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Case Report
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A rare cause of small bowel obstruction in adults: persistent omphalomesenteric duct

Erişkinlerde ince bağırsak tıkanıklığının nadir bir nedeni: Persistan omfalomezenterik kanal

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Previous abdominal surgery is the most common cause of mechanical small bowel obstruction. However, in patients with no abdominal surgery history, it is difficult to diagnose and treat. Omphalomesenteric duct is a primitive embryonic structure of fetal development between the midgut and yolk sac. In some cases, it may persist and result in several complications, particularly in childhood. In adults, intestinal obstruction due to persistent omphalomesenteric duct is an extremely rare circumstance. We report a 42-year-old male patient presenting with omphalomesenteric duct remnant causing small bowel obstruction.

Key Words: Intestinal obstruction; persistent omphalomesenteric duct; small bowel.

Mekanik ince bağırsak tıkanıklığının en sık nedeni önceden yapılmış karın ameliyatlarıdır. Buna karşın, karın ameliyatı hikayesi olmayan hastalarda tanı koyulması ve tedavi zordur. Omfalomezenterik kanal fetal gelişim sırasında midgut ile yolk kesesi arasında yer alan embriyonik bir yapıdır. Bazı kişilerde, varlığı sebat eder ve özellikle çocukluk yaşlarında bazı komplikasyonlara neden olur. Erişkinlerde ise omfalomesenterik kanalın sebat etmesine bağlı gelişen bağırsak tıkanıklığı oldukça nadir rastlanılan bir durumdur. Bu yazıda, omfalomezenterik kanal açıklığının devam etmesine bağlı bağırsak tıkanıklığı gelişmiş 42 yaşındaki erkek hasta sunuldu.

Anahtar Sözcükler: Bağırsak tıkanıklığı; persistan omfalomezenterik kanal; ince bağırsak.

Omphalomesenteric duct (OMD) is an embryonic structure providing communication from the yolk sac to the midgut during fetal development.[1] Normally, it obliterates spontaneously and separates from the intestine between approximately the 5th and 9th weeks of gestation. Complete or partial failure of such closure may result in various lesions. While Meckel's diverticulum is the most common of these residual structures (2% of the population), presence of only a fibrous cord between the small intestine and the surface of the umbilicus is the rare entity. While they may be asymptomatic, some symptoms can occur because of OMD, and most of these symptoms usually appear before the age of four years.[2] Intestinal obstruction in adults is an extremely rare clinical presentation.

In this report, we present a case of persistent OMD causing intestinal obstruction in an adult patient.

CASE REPORT

A 42-year-old man presented to our department with intermittent abdominal pain, nausea, vomiting, and abdominal distension for 24 hours. He defined the absence of gas and feces for 48 hours. Physical examination demonstrated a distended abdomen and mild tenderness. Hyperactive bowel sounds were heard on auscultation. The blood test revealed leukocyte level of 12000/mm^3 and no other laboratory abnormality. Plain abdominal film showed dilated small bowel loops and air-fluid levels (Fig. 1). Ultrasound reported dilated small bowel loops filled with fluid. He had no medical history, no hernia and no history of previous abdominal operations. After conservative follow-up with restriction of oral intake, nasogastric suction and fluid resuscitation, there was no resolution of the obstruction. Therefore, the operative intervention was

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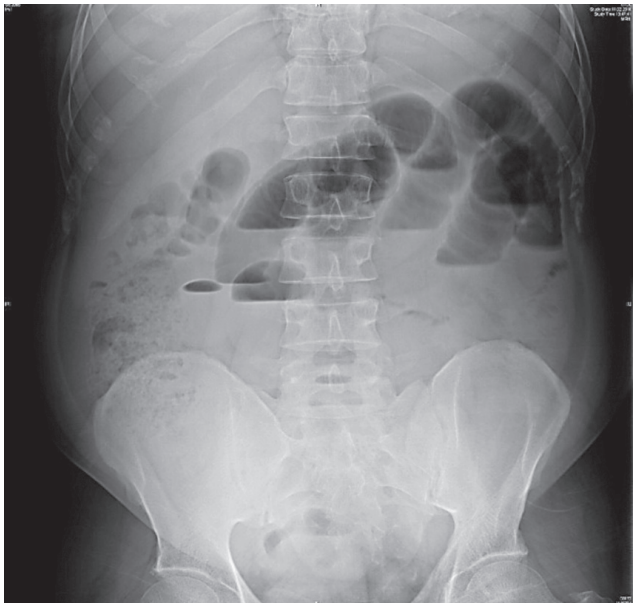

Fig. 1. Plain film shows multiple loops of dilated small bowel and air-fluid levels.

decided and midline laparotomy was performed. During the exploration, a fibrotic band was identified between the antimesenteric border of the terminal ileum and the posterior wall of the umbilicus, causing small bowel volvulus (Fig. 2a). The band was resected without any bowel resection (Fig. 2b). The postoperative period was uneventful and the patient was discharged on the 6th day with full recovery. The pathologic evaluation was reported as fibrous tissue.

