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A CASE SERIES ON ILEOSIGMOID KNOTTING: A RARE CAUSE OF INTESTINAL OBSTRUCTION AND BOWEL ISCHEMIA

General Surgery

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ABSTRACT

Ileo-sigmoid knotting (syn-compound volvulus, double volvulus) is a rare cause of intestinal obstruction. In this condition the ileum knots around the base of the sigmoid colon leading to a closed loop obstruction. The condition is serious, generally progressing rapidly to gangrene. So, awareness of this condition is essential for prompt diagnosis and optimal management. Due to it's rarity, diagnosis is usually intra-operative, rather than earlier. Resection of the gangrenous segment with stoma creation /anastomosis, is the only hope. In this case series, we have discussed 4 such cases, presenting, surprisingly, within just a 4-month period, in our hospital, along with the procedures undertaken and their outcomes.

KEYWORDS

Ileo-sigmoid knotting, compound volvulus, double volvulus

INTRODUCTION:

Ileo-sigmoid knotting (syn-compound volvulus, double volvulus), is a rare surgical emergency. Principally, it is a closed-loop intestinal obstruction involving the sigmoid and ileum, which may rapidly progress to gangrene of both. Preoperative diagnosis is difficult because of its infrequency and atypical radiographic findings.

Where endoscopic decompression is used to treat sigmoid volvulus, it is essential to exclude compound volvulus, as perforation may result in the latter (and hence, contra-indicated).

Post-resuscitation, early surgery is the only viable choice. Nowadays, CT scan helps in making a preoperative diagnosis. Generalized peritonitis and sepsis are the main causes of poor outcome.

Case Presentation:

A) Case 1:-

A 58-year-old male presented with diffuse abdominal pain for 4 days, with abdominal distention, vomiting and obstipation 2 days. The patient was hypotensive and febrile. The abdomen was distended with tenderness and guarding, and the rectum, collapsed. Straight X-ray abdomen in erect posture revealed dilated and obstructed sigmoid colon.

The patient was resuscitated with IV fluids, nasogastric decompression, catheterization were done and IV antibiotics started. Intra-operatively, ileum was found to be coiled around sigmoid colon; but without loss of bowel viability (Fig.1).

Resection of redundant sigmoid colon was done, followed by double-barrel colostomy. Post-operative blood parameters were within normal limits. The patient developed surgical site infection, but could be discharged in a favourable condition.

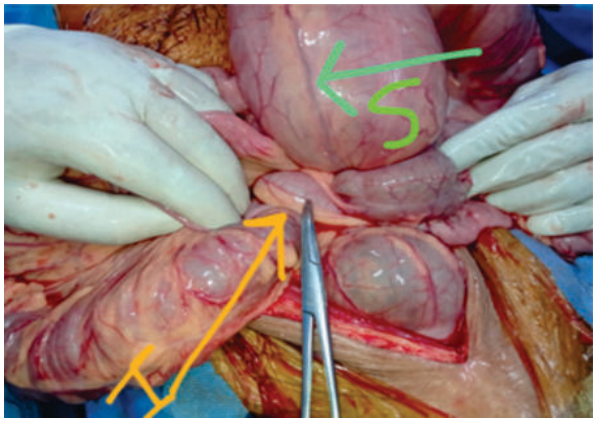

Fig. 1- Ileum (I) noted to be coiled around sigmoid colon(S)

B) Case 2:-

A 60-year-old male presented with abdominal distention and vomiting, associated with obstipation, for 5 days. The patient was hemodynamically stable but abdominal examination revealed distended and tense abdomen with palpable gut loops; IPS was absent and the rectal ballooned. Abdominal erect X-ray revealed dilated sigmoid colon and ultrasound of abdomen revealed some inter-loop collection. Patient was resuscitated and put on IV antibiotics. Intra-operatively, ileum was noted to be twisted around the base of sigmoid colon and, surprisingly, about 36cm of sigmoid was found to be gangrenous. After de-rotation, gangrenous part of sigmoid was resected with Hartmann's procedure, as distal loop was too short. Post-operatively, patient developed AKI and blood counts were high. On post-operative Day 6, patient developed wound dehiscence which was managed by dressing; he was discharged in a stable condition.

Fig. 2- Wound dehiscence managed conservatively

C) Case 3:-

A 72-year-old female presented with obstipation for 8 days, associated with abdominal distention and diffuse abdominal pain for the preceding 5 days progressing to recurrent vomiting. The patient was in shock and was practically gasping during admission. The abdomen was tense and distended, IPS was absent and the rectum collapsed. She was resuscitated with Oxygen and IV fluids including colloids; nasogastric decompression and catheterization were done. Post-resuscitation, X-ray of abdomen revealed a dilated sigmoid colon (Fig. 3).

