

Diagnosis and surgical management of abdominal cocoon : results from 12 cases

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Abstract

This study was designed to describe the characteristics, diagnostic and therapeutic methods of abdominal cocoon.

Twelve patients with abdominal cocoon were surgically treated. The clinical findings from these patients were analyzed. All patients presented with acute complete intestinal obstruction, and 10 had a previous history of abdominal mass.

In nine patients, the whole or part of the small intestines were covered by an ash gray, dense and tough fibrous membrane. The capsule was surgically excised, and the adhesion was released. Partial resection of the small intestines was performed. In the other three patients, the small intestines were only partially covered by a membrane, and there was an extensive adhesion of intestinal tract, forming a large mass which could not be relieved by surgical lysis. Intestinal tube was put in, and fistulation procedures were performed. All patients recovered fully after the surgery.

Conclusions : There are four types of surgical findings in abdominal cocoon. The most common type is that the small intestines are fully covered by a thick white membrane, causing intestinal obstruction. Surgical excision of the membrane and the release of adhesion is the treatment of choice. (*Acta gastroenterol. belg.*, 2009, 72, 447-449).

Key words : abdominal cocoon, intestinal obstruction, abdominal mass, surgery.

Introduction

Abdominal cocoon is a rare peritoneal membrane disease that may lead to small intestinal obstruction. This disease is also known as 'sclerosing encapsulating peritonitis' (SEP), which is characterized by the encasement of the small bowel by a fibrocollagenic cocoon like sac (1,2). Part or the whole small intestine is covered by an off-white fibrous membrane, which forms a cocoon (3). The fibrous encapsulation can also involve but has little mechanical influence on the colon and stomach, and may result in extensive adhesion of small intestine. The etiology and pathogenesis of abdominal cocoon remain obscure. Peritoneal encapsulation or sclerosing encapsulating peritonitis has been considered to be the same clinical entity (4). It presents with recurrent episodes of acute or subacute small bowel obstruction, weight loss, nausea and anorexia, and at times with a palpable abdominal mass (5).

In this article, the clinical data of 12 patients with abdominal cocoon were analyzed, and the surgical treatment was described.

Case reports

Seven males and five females (median age 43 years, range eight months to 78 years, Table 1) were admitted to our hospitals between October, 2000 and October, 2008. All patients had symptoms of abdominal obstruction and a central abdominal mass at the time of the first hospital visit. Physical examination, abdominal X-ray and CT scan suggested complete intestinal obstruction in all patients. In nine patients (six males and three females), exploratory laparotomy was performed after the conservative therapy had failed. Exploratory laparotomy found that the whole or part of the small intestine was covered by a membrane (Fig. 1). An enclosed mass containing air was seen in the abdomen in five of the patients. In three cases (one male and two females), the intestinal tract was covered by an incomplete thick tough membrane. There was extensive adhesion of intestinal tract, which formed a mass that could not be released.

There were four types of intraoperative findings (Table 1). Type 1 (n = 7) : The visceral organs in the abdominal cavity were completely covered by a thick white membrane, and the small intestine was packed and compressed into a mass (Fig. 1). The capsule was near the root of the mesentery and fixed the encapsulated small intestine in abdominal cavity so as to form a mass. There was loose adhesion between the capsule and the small intestine in most areas, but there was tight adhesion in other areas. The capsule was stripped out and excised. After the release of small intestine compression, the small intestines extended suddenly. The serous membrane of intestinal tract and mesentery were intact, and the flexibility of the intestinal walls was normal.

Type 2 was found in one patient. Part of the small intestine was discontinuously covered by a white transparent membrane. The normal structures of most

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Table 1. — Surgical classification of abdominal cocoon

Types	Age	Sex	Surgical findings
1	8 months 5 years 10 years 20 years 44 years 65 years 78 years	F F M F M M M	The visceral organs in the abdominal cavity were fully covered by a membrane
2	21 years	M	Part of the small intestines was discontinuously covered by a membrane.
3	68 years	M	Part of the small intestines was continuously covered by a membrane.
4	42 years 52 years 62 years	M F F	The visceral organs in the abdominal cavity were fully covered by an incomplete membrane, with tight adhesion.



