

Ileoileal Knot as a Content of Obstructed Hernia: What Are the Odds?

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Abstract

An obstructed inguinal hernia is a common surgical emergency, which presents with a variety of contents like the small intestine, omentum, and colon. Intestinal knotting is a rare entity encountered in surgical practice; it occurs when one coil of intestine wraps around the other and eventually leads to complications such as intestinal obstruction, ischemia, and gangrene. Both conditions are considered surgical emergencies and should be dealt with through appropriate surgical measures forthwith. We report the case of an obstructed inguinal hernia, which, on exploration, showed an ileoileal knot as its content. Ileoileal knotting is a very rare phenomenon and, to the best of our knowledge, such an ileoileal knot as a content of obstructed inguinal hernia has not been reported in the surgical literature so far.

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Introduction

Small-bowel obstruction may be caused by a variety of intrinsic or extrinsic lesions, with hernias accounting for 10% of the cases, whereas adhesions and tumors are the more common causes.¹ Small-bowel obstruction due to the knotting of the mesentery is an uncommon entity that can rapidly evolve into the ischemia of the intestinal segment that forms the knot.²

Intestinal knotting, first described in the 16th century by Riverius and later in 1836 by Rokitansky, is the intertwining of two loops of intestine around each other. Three types of intestinal knotting have been described: ileosigmoid, ileoileal, and knot involving the appendix or Meckel's diverticulum.^{2,3} In ileoileal knotting, one dynamic coil of ileum loops around another coil of ileum which is relatively static, giving rise to a knot. The phenomenon of ileoileal knotting is not seen frequently and its description in the literature is rare to find. Hence, we report one such unusual case of ileoileal knotting, which happened to be the content of an obstructed inguinal hernia.

Case Presentation

We describe a 54-year-old man, who was referred to our emergency department with a swelling in the right groin. At the time of discharge, the patient's due consent for the publication of this report was obtained, and he was given assurance of anonymity. The swelling was noticed by the patient 15 years previously but was apparently reducible before and became

What's Known

- Small-bowel obstruction may be caused by adhesions, tumors, hernias, etc.
- Obstruction due to ileo-ileal knotting, whose exact cause is unknown, is an uncommon entity: only 3 cases have been reported so far.

What's New

- This is the first report of an ileo-ileal knot as the content of an obstructed inguinal hernia in the medical literature.

irreducible 2 days prior to his referral to us. He also gave a history of constipation with a sense of abdominal distension and vomiting. The patient had undergone appendectomy 10 years back. He did not have any comorbid illness. On examination, he had tachycardia and looked dehydrated. There was an irreducible swelling in the right inguinal region extending into the right hemiscrotum. The abdomen was distended and tender, and the bowel sounds were exaggerated. A surgical scar of appendectomy was noted in the right iliac region. A quick clinical diagnosis of a right-sided obstructed inguinal hernia was made, and the patient was immediately prepared for surgery. An erect X-ray of the abdomen was done (figure 1), which showed features of small-bowel obstruction. Other laboratory investigations were unremarkable. The patient was taken up for surgery under suitable anesthesia.

Exploration was done through a standard right inguinal incision, which was then extended obliquely over the right hemiscrotum. Once the sac was opened, about 100 mL of dark fluid was present and distended coils of small intestine were found, which were held from slipping back into the abdominal cavity. On further examination, an ileoileal knot with adhesions (figures 2 and 3) was noted about one foot proximal to the ileocecal junction. There was a small patch that showed pre-gangrenous change near the mesenteric border of the ileum. Hence, resection of the part of the small bowel which had the knot, followed by end-to-end anastomosis, was done. A herniorrhaphy was performed, and the wound was closed. The postoperative period was uneventful. The patient was discharged on the 6th postoperative day.

Discussion

Ileoileal knotting is a rare form of intestinal knotting. In spite of an extensive search through the literature, we were able to find only three cases of ileoileal knotting: one case of ileoileal knotting among 92 cases of intestinal knotting reported by Shepherd,^{3,4} second one in an 11-month-old infant reported by Pendse et al,³ and the other in a 68-year-old man reported by Uday et al.² However, an ileoileal knot as the content of an obstructed hernia has not been reported so far.

The exact cause of ileoileal knotting is not known. Factors like freely mobile small intestine with a redundant sigmoid with a long and narrow mesentery have been implicated in the causation of the ileosigmoid knot.^{2,5} Several



Figure 1: Erect X-ray of the abdomen shows multiple air-fluid levels, suggestive of intestinal obstruction.

