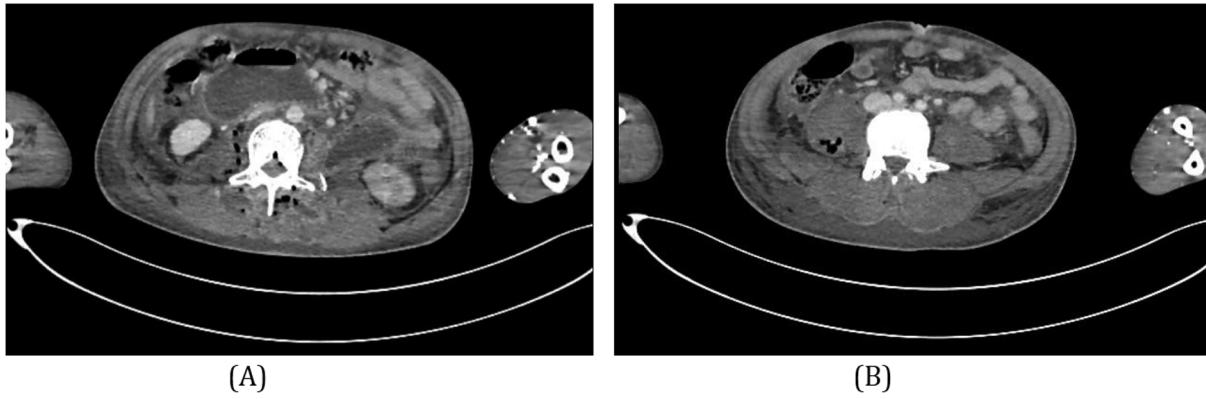


Fig. 4 Axial section of the abdomen showing peripherally enhancing collections with air foci in the paraspinal (A) and right psoas muscle (B).

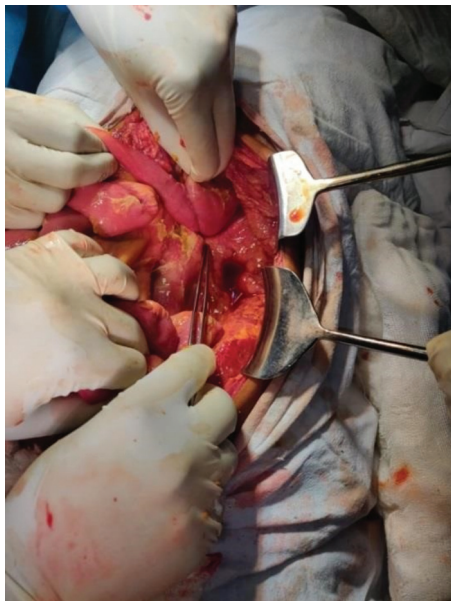


Fig. 5 Intraoperative image revealing the tethered jejunal loop between the L1–L2 vertebra.

abdominal pressure caused entrapment of the small intestine. It is still a matter of debate if the small bowel is pushed into the intervertebral space or is drawn in by a vacuum created by the hyperextension injury.^{3–6}

The preoperative diagnosis of bowel incarceration between vertebral bodies is difficult. It is common to mistakenly consider retroperitoneal hematoma accompanying vertebral injuries to be the cause of patient's early symptoms, which may include nausea and vomiting. Delay in diagnosis leads to increase in edema and swelling of the bowel, which add to difficulty in releasing the pinched bowel. Hence, it is prudent to consider this possibility in a patient with blunt trauma to the abdomen, complaining of intestinal obstruction. Stabilization of the spine fracture and dislocation should be performed after laparotomy after the risk of infection at the fracture site has been minimized effectively.

