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**Case Report**

# Ileo-ileal knotting masquerading as internal hernia: a rare cause of acute intestinal obstruction

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## ABSTRACT

Intestinal knotting is a rare cause of acute intestinal obstruction and in most cases is diagnosed intraoperatively due to its rarity and uncommon presentation. Out of different types of intestinal knots, ileo-ileal knotting is rarest and very few such cases have been reported in the literature. Due to very high mortality, early diagnosis and immediate surgical intervention are needed. Here we present a case of a 52-year-old male patient who presented with a history of non-passage of stool and flatus, after resuscitation patient was planned for exploratory laparotomy. Findings revealed gangrenous ileal loops and an ileo-ileal knot masquerading as an internal hernia. End-to-end anastomosis of the gangrenous ileum was done along with a decompressive proximal loop ileostomy. The patient was transferred to the intensive care unit after surgery. He died on postoperative day 1 due to metabolic acidosis with endotoxic shock. By reporting this case we want to emphasize on the need of keeping intestinal knots as a differential diagnosis while operating a case of acute intestinal obstruction.

**Keywords:** Acute intestinal obstruction, Intestinal knotting, Ileoileal knotting

## INTRODUCTION

One of the most common surgical emergencies in developing countries is intestinal obstruction, and small bowel obstruction (SBO) accounts for the majority of cases. The common causes of intestinal obstruction include adhesions, malignancy, volvulus, and intussusception.[1]

In literature different small bowel knots have been documented like ileosigmoid, cecosigmoid, and ileoileal knotting. Intercoiling of two small bowel loops to form a knot is a rare cause of small bowel obstruction.[3-5] In ileo-ileal knotting one dynamic coil of ileum twists and loops around another a static loop of ileum, giving rise to a knot.[2] Out of all types of intestinal knots ileoileal knot is extremely rare and was found in only 1 of 92 cases of intestinal knots.[6,7]

## CASE REPORT

A 52-year-old male patient presented to the emergency of Sir Sunder Lal Hospital, Banaras Hindu University with chief complaints of pain abdomen for 2 weeks and non-passage of flatus and stool for 1 week. The pain was acute in onset and was exaggerated after a heavy meal after a day of fasting. The pain started from the paraumbilical region and went on to involve the entire abdomen, patient later developed abdominal distension and non-passage of flatus and stool. There was no history of any surgical intervention in past and no medical history.

The patient at presentation was dehydrated and had cold, clammy limbs, a feeble pulse and blood pressure of 86/56 mmHg with a SpO2 of 92% on room air. After initial resuscitation patient's hemo-dynamic status improved and the patient was planned for radiological investigations and

arterial blood gas (ABG) analysis. Initial ABG analysis revealed metabolic acidosis (Ph=7.289, $pCO_2$=34.6, $HCO_3$=18 mEq/mL and $pO_2$=90 mm Hg).

His X-ray abdomen erect revealed multiple air-fluid levels (Figure 1). Hemoglobin (Hb) was 11.1 g/dl, TLC – 12560/$mm^3$, platelet count 270 k/ml, blood urea 37.0 mg/dl, and serum creatinine 1.1 mg/dl. His contrast enhanced computed tomography (CECT) whole abdomen revealed fluid-filled dilated low enhancing bowel loops with evidence of torsion of bowel loops around its mesentery and whirlpool sign (Figure 2).

