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Single Case

Blind Pouch Syndrome-Associated Enterolithiasis Successfully Treated with Colonoscopy

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Keywords

Blind pouch syndrome · Enterolithiasis · Functional end-to-end anastomosis · Colonoscopy

Abstract

Enterolithiasis associated with blind pouch syndrome secondary to functional end-to-end anastomosis is rare, and its endoscopic and radiological features remain poorly described. A 72-year-old woman was admitted to our hospital for abdominal pain and difficulty defecating. Colonoscopy (CS) with Gastrografin revealed a 10 × 8 cm calculus, an anastomotic ulcer, a blind pouch, and an end-to-end anastomosis in the transverse colon. The calculus was successfully crushed and removed with snares and alligator forceps through CS during the ensuing 4-day period. To our knowledge, this is the first report describing the endoscopic and radiological features of blind pouch syndrome-associated enterolithiasis successfully treated with CS.

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Introduction

Blind pouch syndrome is defined as a series of symptoms such as anemia, intermittent abdominal pain, diarrhea, and weight loss, all of which are associated with the formation of a blind pouch secondary to an intestinal anastomosis [1]. Most cases of blind pouch syndrome were shown to be secondary to side-to-side or side-to-end anastomosis, but recently cases of blind pouch have been reported as occurring secondary to functional end-to-end anastomosis [2–7]. Enterolithiasis associated with blind pouch syndrome secondary to functional end-to-end anastomosis is rare and its endoscopic and radiological features remain poorly described.

We herein report a case of enterolithiasis secondary to blind pouch syndrome successfully treated with colonoscopy (CS).

Case Presentation

A 72-year-old woman was admitted to our hospital for abdominal pain and difficulty defecating. She had a history of colorectal cancer and had undergone laparoscopic partial resection of the transverse colon 4 years earlier. A functional end-to-end anastomosis was performed for colonic reconstruction in the patient, who was postoperatively diagnosed with adenocarcinoma, type I, 35 × 30 mm, SS, N1, H0, P0, M0, stage IIIa, and there was no recurrence during postoperative follow-up.

Computed tomography (CT) revealed sac-like dilation of the functional end-to-end anastomosis and a large, multilayered, fecal mass in the transverse colon (axial, Fig. 1a; coronal, Fig. 1b). There was no dilation of the intestinal tract on the oral side of the anastomosis, and fecal ileus was ruled out. The patient underwent CS as well as a Gastrografin enema examination through CS, which revealed a 10 × 8 cm calculus (Fig. 2a, c, d), an anastomotic ulcer (Fig. 2b), a blind pouch (Fig. 2c, d), and an end-to-end anastomosis (Fig. 2c, d) in the transverse colon. Despite the absence of hallmark symptoms of blind pouch syndrome, i.e., anemia, diarrhea, and weight loss, she was diagnosed with blind pouch syndrome-associated enterolithiasis and underwent colonoscopic treatment. Histopathological examination of a biopsy specimen from the anastomotic ulcer showed chronic inflammatory cell infiltration (Fig. 3).

Colonoscopic treatment using snares and alligator forceps was performed during the ensuing 4 days, which led to nearly all of the calculus being crushed and removed. A bowel cleanser was administered, and CS with Gastrografin was performed 3 days after treatment, which showed that the enterolithiasis had disappeared and the anastomotic ulcer had improved (Fig. 2e, f). The patient was discharged 1 week after admission due to improved abdominal pain. With defecation control with laxatives in place, the patient's course was uneventful for 3 months after treatment.

Retrospectively, CT performed at postoperative 5 and 8 months revealed fecal stasis (Fig. 1c) and blind pouch formation (Fig. 1d) at the anastomosis site, respectively.

Discussion and Conclusion

Our case has two important clinical implications. First, functional end-to-end anastomosis of the colon may result in enterolithiasis through blind pouch formation following surgery. However, the endoscopic and radiological features of blind pouch syndrome-associated enterolithiasis remain unknown, with no reports available in the English-language literature.

Anastomosis after colectomy includes hand-sewn and mechanical, end-to-end, side-to-side, and end-to-side anastomoses. Functional end-to-end anastomosis using an autosuture device as reported by Steichen [8] is currently the most widely used of all anastomoses, where, compared with hand-sewn anastomosis, the anastomosis of the intestinal tract with a different diameter is easier, the time required for the anastomosis is shorter, and the complications at the anastomosis site are less likely [9]. To date, 5 cases of blind pouch syndrome have been reported to occur at the functional end-to-end anastomosis site after colectomy (Table 1) [2–6]. The time from surgery to the onset of symptoms is reported to vary between 15 and 52 months among these reports; of these, 4 cases were associated with enterolithiasis, with 2 and 1 of these also associated with ileus and perforation peritonitis, respectively, and 1 case without enterolithiasis also associated with sigmoid colon volvulus. In the present case, massive enterolithiasis was shown to have occurred 48 months after surgery.