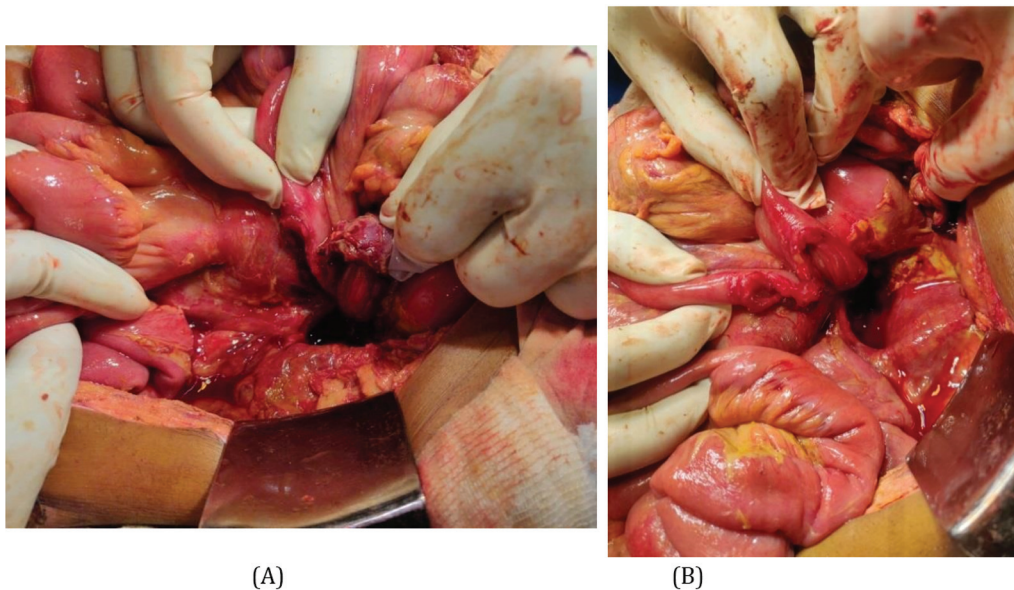


Fig. 6 Intraoperative image showing the perforated jejunal loops during its release.

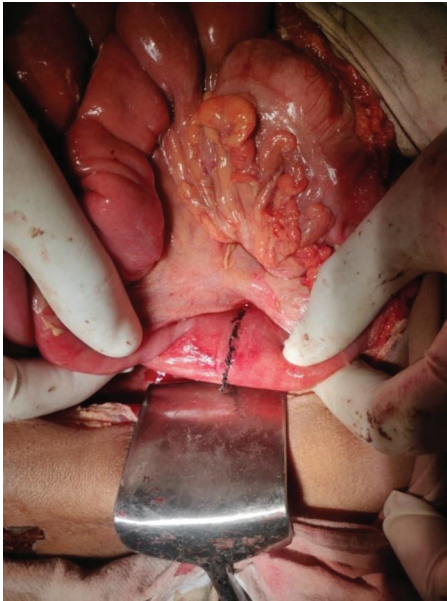


Fig. 7 Bowel perforation was managed with resection and anastomosis.

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Conflict of Interest

None declared.

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References

- 1 Meyerding HW. Spondylolisthesis as an etiologic factor in backache. *J Am Med Assoc* 1938;111(22):1971–1976
- 2 Gharib A, Postel G, Mirza S, Mann FA. A thoracic spine translation injury with lateral facet dislocation. *AJR Am J Roentgenol* 2002; 178(06):1450–1451
- 3 Jing X, Gong Z, Zhang N, et al. Fracture and dislocation of pi re 3jlumbar vertebrae with entrapment of small bowel: a case report and literature review. *J Int Med Res* 2019;47(02): 1043–1051
- 4 Ford WD. Traumatic incarceration of the jejunum between two lumbar vertebrae. *J Pediatr Surg* 1979;14(02):189–190
- 5 Vermassen F, Van Belleghem Y, Van Velthoven V, Derom F. Acute bowel entrapment between two lumbar vertebrae. *Injury* 1988; 19(06):449–450
- 6 Eldridge TJ, McFall TM, Peoples JB. Traumatic incarceration of the small bowel: case report. *J Trauma* 1993;35(06):960–961
- 7 Rodger RM, Missiuna P, Ein S. Entrapment of bowel within a spinal fracture. *J Pediatr Orthop* 1991;11(06):783–785
- 8 Silver SF, Nadel HR, Flodmark O. Pneumorrhachis after jejunal entrapment caused by a fracture dislocation of the lumbar spine. *AJR Am J Roentgenol* 1988;150(05):1129–1130
- 9 Patterson R, Temple WJ, Tranmer B, Miller SD. Traumatic intervertebral incarceration of ileum: a unique lap belt injury. *Injury* 1996;27(08):596–598
- 10 Metaizeau JP, Prévot J, Schmitt M, Bretagne MC. Intestinal strangulation between two vertebra following an axial dislocation of L1/L2. *J Pediatr Surg* 1980;15(02):193–194
- 11 Mollitt DL, Ballantine TV, DeRosa GP. Jejuno-renal injury following traumatic hyperextension. *J Trauma* 1980;20(11): 996–998
- 12 Pesenti S, Blondel B, Faure A, Peltier E, Launay F, Jouve JL. Small bowel entrapment and ureteropelvic junction disruption associated with L3 Chance fracture-dislocation. *World J Clin Cases* 2016; 4(09):264–268
- 13 Vidmar J, Veselko M, Sever M, Oblak C, Smrkolj V. Traumatic jejunal entrapment in a patient with Bechterew disease [article in German]. *Unfallchirurg* 2002;105(01):63–64
- 14 Davis RE, Mittal SK, Perdakis G, Richards AT, Fitzgibons RJ Jr. Traumatic hyperextension/hyperflexion of the lumbar vertebrae with entrapment and strangulation of small bowel: case report. *J Trauma* 2000;49(05):958–959
- 15 Ko S, Park NK, Cho KJ, et al. Lower extremity radicular pain caused by entrapped sigmoid colon between L5 and S1 vertebrae. *Ann Rehabil Med* 2015;39(05):844–847