



Fibrous Omental-Intestinal Banding Causing Acute Small-Bowel Obstruction

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Abstract

Acute abdominal syndrome is a serious health problem that affects people of all ages and genders. The causes are varied, but the most common causes of acute abdomen are acute appendicitis, cholecystitis, pancreatitis and diverticulitis. Acute peritonitis is a cause of acute abdomen and can result from rupture of a hollow viscus or as a complication of inflammatory bowel disease or malignancy, tumor, inflammation, vascular occlusion or obstruction. Intra-abdominal adhesions can also cause such a problem and it has been explained that an omental band is thought to be the cause in about 3% of cases. In this case, an 80-year-old woman with no history of laparotomy or inflammatory bowel disease was found to have an acute abdomen. Ileus was diagnosed preoperatively, but the cause remained unknown until surgery. She had an omental - mesentery of the small bowel - which was released during this operation, which is a rare case and should be kept in mind in the presence of bowel obstruction without any explanation in the preoperative diagnosis.

Keywords: Acute abdomen; Intestinal band; Bowel obstruction

Case Presentation

An 80-year-old woman presented to the emergency department of Bartın State Hospital, Turkey, complaining of acute epigastric and lower abdominal pain and vomiting for several days. The pain was located in the upper abdominal quadrants, especially in the epigastric region, and was not continuous. The pain was sometimes relieved by the analgesics. Nausea was present and vomiting also occurred once a day. Her body temperature was within normal limits and she did not have any fever prior to admission, although the patient could have flatulence, no defecation had been observed in the last two days. On physical examination we observed; hyperactive bowel movements, defense and rebound in bilateral upper sites, predominantly in the epigastric site. Her initial blood counts were as follows: White blood cells 12.2.9 (10⁹/L, neutrophils 8.5 (10⁹)/L and C-reactive protein 24 mg/L. Her hemoglobin was 13.1 g/dL and her hematocrit was 36.4%. The patient's arterial blood gas showed a pH of 7.41, pCO₂ of 32 mmHg, pO₂ of 98 mmHg and HCO₃ of 18.8 mEq/L. On admission, the patient's vital signs were tachycardic, 123 BPM, and hypertensive, 142/106 mmHg. She was admitted for fluid resuscitation, symptomatic relief, monitoring and imaging, and other systems were unremarkable. The test for COVID-19 was negative.

A beak sign and a sharp transition zone are identifiable in the region marked by arrows on the axial and sagittal contrast-enhanced CT images. In the proximal section, a dilated small bowel antrum is visible with air-fluid levels specified by arrowheads. The axial CT image emphasizes the marked contamination of the mesenteric oedema around the expanded antrum. The initial diagnosis based on the beak finding was a bridging ileus or internal hernia. The abdominal radiograph displayed dilated bowel segments and small bowel with air-fluid levels.

A mild urinary infection was found through urine analysis. Signs of gas and low fluid levels were detected through abdominal CT scan and abdominal ultrasound. The ultrasound also revealed the presence of fluid in the abdomen. With the patient's clinical status, the administration of broad-spectrum antibiotics and Ryle's tube aspiration were carried out. However, no improvement was observed after 24 h, and a surgical operation was necessary due to the diagnosis of acute abdomen caused by ileus. A midline incision was made both above and below the umbilicus. Upon entering the abdomen, 200 ml of reactive fluid was observed and later aspirated. We further investigated the region to establish the origin of the responsive fluid. The appendix appeared to be normal. Throughout our analysis, we detected an omental band located in the mesentery of the small intestine,

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Received Date: 17 Oct 2023

Accepted Date: 30 Oct 2023

Published Date: 03 Nov 2023

Citation:

Doğan Y, Çırak S. Fibrous Omental-Intestinal Banding Causing Acute Small-Bowel Obstruction. *Clin Case Rep Int.* 2023; 7: 1624.

