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Case Report

Sigmoid Volvulus with Widespread Bowel Ischemia after Endoscopic Reduction Successfully Treated with Elective Laparoscopic Surgery

Koji Yasuda Shoji Oura Nozomi Kashu Hiroyuki Yoshitake
Tomoya Takami Hiroshi Shintani Naoki Kataoka
Tomoyuki Yamaguchi Shinichiro Makimoto

Department of Surgery, Kishiwada Tokushukai Hospital, Kishiwada, Japan

Keywords

Conservative treatment · Elective laparoscopic surgery · Sigmoid volvulus · Widespread ischemia

Abstract

An 87-year-old man complaining of abdominal distention was referred to our hospital. Plain radiograph and enhanced computed tomography (CT) showed a dilated sigmoid colon with a coffee bean sign, leading to the diagnosis of sigmoid volvulus. Based on symptoms and the CT and laboratory test findings, we initially treated the patient with endoscopic reduction, resulting in successful reduction of the sigmoid volvulus with widespread presumed mucosal ischemia. Due both to the lack of emerging symptoms suggesting colon perforation and to the laboratory test findings after endoscopic reduction, we treated the patient without further urgent surgical intervention. Two months later, the patient underwent successful elective laparoscopic surgery with a redundant sigmoid colon resection and a functional end-to-end anastomosis. He has been well without any events for 20 months. Conservative treatment with careful observation should be taken into consideration in the treatment of sigmoid volvulus with mild to moderate ischemia after endoscopic reduction.

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Introduction

Various malignant diseases can cause large bowel obstruction. Especially, rectosigmoid, rectal, and anal malignancies tend to cause colon obstruction due to their smaller luminal sizes [1]. Noncolonic malignancies such as ovarian and pancreatic cancer can also cause colonic obstruction despite their low incidence rates compared with those of colonic malignancies [2].

Similarly, various benign diseases can cause colon obstruction functionally or mechanically. Of these, colon volvulus is the leading cause of colon obstruction and is common in the cecum and sigmoid colon [3]. Unlike cecal volvulus, sigmoid volvulus generally presents with abdominal pain, abdominal distention, and constipation/obstipation. In addition to these typical symptoms, plain radiograph [4] and computed tomography (CT) [5] facilitate the diagnosis of sigmoid volvulus.

Sigmoid volvulus generally needs immediate surgery on suspected/definitive perforation of the affected colon or primary endoscopic reduction followed by elective surgery due to its high rate of recurrence without further surgical intervention [6]. However, the presence of colonic mild to moderate ischemia after endoscopic reduction annoys the attending physician whether to urgently resect the affected colon or not.

We here report a case of sigmoid volvulus with widespread bowel ischemia after endoscopic reduction successfully treated with elective laparoscopic surgery under careful observation.

Case Report

An 87-year-old Japanese man complaining of abdominal distention was referred to our hospital. He had been surgically treated for early colon cancer and abdominal aortic aneurysm and nonsurgically for sigmoid colon volvulus. After being aware of insidiously presenting abdominal distention, the patient had failed to defecate for 12 h due to lack of intestinal peristalsis. He had no fever and complained of neither chills nor abdominal pain. Blood tests showed a mild inflammatory response and normal CPK level: white blood cells 10,200/ μ L, C-reactive protein 0.183 mg/dL, and CPK 89 U/L. Plain abdominal radiograph and enhanced CT showed a markedly dilated colon in the fashion of the so-called coffee bean sign (Fig. 1). Blood test and enhanced CT findings (Fig. 2) led to the diagnosis of sigmoid volvulus without colon necrosis. The patient underwent initial and careful endoscopic reduction (Fig. 3a), leading to the successful reduction of the sigmoid volvulus followed by the improvement of abdominal distention. Although pretreatment assessment was sigmoid volvulus without colon necrosis, postreduction endoscopy showed widespread presumed mucosal ischemia (Fig. 3b). Considerable spread of the affected mucosa made it difficult for us to rule out the presence of transmural ischemia, which could lead to the necrosis of the sigmoid colon followed by peritonitis. However, we judged that the patient lacked the definitive evidence of necrosis of the detorsed sigmoid colon and decided to follow the patient with infusion, nil per os, and antibiotics administration under careful observation. Due both to no relapse of the abdominal symptoms and to the lack of increasing inflammatory response judged by laboratory tests, the patient started to take a meal on the 5th day and was discharged on the 9th day after endoscopic reduction of the sigmoid volvulus. Two months later, i.e., after full recovery of his physical condition, the patient received endoscopic surgery with a 20-cm resection of the redundant sigmoid colon and a functional end-to-end anastomosis as an elective surgery to prevent further recurrence.

He recovered uneventfully and was discharged on the 8th day after the operation. He has been well without any events for 20 months.

