Clinical Case Report

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Obstructive ileus caused by metal staples 6 years after the initial surgery

A case report

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Abstract

Rationale: Complete small bowel obstruction (SBO) is a common surgical emergency often resulting from adhesive bands installed after a surgical procedure. However, SBO caused by surgical staples used in a previous operation is unusual. Herein, we report a rare case of adhesive ileus induced by surgical staples.

Patient's concerns: A 58-year-old woman visited our Emergency Department with right lower quadrant (RLQ) pain and vomiting. The patient had undergone laparoscopic total hysterectomy with the Endo GIA stapler for uterine myoma 6 years prior.

Diagnoses: Computed tomography (CT) revealed a closed-loop obstruction with volvulus involving the distal ileum.

Interventions: After suspected failure of conservative therapy with fluid resuscitation and Levin tube decompression, emergency laparoscopic surgery was performed. A fibrous band around the surgical staples considered to have been used in a previous operation was observed which extended to the greater omentum, through which a segment of the bowel formed a closed-loop obstruction around the right ovary.

Outcomes: The patient's symptoms resolved and a follow-up on post-operative day 14 showed no symptoms.

Lessons: Surgeons using surgical staples should be aware that adhesion may occur when the staples are exposed to the abdominal cavity, which can lead to the risk of SBO several years after surgery. Thus, staples should not be exposed to the abdominal cavity, or anti-adherent substances should be used to minimize the possibility of such complications.

Abbreviations: CT = computed tomography, IV = intravenous, RLQ = right lower quadrant, SBO = small bowel obstruction.

Keywords: ileus, intestinal obstruction, laparoscopy, small intestine

1. Introduction

Small bowel obstruction (SBO) is a common clinical entity in emergency medicine. Approximately 65% to 75% of SBOs are due to peritoneal adhesions, aberrant fibrous bands within the abdominal cavity that constrict the intestine and disrupt its luminal flow.[1,2] There are a number of causes of SBO, with adhesion formation being the most common.[3] In this report, we describe a rare case of SBO caused by the remnant of a metal staple forming an adhesive band around the terminal ileum. To our knowledge, this is the first documented case of SBO caused by chronic adhesion of a metal staple. We obtained written informed consent from the patient to report this case. This study was approved by the Seoul ST. Mary's Hospital Research Ethics Board and the informed consent was obtained from the patient.

2. Case presentation

A 58-year-old, previously healthy woman presented to the Emergency Department with complaints of right lower quadrant (RLQ) pain and vomiting 1 day in duration. The patient underwent laparoscopic total hysterectomy with the Endo GIA stapler due to uterine myoma 6 years prior, in the United States. The patient reported no recent abdominal injury or history of acute or chronic intra-abdominal inflammation, and her medical history did not indicate a major disease.

The patient's vital signs were stable upon presentation, including a blood pressure of 117/46 mmHg, heart rate of 85 beats per minute, oxygen saturation of 95%, respiratory rate of 20 breaths per minute, and temperature of 37.3 °C. Her physical examination was notable for active bowel sounds and tenderness in the RLQ without abdominal guarding, distention, or palpable mass. During the evaluation, the patient experienced paroxysmal worsening of abdominal pain that caused occasional retching. The laboratory testing showed a normal white blood count (8.93×10^9/liter, normal $4.0–10.0 \times 10^9$/liter), but elevated neutrophil fraction (84.2%, normal 40%–80%). Abdominopelvic computed tomography (CT) with intravenous (IV) contrast revealed a suspicious closed-loop obstruction with volvulus involving the distal ileum (Fig. 1).

The patient received fluid resuscitation and, after admission to the hospital, developed subsequent peritoneal signs. Due to

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Figure 1. CT scan of the abdomen and pelvis (axial and coronal views) demonstrating the dilated small bowel loops (thin arrow) with the volvulus and a surgical clip (thin arrow) in the lower abdomen. CT = Computed tomography.

concern of strangulation, we informed the patient and her family members of the situation, and a written informed consent to treatment was provided, and then the patient underwent laparoscopic exploration on the same day. She was found to have a fibrous band around the surgical staples estimated to have been used in a previous operation, extending to the greater omentum, through which a segment of the bowel formed a closed-loop obstruction around the right ovary. The adhesive band was loose and thus was easily detached from the ovary. After the entire length of the intestine was inspected, and its viability was confirmed, adhesiolysis was performed on the omental and right ovary site adhesion. The adhesive band was extremely loose and easily detached from the ovary. After detachment, a surgical clip was still left to hold a portion of the small intestine (Fig. 2). The twisted small bowel (Fig. 3) was loosened and naturally released. Brown fluid in the pelvic cavity was irrigated, and the metal clip was removed.

