

# Abdominal Cocoon Secondary to Tuberculosis

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## ABSTRACT

Abdominal cocoon or sclerosing encapsulating peritonitis is a rare cause of intestinal obstruction that has been described mostly in young adolescent girls. Thick fibrotic peritoneum encasing the small bowel in a small volume is a pathognomonic feature. This condition presents many difficulties in preoperative diagnosis. Early diagnosis can result in proper management, and may prevent the need for bowel resection. The author reports a case of a male patient with intermittent subacute intestinal obstruction and an abdominal cocoon encasing the small bowel secondary to abdominal tuberculosis, which was suspected preoperatively by radiology. To the best of our knowledge, this case represents one of the very few male patients with this disease entity reported in medical literature.

**Key Words:** Cocoon, intestinal obstruction, peritoneum, tuberculosis

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Abdominal cocoon is a rare acquired condition involving encapsulation of the small bowel by a fibrous membrane. Although well documented, the exact etiology is often unclear. The present report describes a case wherein the tubercle bacillus was identified as the etiological agent. The clinical, pathological and radiological features of this unusual disease are discussed.

## CASE HISTORY

A 30-year-old man presented with complaints of vomiting and abdominal pain lasting a few days. He had several similar episodes in the past with spontaneous symptomatic relief. The patient had no previous history of practionol use, hepatic disease, abdominal surgery, peritoneal dialysis, ventriculoperitoneal and peritoneovenous shunting. Additionally, no clinical features of connective tissue disease or sarcoidosis could be identified. A family history of chest tuberculosis was, however, positive. Clinical examination revealed mildly distended abdomen. Laboratory studies were unremarkable.

Plain radiograph of the abdomen in supine posture revealed mildly dilated small bowel loops in the mid-abdominal region. Plain radiograph of the chest revealed fibrocalcific changes in the upper lobe of the right lung.

Abdominal ultrasonography revealed clustering of the small bowel loops in the mid-abdominal region. Mild interloop ascites was also noted. Few enlarged lymph nodes were seen in the small bowel mesentery.

Contrast-enhanced computed tomography (CT)

of the abdomen was performed. It revealed clustered small bowel loops encapsulated within a thick membrane-like sac in the mid-abdomen [Figures 1 and 2] with dilated stomach and duodenum. Small amount of interloop ascites was also evident. Lymphadenopathy was noted in the small bowel mesentery and in the gastrohepatic ligament.

Based on the above findings, abdominal cocoon secondary to tuberculosis was suspected.

Exploratory laparotomy was performed few days later. At surgery, considerable length of the jejunum and ileum was found encased in a whitish, thickened membrane, which was resected. Lymphadenopathy was noted in the small bowel mesentery.

Histology of the membrane revealed fibrosis without inflammation, and nodal microscopy revealed features of tuberculosis.

Based on the clinical, radiological, surgical and histopathological findings, a diagnosis of abdominal cocoon secondary to abdominal tuberculosis was made. Postoperatively, the patient was initiated on anti-tuberculous treatment for 9 months. During 1 year of postoperative follow-up period, the patient remained asymptomatic.

## DISCUSSION

There are numerous causes of intestinal obstruction. Kochhar *et al.* reported external hernias, volvulus, tuberculosis



**Figure 1:** Contrast-enhanced axial CT image of the abdomen shows abdominal cocoon in the mid-abdomen with a membranous covering especially posteriorly and on the left side



**Figure 2:** Sagittal MPR contrast-enhanced CT image shows abdominal cocoon in the anterior part of abdomen adherent to the anterior abdominal wall

and post-operative or inflammatory adhesions as the most common causes of intestinal obstruction in India.<sup>[1]</sup>

Intestinal obstruction secondary to abdominal cocoon or *peritonitis chronica fibrosa incapsulata* is an infrequent clinical entity. Foo *et al.* first applied the term “abdominal cocoon” in 1978.<sup>[2]</sup>

Sclerosing encapsulating peritonitis (SEP) is an acquired condition. Prior abdominal surgery or peritonitis, chronic ambulatory peritoneal dialysis and prolonged use of practolol are the main causative factors.<sup>[3]</sup> Other conditions such as history of ventriculoperitoneal and peritoneovenous shunts, sarcoidosis, cirrhosis, systemic lupus erythematosus, propranolol therapy for constrictive pericarditis, fibroid uterus, endometrioma or tumor of ovary, and recurrent peritonitis have also been implicated.<sup>[4]</sup> Abdominal cocoon is a variant of SEP in which the small bowel is partly or completely encased in a thick, fibrous membrane.<sup>[5]</sup> The

disease is commoner in the tropical and subtropical regions, and occurs mainly in young females. Postulated etiology of retrograde menstruation coupled with viral infection does not explain the occurrence in males. Although Foo *et al.* postulated tubercle bacilli as an etiology agent, no organisms were isolated in majority of the previously reported cases.<sup>[2]</sup>

The patient may present with signs and symptoms of acute, subacute or chronic intestinal obstruction, abdominal distension, weight loss or a mobile abdominal mass. The classic barium finding, described by Sieck *et al.*, is a serpentine or concertina-like configuration of dilated small bowel loops in a fixed U-shaped cluster or a “cauliflower sign,” but these are not always present<sup>[5,6]</sup> and are nonspecific. Delayed transit is more diagnostic.

Characteristic sonographic findings include altered peristalsis, adherence of the bowel to the anterior abdominal wall, intraperitoneal echogenic strands and membrane formation during the late stages of the disease.

CT is an important diagnostic tool, but few have reported CT findings of abdominal cocoon.<sup>[3,7]</sup>

A typical finding of abdominal cocoon on CT is a concentration of a part of or the entire small bowel in the center of the abdomen encased by a soft tissue-density mantle.<sup>[7]</sup> Other CT features that may be seen include signs of obstruction, fixed and adherent intestinal loops, bowel wall thickening, localized fluid collections, peritoneal thickening and enhancement, calcification in peritoneum or bowel wall, and reactive adenopathy.<sup>[3]</sup> Ascites is an uncommon feature.

Prior to the era of CT imaging, definitive diagnosis was usually made during surgery.<sup>[5]</sup> The thickened membrane may be adherent to the surrounding structures. Within the cocoon, there may be interloop adhesions or adhesions between loops and the capsule. Extensive bowel resection is associated with high morbidity. Symptomatic relief generally ensues following conservative surgery, although recurrence has been reported.<sup>[5,6]</sup>

Histopathological examination of the encapsulating membrane persistently shows thickened vascular fibrocollagenous tissue, with or without chronic inflammatory reaction evidenced by lymphocytic and plasma cell infiltrates. Mesenteric lymph nodes may demonstrate nonspecific reactive hyperplasia and may reveal the etiology.

Kaushik *et al.*<sup>[4]</sup> had reported six cases of abdominal cocoon secondary to tuberculosis, where the diagnosis was made during surgery since these cases presented with acute intestinal obstruction. In these cases, they were able to demonstrate caseating epithelioid cell granulomas in the membrane, although acid-fast bacilli could not be

demonstrated. However, in our report, we were able to suspect the diagnosis preoperatively based on CT abdomen findings, allowing for surgical intervention that helped in early definitive diagnosis, thus improving the prognosis.

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