Discussion

The initial step to diagnosing sigmoid volvulus is imaging diagnosis mainly with plain radiograph and CT. Thereafter, colonoscopy is generally done to further confirm the diagnosis and try to endoscopically detorse the sigmoid volvulus, if applicable. When endoscopic reduction is impossible, the disorder unquestionably needs an emergent operation due to the dismal prognosis of the sigmoid volvulus with perforation and peritonitis [7]. The attending physician, however, worries about the judgment either to follow or to emergently operate the patient when the sigmoid colon shows some ischemic changes after endoscopic reduction.

Compared with the stomach and small intestine, the colon often suffers from ischemia due to the presence of watershed areas between the major vessels: superior mesenteric artery, inferior mesenteric artery, and systemic circulation. In addition to the splenic flexure, the rectosigmoid junction is prone to ischemia, making the attending physician more anxious for the presence of colonic ischemia after endoscopic reduction of the sigmoid volvulus. Intramucosal pH measurement has been reported to be useful in predicting and managing the sigmoid colon with some ischemia after aortic operation [8]. Intramucosal pH measurement, however, is impractical in most medical facilities due to the lack of device to exactly measure the pH of the colon.

The guideline [9] says that endoscopic reduction should be performed when the laboratory tests do not indicate colon necrosis. In this case, we initially detorsed the sigmoid volvulus endoscopically and, even after the confirmation of widespread ischemia of the sigmoid colon, carefully followed the patient due both to the lack of emerging symptoms suggesting colon necrosis and to the laboratory test findings. Unlike cecal volvulus, easier endoscopic accessibility to the sigmoid colon further encouraged us to follow the patient conservatively with the intent of aiming for elective surgery.

Elective surgery after adequate bowel preparation enabled us to treat the patient with laparoscopic surgery, resulting in an uneventful postoperative course. Application of elective endoscopic surgery to the sigmoid volvulus has considerable debate, but has provided great benefit to this elderly patient with minimal damage. Despite the presence of prior surgeries in this case, we judged that laparoscopic surgery could be applicable because serial CTs provided the information about the adhesion among the sigmoid colon, small intestine, and peritoneum. When performed by a skilled team with full laparoscopic surgical expertise, elective laparoscopic surgery after successful endoscopic reduction should play an important role, especially in the treatment of elderly patients with sigmoid volvulus and various comorbidities such as cardiovascular and psychiatric disease.

In conclusion, conservative treatment with careful observation should be taken into consideration in the treatment of sigmoid volvulus with mild to moderate ischemia after endoscopic reduction. Elective laparoscopic surgery of the endoscopically detorsed sigmoid volvulus is a feasible alternative to conventional open surgery.

Statement of Ethics

We have reported this case in compliance with the Declaration of Helsinki. Informed written consent was obtained from the patient for publication of the clinical data.

Disclosure Statement

The authors have no conflicts of interest to declare.

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Author Contributions

K. Yasuda contributed the design of the report. S. Oura and S. Makimoto drafted the manuscript. N. Kashu, H. Yoshitake, T. Takami, and H. Shintani, collected the data. N. Kataoka and T. Yamaguchi revised the manuscript. All authors read and approved the final version of the manuscript.

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Fig. 1. Plain abdominal radiograph showing a dilated sigmoid colon reaching up to the left diaphragm in the fashion of the so-called coffee bean sign.

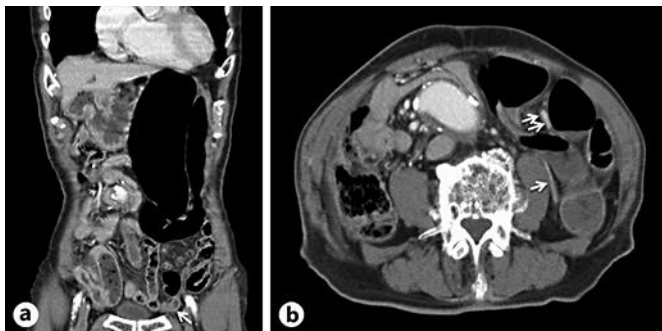


Fig. 2. Enhanced CT of the abdomen. **a** Coronal view of the enhanced CT showed a dilated sigmoid colon and the absence of rectal gas (arrow). **b** Axial view of the enhanced CT showed a dilated colon and patent mesenteric (arrow) and marginal (arrows) arteries. CT, computed tomography.

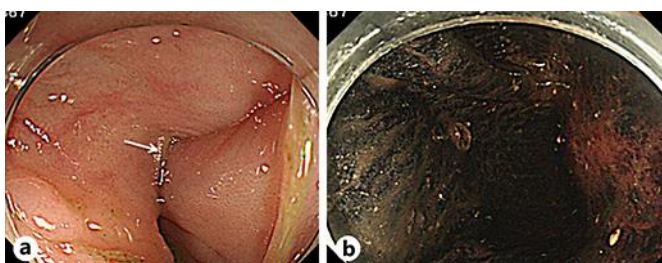


Fig. 3. Colonoscopy showed a twisted portion (arrow) of the sigmoid colon (**a**) and widespread presumed mucosal ischemia after endoscopic reduction (**b**).