

Strangulating bowel obstruction due to a small intestinal knot in a case of parastomal hernia

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ABSTRACT

An intestinal knot is a rare cause of intestinal obstruction. We report a rare case of strangulating bowel obstruction due to a small intestinal knot. A 69-year-old man who had an end colostomy was admitted with severe abdominal pain and vomiting. Contrast enhancement computed tomography showed dilated intestinal loops with decreased contrast enhancement in the parastomal hernia sac. Emergent laparotomy revealed a dilated and congested intestinal loop strangulated by a small intestinal knot. The knot was carefully untied, and the color of the intestinal loop improved subsequently. Intestinal resection was not performed. Immediate diagnosis and prompt surgical treatment are crucial for strangulating small bowel obstruction due to an intestinal knot. A high degree of clinical suspicion of an intestinal knot is needed in patients with a large extra-abdominal cavity.

Keywords: strangulating bowel obstruction, intestinal knot, parastomal hernia

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INTRODUCTION

An intestinal knot can be a rare cause of bowel obstruction, including ileosigmoid (most common), ileocecal, ileoileal, appendico-ileal, and Meckel's diverticulum knot formation.^{1,2} Herein, we reported a rare case of strangulating bowel obstruction due to a small intestinal knot associated with a parastomal hernia, and hypothesized the developing mechanism.

CASE PRESENTATION

A 69-year-old man who had undergone Hartmann's operation (resection of the rectosigmoid colon with closure of the rectal stump and formation of an end colostomy) 4 years earlier visited our hospital with severe abdominal pain and vomiting. He demonstrated no passage of flatus and feces from the colostomy for a period of one day before admission. Local abdominal bulging was grossly observed around the stoma, suggesting a parastomal hernia. Laboratory

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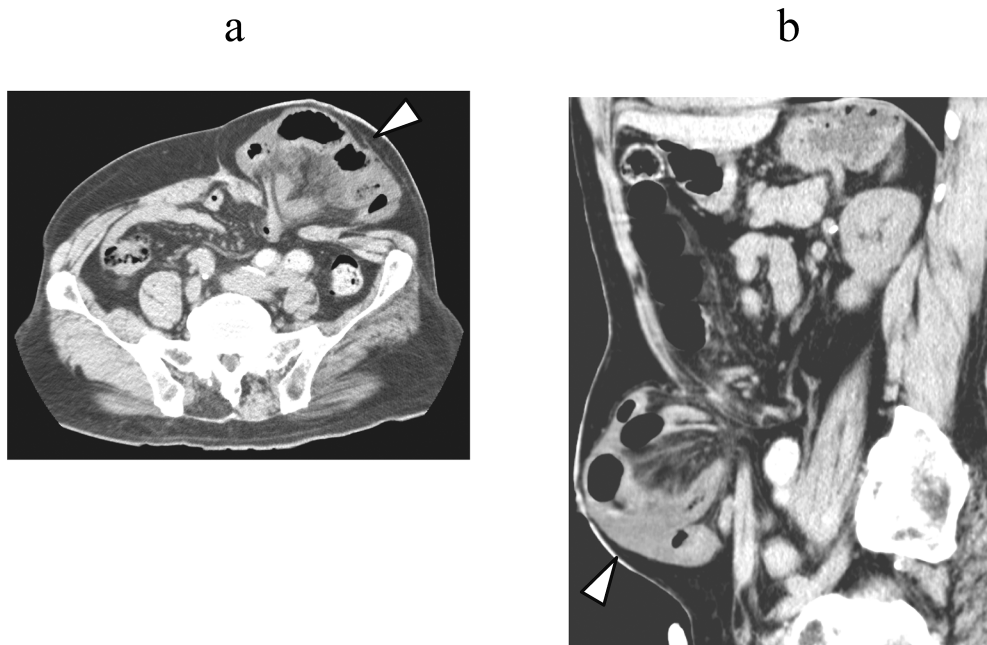


Fig. 1 CT showing a dilated bowel loop

Fig. 1a: Axial image. A dilated bowel loop (arrowhead) with decreased contrast enhancement extending through the abdominal wall into the subcutaneous tissue, and mesenteric congestion.

Fig. 1b: Sagittal image.

data showed an elevated white blood cell count and renal dysfunction. Contrast enhancement computed tomography showed a dilated bowel loop with decreased contrast enhancement extending through the abdominal wall into the subcutaneous tissue, and mesenteric congestion (Figure 1). An emergency operation was performed with a diagnosis of strangulating bowel obstruction. Laparotomy revealed a dilated and congested small intestinal loop strangulated by a small intestinal knot (Figure 2). The knot was carefully untied and the color of the intestinal loop improved subsequently. Intestinal resection was not performed, and the postoperative course was uneventful. Surgical repair for the parastomal hernia was planned, however, has not been performed because of his multiple comorbidities including chronic kidney disease, aortic valve regurgitation, and femoral neck fracture.

DISCUSSION

An intestinal knot is considered a rare cause of bowel obstruction, and ileosigmoid knot formation is reportedly most common.^{1,2} The knot may occur when there is a long and thin mesentery with little fatty tissue, freely mobile small intestine, and hyperperistalsis due to heavy food intake during a short period.^{1,3} In our case, the large extra-abdominal cavity formed by a parastomal hernia could have been a predisposing factor. A small intestinal loop presumably entered the parastomal hernia sac, became tangled within the cavity, and formed a knot (Figure 3).

