Case Report

Adhesional Small-bowel Obstruction in the Absence of Previous Abdominal Operations

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SUMMARY

Most of the small-bowel obstructions (SBOs) are the result of adhesions caused by a previous abdominal operation. The commonest previous surgical procedures were colorectal surgery, followed by gynecological surgery, hernia repair, appendicectomy, and cholecystectomy. Etiologies of SBO other than adhesion include organic or abnormal lesions, such as neoplasm, hernias, inflammatory bowel disease, volvulus, intussusception, radiation, intestinal tuberculosis, gallbladder stone, superior mesenteric artery syndrome, and so forth. Under some rare circumstances, SBO may occur without the history of an operation and without radiologic evidence of organic lesions. In such a condition, an accurate diagnosis may be difficult to make, and a timely surgical intervention may be delayed with a result of morbidity or mortality of the patient.

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1. Introduction

Most of the small-bowel obstructions (SBOs) are caused by adhesions from a previous abdominal operation 1–7 or a variety of anatomic abnormalities, such as incarcerated hernias, intussusception, or volvulus. 1,2,4,5,7,8 But a minority of SBO has no evidence of previous abdominal operations 1,4,5,7 and no recognized organic lesions by radiologic study or clinical examinations. In these rare situations, especially those found in elderly patients with multiple comorbidities and long-term bedridden states, patients were treated as having paralytic ileus rather than adhesion obstructions, and a timely surgical intervention may be delayed with a consequence of morbidity or mortality. 1,8 Here, we report a case of SBO in the absence of a previous abdominal surgery and describe the clinical presentation, operative findings, management, and hospital course.

2. Case Report

A 76-year-old man had a medical history of hypertension, chronic obstructive pulmonary disease, brain atrophy, and lumbar spine compression fracture, which caused him to be bedridden for more than 5 years. The lumbar spine compression fracture was managed in a conservative manner without any surgical intervention. The patient presented with abdominal fullness, easy choking, and dyspnea for a few days and was admitted to the intensive care unit with mechanical ventilator support under the diagnosis of pneumonia and respiratory failure. On the fifth day of admission, we noticed that the patient had progressive abdominal distention with signs of intestinal obstruction, such as nausea, vomiting, and no stool passage for 3 days. On physical examination at that time, the heart rate was 98 beats/min; blood pressure was 130/69 mmHg; respiration was 26 breaths/min; and body temperature was 38.7 °C. Inspection of the abdomen revealed a symmetric and distended abdomen, with no scar and localized bulges in the abdominal wall. In auscultation, we noticed decreased bowel sounds ranging from 3 to 5 per minute. Occasionally, the bowel sounds were faint but still audible, with no high-pitched tinkling sounds or bruit. The abdomen was generalized with a tympanic percussion note, and there was no localized tenderness or muscular resistance. Laboratory data revealed a leukocyte count of 11,600 cells/mm 3 with 78% polymorphonuclear leukocytes. The abdominal plain film showed enlarged small-bowel loops in the middle abdomen, with no air-fluid level or free air in the subdiaphragm area. The abdominal computed tomography (CT) showed marked segmental dilatation of small-bowel loops with thin and enhancing wall from proximal jejunum to proximal ileum. The distal portion of the ileal loops is collapsed, so is

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the colon to the rectosigmoid junction. Two foci of abrupt change of the jejunal caliber were found (Fig. 1). No evidence of neoplasm, hernias, volvulus, and intussusception was found by CT. In view of the patient's long-term bedridden state and his condition of brain atrophy, pneumonia under ventilation support, along with no history of previous abdominal surgery, paralytic ileus was the more favored impression. At first, we adopted the conservative management with the pharmacotherapy of metoclopramide, mosapride citrate, and neostigmine. However, abdominal distention did not improve. Unfortunately, there was a sudden onset of hypotension, and tachycardia developed on the 10th day of admission. At that time, the heart rate was 128 beats/min; blood pressure was 62/34 mmHg; respiration was 36 breaths/min; and body temperature was 38.2°C. On abdominal examination, the abdominal contour appeared distended, bowel sounds were barely audible, and abdomen was tympanic on general percussion. Signs of peritoneal inflammation such as rebound tenderness and involuntary rigidity were noticed. Laboratory data revealed a leukocyte count of 10,100 cells/mm with 93% polymorphonuclear leukocytes. The serum C-reactive protein level was 10.39 mg/dL. The abdominal X-ray showed increased radiopacity with decreased bowel gas in the lower abdomen. The abdominal CT scan revealed a segmental dilatation of jejunal loops and an accumulation of fluid in the peritoneal space. A segment of jejunum with abrupt narrowing of lumen was noted (Fig. 2), raising the concern of possible SBO. Because the patient was in persistent shock status, emergent surgical intervention was conducted. Three adhesion bands at the level of the jejunum and strangulated small bowel with perforation were found (Fig. 3). The adhesive strangulated intestinal loop was released after lysis of the band. The surgeon resected the ischemic bowel 60 cm away from the ligament of Treitz down to 100 cm to ileocecal valve, including perforated part of small bowel, and reanastomosis was done. The patient was discharged home under a stable condition 53 days after the operation.

