

Small Bowel Volvulus due to Ileocecal Valve Failure Secondary to an Obstructing Rectal Adenocarcinoma: First Reported Case

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ABSTRACT

Intestinal obstruction is a problem commonly encountered by the general surgeon. It can be classified as either large bowel or small bowel obstruction. Occasionally, the two entities occur together with the small bowel obstruction usually being sequelae of large bowel obstruction via an incompetent ileocaecal valve. We report a case of a 70-year-old man who presented with large bowel obstruction due to an obstructing rectal tumor. On initial radiological investigations, it was noted to be solely a large bowel obstruction, however, on laparotomy, he was found to have both large and small bowel obstruction with the latter being due to a small bowel volvulus.

Learning Points

1. Failure of resolution of abdominal distension on defunctioning trephine loop ostomy warrants a search for another cause via laparotomy
2. Sudden failure of the ileo-cecal valve due to backpressure from large bowel obstruction can cause a sudden gush of liquid stool and air resulting in small bowel volvulus
3. Small bowel volvulus can occur in the presence of large bowel obstruction

KEYWORDS large bowel obstruction, small bowel volvulus, ileocecal valve failure

INTRODUCTION

Intestinal obstruction is a common diagnosis encountered on the surgical floor and different methods of treatment are well established. One such method of treatment is performing a defunctioning ostomy via a trephine incision. Failure of resolution of abdominal distension via a technically sound defunctioning trephine ostomy warrants a search for another cause of the intestinal obstruction via laparotomy. This case highlights such a situation where on laparotomy a small bowel volvulus was unexpectedly discovered with the pre-operative diagnosis being large bowel obstruction secondary to a rectal tumor. It is important to highlight that sudden failure of a competent ileocaecal valve with the subsequent rush of bowel contents can predispose to a small bowel volvulus.

CASE PRESENTATION

A 70-year-old male without any known medical problems was referred to our facility by a private physician with a 2-month history of weight loss, decreased caliber of stool, and abdominal distension. The abdominal distension worsened with associated colicky abdominal pain, vomiting, and constipation over the past day. No history of rectal bleeding was elicited and no history of cancer in the family was noted. His past surgical history was unremarkable and he has a history of smoking one pack of cigarettes a day for 10 years; however, he stopped smoking 40 years ago. The remaining history and review of systems were unremarkable.

Examination revealed an elderly male in no obvious distress with a tachycardia of 101 and remaining vital signs were within normal limits. Abdominal examination revealed a grossly distended, but non-tender abdomen with the absence of peritonism. Bowel sounds were noted to be increased. Digital rectal examination revealed no palpable mass.

Investigations

Blood investigations revealed: A normal complete blood count. Plain abdominal radiographs revealed dilated loops of large bowel (Fig. 1).

A CT scan of the thorax, abdomen, and pelvis revealed severely dilated left and right colon with the

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Fig. 1 Abdominal X-ray demonstrating dilated loops of large bowel.

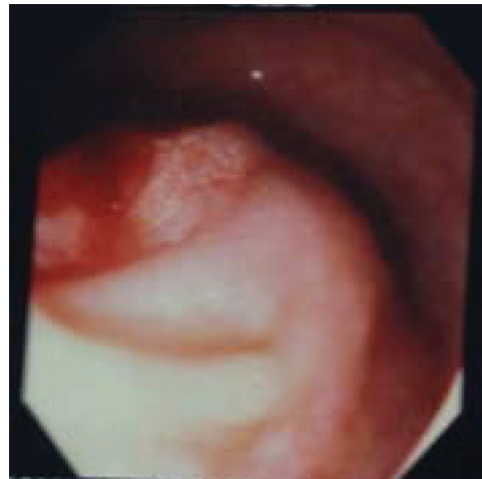


Fig. 4 Rectal tumor demonstrated on flexible sigmoidoscopy.



Fig. 2 Computed tomography image (coronal section) demonstrating dilated loops of large bowel with collapsed small bowel.



Fig. 5 Intraoperative photograph: *white arrow* indicates the initial incision for the trephine colostomy and the *black arrow* indicating the ultimate lower midline incision.

