

# Ileosigmoid knot – A Surgeon’s Nightmare

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## ABSTRACT

Ileosigmoid knot, also known as compound volvulus, is an unusual and a rare cause of intestinal obstruction. We are reporting a case of ileosigmoid knot in a 30-year-old male, who presented with lower abdominal pain. On examination, there was tenderness in the suprapubic area and later, the patient developed features of peritonitis. Exploratory laparotomy revealed a large volume of haemorrhagic fluid with gangrenous sigmoid colon, distended and gangrenous ileum twisted round the base of the sigmoid loop. Gangrenous portion of the ileum and sigmoid colon was resected and end to end anastomosis with Hartmann’s procedure was done.

**Keywords:** Ileosigmoid knot, Gangrenous sigmoid colon and ileum, Hartmann’s procedure

## INTRODUCTION

Ileosigmoid knot, also known as compound volvulus or double volvulus, consists of either an intertwining or a knot formed between a loop of ileum and sigmoid colon, causing a complex intestinal obstruction and leading to strangulation of one or both the segments. It is an unusual clinical entity and a rare cause of intestinal obstruction [1]. This condition has a high incidence in east Africa, but it is rare in other parts of the world. Occasionally, cases have been reported from South Africa, North European countries, India and very rarely from USA. It was first reported by Parker in 1845. Its incidence in the general population is not known, but it is most commonly seen in adult males and its peak incidence is in the fourth decade [2]. The condition is serious, generally progressing rapidly to gangrene of both ileum and sigmoid colon. Hence, an early diagnosis and operative treatment are vital [1]. Pre-operative diagnosis of this condition is difficult, because of its infrequency and atypical radiographic findings. Awareness of the condition is essential, for prompt diagnosis and optimal management.

## CASE REPORT

A 30-year-old male was brought to the emergency department in the evening, with history of lower abdominal pain since 14 hours. The patient was a known case of nephrolithiasis since 2 years. On examination, BP was 110/70 mmHg, PR was 86/minutes, there was mild pallor and suprapubic tenderness. There was no history of constipation, dysuria, nausea or vomiting and fever. As the pain did not decrease with conventional analgesics, he was admitted to the Department of Surgery. On plain X-ray of abdomen (erect and supine), no specific features were seen, except few distended large bowel shadows at the periphery. As there was no specific finding suggestive of any serious surgical condition, patient was managed conservatively with the suspicion of him having a urinary tract infection. On laboratory investigation; Hb was 11gm%, RBS was 121mg%, S. urea was 67mg%, S. creatinine was 2 mg%, S. Na+ was 141mmol/l, S.K+ was 5.2 mmol/l and S. Cl- was 107mmol/l.

Initially, there was a slight decrease in pain, but by the next morning, patient became very distressed and he developed tachycardia, tachypnoea and hypotension. The abdominal tenderness and pallor increased. There was guarding and rebound tenderness. After vigorous resuscitation with administration of intravenous fluids, patient underwent emergency exploratory laparotomy. On exploration, it was seen that there was large volume of haemorrhagic fluid in the peritoneal cavity, loops of small bowel were distended and gangrenous. The sigmoid colon was also gangrenous and it was lying deep in the right iliac fossa, with the ileum and its mesentery

twisted round the base of the sigmoid loop [Table/Fig-1]. The ileum and sigmoid were first decompressed and the knot was released. The gangrenous portion of ileum, which was around 55 cm and gangrenous sigmoid loop which was around 18 cm, were resected [Table/Fig-2]. End to end ileo-ileal anastomosis, approximately 25cm



[Table/Fig-1]: Showing twisting ileum at the base of mesentery of sigmoid colon( shown by black arrow)



[Table/Fig-2]: Showing resected part of ileum

proximal to ileocaecal junction and Hartman's procedure, were done. During operation, one unit of blood and during immediate postoperative period, one unit of blood were transfused.