DISCUSSION

Mechanical small bowel obstruction is the most frequently encountered surgical problem of the small intestine. Intraabdominal adhesions related to previous abdominal surgery account for up to 75% of the cases of small bowel obstruction. Less prevalent etiologies include hernias, neoplasms, and inflammatory processes such as Crohn's disease or tuberculosis.[3,4] Intestinal obstruction due to persistent OMD, especially in adult patients, is extremely rare, with very few cases reported in the literature.[5-8]

Immediate diagnosis and differential diagnosis of the condition are important for deciding the treatment to be applied. The appropriate treatment and timing of the surgery remain controversial. However, the initial therapy of the bowel obstruction is standard and independent of the etiology. Fluid and electrolyte replacement, restriction of oral intake, and nasogastric suction are the important aspects of supportive care of patients with intestinal obstruction.[4] Broad-spectrum antibiotics may be administered in some because of concerns that bacterial translocation may occur or as a prophylaxis for possible resection. However, there are no controlled data to support this antibiotherapy. We performed the initial therapy for small bowel obstruction and antibiotic was administered only as prophylactic before the surgery.

Non-operative treatments are effective and safe methods, particularly for adhesive small bowel obstructions.[4,6] However, if there is no history of an abdominal operation and no resolution of the obstruction findings, greater caution is required. Immediate diagnosis is especially important for the dangerous form of the obstruction, closed loop type obstruction, in which a segment of intestine obstructed both distally and proximally leads to rapid rise in the luminal pressure, and progresses to strangulation.[9,10] Small bowel volvulus, such as in the presented case, is one of the causes of closed loop obstruction; therefore, early surgery prevented the strangulation of the intestinal loops.

Omphalomesenteric duct or vitelline duct is the connection between the yolk sac and the primitive midgut. Under normal circumstances, the duct obliterates to a thin fibrous band and is absorbed spontaneously during the 5th to 9th weeks of gestation. The intestine resides free within the peritoneal cavity. Persistence of the duct may result in several anomalies of the OMD including a blind OMD (Meckel's diver-

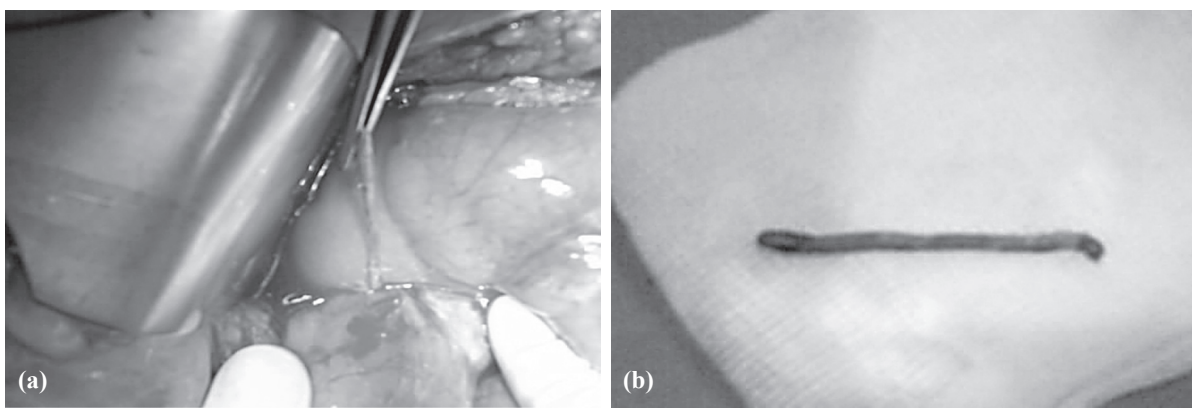

Fig. 2. **(a)** Intraoperative view of the OMD between the intestinal loops and the abdomen. **(b)** The view of the OMD after resection.

ticulum), omphalomesenteric cyst (a central cystic dilatation in which the duct is closed at both ends but patent in its center), an umbilical-intestinal fistula resulting from the duct remaining patent throughout its length, umbilical polyp resulting from the persistence of the distal end of the OMD, and complete obliteration of the duct, resulting in a fibrous cord extending from the ileum to the umbilicus.[11] The most common presentation of a persistent duct (67%) is the Meckel's diverticulum, found in approximately 2% of the population.[12] Other OMD remnants occur infrequently. Although they may be asymptomatic, common symptoms of OMD malformations include abdominal pain, intestinal bleeding, intestinal obstruction, infection of the cyst, umbilical drainage, and umbilical hernia, and all of these symptoms appear to be age-dependent, usually before the age of four years. Adult cases of OMD remnant other than Meckel's diverticulum are extremely rare. Though surgical intervention is necessary for a symptom-producing OMD remnant, it is not required for asymptomatic subjects. Intestinal obstruction, one of the complications of OMD, occurs owing to many mechanisms including intussusception of the diverticulum and volvulus or internal herniation from a fibrous connection, as in our patient.

It is difficult to understand the etiology of the obstruction without diagnostic laparotomy or laparoscopy. Abdominal plain radiographs and ultrasonography are non-specific for small bowel obstruction. Abdominal computerized tomography may be useful to show the band originating from the umbilicus and continuing between the small bowel loops, as reported before.[6] In our case, we did not use computerized tomography, and both the plain radiographs and the abdominal ultrasonography were non-diagnostic. However, diagnosis was possible during laparotomy. The surgical excision of the fibrotic band is sufficient therapy. If intestinal strangulation is present, intestinal resection should be considered. Other types of symptomatic persistent OMD require different approaches, such as open surgical excision or laparoscopic excision.[8,11,12]

In conclusion, small bowel volvulus due to persistent OMD is a very rare cause of intestinal obstruction in adults. However, in patients without any previous abdominal surgery, a correct diagnosis becomes more important. The excision of the OMD remnant is an easy, safe and definitive therapy.

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