

Abdominal cocoon complicated with early postoperative small bowel obstruction

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Abdominal cocoon is a rare entity first described and named by Foo in 1978.¹ It is characterized by a complete or partial encasement of the small bowel by a thick and fibrotic membrane (cocoon).² The loops within the cocoon are normal and adherent to each other. The ideal treatment is operative, with dissection of the membrane from the intestine and separation of adherent loops of the small bowel until they are laid free and return to their normal configuration.³ However, extensive adhesiolysis may contribute to the occurrence of early postoperative small bowel obstruction (EPSBO). This is the first reported case of EPSBO complicating abdominal cocoon.

CASE

A 69-year-old man presented with colicky abdominal pain, vomiting and constipation for a day. His medical history included recurrent abdominal pain. The patient had neither an abdominal operation nor medical treatment. On physical examination, the patient was in distress but afebrile and hemodynamically stable. Systemic examination revealed no abnormality, but an abdominal examination revealed fullness in the right half of the abdomen. A tender lump was palpated in the right lower quadrant of the abdomen with mild muscle guarding. There was mild tenderness, rebound tenderness and rigidity in the right half of the abdomen, especially in the hypogastrium. Percussion revealed a tympanitic note over the swelling. There was no hepatomegaly or splenomegaly, and no free fluid was evident on clinical examination. The bowel sounds were exaggerated and high-pitched on auscultation. A rectal examination was unremarkable.

A plain upright abdominal x-ray showed a few dilated loops of the small bowel with air-fluid levels, with no free gas under the dome of the diaphragm. Abdominal ultrasonography revealed dilated bowel loops in the right half of the abdomen. A CT scan of the abdomen demonstrated a fibrous peritoneal sac separating the

cocooned intestinal loops from the surrounding bowel (Figure 1). The laboratory blood analyses (complete blood count, differential, electrolytes and liver biochemistry) were within normal limits. A provisional diagnosis of abdominal cocoon with peritonitis was made. After rehydration and nasogastric decompression, little improvement occurred. The abdominal pain and distension persisted and even became worse, and the patient underwent emergency laparotomy.

The entire small bowel was encased in a cocoon-like fibrous membrane, which extended laterally to involve the ascending and descending colon. The small gut within this membrane was seen coiled up in a concertina-like fashion and with flimsy interlooping adhesions (Figure 2). Within the sac, 20 cm of the ileum, from 80 to 100 cm off the ileocecal valve, were found to be ischemic. The greater omentum was not observed. The mesentery was blocked with lidocaine and the gangrenous bowel warmed with a hot gauze pad. Twenty minutes later, the segment of the bowel was not improving. Resection of the gangrenous bowel and end-to-end



Figure 1. Abdominal CT scan showing that the small intestine was restricted to the central part of the abdomen because of the presence of a fibrous sheath.

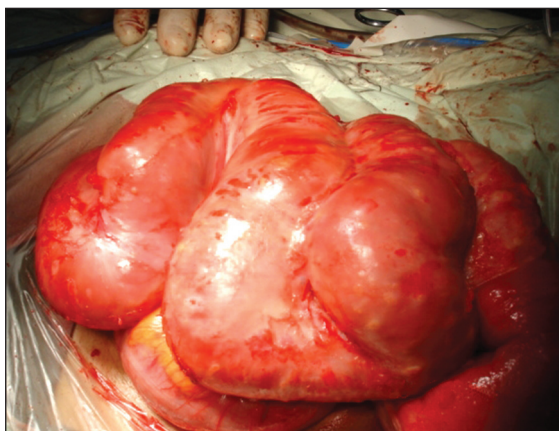


Figure 2. A fibrotic, cocoon-like membrane covering enteric loops (intraoperative photograph).



Figure 3. The small gut within this membrane coiled up in a concertina-like fashion and with flimsy interlooping adhesions (intraoperative photograph).

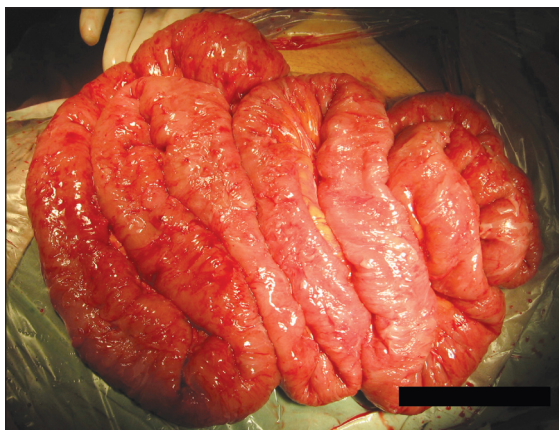


Figure 4. The separated loops of small bowel were normal (intraoperative photograph).

anastomosis of the small bowel were performed. The membrane was peeled off and extensive adhesiolysis of the small bowel loops was performed by blunt dissection (Figure 3). Adherent loops of the small bowel were separated to completely free the obstruction (Figure 4). The excised sac and bowel were studied histopathologically, which showed fibrocollagenous tissue with few inflammatory cells (Figure 5). The bowel segment showed acute inflammatory reaction and ischemia and necrosis spots accompanied by inflammatory infiltrates.

