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**Columns: Case Report**

**Congenital peritoneal encapsulation**

Teixeira D *et al.* Rare presentation of intestinal obstruction

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**Abstract**

Introduction: Peritoneal encapsulation is a rare congenital malformation, characterized by a thin accessory peritoneal membrane which covers all or part of the small bowell, forming an accessory peritoneal sac. Most cases are asymptomatic and diagnosed incidentally during surgery and/or autopsy. Clinical presentation with intestinal obstruction is extremely rare and we report a case. Case report: ♂, 25, admitted to the emergency department with diffuse abdominal pain, crampy, with 8 h evolution, associated with nausea, vomiting and constipation in the last 48 h. The abdominal examination revealed an asymmetric and fixed distension, with hard consistency on palpation of the lower abdominal quadrants. The abdominal radiography reveals a small bowell distension and fluid levels. Submitted to laparoscopic surgery that recourse to conversion because there is a total peritoneal encapsulation of the small intestine. After opening the peritoneal sac we find a rotation of the mesentery at its root conditioning twisting of the small and consequent occlusion. Uneventful postoperative with discharged at 6th day. Conclusion: The EP is a very rare congenital anomaly characterized by abnormal bowel back into the abdominal cavity in the early stages of development. Your knowledge becomes important because although rare, should be diagnosis in patients with intestinal obstruction in the absence of other etiologic factors.

**Key words:** Peritoneal encapsulation; Intestinal obstruction; Surgery

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**Core tip:** Peritoneal encapsulation is a rare congenital malformation, characterized by a thin accessory peritoneal membrane which covers all or part of the small bowell, forming an accessory peritoneal sac. Most cases are asymptomatic and diagnosed incidentally during surgery and/or autopsy. Clinical presentation with intestinal obstruction is extremely rare and we report a case.

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**INTRODUCTION**

Peritoneal encapsulation (PE) is a rare congenital malformation, characterized by na accessory peritoneal membrane covering partially or totally the small bowell. Most cases are asymptomatic and diagnosed incidentally during surgery and/or autopsy[1-4].

PE, abdominal cocoon (AC) and the sclerosing encapsulated peritonites (SEP) are rare entities that affect the small intestine encapsulation. PE is na embryological malformation, the AC is idiopathic, while SEP is predominantly associated with peritoneal dialysis[3]. However, on current literature these entities are predominantly represented by clinical cases.

Clinical presentation with intestinal obstruction is extremely rare[1-4].

**CASE REPORT**

A 25-year-old male with past history of gastrites, that has no medication or surgical history. Admitted to the Emergency Department presenting crampy and diffuse abdominal pain, within 8 h associated with nausea, vomiting and constipation for the last 48 h.

On admission, he was hemodynamically stable, apyretic and slightly dehydrated. The abdominal examination reveals a fixed and asymmetrical distension, with superficial and deep palpation pain, especially in the lower quadrants, with hard consistency and signs of peritoneal irritation.

The analytical study showed no significant changes and the simple abdominal radiograph documented distention of small bowel loops with air-fluid levels. Submitted to laparoscopic surgery that recourse to conversion after establishing pneumoperitoneum.

When abdominal wall was opened, there was a thin membrane covering the small intestine with hypoplasia of the great omental (Figure1A).The obstruction was found to be caused by the right border of the sac posteriorly. The band which obstructed the small bowel, was traced to the superior mesenteric artery near its origin at the root of the mesentery and passed downwards as a tight band across the front of the ileum a few inches proximal to the ileocaecal valve where the ileum lay just above the sacral promontory (Figure 1B-D). At this point it trapped the ileum against the promontory causing obstruction. The band was divided to release the obstruction. The band contained a vessel which divided into two branches above the terminal ileum (Figure 1E). One passed downwards and backwards deep into the pelvis towards the upper part of the rectum. The other passed across the front of the ileum to end up in the sigmoid colon. The accessory peritoneal sac was excised.

Histologic examination of the specimen demonstrated fibrovascular tissue covered by mesothelium of peritoneal origin (Figure 1F).

Postoperative period held without complications and patient has been discharged at 6th postoperative day.

**DISCUSSION**

PE is a rare congenital malformation, characterized by an accessory peritoneal membrane covering partially or totally the small bowell.
It was first described in 1868 by Cleland, and least than 20 reports in the literature, the most diagnosed accidentally[1]. However, the actual incidence of EP becomes a challenge due to the difficulty of distinguishing between this entity and the AC/SEP.

The boundaries of the peritoneal sac are laterally the ascending and descending colon, superiorly the transverse colon and inferiorly the rear surface of the parietal peritoneum. The membrane covers the entire small bowell, since Treitz angle to the ileocolic junction. The great omental, if present, covers the bag but is separated from it in full[1-4].

Embryologically, PE appears to be explained by abnormal return the small bowell to the abdominal cavity during the 12th week of pregnancy, and the coating of the yolk sac migrates together with the intestine, rather than remaining in the umbilical pedicle[1].

Most cases are asymptomatic an diagnosed incidentally during surgery and/or autopsy. The case we described reveals clinical presentation with intestinal obstruction being extremely rare[1-4].

With respect to the physical examination, a patient with intestinal obstruction caused by peritoneal encapsulation presents two clinical signs. Asymmetrical and fixed abdominal distension, peristalsis without variation and differences in the consistency of the abdominal palpation[1,5].

The preoperative diagnosis may be impossible because of abdominal radiography is often normal or only reveal distended loops of small bowel, as presented in our case, as did the CT scan[1]. During contrast injection the abdomen, the AC is characterized in one aspect of loops serpentiniform eslender, with a set of U-shaped loops, and slowed transit. ACT scan may reveal aggregated loops of small intestine in the central region of the abdomen with a dense coat and signs of obstruction, intestinal wall thickening, ascites and fluid collections located[1,3,5]. Differential diagnoses of PE are SEP and AC.