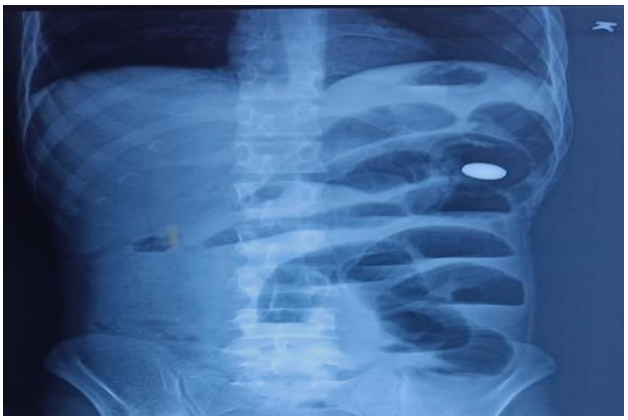

**Figure 1: X-ray abdomen reveals multiple air fluid levels.**

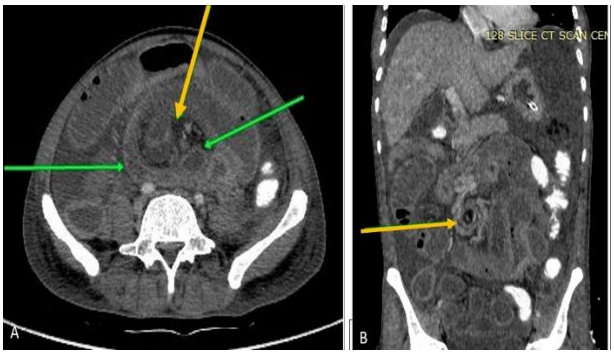


**Figure 2: Fluid filled dilated bowel loops with rotation of mesentery and whirpool sign (yellow arrow).**

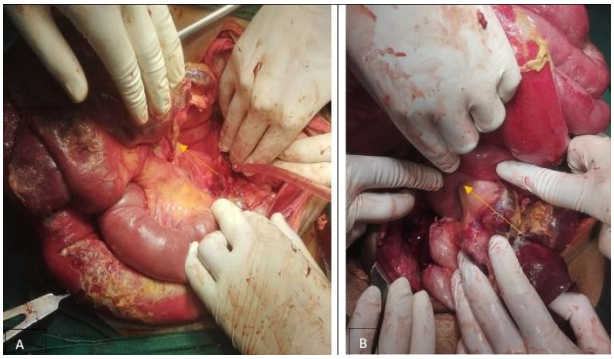


**Figure 3: Ileo-ileal knot seen intra-operatively with gangrenous terminal ileal loop.**

Based on the CECT image a diagnosis of small bowel volvulus was made and emergent surgery was planned. The patient underwent emergency laparotomy and around 200 ml serosanguinous peritoneal fluid was found, Bowel was edematous, and dense interloop adhesions were present. After adhesiolysis and lavage, examination revealed intertwining and twisted small bowel loops matted together giving the appearance of an internal peritoneal hernia. About 3.5 feet segment of the involved ileum was gangrenous (Figure 3). Derotation of the twisted ileal segment was difficult due to the dense adhesions and therefore enterotomy was done to decompress the involved loop. Resection and end-to-end anastomosis of the gangrenous ileum was done along with a decompressive proximal loop ileostomy. The diagrammatic representation of ileo-ileal knotting seen during surgery is shown in Figure 4.

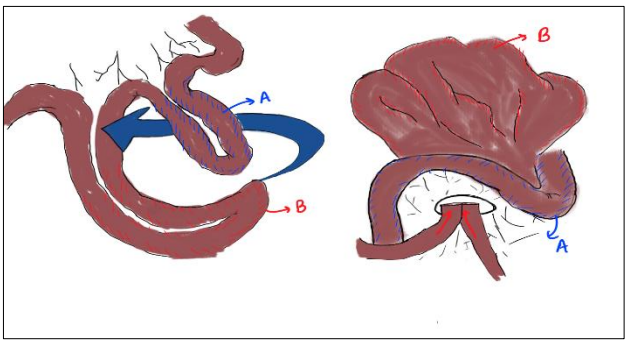


**Figure 4: Diagrammatic representation of ileoileal knotting.**

The patient was transferred to the intensive care unit after surgery. He expired on postoperative day 1 due to metabolic acidosis with endotoxic shock.

## DISCUSSION

Riverius in 16th century described about intestinal knotting as “intertwining of two bowel loops” and later in 1836 Rokitansky termed it as compound volvulus.[8,9] The common causes of small bowel obstruction include adhesion, volvulus, intussusception, and malignancy. Reports of intestinal knots are rare and that of ileoileal knotting is the rarest. Very few cases have been reported from India. The most common presenting symptom is abdominal pain (93%) followed by vomiting (64%) and abdominal distension (57%).[10] There is paucity regarding the etiopathogenesis of ileoileal knotting. The mortality rate is around 40-50%. In most cases, the diagnosis is made intraoperatively and the aim of surgery remains to maintain the intestinal continuation, if possible, if not exteriorization of the involved bowel loop is done.

In the present case the demonstration of whirlpool sign on CECT scan was suggestive of small bowel volvulus. This condition is predisposed by a narrow base of mesentery, a loaded small bowel or a focal intestinal adhesion which can be the apex of the rotated loop. Associated twisting of

the mesentery may lead to intestinal ischemia and gangrene. The intraoperative findings in this patient were suggestive of inter-coiling of the ileal loops with one intestinal loop twisting around an adjacent loop giving the appearance of an ileo-ileal knot rather than a simple rotation on the mesenteric axis which is the hallmark of volvulus.

## CONCLUSION

In a patient presenting as small bowel obstruction, intestinal knotting is a rare entity, Ileo-sigmoid knot is the most common knot whereas ileo-ileal knots are the rarest. In most cases, diagnosis is made intraoperatively and one should keep intestinal knots as a possibility before exploration. Preoperative resuscitation, antibiotic coverage, and electrolyte correction are important. If intraoperatively one encounters intestinal knots the aim should be derotation and appropriate fixation of small intestine to prevent recurrence. The presence of gangrene will necessitate resection of the involved segment followed by primary end to end anastomosis or a diverting ileostomy depending on the hemo-dynamic status of the patient.

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