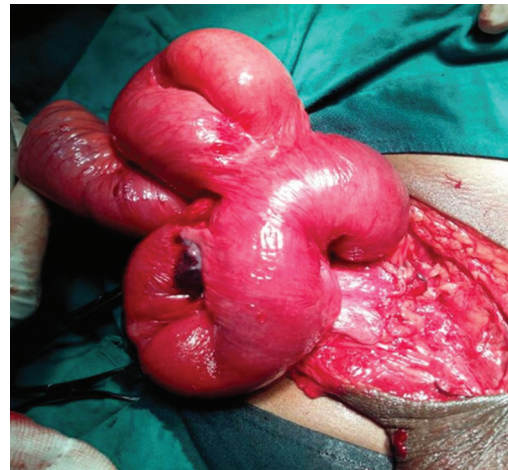


Figure 2: Intraoperative image shows an ileoileal knot as the content of the hernia.

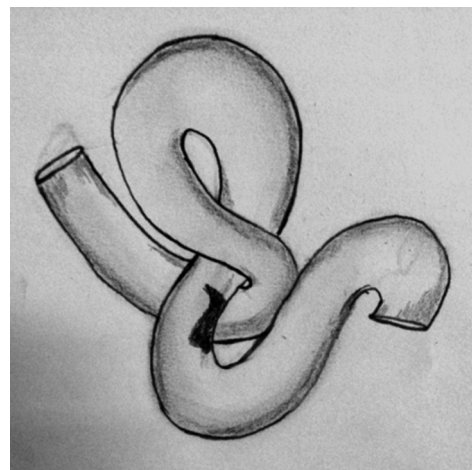


Figure 3: Pictorial representation of the ileoileal knot, which was found as the content of the hernia.

studies have reported a relationship between dietary habits and ileosigmoid knots in that the ingestion of a single daily meal is associated with a higher incidence of knotting.⁶⁻⁸ When a semi-liquid bulky meal progresses into the

proximal jejunum, it increases the mobility of the intestine. The heavier segments of the proximal jejunum then fall into the left lower quadrant. The empty loops of the ileum and distal jejunum twist and rotate around the base of the narrow sigmoid colon.⁸ Subsequent peristalsis results in the formation of an ileosigmoid knot with an obstruction involving two closed loops: one in the small intestine and the other in the sigmoid colon. Another predisposing risk factor is late pregnancy because of the obvious displacement of the bowel.⁹

In this particular case, we could hypothesize that the adhesions that were formed following open appendectomy may have contributed to the knotting. The adhesions would have made one loop of the ileum relatively static, around which another dynamic loop of ileum may have encircled. The inguinal hernia was reducible as long as a plain coil of intestine was its content and once the ileal knot slipped into the hernia sac, it became irreducible. The knot was asymptomatic until it slipped into the hernia sac and then presented as an obstruction. The pre-gangrenous patch, which may be noticed in figures 2 and 3, is a result of the ileal knot causing mesenteric compression, in turn leading to an impaired blood supply to the corresponding part of the bowel wall. Once the knot is formed, a vicious cycle of events sets in, involving intestinal occlusion and ischemia finally leading on to the gangrene of the bowel.

The diagnosis of intestinal knotting preoperatively is extremely difficult. Many a time it is diagnosed intraoperatively. The usual presentation will be that of an acute abdomen with abdominal distension. A plain X-ray of the abdomen in erect posture will be able to demonstrate the features of intestinal obstruction. A computed tomography scan of the abdomen and pelvis may be done where necessary.

Because ileoileal knotting is an intraoperative diagnosis most of the times, which may be described as an “on-tablesurprise”, the onus of making the right decision to manage such a case will have to be borne by the operating surgeon, in the best interest of the patient. Manipulation of the ileum with the intention of untying the knot may be enough, provided that all the segments are viable, but is not recommended for the fear of the perforation of the bowel. The necrotic part of the bowel should be extirpated and an end-to-end anastomosis should be done. However, if the distal segment is less than 10 cm from the ileocecal valve, then an ileocolic anastomosis may be considered.²

Conclusion

Ileoileal knotting is a rarity by itself, and that to present as the content of an obstructed inguinal hernia, as surprising as it may sound, just raises the odds to a whole new level. This just goes on to prove that every case is unique in its own way.

Conflict of Interest: None declared.

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