Bowel obstruction due to an intestinal knot causes severe abdominal pain, with rapid progression of symptoms, and sudden deterioration of the general condition due to intestinal ischemia

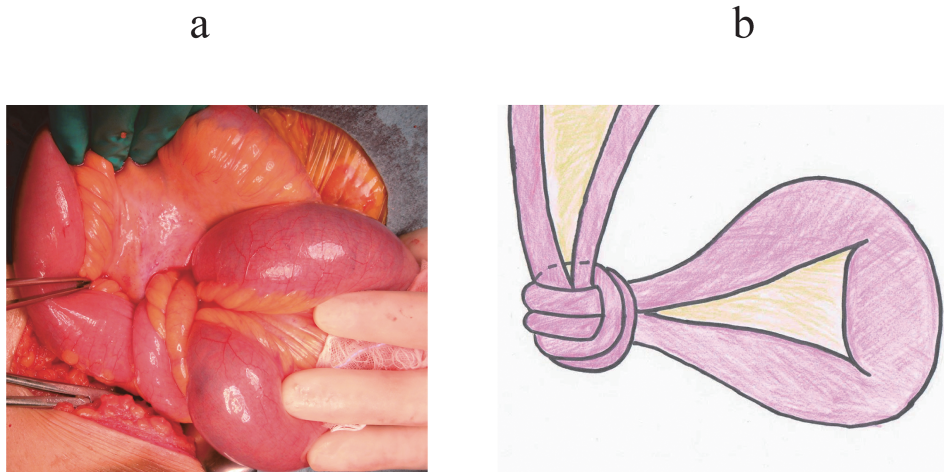


Fig. 2 Intraoperative finding

Fig. 2a: Intraoperative photograph showing a dilated and congested small intestinal loop strangulated by a small intestinal knot.

Fig. 2b: Schematic representation.

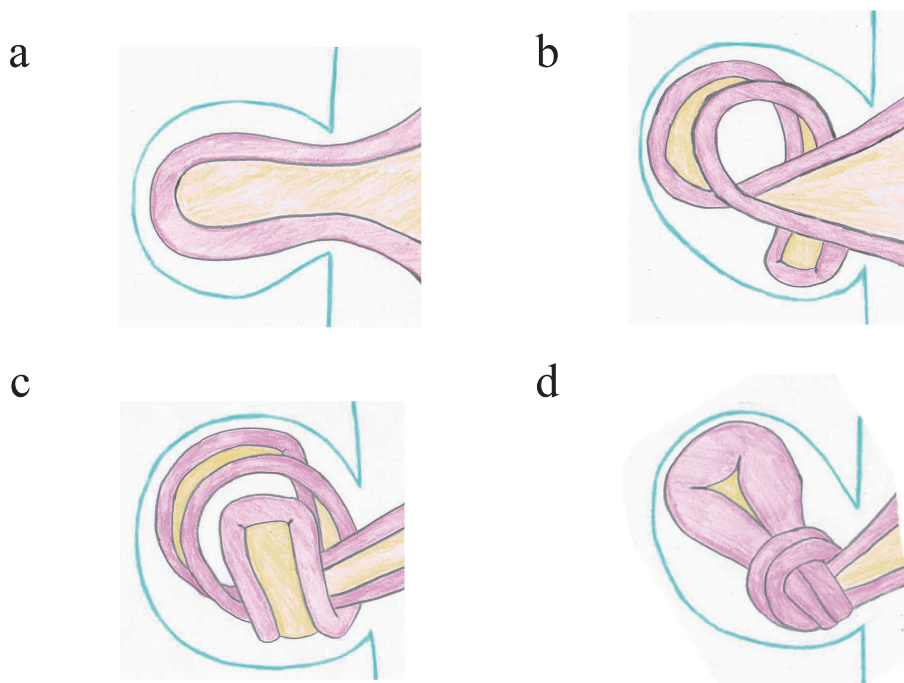


Fig. 3 Presumed mechanism of intestinal knot formation in a parastomal hernia sac in this order (a, b, c, and d)

or gangrene.⁴ Therefore, immediate diagnosis and prompt surgical treatment are crucial. A high degree of clinical suspicion of an intestinal knot is needed in patients with a large extra-abdominal cavity, because the diagnosis of an intestinal knot is cumbersome.

INFORMED CONSENT

Informed consent was obtained from the patient who was included in the study.

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DISCLOSURE STATEMENT

The authors declare that there is no conflict of interest.

REFERENCES

- 1 Dunkerley GE. Intestinal obstruction due to knotting two loops of small intestine. *Br J Surg.* 1953;41(165):66–70. doi:10.1002/bjs.18004116517.
- 2 North LB, Weens HS. The intestinal knot syndrome. *Am J Roentgenol Radium Ther Nucl Med.* 1964;92:1042–1047.
- 3 Raveenthiran V. The ileosigmoid knot: New observations and changing trends. *Dis Colon Rectum.* 2001;44(8):1196–1200. doi:10.1007/BF02234644.
- 4 Shepherd JJ. Ninety-two cases of ileosigmoid knotting in Uganda. *Br J Surg.* 1967;54(6):561–566. doi:10.1002/bjs.1800540615.
- 5 Mallick IH, Winslet MC. Ileosigmoid knotting. *Colorectal Dis.* 2004;6(4):220–225. doi:10.1111/j.1463-1318.2004.00361.x.