CASE REPORT

Laparoscopic management of an unusual case of small bowel obstruction: appendiculoileal knotting

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SUMMARY

Appendicitis presenting at small bowel obstruction due to the formation of encircling loop around a bowel segment is a rare occurrence. We report such case managed with the laparoscopic approach. A 45-year-old woman presented to emergency services with severe pain in abdomen and bilious vomiting in the past 2 days, having a history of abdominal hysterectomy 10 years ago. The abdominal examination was suggestive of bowel obstruction. A CT showed dilated bowel loops with complete cut-off at the level of the terminal ileum. The patient was taken for diagnostic laparoscopy. The inspection of the small bowel revealed an appendicular looping around the small bowel lumen. After separating, the appendix obstruction was relieved. Then, the tip of the appendix was dissected free from the parietal wall along with approximately 5 mL purulent fluid. Appendectomy was completed and based looped doubly using catgut endoloop. The patient had an uneventful recovery and was discharged on the second postoperative day.

BACKGROUND

Small bowel obstruction (SBO) is a common entity in general surgical practice. The common causes include adhesions due to previous surgeries, hernias and neoplasia. Inflammatory processes like appendicitis, diverticulitis and so on can cause mechanical SBO by adhesion to the bowel loops. Appendicitis presenting at SBO due to the formation of encircling loop around a bowel segment is a rare occurrence. With few case reports available in the literature, as per our knowledge, there is no report of managing such a case via a laparoscopic approach.

CASE PRESENTATION

A 45-year-old woman presented to emergency room with severe pain in abdomen and bilious vomiting in the past 2 days, with the history of loose stools followed by obstipation for 1 day. There was no known comorbidity. There was history of open hysterectomy 10 years ago. No history of any similar complaints in the past. On examination, she was mildly dehydrated; pulse rate was 90/min, with blood pressure of 130/88 mm Hg. Her systemic examination was unremarkable. On per abdomen examination, a midline vertical scar mark was seen in the lower abdomen. The abdomen was mildly distended with generalised diffuse tenderness without any guarding. Bowel sounds were slightly exaggerated. Per rectal examination was

unremarkable. She was resuscitated and started on intravenous fluids; nasogastric tube and a urinary catheter were placed. A working diagnosis of adhesive obstruction was made.

INVESTIGATIONS

Her blood investigations, haemogram, renal function tests, serum electrolytes, viral markers were all normal. An X-ray abdomen was taken which revealed multiple air fluid levels and dilated small bowel loops which were predominantly clumped in the left upper quadrant. Subsequently, a CT scan was done which showed dilated bowel loops with a transition and a complete cut-off at the level of the terminal ileum ([figure 1](#)). With a provisional diagnosis of acute intestinal obstruction probably due to adhesions, diagnostic laparoscopy was planned.

TREATMENT

Since there was previous lower abdomen surgery, so pneumoperitoneum was created using Veress needle in the epigastric region. A 5 mm port for the camera was then placed at the same site. Two additional 5 mm ports were made in the right and left hypochondrium, under vision. The bowel inspection revealed a band-like structure looping around the small bowel lumen ([figure 2](#)). Though it appeared to be the appendix, the same could not be confirmed because of dilated bowel loops and inability to see the caecum from this port position. Accordingly, few additional ports were made following appendectomy positions: a suprapubic 10 mm camera port, 10 mm umbilical port and 5 mm port in the right iliac fossa. In this port position, it was confirmed that the appendix was looping around a terminal ileal loop causing closed-loop obstruction ([figure 3](#)). Since it was difficult to localise the tip of the appendix as it has adhered to the parietal wall, appendix was divided in its midportion/body ([figure 4](#)) using the harmonic scalpel. After separating, the appendix obstruction was relieved. Then, the tip of the appendix was dissected free from the parietal wall along with approximately 5 mL purulent fluid ([figure 5](#)). Appendectomy was completed by looping the base doubly using catgut endoloop ([figure 6](#)). The specimen which included both proximal and distal parts of the appendix was extracted in a bag from the umbilical port. Thorough peritoneal lavage was done. The sheath at 10 mm port sites was closed using Nylon no. one suture. Skin approximated in a subcuticular fashion. Liquid diet was started next day, initially with clear

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Figure 1 CT scan of the abdomen. (A) Point of transition in terminal ileum suggestive of complete small bowel obstruction.

fluids followed by soft diet. The patient was discharged on the second postoperative day. Histopathology revealed changes of acute appendicitis with transmural inflammation.