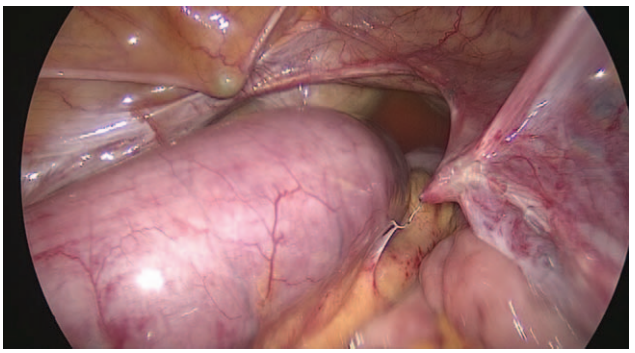

Figure 2. Intraoperative finding showing the greater omentum to the jejunum, through which a segment of bowel formed a closed-loop obstruction due to adhesion of a surgical clip.

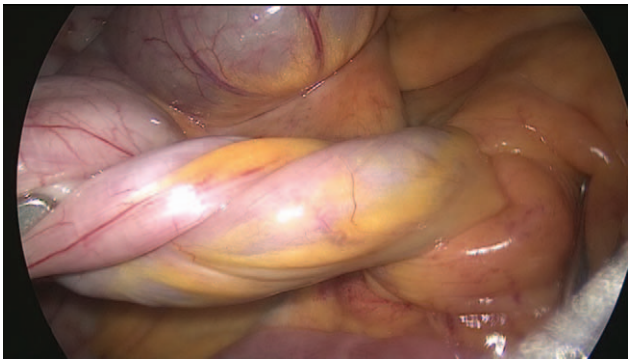

Figure 3. Closed loop obstruction with volvulus involving the distal ileum.

The patient was allowed to sip clear fluids from postoperative day 1, with oral intake increased as tolerated. She then resumed a normal diet and was subsequently discharged. At follow-up on postoperative day 14, the patient was asymptomatic and had a normal physical examination.

3. Discussion

In the United States, fewer than 1% of emergency department patients are diagnosed with SBO each year [4]. However, the disease accounts for 15% of all surgical inpatients and costs more than $1 billion per year [5]. Moreover, patients with SBO have disproportionately higher morbidity and mortality rates than the general population, and delayed diagnosis is associated with a greater risk of bowel resection [6–8].

Currently, many laparoscopic procedures incorporate the use of linear cutter staplers, such as laparoscopic appendectomy, laparoscopic gastrointestinal surgery, and laparoscopic gynecological surgery. Several studies have reported acute SBO caused by loose staples from linear cutters after appendectomy [9–11]. In a previous study, acute SBO 4 weeks postoperatively was reportedly caused by a staple from linear cutters after laparoscopic-assisted vaginal hysterectomy [12]. A chronic adhesive band induced by surgical staples several years after surgery, as in our patient case, has not been reported to date.

In our case, during laparoscopic exploration, a single fibrous metal staple band forming a closed-loop SBO that threatened bowel strangulation was observed. In addition, many free metal staples were present in her pelvic cavity. These are considered by most to be innocuous and generally are. However, in the present case, a single loose linear cutter staple in the abdomen caused mechanical bowel obstruction 6 years after surgery.

This case report indicates that metal staples can cause SBO even several years after the initial surgery. The use of surgical staples has increased due to the growing application of laparoscopic surgery. Surgeons using a surgical stapler should be aware the staples may cause adhesion when exposed to other tissues in the abdominal cavity. We recommend that as many loose staples as possible be removed with a grasper or with suction at the termination of laparoscopy. In addition, performing Lambert suture or applying anti-adhesive agents to the staple line may reduce the risk of SBO.

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