To date, gastrointestinal series and CT [2, 3] have been reported as useful modalities for the diagnosis of blind pouch syndrome at functional end-to-end anastomosis sites. Recently, coronal reformatted multidetector CT has been shown to aid in detecting a blind pouch by revealing a dilated tract or surgical suture [6, 7, 10]. In the present case, CS clearly revealed enterolithiasis, an anastomotic ulcer, a blind pouch associated with functional end-to-end anastomosis, and a Gastrografin enema examination through CS and multidetector CT revealed enterolithiasis and a blind pouch associated with functional end-to-end anastomosis. Thus, an accurate diagnosis of the present case was achieved only by using multiple modalities.

Blind pouch formation at functional end-to-end anastomosis sites has been reported to be due to the incision of the circular muscle involved in peristalsis, lack of peristalsis at the anastomosis, and dissonance of peristalsis between the anastomosed intestines [7]. However, the mechanism of onset of blind pouch syndrome associated with functional end-to-end anastomosis remains still unknown. In the present case, CT performed at postoperative 5 and 8 months revealed fecal stasis and blind pouch formation at the anastomosis site, respectively, thus suggesting that the blind pouch had formed early after surgery.

The second important issue that emerged in our case was that blind pouch syndrome-associated enterolithiasis was successfully treated with CS. According to Gurvits and Lan [11], stasis due to blind pouch formation could lead to changes in the intestinal microenvironment, ultimately leading to bacterial overgrowth and accelerated enterolithiasis formation. Although most reported cases involved surgical management, colonoscopic treatment may represent the first-choice treatment for enterolithiasis without ileus [12, 13]. While our case involved massive enterolithiasis, the calculus was successfully crushed and removed with snares and alligator forceps via the CS channel during a consecutive 4-day period, thus obviating the need for surgical treatment.

In conclusion, functional end-to-end anastomosis of the colon may result in enterolithiasis associated with blind pouch formation following surgery. Colonoscopic treatment may be

deemed the first-choice treatment for blind pouch syndrome-associated enterolithiasis without ileus.

Statement of Ethics

Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

Conflict of Interest Statement

The authors have no conflicts of interest to disclose in association with this study.

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Author Contributions

All authors contributed equally to the study as well as to the preparation of the manuscript for publication.

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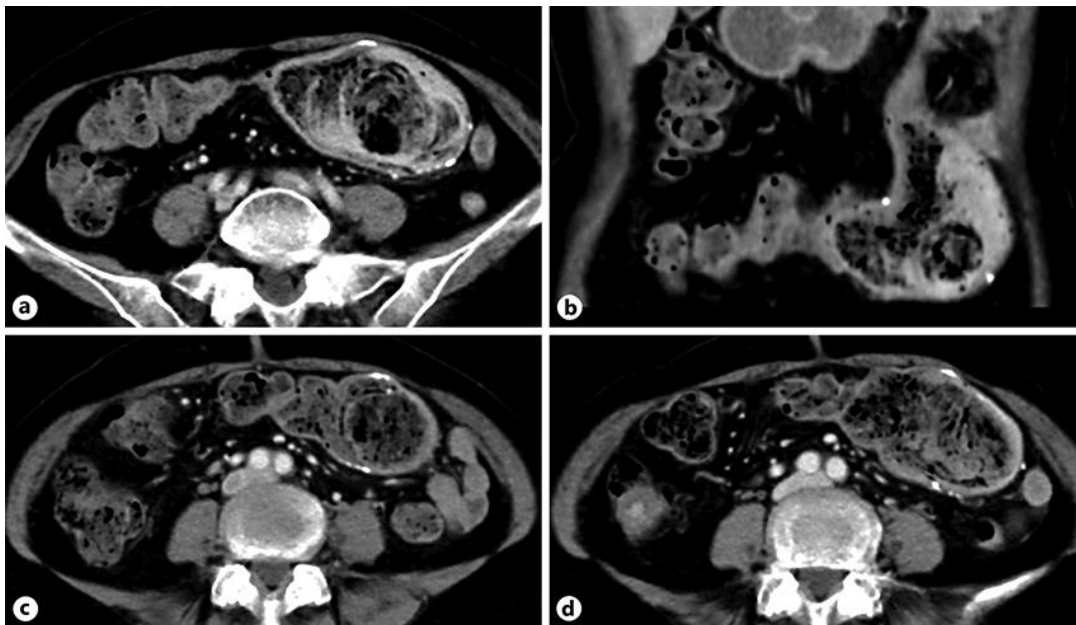


Fig. 1. CT examination. **a** Sac-like dilation of the functional end-to-end anastomosis as well as a large, multilayered fecal mass were recognized in the transverse colon. **b** Coronal reformatted multidetector CT revealed a blind pouch and a functional end-to-end anastomosis. **c** CT performed at postoperative 5 months revealed fecal stasis. **d** CT performed at postoperative 8 months revealed blind pouch formation at the anastomosis site. CT, computed tomography.