Bowel function returned on the fifth postoperative day and the patient started oral intake. Unfortunately, 8 days after surgery the patient presented with abdominal distention, vomiting, constipation and a slight abdominal pain. Plain x-ray of the abdomen (standing) showed multiple air-fluid levels. A diagnosis of early postoperative small bowel obstruction was made. After gastrointestinal decompression, the patient was resuscitated. Antibiotics were given, and a central vein catheterization was made for total parenteral nutritional support. Dexamethasone and stilamin were used, particularly to treat EPSBO.^{4,5} The patient's recovery was uneventful and he was discharged from the hospital on the 20th postoperative day. One year after the operation, he was in good health.

DISCUSSION

Abdominal cocoon is a rare entity and its etiology and pathogenesis remain obscure.⁶ A number of hypotheses have been proposed to explain the formation of the membrane, but there is no objective evidence to substantiate these hypotheses.^{3,7} It is extremely difficult to establish the diagnosis of abdominal cocoon preoperatively. Diagnosis is usually made at laparotomy. In this patient, a CT scan revealed that the small intestine was restricted to the central part of the abdomen due to the presence of a fibrotic sheath. Therefore, abdominal cocoon was diagnosed preoperatively. Surgery is the required treatment in patients with abdominal cocoon, with lysis of the membrane and adhesions being the main method. Careful dissection and excision of the thick sac with release of the small intestine leads to complete recovery. Resection of the bowel is indicated only when it is nonviable.^{3,7,8} Enterolysis should be done according to accepted treatment, but this may increase the risk of EPSBO. This phenomenon has not been well recognized. To our knowledge, abdominal cocoon accompanied by EPSBO has not been reported.

Most authors have applied a definition of EPSBO similar to that of Ellozy et al, who diagnosed EPSBO when crampy abdominal pain, vomiting and radiographic findings consistent with intestinal obstruction

were present after an initial return of bowel function within 30 days after surgery.^{4,9} The majority of episodes of EPSBO are most probably caused by adhesions.¹⁰ In two series, the cause of such obstruction was reported to be adhesions in 91% and 92% of patients.^{11,12} The incidence of strangulation in EPSBO is very low.¹⁰ Most instances of mechanical EPSBO can be treated expectantly for at least 10 to 14 days with almost no risk of bowel strangulation. Many episodes of EPSBO resolve spontaneously with no cause identified.^{9,10}

It is noteworthy that EPSBO is a postoperative complication associated with surgery for abdominal cocoon after extensive adhesiolysis. Many factors contribute to the development of EPSBO after surgery for abdominal cocoon. First, both abdominal cocoon and EPSBO are associated with enhanced collagen production and subsequent fibrosis.^{9,13} Second, efforts to divide adhesions may further precipitate and increase their formation.

We think EPSBO is a distinct complication, which needs close attention. And the symptoms of the case are different from that of the EPSBO after other abdominal surgeries. Abdominal distention, without colicky abdominal pain, is the typical and most notable finding. This complication should be treated conservatively.^{10,14} However, more important is the prevention of EPSBO.

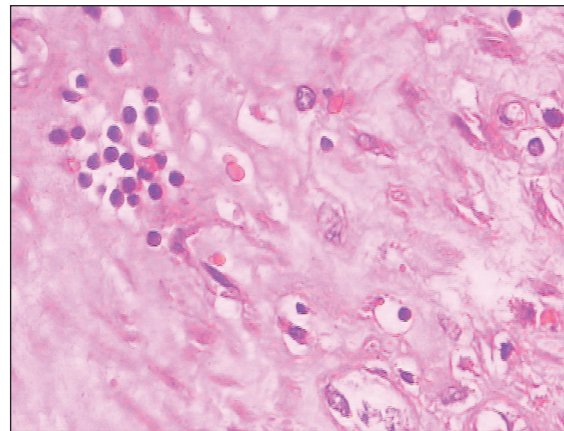


Figure 5. Histological findings of the thickened membrane showing proliferation of fibroconnective tissue and inflammatory infiltrates.

Prevention includes sound operative techniques, attention to detail, gentle dissection and handling of tissues, careful hemostasis to avoid hematoma formation, and thorough peritoneal cleansing, leaving as little foreign material as possible (for example, non-absorbable suture material).⁹ The surgical approach to abdominal cocoon can be different in different situations and extensive adhesiolysis should be avoided to prevent EPSBO.

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