

Case Report

A Rare Case of Abdominal Cocoon Associated with Internal Hernia in an Adult

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ABSTRACT

A transmesenteric internal hernia (TIH) is a protrusion of a viscus through the mesenteric defect. It is secondary to previous gastrointestinal surgery in an adult. Early diagnosis and management are warranted to prevent the strangulation of the bowel in a TIH. Here, we are reporting a case of a 24-year-old gentleman with COVID-positive status who has presented with cough, abdominal cocoon, and features of subacute intestinal obstruction (SAIO) without any previous history of abdominal surgery. A nonoperative trial is given in the management of abdominal cocoon with SAIO. In contrast, delay in surgical intervention in TIH leads to bowel gangrene. Surprisingly even on contrast-enhanced computed tomography of the abdomen, TIH was not picked up. We have diagnosed this case intraoperatively with gangrene of the bowel. In an abdominal cocoon without any history suggestive of tuberculosis or previous surgery, or any other condition that leads to an intra-abdominal reaction, an internal hernia should be kept as a differential diagnosis. The delay in diagnosis and surgical intervention is associated with potentially disastrous complications.

KEYWORDS: *Cocoon, hernia, internal hernia, intestinal obstruction, transmesenteric*

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INTRODUCTION

An internal hernia is a protrusion of the viscera through the peritoneum or mesentery inside the abdominal cavity. The opening can be expected (foramen of Winslow) or abnormal (trans omental/transmesenteric). The incidence of internal hernia is about 0.2%-0.9%.^[1] In children, the transmesenteric internal hernia (TIH) occurs due to intestinal atresia. It is acquired in adults because of previous gastrointestinal surgery or any other intra-abdominal condition causing fibrosis. In the absence of congenital anomalies or previous gastrointestinal surgery, preoperative diagnosis of TIH is challenging.^[1] It can present as acute or subacute intestinal obstruction with an abdominal lump. The clinical presentation is not always straightforward because the symptoms may be intermittent or continuous, leading to difficulty in diagnosis and a high risk of strangulation. Chronic inflammation caused by a recurrent subacute intestinal obstruction in an internal hernia may lead to cocoon formation. An abdominal cocoon encapsulates the small

intestine by fibro-collagenous membrane.^[2] This rare condition can be found in the tuberculous abdomen, especially in the endemic zone for tuberculosis. Other causes of fibro-collagenous membrane formation include previous abdominal surgery, peritoneal dialysis, cirrhosis, and idiopathic. It can present as an acute or subacute intestinal obstruction. We have discussed how abdominal cocoon misled the diagnosis and delayed the operative management of TIH.

CASE PRESENTATION

A 24-year-old gentleman presented to the emergency department with complaints of cough, abdominal pain, vomiting, and constipation for 10 days. Clinical examination revealed abdominal cocoon. There was no

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history of previous gastrointestinal surgery. The patient was initially managed nonoperatively at the primary healthcare center because of an abdominal cocoon with subacute intestinal obstruction. On presentation to the emergency, the patient was disoriented (GCS-E2V2M4), afebrile, pulse rate was 146 beats/minute, and blood pressure (BP) was 71/60 mm Hg, SpO₂ 98% on room air. The abdomen was distended. A palpable lump was found in the central abdomen and left hypochondrium, which was firm and nontender (abdominal cocoon) with visible peristalsis noted, and bowel sounds were exaggerated. There was decreased air entry in the right basal zone on chest examination. The patient was admitted with a working diagnosis of acute intestinal obstruction with abdominal cocoon and immediately intubated because of poor GCS (E2V2M4) and eventually turned out to be COVID positive. Normal saline (NS) (@ 30 mL/kg) bolus was given in view of shock with the continuation of intravenous (IV) maintenance fluid (NS @ 100 mL/hour). The patient responded to IV fluids resuscitation and BP became 100/70 mmHg. A plain x-ray abdomen erect, showing multiple air-fluid levels. Laboratory findings revealed a total leukocyte count of 21,000/cmm, Hb of 16 gm/dL, platelets count of 110,000/cmm, serum creatinine of 1.7 mg/dL, and the rest of the blood parameters were unremarkable. Because of an abdominal cocoon, a contrast-enhanced computed tomography scan of the abdomen was done, which showed features of small bowel obstruction [Figure 1] with small bowel loops clumped in the left hypochondriac and left lumbar region (abdominal cocoon) and features of ischemia in a segment of the small bowel of the cocoon [Figure 2].

