

Ileo-sigmoid knotting presented as a rare cause of intestinal obstruction and bowel ischemia: A case report



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ABSTRACT

Ileosigmoid knotting causing intestinal obstruction is also known as double volvulus or compound volvulus. It is a rare cause of intestinal obstruction. It involves the sigmoid and ileum causing closed-loop intestinal obstruction. The endoscopic decompression in ileosigmoid knotting may lead to perforation of intestine. We present a case of 80-year-old male patient who presented with ileosigmoid knotting at our surgical emergency setting.

Key words: Ileosigmoid knotting; Compound volvulus; and Sigmoid colon

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INTRODUCTION

Ileosigmoid knotting was first described in the literature by Parker in 1845.¹ It is a rare surgical emergency causing intestinal obstruction.¹ It is a closed-loop intestinal obstruction that involves the sigmoid and ileum. The ileum wrapping around the base of the sigmoid colon forming a knot, causing ileum as well as sigmoid colon to become gangrenous.² Various causes of intestinal obstruction due to knotting include appendico-ileal, ileocaecal, ceco-sigmoid and ileo-ileal knotting.³ It is important to differentiate between simple sigmoid volvulus and ileosigmoid knotting because endoscopic decompression is contraindicated in ileosigmoid knotting.

CASE REPORT

An 80-year male patient presented to surgical emergency with complaints of acute onset of pain abdomen of moderate intensity, dull aching nature, non-passage of flatus and stool for past 2 days and non-billious vomiting 2-3 episodes for the past 1 day.

The patient had no previous history of blunt trauma or any surgical intervention in the past. On clinical examination, the patient was conscious and oriented afebrile with a pulse of 104 bpm, blood pressure 100/60 mmHg, and respiratory rate of 20/min.

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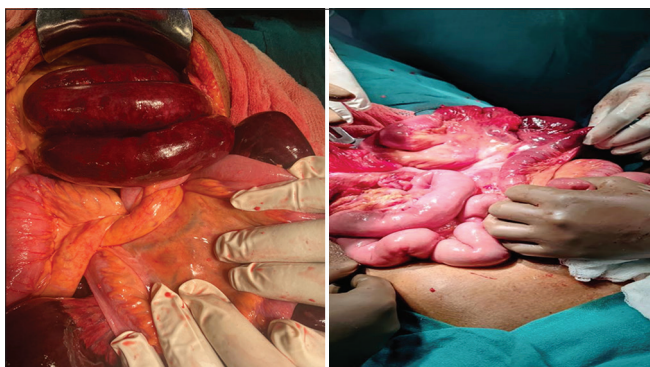


Figure 1: Intraoperative findings of gangrenous ileum before and after de-rotating in a case of ileosigmoid knotting

Examination

Abdomen was distended, tenderness was present in the left iliac fossa, and bowel sounds were exaggerated.

Laboratory investigations revealed TLC: 19000, Urea: 28, Creatinine: 0.6, Sodium: 130, Potassium: 4.6. The patient was advised a plain abdominal radiograph, which showed dilated small and large bowel loops. On ultrasonography of abdomen: Gaseous bowel loops with free fluid were present in pelvis and paracolic gutters. Contrast-enhanced computed tomography (CT) abdomen was done which showed dilated sigmoid colon with closed loop obstruction with bird of prey sign, proximal ileal and jejunal loops dilated with closed loop obstruction, and small bowel feces sign with acute ischemic changes in ileum with a thrombosis in proximal superior mesenteric artery.

The patient was resuscitated with intravenous fluid therapy, broad-spectrum antibiotics, ryles tube aspiration, and Foley's Catheterization. Exploratory laparotomy was performed, and operative findings were noted. Ileosigmoid knotting was found and the distal ileum approximately 120 cm was gangrenous (Figure 1). Deknotting of the ileum and sigmoid was done and the gangrenous part of the ileum was resected, and end ileostomy was performed, and abdominal drain was placed. Anastomosis was not performed due to the hemodynamic instability of the patient and extensive bowel edema. Patient was shifted to surgical intensive care unit. Nasogastric tube, urinary bladder catheter, and abdominal drain were removed on the 2nd post-operative day. The post-operative period was uneventful. Patient was initiated on oral liquid diet on 4th post-operative day. Patient was discharged under stable conditions on 7th post-operative day.