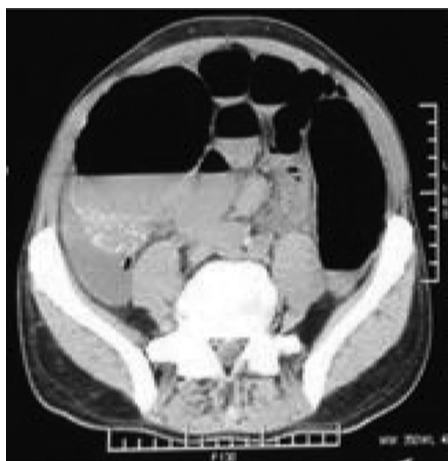


Fig. 3 Computed tomography image (horizontal section) demonstrating dilated loops of large bowel with collapsed small bowel.

cecum measuring $14 \times 9.8 \text{ cm}^2$ due to a stenotic upper rectal neoplasm involving recto-sigmoid junction. There is full thickness wall involvement and at least six sub-adjacent paracolic nodes with a maximum diameter of 1.1 cm. The small bowel appears normal and there is a small amount of free fluid noted with the absence of free air (Figs. 2 and 3). There was no liver or pulmonary metastasis and clinically staged at T3N2 diseases.

A flexible sigmoidoscopy was performed revealing an obstructing tumor 10 cm from the anal verge. The scope was unable to traverse the lesion (Fig. 4).

Differential diagnosis

Large bowel obstruction due to obstructing rectal carcinoma.

Treatment

The patient was resuscitated and taken to the operating room. Based on the location of the tumor, we decided to perform a less invasive defunctioning trephine sigmoid loop ostomy, followed by neoadjuvant chemoradiation, and then planned elective anterior resection. However, on completion of the stoma and suctioning of the contents proximally, there was minimal improvement of the abdominal distension. A strong suspicion of other pathology was made and decision was made to convert to laparotomy (Fig. 5). Findings included, dilated loops of small bowel with volvulus of the ileum (Fig. 6) and

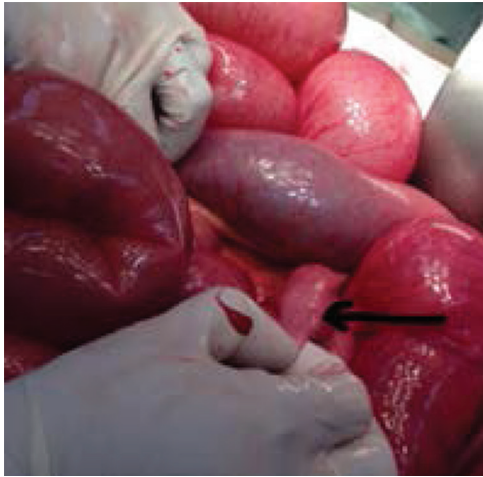


Fig. 6 Intraoperative photograph demonstrating point of twisting in distal ileum.

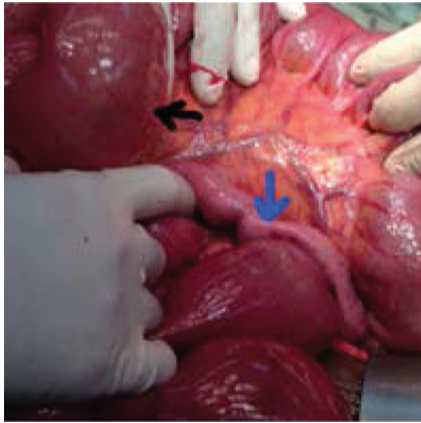


Fig. 7 Intraoperative photograph: *black arrow* demonstrating loop of small bowel running across the root of distended bowel and *blue arrow* indicating the dilated loop of small bowel.



Fig. 8 Intraoperative photograph of the small bowel after detorsion.

distal jejunum, and a constricting lesion at the recto-sigmoid junction.