Fig. 1. — Exploratory laparotomy in a 78-year-old patient. The surface of the whole small intestine was covered by an off-white tough capsule, and the small intestine was compressed into a mass.



Fig. 2. — Part of small intestine was covered and compressed by a thick tough membrane.

visceral organs could be seen in the abdominal cavity, and the small intestine was normal. The membrane covered the intestinal tract and the two sides of the mesentery, and reached the root of the mesentery. There was adhesion between the membranes, which resulted in the obstruction of small intestine. The membrane covered about three quarters of the length of the small intestine. There was loose adhesion between the small intestines and serous membrane of mesentery. The membrane was stripped out, the adhesion was released.

In one elderly patient (type 3), part of the small intestine was continuously covered and compressed by a thick tough membrane (Fig. 2). After incising the capsule, the mass formed from tightly adhered intestinal tract could not be released. Resection and anastomosis of an encapsulated length of small intestine was conducted.

In another three patients (type 4), the visceral organs in the abdominal cavity were covered by an incomplete thick tough membrane with tight adhesion. The intestinal tract could not be released. An incision was made in the dilated intestinal segment, and a Pezzer drain was applied.

The pathological examination of the excised capsules showed fibrous tissues with partial calcification and degeneration. There were also abundant inflammatory cells.

In the three patients who received Pezzer drain, the drainage tube was closed 4 weeks after the surgery. After 6 months, the drainage tube was withdrawn, and the sinus tract was healed. The 12 patients were followed up for about 6-68 months (median 16 months) in our surgical clinic. None of the patients showed signs of intestinal obstruction or any other significant abdominal symptoms during the follow up.

Discussion

Abdominal cocoon can be congenital or acquired (2). Congenital developmental deformity may be a major factor (2). The fibrous capsule is produced through the deformity of peritoneal membrane, mesentery of small intestine or greater omentum. The first three types of the abdominal cocoon in our study (Table 1) are likely caused by congenital developmental deformity, because

patients had no other medical conditions that may have caused the abdominal cocoon. The 6 male patients included adults and children, while the three female patients were all children. In addition, female genital tract inflammation and backflow of menstrual blood through the oviduct may cause chemical peritonitis and result in formation of capsules seen in patients with abdominal cocoon (1).

Abdominal cocoon often has no specific clinical manifestations. Although some authors have described a few radiological signs on plain x-ray, barium series and computerized tomogram scan, difficult to make a definite pre-operative diagnosis of this entity (6). Its main manifestations include long-term chronic incontinous manifestations of intestinal obstruction, such as attacks of colicky pain abdomen, nausea, vomiting with intestinal obstruction (7). There may be a presence of a nontender soft mass on abdominal palpation (8). An abdominal mass may or may not be present (4). CT examination shows that the ansa intestinalis are encapsulated by thickened peritoneal membrane (9), and the gas-liquid level in abdominal cavity is sometimes found.

A preoperative diagnosis may be feasible by a combination of barium follow-through and abdomen CT, few have reported CT findings of abdominal cocoon. It is therefore extremely difficult to establish the diagnosis of abdominal cocoon preoperatively (2). Like our patients, most previously reported cases were diagnosed when a laparotomy is performed for obstructive symptoms (2,10). However, if the symptomatology of intestinal obstruction is associated with a central abdominal lump which, through ultrasonography, is shown to be composed of distended bowel containing air and solid matter without fluid, one should suspect its possibility.

When there is no complete intestinal obstruction, conservative treatment can be used. However, the intestinal tract is often encapsulated and compressed. Therefore, surgical intervention is often required to restore the normal function of the small intestines (11). All our patients have tried but failed conservative therapy before the surgery. Careful dissection and excision of the thick sac with the release of the small intestine led to

complete recovery. Resection of the bowel is indicated only if it is nonviable (7). As for the patients with loose adhesion of intestinal tract and complete capsule, the fibrous membrane encapsulating small intestine should be thoroughly excised, and the adhesion should be released.

In conclusion, cocoon should be considered in patients with intestinal obstruction and an abdominal mass. There are four types of surgical findings in abdominal cocoon. The most common type is that the small intestines are fully covered by a thick white membrane, causing intestinal obstruction. Surgical excision of the membrane and the release of adhesion is the treatment of choice with a good long-term effect.

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