Fig. 3- Blue arrow showing dilated sigmoid colon

Intra-operatively, around 40cm of sigmoid colon and 20cm of ileum were noted to be gangrenous; ileum was also found to be coiled in 2 turns around the sigmoid (Fig.4). Resection of the gangrenous segments followed by double-barrel ileostomy and Hartmann's procedure was performed. Post-operatively patient deteriorated, developed multi-organ dysfunction and had to be put on mechanical ventilation; she expired on post-operative day 6.

Fig. 4- Gangrenous changes in ileum (thick arrow) and sigmoid (thin arrow)

D) Case 4:-

A 66-year-old female presented to the emergency with history of diffuse abdominal pain for 4 days, distention for 2 days and vomiting. She had irregular defecation over a week with cessation of the same for the preceding 24 hrs. On examination, her vitals were within normal limits. Abdominal examination revealed distended and tender abdomen with palpable gut loops with absent IPS. Rectal examination showed ballooning and erect x-ray abdomen suggested intestinal obstruction (Fig.5) with complimentary findings on USG. Post-resuscitation laparotomy revealed ileum to be twisted around the base of the sigmoid colon, but no gangrenous changes were present. After de-rotation, resection of redundant sigmoid was done followed by Hartmann's procedure. Once the stoma was functional and the wound satisfactory, the patient was discharged in stable condition, on post-operative day 5.

Fig. 5- X-ray showing dilated sigmoid (thin arrow) with coil of ileum (thick arrow)

DISCUSSION:

Ileosigmoid knotting is an unusual entity in the West, but is comparatively common in certain African, Asian and Middle Eastern nations. The pathogenesis of ileosigmoid knotting is dependent on three factors: a) a long small bowel mesentery with free mobile small bowel, b) a long sigmoid with a narrow pedicle, and c) a bulky diet with the presence of an empty small bowel (1,5). Some studies promote the theory that a bulky diet may progress to the proximal jejunum and increase the mobility of the small bowel and fall in the left lower quadrant of the abdomen (5). Loops of ileum and distal jejunum may rotate around the narrow pedicle of the sigmoid in a clockwise manner and further peristalsis progresses the rotation to a closed loop of intestine (5), one in small bowel and another in sigmoid colon. Evidence for the mechanism is suggested by studies carried out on Baganda people in Uganda who eat once a day and on Muslims who eat a single daily meal during the Ramzan fast. Ileosigmoid knotting is predominately seen in males (80.2%) with a mean age of 40 years.

There are secondary factors besides the anatomical factors mentioned above, such as late pregnancy, trans-mesenteric herniation, meckel's diverticulitis with band, and ileocaecal intussusceptions (5). Ileosigmoid knot is classified into three types,-

a)Type 1- The ileum (active component) wraps itself around the sigmoid colon (passive component) in a clockwise or anticlockwise direction (Type A when clockwise and Type B when anticlockwise).

b) Type 2 - The sigmoid colon (active component) wraps itself around a loop of ileum (passive component) in a clockwise or anticlockwise direction.

c) Type 3 - The ileocaecal segment (active component) wraps itself around the sigmoid colon (passive component).

Among them, the most common type reported is type I (53.9– 57.5%), followed by type II (18.9–20.6%), type III (1.5%), and others undetermined. The direction of torsion is clockwise in 60.9–63.2% of cases.

The diagnostic difficulty is partly caused by the unfamiliarity of this rare entity and the confusing and self-contradictory features of the disease. While clinical features such as vomiting suggest small bowel obstruction, the radiographic findings are that of colonic distension,

which is uncommon in small bowel obstruction. The three features of the clinical picture of small bowel obstruction, radiographic evidence of predominately large bowel obstruction, and inability to insert a sigmoidoscope could possibly form a useful diagnostic triad for ileosigmoid knotting.

Initial management of ileosigmoid knot begins with aggressive intravenous fluid resuscitation and acid-base imbalance correction (10). Surgical intervention should follow after the achievement of hemodynamic stability (10). Antibiotic therapy should be implemented in the pre and post-operative periods for 5–7 days with, for example, cephalosporins, metrodinazole, and aminoglycosides (10). Various surgical procedures to manage ileosigmoid knot are mentioned in the literature (1). The intraoperative anatomical and pathological findings dictate the surgical procedure of choice (1). The most common procedure performed is ileal and sigmoid resection with primary enteroenteric anastomosis for ileum and Hartmann's procedure/colostomy for descending colon, if both ileum and sigmoid are gangrenous (1).

CONCLUSION:

Ileosigmoid knotting is a rare cause of intestinal obstruction and bowel ischemia. It is important to differentiate between ileosigmoid knot and simple sigmoid volvulus to avoid morbidity. CT scan may facilitate early diagnosis. Surgical intervention in general includes bowel resection with or without primary anastomosis.

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