The volvulus was detorted and the loop of small bowel at the root of the mesentery was released (Figs. 7 and 8). At laparotomy, the tumor was felt resectable and there was



Fig. 9 Intraoperative photograph of anterior resection specimen.

no palpable liver metastasis or intra-peritoneal deposit. A rigid sigmoidoscopy was performed on table and noted a polyp in upper rectum in addition to the obstructing rectal lesion. An anterior resection, manual decompression of the proximal colon and primary colo-rectal anastomosis was performed (Fig. 9).

Outcome and follow up

The patient had an uneventful post-operative period and was discharged at day 5 post operation. Histopathology examination revealed a well-differentiated adenocarcinoma with pT3pN2Mx diseases. The case was discussed at the multidisciplinary team meeting and decision was made for adjuvant chemotherapy. The patient was last seen in our outpatient clinic at his 24 months followup and at that time he was doing well.

DISCUSSION

Malignant intestinal obstruction occurs in about 15% of patients presenting with colorectal cancer.¹ The management of a malignant obstruction will depend on several factors, such as whether it is complete or partial, the functional status of the patient, the advanced nature of cancer, and facilities available, etc. One such option is to perform a defunctioning ostomy, which can be done either through a laparotomy or trephine. We initially choose a trephine approach because of it has many advantages. Even though there are controversies, it is often difficult to identify the colon via trephine incision, a lap assisted ostomy or exploratory laparotomy could have been the initial choice; however, each of this approach has its own pros and cons. The lap-assisted ostomy was not done in our case, as the abdomen was distended which increases the theoretical risk of inadvertent bowel injury and also because of limited resource, the laparoscopic tower was not available to use in emergency at that time.

Avoidance of a laparotomy via trephine approach reduces post-operative pain, hospital stay, and results in quicker recovery and initiation of treatments, such as

chemotherapy and radiotherapy.²⁻⁴ However, on fashioning the ostomy resolution of the abdominal distension did not occur which prompted us to search for other pathology, on laparotomy, a small bowel volvulus involving the distal jejunum and ileum was noted and there was no identifiable band, adhesions, or other cause noted to cause this volvulus.

Small bowel volvulus is an unusual cause of intestinal obstruction. It is a result of twisting of a loop of bowel on its mesenteric axis, thus occluding the lumen and blood supply. This can result in strangulation, as well as closed-loop bowel obstruction eventually leading to ischemia, gangrene, and perforation, making this a surgical emergency. Small bowel volvulus can be either primary without any predisposing risk factors or secondary to congenital or acquired lesions.⁵ Primary small bowel volvulus has been correlated to ingestion of a large amount of fiber rich foods in a short period of time. The presence of bulky contents in the small bowel along with strong peristaltic waves predisposes to volvulus.⁶ Secondary causes of volvulus are many, post-surgical adhesions, congenital bands or malrotation just to name a few.⁷ In our case, this small bowel volvulus was secondary to the large bowel obstruction. Initially, our patient had a competent ileocaecal valve based on his initial CT showing only large bowel obstruction. We postulate this valve acutely failed resulting in a rapid gush of air and liquid into the distal ileum causing it to twist resulting in a volvulus. After thorough search of the academic literature, we believe this is the 1st reported case of such an occurrence where both malignant large bowel obstructions occurred along with a small bowel volvulus.

The management of small bowel volvulus is surgical. Prompt diagnosis and management are required to prevent the associated morbidity and mortality which has been quoted as high as 42–67%.⁸⁻¹⁰ The definitive management of small bowel volvulus is controversial. When compromised bowel is present, then resection is mandatory. However, when bowel is viable, in primary volvulus, fixation of the bowel is recommended by some authors citing recurrence rates as high as 30% for patients who underwent detorsion only.^{11,12} For secondary volvulus, treatment is guided by the underlying cause.

Finally, the management of intestinal obstruction lies with the surgical team. This case highlights a

unique scenario that should be kept in mind of practicing surgeons.

AUTHOR CONTRIBUTION

All authors have contributed significantly in designing and organizing to write manuscript, collecting data, as well help in critically analyzing the manuscript. All authors have approved the final version of this manuscript.

CONSENT

Patient consent was obtained to publish this article into a Medical Journal.

GUARANTOR

The corresponding author will accept the full responsibility of the work.

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