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Figure 1: The abdominal x-ray showed some dilated bowel segments and air-fluid.

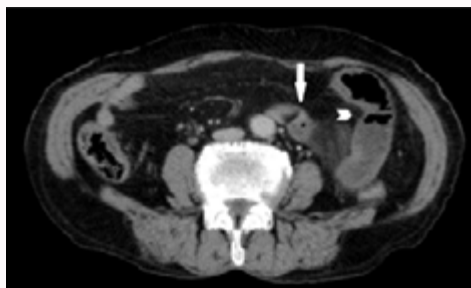


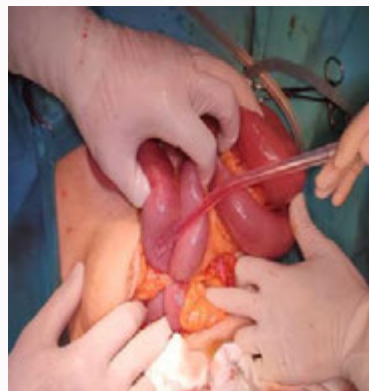
Figure 2: A beak sign and a sharp transition zone are identifiable in the region marked by arrows on the axial



Figure 3: Sagittal contrast-enhanced CT images. In the proximal section, a dilated small bowel antrum is visible with air-fluid levels specified by arrowheads.

resulting in partial constriction of the jejunal segment. During the examination, an omental band was discovered in the small bowel mesentery which caused a partial narrowing of the jejunal segment. The logical progression of information was maintained throughout with causal connections made between statements. This pathological condition was the underlying cause of the patient's symptoms and was confirmed by visual evidence (Picture 1, 2). The proximal region of the small intestine was found to be dilated and exhibiting edema.

The anomalous band extended from the omentum to the mesentery of the small intestine, with no rotating anomalies of any bowels noted. The band was released, the proximal bowel decompressed, and an abdominal lavage and pelvic drain insertion were performed. The incision was closed anatomically. On the first postoperative



Picture 1: Pathological condition.



Picture 2: Pathological condition.

day, gaseous discharge was observed, along with approximately 150 cc of serous discharge from the drain. The nasogastric and passer drains were removed, and the patient was mobilized. A fluid diet was commenced on the first day following surgery, followed by a regular diet on the second day. Bowel movements were observed on the third day after the operation. The patient was discharged on the fourth day post-surgery and experienced no further complications during the follow-up period. We have not encountered any cases of an elderly patient showing sub-ileus symptoms without previous abdominal surgeries or other risk factors, with the exception of an omental-small intestine band. Nonetheless, we are unable to determine the cause of this band's development.

Discussion

A distinction should be drawn between congenital and acquired adhesions. Congenital adhesions may occur during organogenesis or as a result of abnormal embryonic development of the peritoneal cavity. These adhesions may be asymptomatic and only incidentally diagnosed [1]. Acquired adhesions may develop as a consequence of both postoperative and non-operative inflammatory processes. Non-surgical causes of adhesions include several inflammatory sources, including pelvic inflammatory disease, peritonitis, cholecystitis, and diverticulitis. Endometriosis, infections, and complications arising from intrauterine contraceptives could also trigger an inflammatory response leading to pelvic adhesions. Peritoneal adhesions can develop due to various factors such as infection, ischemia, and foreign body response. This is a major cause of morbidity, with 66% to 79% of patients experiencing adhesions after undergoing such surgeries [2,3]. Following abdominal surgery, the risk associated with