The patient underwent exploratory laparotomy. Intraoperatively, the bowel loops were found clumped and encased like a cocoon with dense adhesions. The bowel loops were gradually delineated by adhesiolysis. Upon dissecting and excising the sac, the bowel loops were found dilated and herniating through a 3 × 3 cm defect in the mesentery of the ileum [Figure 3]. The herniated bowel loops showed gangrenous changes. The bowel segment resection (60 cm of the bowel, 10 cm proximal to the ileocecal junction) was done and a double-barrel ileostomy was made. Postoperatively, patient was kept on a ventilator because of COVID pneumonia. The patient was given an injection of Meropenem [1 gm IV 8th hourly] and Metronidazole (500 mg IV 8th hourly) for five days. The stoma started functioning from postoperative day 3 (POD-3) and the patient was started on nasogastric tube feeding on POD-3. A tracheostomy was done on POD-4 because of the requirement for prolonged ventilator support. Endotracheal secretion culture report suggests pseudomonas aeruginosa sensitive

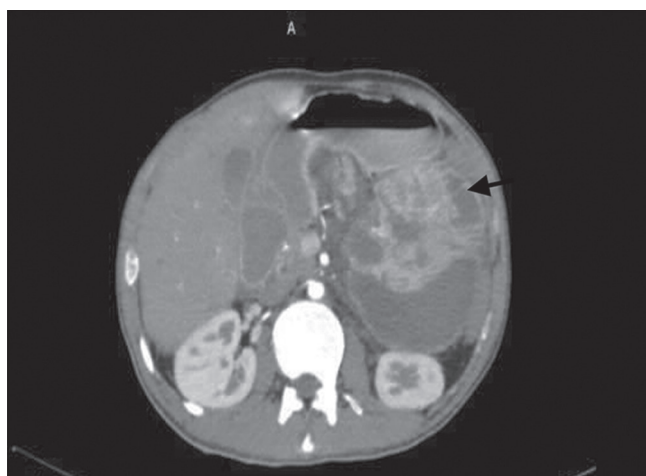


Figure 1: Axial CECT abdomen section showing dilated small bowel loops clumped in left hypochondriac and lumbar region (arrow)

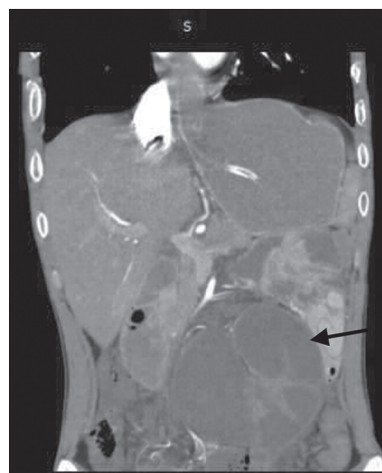


Figure 2: CECT abdomen showing thickened membrane (arrow) surrounding the intestinal loop (cocoon)

