Ileo-ileal knot causing small bowel gangrene: 
An unusual presentation

SK Uday, Pavan Kumar Ch Venkata, PRK Bhargav, Subith Kumar

ABSTRACT

Introduction: Mechanical intestinal obstruction with closed loop phenomenon secondary to knotting of the mesentery is an uncommon entity that can rapidly evolve into ischemia of the intestinal segment that forms the knot. It originates with the wrapping of the mobile ileal loop compromising the mesentery in the center of the knot and is an unusual cause of intestinal strangulation. Case Report: We report a case of small bowel gangrene caused by ileo-ileal knotting. Patient underwent emergency exploratory laparotomy and resection of gangrenous small bowel segment with end to end anastomosis. Conclusion: Ileo-ileal knotting should be considered in the differential diagnosis of acute intestinal obstruction associated with abdominal tenderness and absence of peritonitis. Emergent exploratory laparotomy with high index of suspicion yields optimal results.

Keywords: Ileo-ileal knot, Small bowel gangrene, Intestinal obstruction, Laparotomy

INTRODUCTION

Intestinal knot formation was first described by Riverius in 16th century and later by Rokitansky in 1836. Mechanical small bowel obstruction due to knotting of the mesentery is an uncommon entity that can rapidly evolve in to ischemia of the intestinal segment that forms the knot. It is an unusual cause of intestinal strangulation. Three types of intestinal knotting are described — ileo-ileal, ileo-sigmoid and Meckel’s diverticulum or appendix. The process usually occurs when there is free movement of intestine with associated narrow mural attachment of the peritoneum. In ileo-sigmoid knotting sigmoid colon forms the axis around which small bowel loop encircles. In ileo-ileal knotting one loop of the ileum remains static around which other loop encircles to form a knot. It is very uncommon in young age and involves loops of ileum. Because of the rarity of the entity, there is no data on age and sex predilection. Here, we report a rare case of small bowel gangrene caused by ileo-ileal knotting, without any antecedent vascular, mechanical or inflammatory cause.

CASE REPORT

A 68-year-old man presented with history of abdominal pain, distension and vomiting for two days. He was initially treated with nasogastric aspiration, parenteral crystalloids and antibiotics. He had no history of trauma, previous surgery, tuberculosis,
cardiovascular or metabolic disease. His clinical chemistry and hematology investigations were unremarkable. Abdominal examination revealed generalized abdominal distension with tenderness, guarding and rigidity all over the abdomen. Bowel sounds were absent. Abdominal ultrasonography was suggestive of moderate free fluid in the peritoneum. X-ray erect abdomen showed small bowel pattern of air-fluid levels, but no pneumoperitoneum. A provisional diagnosis of acute gangrenous small bowel obstruction was made. Emergency exploratory laparotomy was performed, which revealed about 400 ml of dark bloody fluid collection in the peritoneal cavity with three feet of gangrenous segment of small intestine, about 15 cm from ileo-cecal junction. There was gangrene and tight knotting of loop of small bowel (Figure 1). It was possible to undo the knot, revealing a clear demarcation line between gangrenous and viable segment (Figure 2). Resection of the gangrenous segment of small intestine with end to end anastomosis was done (Figure 3). Broad spectrum intra-venous antibiotics, blood transfusion, analgesics and intra-venous fluids were administered during perioperative period. Patient had uneventful post-operative period. Patient discharged on eighth post-operative day.

**DISCUSSION**

The ileo-ileal knot is very rare surgical emergency that can rapidly evolve to gangrene of the affected bowel segment. In our literature search, only one case has been reported, in an 11 month old infant [1]. It is very difficult to diagnose this condition preoperatively, as the patient presents with acute abdomen with a broad differential diagnosis. Ileo-ileal knotting is similar to that of ileo-sigmoid knotting [2]. Ileal knotting caused due to appendix [3] or Meckel’s diverticulum have been reported. Once the knot is formed, it sets off a vicious cycle of intestinal occlusion and ischemia due to continuous peristalsis and vascular pulsations, all leading towards to gangrene. When all segments are viable untiring the knot may be enough since recurrence is uncommon. When irreversible ischemia is present needle or controlled enterotomy decompression should be done prior to en bloc resection of the congested segments. Manipulation of the knot with intention of untiring is not recommended, because of a high risk of perforation. Once the necrotic ileum is extirpated a primary end to end anastomosis of the small bowel should be done if the distal ileum is not affected. On the other hand, if the remaining segment is closer than 10 cm to the ileoceleal valve, end to side ileocolic anastomosis is preferred. The cause of ileo-ileal knotting is not known. Factors such as freely mobile small intestine and redundant sigmoid colon with a long and narrow mesentery have been implicated in ileosigmoid

Figure 1: Ileal knot with gangrenous small bowel (arrow).

Figure 2: Untied ileal knot showing demarcation between gangrenous and healthy small bowel (arrow).

Figure 3: Small bowel end to end anastomosis (arrow).
knotting [4]. Normal vaginal labour has triggered ileal knotting in one case [5]. In the present case, untying of the knot was possible, but a nonviable bowel necessitated its resection. Early operative intervention could have obviated resection.

CONCLUSION

Ileo-ileal knotting as a cause of acute intestinal obstruction is very rare clinical entity. High index of suspicion and immediate surgical intervention prevents gangrene and bowel resection.

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Author Contributions

SK Uday – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

Pavan Kumar Ch Venkata – Analysis and interpretation of data, Revising it critically for important intellectual content, Final approval of the version to be published

PRK Bhargav – Acquisition of data, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

Subith Kumar – Acquisition of data, Analysis and interpretation of data, Revising it critically for important intellectual content, Final approval of the version to be published

Guarantor

The corresponding author is the guarantor of submission.

Conflicts of Interest

Authors declare no conflict of interest.

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