Post-operatively, patient developed superficial wound infection which was treated with regular dressings. After 12 days, patient was discharged and at discharge, colostomy was found to function well and enteral feeding was started. After 6 weeks, colostomy closure was done. At follow up, patient was found to be doing well and he gained weight normally.

## DISCUSSION

Ileosigmoid knot has a relatively higher incidence in east Africa, but it is rare in other parts of the world. Occasionally, cases have been reported from south Africa, north Europe, India and very rarely from USA. Parker has been credited for describing the first patient of ileosigmoid knot in 1845. It more commonly affects men who are in fourth decade of life [2]. The condition is common in African people, due to geographical, racial, habitual and dietary factors [2,3].

In this condition, knotting leads to closed loop obstruction and it causes gangrene of both the ileal loops and the sigmoid colon within a few hours in most patients; so, early recognition and prompt surgical treatment of this condition are essential. Although the radiographic appearances and clinical features have been described in various reports, diagnosis of this condition is difficult, because of its infrequency and atypical radiographic findings [4].

Alver [1] classified the ileosigmoid knot into 3 types, based on mechanism of formation of knot. In Type I (commonest), ileum is the active component, wrapping itself around the sigmoid colon (passive component) to form the knot in clockwise or anti-clockwise direction. In Type II, the sigmoid colon (active component) wraps itself around a loop of ileum (passive component) in clockwise and anticlockwise direction. In Type III, ileocaecal segment (active component) wraps itself around the sigmoid colon (passive component). Types I and II have been classified into A and B, depending on whether knot was clockwise or anticlockwise.

Aetiology of ileosigmoid knot remains controversial. This condition is common in east Africa, particularly among the young males of the Baganda tribe [2]. Three factors are responsible for ileosigmoid knot; a long small bowel mesentery and a freely mobile small bowel, a long sigmoid colon on a narrow pedicle and finally, the ingestion of a high bulk diet in presence of an empty small bowel [4-6]. Abdominal wall relaxation during sleep or post partum period also plays an important role in its aetiology. Meckel's diverticulum has been reported to be present in 14-53% of the cases.

Pre-operative diagnosis of ileosigmoid knot is very difficult and it is possible to diagnose this condition preoperatively, only in about

20% of cases [1]. Plain abdominal radiographs may show the characteristic double closed loop obstruction, with the sigmoid colon in the right upper quadrant and the small bowel loops in the left, but this is only an occasional finding. CT scan reveals the classical "whirl sign" of volvulus, created by the twisted mesentery and bowel, and the afferent and efferent limbs of the sigmoid colon have the appearance of a beak. The whirl is reported to be visible on a large number of contiguous slices in an ileosigmoid knot, as compared to that in sigmoid volvulus. A radial distribution of the intestine and mesenteric vascular structures on CT scan can also suggest the diagnosis.

The initial management involves an aggressive resuscitation with intravenous fluid and correction of electrolyte and acid base balance. After haemodynamic stabilization, treatment should be a prompt laparotomy [4]. If the colon is gangrenous, the knot should be resected intact. Making a prolonged attempt to untwist the knot is not recommended, as it may lead to perforation of fragile gangrenous bowel or to septic shock, due to release of toxin from the gangrenous loops [2]. At laparotomy, the diagnosis is easier, if the condition is kept in mind. If the ileal resection extends to less than 3 inches from ileocaecal junction, the distal stump of ileum is closed and end to side anastomosis of proximal small bowel to ascending colon is performed [2]. The continuity of large bowel can be established by doing end to end anastomosis, but if the condition of the bowel or general condition of the patient does not permit primary colonic anastomosis, a colostomy with distal mucous fistula is recommended. Hartmann's procedure is performed if the gangrene extends to the distal part of colon [2].

## CONCLUSION

Ileosigmoid knot is a rare but life threatening cause of closed loop intestinal obstruction. So, prompt suspicion, early diagnosis and urgent exploratory laparotomy may improve the survival chance of the patient.

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