SEP was first described in 1907[6] being an acquired entity, in which the small bowell is covered by a whitish-gray dense collagen membrane. Is usually associated with chronic peritoneal dialysis therapy with beta-blockers, recurrent peritonitis, peritoneum or venous-ventricular-peritoneal shunts, sarcoidosis, tuberculosis, Mediterranean fever, protein S deficiency after liver transplantation, Lupus Erythematosus and fibrogenic foreign material.

The AC was first described by Foo *et al*[7]in 1978. It typically occurs in adolescent females in tropical or subtropical countries. The etiology is unknown, although several the orie shave been presented, such as the retrograde menstruation with over-viral infection, peritonitis and retrograde cell-mediated immune response promoted by gynaecological infection. It is likely that the AC may be the result of sub-clinical peritonitis. The small bowell is encapsulated by a fibrocollagenous membrane similar to that in the case SEP manner.

It may be associated with other anomalies such as embryological hypoplasia of great omental, as exemplified by our case as well as malformations of the mesenteric vessels[5].

The therapeutic approach in cases of intestinal obstruction caused by the PE consists on urgent surgery with excision of the membrane and lysis of adhesions between loops. Normally, enterectomy is not necessary, except incases of non-reversible ischemia[3,4].

At present case there was at wisting at emergency root of peritoneal membrane, along the ileocolic vessels, conditioned by adherence that, after lysis, provided reversibility of the caliber of the small bowel loops, without ischemia. Unlike the cases of SEP related to peritoneal dialysis which earns the surgical mortality beyond 60%-80%, the PE has a high survival rate with low recurrence[5]. Histologically the membrane is composed of fibrovascular tissue covered by mesothelium from peritoneal origin. The postoperative course usually runs uneventfully, with no reported cases of recurrence[2-4].

The PE is an extremely rare congenital anomaly characterized by abnormal bowel back into the abdominal cavity in the early stages of development. Your knowledge becomes important because although rare, it should be diagnosis in patients with intestinal obstruction in the absence of other etiologic factors, such as the authors describe in clinical case.

**COMMENTS**

***Case characteristics***

Peritoneal encapsulation (PE) is a rare congenital malformation, characterized by an accessory peritoneal membrane covering partially or totally the small bowell.

***Clinical diagnosis***

Most cases are asymptomatic and diagnosed incidentally during surgery and/or autopsy. Asymmetrical and fixed abdominal distension, peristalsis without variation and differences in the consistency of the abdominal palpation are the main clinical signs

***Differential diagnosis***

Differential diagnoses of PE are SEP and AC.

***Laboratory diagnosis***

The preoperative diagnosis may be impossible because of abdominal radiography is often normal or only reveal distended loops of small bowel, as presented in our case, as did the CT scan.

***Pathological diagnosis***

The small bowell is encapsulated by a fibrocollagenous membrane from peritoneal origin.

***Treatment***

The therapeutic approach in cases of intestinal obstruction caused by the PE consists on urgent surgery with excision of the membrane and lysis of adhesions between loops. Normally, enterectomy is not necessary, except in cases of non-reversible ischemia.

***Related reports***

The postoperative course usually runs uneventfully, with no reported cases of recurrence.

***Peer-review***

This paper is reporting an interesting congenital anomaly.

**REFERENCES**

1 **Naraynsingh V**, Maharaj D, Singh M, Ramdass MJ. Peritoneal encapsulation: a preoperative diagnosis is possible. *Postgrad Med J* 2001; **77**: 725-726 [PMID: 11677284]

2 **Sherigar JM**, McFall B, Wali J. Peritoneal encapsulation: presenting as small bowel obstruction in an elderly woman. *Ulster Med J* 2007; **76**: 42-44 [PMID: 17288307]

3 **Chew MH**, Sophian Hadi I, Chan G, Ong HS, Wong WK. A problem encapsulated: the rare peritoneal encapsulation syndrome. *Singapore Med J* 2006; **47**: 808-810 [PMID: 16924364]

4 **Al-Taan OS**, Evans MD, Shami JA. An asymptomatic case of peritoneal encapsulation: case report and review of the literature. *Cases J* 2010; **3**: 13 [PMID: 20150981]

5 **Rajagopal AS**, Rajagopal R. Conundrum of the cocoon: report of a case and review of the literature. *Dis Colon Rectum* 2003; **46**: 1141-1143 [PMID: 12907915]

6 **Naidoo K**, Mewa Kinoo S, Singh B. Small Bowel Injury in Peritoneal Encapsulation following Penetrating Abdominal Trauma. *Case Rep Surg* 2013; **2013**: 379464 [PMID: 23533912]

7 **Foo KT**, Ng KC, Rauff A, Foong WC, Sinniah R. Unusual small intestinal obstruction in adolescent girls: the abdominal cocoon. *Br J Surg* 1978; **65**: 427-430 [PMID: 656764]

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**Figure 1 Intraoperative aspect.** Finding total peritoneal encapsulation of the small bowell and great omental hypoplasia (A). Opening the peritoneal sac and excision of almost all of the anchor points up (B-D). The obstruction was found to becaused by the right border of the sac posteriorly.At this point it trapped the ileumagainst the promontory causing obstruction. Theband was divided to release the obstruction.The band contained a vessel which divided intotwo branches above the terminal ileum (E). Histologic examination of the specimen demonstrated fibrovascular tissue covered by mesothelium of peritoneal origin (F).