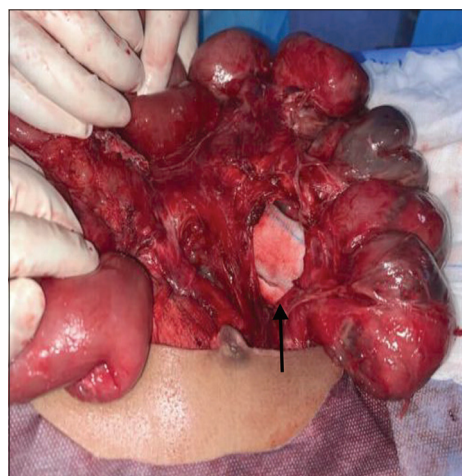


Figure 3: Intraoperative image showing defect in mesentery of the ileum measuring 3 × 3 cm (depicted by arrow)

to Colistin and trimethoprim-sulfamethoxazole. Injection of Colistin [IV 4.5 Miu (million units) 12th hourly] and Colistin nebulization 1miU eighth

hourly was started from POD-6 along with oral trimethoprim-sulfamethoxazole (800 + 160 mg) till POD-10. The patient was out of ventilator support from POD-10 and the tracheostomy tube was blocked and removed on POD-12. The patient was discharged on POD-17. The patient was doing well on follow-up.

DISCUSSION

Internal hernia is one of the rare causes of intestinal obstruction. The diagnosis of internal hernia is made relatively late and, in most cases, diagnosed during laparotomy. The delay in the diagnosis usually leads to bowel ischemia, eventually leading to bowel strangulation.

A patient with an internal hernia usually presents with features of acute intestinal obstruction. There are no signs specific to internal hernia and no imaging findings are conclusive of internal hernia.^[3] A high clinical suspicion should be made if a young patient presents with intestinal obstruction with abdominal cocoon without a prior history of abdominal surgery or pulmonary tuberculosis (as in our case).

Computed tomography (CT) is a sensitive and specific modality to diagnose intestinal obstruction, but there are no CT criteria for an internal hernia. Even with an advanced modality like CT, the herniation of bowel loops could not be delineated. The herniation of the intestinal loops leads to obstruction, followed by compromise in the intestinal blood supply, leading to strangulation of herniated contents. All these events happen in quick succession so that without proper intervention, there will be intestinal ischemia. The strangulated bowel is responsible for the high mortality in patients. Hence, a differential of internal hernia should always be included in cases of intestinal obstruction with abdominal cocoon.

Even with prompt management, the mortality rate stands between 20% and 75%, and in a study by Hizir Akyildiz *et al.*,^[4] it was 36%, indicating the high fatality rate of internal hernia. A multiorgan failure with intra-abdominal sepsis caused the majority of the deaths. Age, delayed surgery, massive intestinal gangrene, and postoperative acute respiratory distress syndrome are the major factors that influence mortality. Abdominal cocoon syndrome is characterized by partial or total encapsulation of the small intestine with a thick fibrotic membrane.^[5] Tuberculosis is one of the causes of encapsulation. The incidence of the abdominal cocoon lies between 0.4% and 5.5%.^[6] It usually presents as a subacute intestinal obstruction clinically and abdominal radiographs are not entirely specific and usually inconclusive. In CT scans, bowel

loops are usually found clumped in a single area with soft-tissue density covering the clumped bowel loops. Other findings, such as ascites, peritoneal thickening, peritoneal calcifications, and intestinal wall thickening, can be found.^[7] In a case report by Altintas *et al.*,^[2] a TIH presented as an abdominal cocoon. There was a defect in the small bowel mesentery through which the bowel loops were found herniating. The surgical intervention usually includes laparotomy with reduced contents and defect closure. When the bowel is incarcerated too tightly to reduce, the defect can be widened and the hernia can be reduced. If the bowel is gangrenous, then resection of the segment is done.^[8] However, it should be ensured that the rest of the mesentery should be explored to rule out any other defect sites. Also, any areas of potential herniation should be closed to prevent recurrences.^[9]

CONCLUSION

Even with the latest imaging modalities, the diagnosis of internal hernia is quite challenging and there should be a high degree of suspicion for the same. In an abdominal cocoon without any history suggestive of tuberculosis or previous surgery, or any other condition that leads to an intra-abdominal reaction, an internal hernia should be kept as a differential diagnosis. The delay in diagnosis and surgical intervention is associated with potentially disastrous complications.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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