3. Discussion

Intra-abdominal adhesion is thought to be the most common cause and responsible for 49–80% of SBO.1–6 In patients with adhesional SBOs, only 3–9% had no previous abdominal operations.1,2 In our patient, the operation finding revealed three adhesion bands in the jejunum. The patient had no history of any previous abdominal surgery, with no operative scar in the abdomen found by physical examination. Tracing back his medical history, there were no intra-abdominal infections, such as appendicitis, diverticulitis, or inflammatory bowel disease, either. The precise mechanism for the formation of adhesion bands in this case is uncertain.

The accurate diagnosis and timely management are crucial to the outcome of the patients, especially proper timing for emergent surgical intervention for the impending or actual ischemia of the small bowel. On physical examination, abdominal distention is often found, but the extent and location may be variable and nonspecific. The abdominal tenderness, muscle rigidity, and rebound tenderness may indicate peritonitis. Although the serum laboratory tests are also nonspecific, the high (greater than 15,000 white cells/mm) or very low (less than 4,000 white cells/mm) white count may raise the suspicion of bowel ischemia.7 A plain film of the abdomen may have the classic findings of distended small bowel (>3 cm in diameter), air-fluid levels, and paucity of

![Fig. 2](image2.png)

Fig. 2. The second abdominal computed tomography (CT) revealed dilatation of jejunal loops and an accumulation of fluid in the peritoneal space. A segment of jejunum with abrupt narrowing of lumen was noted (arrow). The obstruction level is identical with the operative finding. However, there was no evidence of intestinal strangulation in both the first and the second CT scan.

![Fig. 3](image3.png)

Fig. 3. Three adhesion bands at the level of the jejunum and strangulated small bowel with perforation were found. This picture showed two of the adhesion bands (arrow) found during the operation.
colonic gas.\textsuperscript{4} The findings that are predictive of high-grade SBO, which is more susceptible to strangulation than low-grade SBO, are the presence of more than two air-fluid levels, air-fluid levels wider than 2.5 cm, and air-fluid levels differing more than 2 cm in height from one another within the same small-bowel loop.\textsuperscript{8} However, in conditions such as closed-loop obstruction, proximal obstruction, or fluid-filled obstructed small-bowel loops, the abdominal plain film may reveal a gasless abdomen, which makes the radiologic diagnosis difficult.\textsuperscript{4} The criterion for using CT to diagnose SBO is the presence of dilated proximal small-bowel loops and collapsed distal bowel. If a transition zone of caliber change between the dilated proximal and collapsed distal bowel is identified, the diagnosis is more certain.\textsuperscript{3,10} CT is also the preferred model for investigating an underlying cause, such as mesenteric artery occlusion, the location of the transition point, and the specific etiology of obstruction, such as hernia, intussusception, volvulus, or mass lesions.\textsuperscript{4,5} But there is also a limitation to the detection of tiny adhesion bands.

The only definite method is exploratory laparotomy or diagnostic laparoscopy in certain circumstances.\textsuperscript{7} Because exploratory laparotomy increases the incidence of ventral hernia, postoperative ileus, postoperative pain, and length of hospital stay, the laparoscopic method is preferred nowadays.\textsuperscript{3} The feasibility of diagnostic laparoscopy for SBO is high (60–100\%).\textsuperscript{11} However, the timing to transfer from a conservative management to a surgical intervention is difficult. Repeated clinical examinations by an experienced hand are still most valuable.\textsuperscript{7}

It is reasonable for the initial management of SBO without any evidence of adhesion to adopt conservative manners, such as electrolyte replacement, intravenous fluid resuscitation, nasogastric tube decompression, bowel rest, and antibiotics treatment.\textsuperscript{2,4,7,12} There are conditions in which surgical intervention is recommended, such as complete SBO, closed-loop obstruction, volvulus, obstructing neoplasms, evidence of intestinal ischemia, incarcerated external hernia, or failed conservative management of partial SBO bowel obstruction.\textsuperscript{4} According to Miller et al.,\textsuperscript{9} nonoperative management for adhesive SBO especially after one or more operation in stable patients resulted in a good prognosis and a shorter hospital stay. To find out whether diagnostic uncertainty caused diagnostic delay for patients with SBO but with no previous operative history and no definite organic lesions, Butt et al.\textsuperscript{1} had compared patients who had one or more previous abdominal operations with those without a history of abdominal operation, and there was no difference of the morbidity, mortality, and length of hospital stay between the two groups. All the patients with unexplained adhesional SBO (34 of total 1,036 patients) in this study had received operation in the end. The authors suggested that routine exploration should be conducted in all patients with unexplained adhesional SBO because the cause of SBO in this population is almost impossible to determine preoperatively.\textsuperscript{1} On the other hand, most patients with SBO because of postoperative adhesions could tolerate supportive treatment and recover well within 1 week on average, although some patients require more than 10 days of observation.\textsuperscript{13}

When patients had suspected SBO but no previous abdominal surgery, it is difficult to tell who need only conservative management and who need surgical interventions, even with the help of modern facilities of CT, unless it had revealed a definite cause of obstruction. In these situations, frequent physical examination of the abdomen and attention to signs of acute abdomen are most valuable.

In elderly patients with multiple comorbidities and a long history of bedridden state, paralytic ileus is often thought to be the cause of abdominal distention and indigestion. If such patients have a previous abdominal surgical history, the cause may lie in the postoperative adhesion. Most conditions in these two cases can be managed conservatively with optimal results. However, in elderly bedridden patients with no previous abdominal operations and other causes of SBO as in our case, adhesional SBO would develop leading to bowel ischemia, and timely surgical intervention is needed.

References