adhesions is 3.8% for morbidity, with an average readmission rate for Small-Bowel Obstruction (SBO); 56% of cases can be attributed to adhesions. Recently, a study found that patients who had undergone at minimum one previous abdominal surgery developed between one and over ten adhesions [4]. A differentiation ought to be made between congenital and acquired adhesions. Congenital adhesions could transpire during organogenesis or as a result of irregular embryonic development of the peritoneal cavity. These adhesions could remain asymptomatic and diagnosed only incidentally [5]. Acquired adhesions might arise due to both postoperative and non-operative inflammatory processes. Non-surgical causes of adhesions comprise various inflammatory sources, such as pelvic inflammatory disease, peritonitis, cholecystitis, and diverticulitis. Additionally, inflammatory responses provoked by endometriosis, infections, and complications arising from intrauterine contraceptives may lead to pelvic adhesions. Peritoneal adhesions can develop due to a multitude of factors, including infection, ischemia, and foreign body response. Technical term abbreviations are explained throughout the text to ensure clarity. Common formatting features, consistent citation, and style guides were conscientiously observed to maintain academic writing quality. Adhesions are a significant cause of morbidity, with up to 79% of patients experiencing them after undergoing relevant surgeries [2]. The risk associated with adhesions after abdominal surgery is 3.8% for morbidity, with small-bowel obstruction causing an average readmission rate; approximately 56% of such cases can be attributed to adhesions. A recent study has shown that patients who had undergone at least one previous abdominal surgery had developed over ten adhesions. These postsurgical adhesions significantly impact quality of life, resulting in small bowel obstruction, difficult re-operative surgery, chronic abdominal and pelvic pain, and female infertility. Although intra-abdominal adhesions are observed after surgery on the omentum, small bowel, abdominal wall, and female reproductive organs, adhesions that lead to obstruction in the small intestine, particularly the ileum, are of highest concern [6,7]. Miller and Winfield [8] emphasize that adhesions can result in bowel obstruction. It is important to note that this is a significant postoperative complication that warrants further investigation. There were 32 postoperative cases of ileal obstruction, 4 cases in the jejunum, 6 cases in a small unidentified area of the jejunum, and one case in the transverse colon caused by adhesions [9]. A 47-year-old woman suffered from SBO due to greater omental banding, caused by chronic constipation. Histological examination after biopsy revealed fat necrosis in the omental band [10]. Only one instance was found in the literature of a bifid omentum experiencing torsion, causing severe abdominal discomfort [11]. Sinwar reported a case of a 42-year-old man with SBO secondary to greater omental encasement with no history of abdominal surgery. Biopsy eventually revealed tubercular granuloma on histological examination causing chronic inflammation [12]. The second case was a 31-year-old man with SBO secondary to lesser omental encasement and only mild inflammation of the omentum on histological examination, also without a history of abdominal surgery [8]. Habib et al. explained 16 adults' congenital omental bands [2], formed by abnormal adhesion of the peritoneal folds during embryogenesis [13]. Following the analysis of adhesions, it was ascertained that 48% of the adhesions were single-band, 40% consisted of multiple bands or a single band, 2% were omental bands, and 10% were regional adhesions. Intra-abdominal adhesions are a common occurrence in aid surgery [14] and can lead to several clinical complications, such as bowel obstruction, atypical abdominal pain, and bowel dysfunction. While there exist

several possible reasons for SBO, determining the underlying etiology through clinical presentation is seldom possible. Nevertheless, a depicted case established the significant contribution of CT imaging in early management by facilitating a preoperative diagnosis of an internal hernia [15]. Computed Tomography (CT) has shown to be advantageous in identifying the location, extent, and etiology of obstructions [16]. Identification of adhesions as the cause of SBO is still determined by the sudden shift in bowel caliber, with no other evidence of obstruction causes. It remains a diagnosis of exclusion [17]. Through our literature review, we have noted a rare occurrence of acute abdomen in elderly patients caused by an omental band-mesentery in the small intestine, with no prior abdominal operations or sub-ileus predispositions. The formation of the omental band is not fully understood. This case is rarely reported, and only a small number of previous cases are documented in the literature. It is recommended that intensive diagnostic investigations and prompt surgical intervention be considered for adult patients displaying signs and symptoms of acute small bowel obstructions to prevent potential complications associated with this condition.

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