OUTCOME AND FOLLOW-UP

The patient was followed in the outpatient clinic after a month, and was in good health.

DISCUSSION

Intestinal obstruction accounts for about 15% surgical admissions in the emergency.¹ Out of the numerous causes described, postoperative adhesions account for about 74% cases.² Appendicitis can present as mechanical SBO, though rarely. Harris *et al* retrospectively reviewed 1114 patients in their centre who were diagnosed with appendicitis, appendicular perforation or gangrene. Out of these 1114 patients, 10 cases were diagnosed to be having subacute intestinal obstruction (SAIO) preoperatively. On exploration of these cases, the cause of SAIO was found to be either perforated or gangrenous appendicitis. The appendix in these cases lied across the ileum and was bound by adhesions to the caecum or parietal wall or ascending colon thereby causing obstruction.³

Figure 2 Laparoscopic view of appendix knotting around the loop of terminal ileum causing closed-loop obstruction. (A) Loop of terminal ileum. (B) Appendix making a knot.

Figure 3 Appendix knotting around the terminal ileal loop with its tip adhered to the parietal wall. (A) Loop of terminal ileum. (B) Appendix. (C) Tip of appendix adhered to the parietal wall.

Only a few examples are described in the literature where the appendix was found to be looped around the small bowel loop thereby causing obstruction and, in some cases, even strangulation and gangrene. In a literature review by Ondrej and Jiri,⁴ only 17 cases from the period of 1963 to 2015 were found in which appendix was obstructing by knotting around the bowel loop. Out of these, seven patients were treated by simple appendectomy as there was no gangrene. Others had to undergo resection of the gangrenous segments which included segmental resection in five, ileocaecal resection in four and right hemicolectomy in one case.⁴

As the experience and techniques in laparoscopy are evolving, it is now widely used as the preferred approach for selected cases of intestinal obstruction. There are no randomised clinical trials yet to prove its safety or feasibility in the treatment of intestinal obstruction, although multiple retrospective studies have shown laparoscopy to be a safe and effective tool for the treatment of the intestinal obstruction in selected cases. A multicentre retrospective analysis by Levard *et al* included 308 patients with acute SBO in 35 centres who were approached laparoscopically. Out of 308 patients, 168 were managed successfully laparoscopically while 140 cases required laparotomy. It was concluded that laparoscopy was more likely to be successful in patients who were seen early in their course of the disease (<24 hours) or have undergone just one or two interventions in the past. The rate of success was higher in patients with bands (54%) than in those with adhesions (31%) or other causes of obstruction.⁵

Figure 4 Appendix being divided in its middle with the harmonic scalpel. (A) Appendix.

Figure 5 Appendicular tip adhered to the parieties. (A) Small amount of pus present at the tip of the appendix.

As per our knowledge, there is no description of any such cases managed laparoscopically. In our institute, we routinely approach cases of intestinal obstruction laparoscopically with variable success rate depending on the patient profile. As in this case, the patient

Figure 6 Appendix being looped using catgut endoloop at its base. (A) Appendicular base.

Learning points

- ▶ Appendicitis causing mechanical bowel obstruction is a rare entity.
- ▶ Laparoscopy can be a useful tool in selected cases of small bowel obstruction.
- ▶ Early laparoscopic intervention can help prevent unnecessary bowel resections and lower the morbidity by decreased pain and early discharge.

presented early in the course of disease with only mild abdominal distension, a single scar in the lower abdomen, so laparoscopy was planned. The appendix was inflamed, and its tip was adhered to the parietal wall, thereby forming a loop around the terminal ileum. This looping of terminal ileum caused SBO, which got relieved on by appendectomy.

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