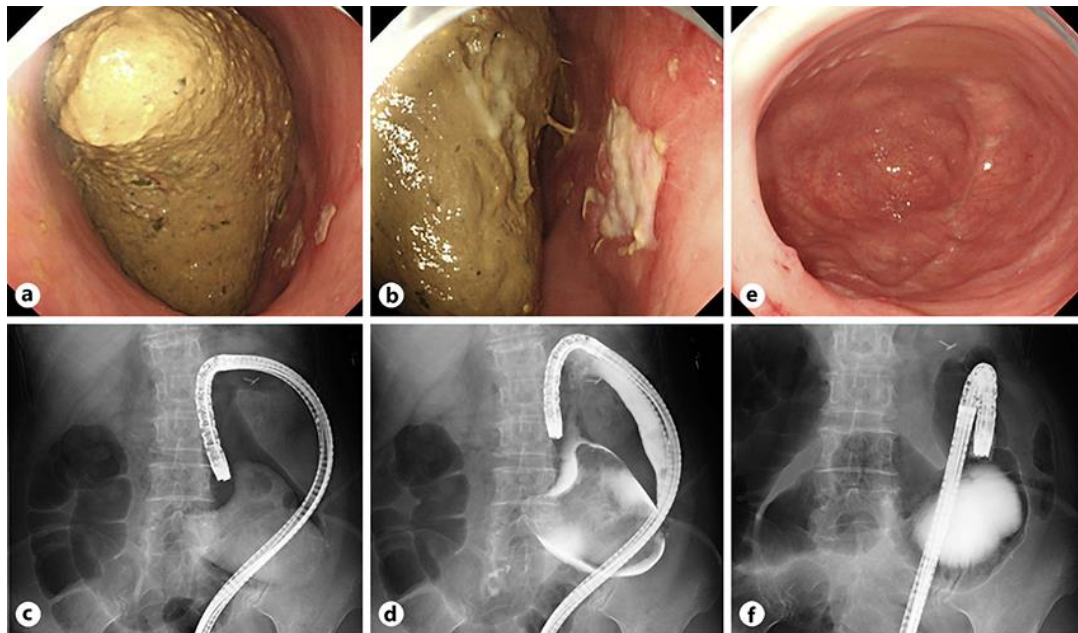


Fig. 2. CS with a Gastrografin enema examination. CS revealed enterolithiasis (a) and an anastomotic ulcer (b). Gastrografin enema examination through CS revealed a 10 × 8 cm calculus, a blind pouch, and an end-to-end anastomosis in the transverse colon (c, d). CS with Gastrografin was performed 3 days after treatment, which showed that enterolithiasis had disappeared (e) and the anastomotic ulcer had improved (f). CS, colonoscopy.

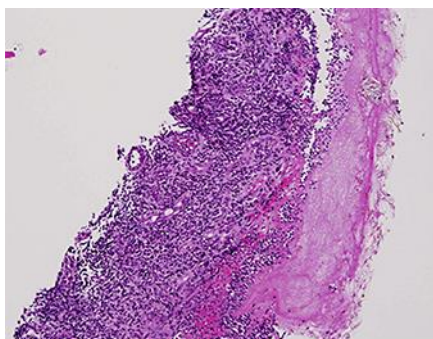


Fig. 3. Histopathologic examination. A biopsy specimen from the anastomotic ulcer showed chronic inflammatory cell infiltration (×100).

Table 1. Cases reported to date of blind pouch syndrome associated with functional end-to-end anastomosis after colonoscopy

No.	Ref.	Year	Age, years	Sex	Location	Postoperative time of onset	Symptom	Diagnosis	Fecal calculus	Treatment
1	2	2010	60	F	descending colon	13 months	abdominal pain and vomiting	ileus and blind pouch syndrome-associated enterolithiasis	+	colonoscopy
2	3	2012	57	F	sigmoid colon	22 months	abdominal pain and constipation	blind pouch syndrome-associated enterolithiasis	+	intestinal resection
3	4	2014	54	M	sigmoid colon	45 months	abdominal pain and bloating	sigmoid colon volvulus	+	laparoscopic colectomy
4	5	2015	66	F	sigmoid colon	52 months	abdominal mass, abdominal pain, and constipation	ileus and blind pouch syndrome-associated enterolithiasis	+	intestinal resection
5	6	2015	81	M	transverse colon	18 months	abdominal pain and vomiting	perforation peritonitis caused by the fecal mass at the anastomotic site	+	intestinal resection and colectomy
6	our case	2020	72	F	transverse colon	48 months	abdominal pain and difficulty defecating	blind pouch syndrome-associated enterolithiasis	+	colonoscopy