DISCUSSION

Ileosigmoid knotting occurs due to wrapping of the base of the sigmoid colon by the ileum (Figure 2). The exact incidence of ileosigmoid knotting is not known, but it is high in African, Asian, Middle Eastern, South American, and

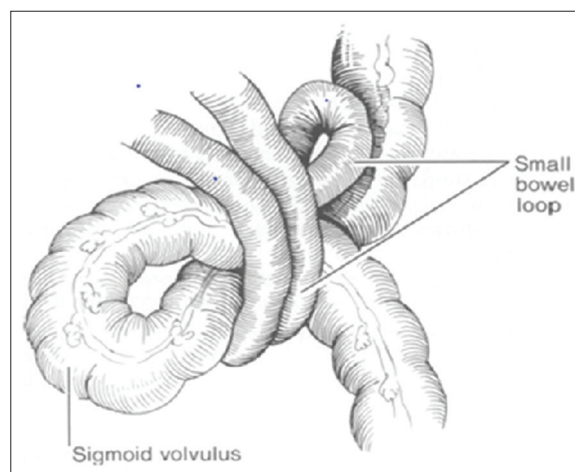


Figure 2: Schematic view of ileosigmoid knotting

Eastern and Northern European countries.⁴ Three factors implicated in the pathophysiology of ileosigmoid knotting are a long sigmoid colon, freely movable small bowel, and consumption of a bulky vegetarian diet in the presence of an empty small bowel.⁵ Other predisposing factors are late pregnancy, transmesenteric herniation, Meckel diverticulitis with a band, ileocecal intussusception, and floating caecum.¹

Alver classified it into four types based on the mechanism of formation of the knot. In Type I which is the most common, the ileum is the active component, wrapping itself around the sigmoid colon which is the passive component to form the knot. Type II is the reverse of Type I with the sigmoid being the active component and the ileum being the passive part. Type III is when both the ileum and the caecum (the ileocaecal segment) act as the active component and wrap around the redundant sigmoid. Type IV or the undetermined type is when differentiating the two components from each other is impossible. Types I and II are further classified into subtypes A and B depending on whether the twisting is clockwise or counterclockwise, respectively.⁶

Atamanalp has proposed a new classification based on the age of the patient, associated diseases, and the presence of gangrenous bowel (Table 1).⁷

C (Class). A (Age): A0: under 60 years; A1: 60 years and older. D (Associated disease): D0: Absent, D1: Present. S (Shock): S0: Absent, S1: Present. G (Bowel gangrene): G0: Absent, G1: Present in the ileum or sigmoid colon, G2: Present in both segments.

Diagnosis can be established by the triad of the clinical picture of small bowel obstruction, radiographic features suggestive of predominately large bowel obstruction and CT scan. CT scan is an emerging tool for the diagnosis of ileosigmoid knotting. CT scans show proximal ileal, jejunal loops, and dilated sigmoid colon with closed

Table 1: New classification of ileosigmoid knot proposed by Atamanalp

C1	C2		C3		C4		C5	C6
	C2a	C2b	C3a	C3b	C4a	C4b		
A0 D0	One of A, D1 Either older 60 years or present of associated diseases	Two of A, D1 Older 60 years and present of associated diseases	One of A, D1 Either older 60 years or present of associated diseases	Two of A, D1 Older 60 years and present of associated diseases	One of A, D1 Either older 60 years or present of associated diseases	Two of A, D1 Older 60 years and present of associated diseases		
S0	S0 Shock absent	S0 Shock absent	S1 Shock present	S1 Shock present	S0 Shock absent	S0 Shock absent	S1 Shock present	
G0	G0 Bowel gangrene absent	G0 Bowel gangrene absent	G0 Bowel gangrene absent	G0 Bowel gangrene absent	G1 Bowel gangrene in ileum or sigmoid	G1 Bowel gangrene in ileum or sigmoid	G1 Bowel gangrene in ileum or sigmoid	G2 Bowel gangrene in ileum and sigmoid

C (Class). A (age): A0: under 60 years; A1: 60 years and older. D (Associated disease): D0: absent, D1: present. S (Shock): S0: absent, S1: present. G (Bowel gangrene): G0: absent, G1: present in the ileum or sigmoid colon, G2: present

loop obstruction with bird of prey sign. Endoscopic decompression of ileosigmoid knot may lead to perforation or injury.¹ Initial management of ileosigmoid knot begins with aggressive intravenous fluid resuscitation and acid-base imbalance correction.⁸ Surgical intervention should follow after the achievement of hemodynamic stability.⁸ The most common procedure performed is ileal and sigmoid resection with primary enteroenteric anastomosis, functional ileostomy, and Hartmann's procedure/colostomy for descending colon, if both ileum and sigmoid are gangrenous.¹ In our case, functional end ileostomy was performed after deknottting of ileal and sigmoid loops, and resection of gangrenous part of ileum.

CONCLUSION

Ileosigmoid knotting is a rare clinical entity, it should be always considered in the differential diagnosis of patients presenting with signs and symptoms of small bowel obstruction in an emergency setting. It is associated with a high rate of morbidity and mortality; a high index of suspicion remains the most useful tool. CT may facilitate early diagnosis. Ileosigmoid knotting should be differentiated from a sigmoid volvulus. Surgical intervention in general includes bowel resection with or without primary anastomosis. The possibility of short bowel syndrome as the complication of the treatment should be considered and treated accordingly.

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