CLOSED LOOP INTESTINAL OBSTRUCTION SECONDARY TO ILEO-SIGMOID KNOTTING (ISK) – A DIAGNOSTIC CHALLENGE

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ABSTRACT Intestinal obstruction due to Ileo-sigmoid knotting is a rare phenomenon associated with a high mortality rate leading to bowel gangrene and peritonitis. We present a rare cause of closed loop intestinal obstruction in a 46-year-old male patient who presented to the emergency department with complaints of severe abdominal pain, distension and multiple episodes of vomiting in the past 1 day. Prompt resuscitation and exploratory laparotomy revealed knotting of the sigmoid colon around the mesentery of the small intestine with segmental gangrene of both the sigmoid colon and small intestine. Resection of the gangrenous ileal segment with end-to-end anastomosis followed by Hartman's procedure to the gangrenous sigmoid colon. Ileo-sigmoid knotting is a surgical emergency with rapid progression to bowel gangrene and peritonitis, leading to sepsis and a high mortality rate. Therefore, early diagnosis, fluid resuscitation and prompt surgical intervention are key steps toward management.

KEYWORDS Closed loop obstruction, Ileo-sigmoid knotting

Case report

We report a case of a 46-year-old male who presented with complaints of severe abdominal pain, distension, bilious vomiting and obstipation for one day. On admission, the patient was grossly dehydrated with features of shock. The abdomen was tense, distended, and tender with guarding and rigidity on examination. Bowel sound was absent. Blood investigations revealed leukocytosis and deranged renal function tests. The abdominal radiograph revealed gas-filled bowel loops. An abdomen ultrasound revealed dilated, non-peristaltic bowel loops with the interloop collection. The collection was noted to be hemorrhagic fluid on an ultrasound-guided peritoneal tap.

A provisional diagnosis of closed-loop intestinal obstruction with bowel gangrene was made. An emergency laparotomy was performed after hemodynamically stabilizing the patient. A large volume of hemorrhagic fluid with extensive gangrene of the small intestine and sigmoid colon was noted on surgical exploration. Further exploration revealed knotting of the sigmoid colon around the mesentery of the small intestine with segmental gangrene of the entrapped small intestine and sigmoid colon **(Figure 1)**. Since a part of the sigmoid colon encircling the mesentery of the small intestine was viable, we decided to derotate the sigmoidal volvulus. Resection of the gangrenous small intestine was followed by end–end anastomosis and that of the sigmoid colon by Hartman's procedure. The postoperative period was uneventful. Colostomy was functional on the second postoperative day while the normal diet was gradually resumed over 4 to 5 days. The patient was discharged on the 10^{th} postoperative day with a functioning colostomy.

Discussion & Conclusion

Ileo-sigmoid knotting (ISK) - virtually a fatal form of volvulus first encountered by Parker in 1845 is a condition in which the ileum and sigmoid colon wrap around each other, resulting in a closed loop obstruction.[1]. Olcay Alver et al. classified ISK into 3 types [2]. Type A - The ileum (active component) wraps itself around the sigmoid colon (passive component) in a clockwise or anticlockwise direction. (A- clockwise and B – anticlockwise).

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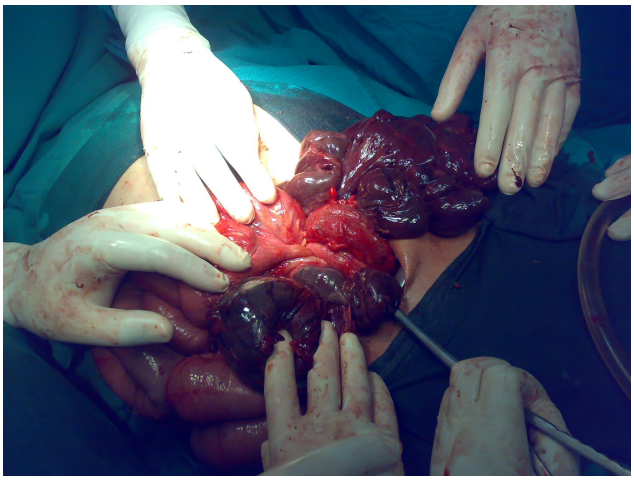

Figure 1

Type B - The sigmoid colon (active component) wraps itself around a loop of the ileum (passive component) in a clockwise or anticlockwise direction. Type C - The ileocecal segment (active component) wraps itself around the sigmoid colon (passive component). Type 1 being most common (53.9-57.5%) while type 2 and 3 are rare (18.9-20.6% and 1.5% respectively).[3]

Our patient was a type 2 ISK in which the sigmoid colon wrapped around the mesentery of the small intestine, thereby strangulating the blood supply.

Several anatomic and physiological features serve as a predisposing factor for the development of ISK. These include redundant sigmoid colon with a long mesocolon and a narrow attachment, hypermobile small bowel with elongated mesentery, and consumption of a high bulk diet with an empty small bowel. Once the ileo-sigmoid knot is formed, it progresses rapidly to bowel gangrene leading to generalized peritonitis, sepsis and shock.

In conclusion, the Ileo-sigmoid knot usually presents features of intestinal obstruction associated with a short history and rapidly deteriorating vitals (mortality ranges from 0% to 48%). Optimal management of this rare condition revolves around early pre-operative resuscitation, administration of empirical antibiotics and surgical resolution of the obstruction. Most cases present with gangrene of the ileum, sigmoid colon or both at the time of presentation.[2,4] Unknotting of the sigmoid colon is not recommended but may be tried carefully, especially if some viable loop is present and can be achieved after decompressing both sigmoid as well as small intestine through separate enterotomies. Some recommend that no attempt be made to untie the knot. Instead, it should be resected en masse.[5] Gangrenous small bowel can then be resected followed by an end-to-end anastomosis of the viable loops but can be difficult if terminal ileum is less than 10 cms; in that case, side to side ileocolic anastomosis is a good option after closing the distal stump. Similarly, the gangrenous sigmoid colon should also be resected, followed by primary anastomosis (If history is short, viable bowel is clean, well vascularized and not distended); otherwise, a Hartman's procedure or a covering colostomy can be performed.

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Conflict of interest

There are no conflicts of interest to declare by any of the authors of this study.

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