A Case of Abdominal Abscess in Crohn's Disease: Successful Endoscopic Demonstration of an Obscure Enteric Fistula by Dye Injection via a Percutaneous Drainage Catheter

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Key Words

Crohn's disease · Percutaneous abscess drainage · Dye injection · Indigo carmine · Enteric fistula

Abstract

Abdominal and pelvic abscesses occur in approximately 10–30% of Crohn's disease patients during the course of the disease; most of these abscesses have an enteric communication. For this condition, percutaneous abscess drainage (PAD) rather than emergency surgery has recently been recognized as a valuable procedure for initial treatment. However, in cases wherein the abscess is accompanied by an enteric fistula, the recurrence of abscess might be inevitable without the management of the enteric fistula. Therefore, demonstration and evaluation of the enteric fistula is essential to prevent abscess recurrence; however, this is not necessarily a simple procedure. Here, we report abdominal abscess accompanied by a rectal fistula in a patient with Crohn's disease; this condition was successfully treated by PAD. Furthermore, PAD was also useful in identifying the fistula by colonoscopy involving dye injection via the drainage catheter. To our knowledge, no previous literature has reported the use of dye injection via the drainage catheter for identifying a fistula during endoscopic examination. We present here the radiographic, sonographic, and endoscopic findings of this case.

Introduction

Abdominal and pelvic abscesses occur in approximately 10–30% of Crohn's disease patients during the course of the disease; most of these abscesses have an enteric communication [1–5]. For this condition, percutaneous abscess drainage (PAD) rather than emergency surgery has recently been recognized as a valuable procedure for initial treatment [1–5]. However, in cases where the abscess is accompanied by an enteric fistula, abscess recurrence might be inevitable without the management of the enteric fistula [1–6]. Therefore, demonstration and evaluation of the enteric fistula is essential to prevent abscess recurrence; however, this is not necessarily a simple procedure.

We report an abdominal abscess accompanied by a rectal fistula in a patient with Crohn's disease; this condition was successfully treated by PAD. Furthermore, PAD was also useful in identifying the fistula by colonoscopy involving dye injection via the drainage catheter. To our knowledge, no previous literature has reported the use of dye injection via the drainage catheter for identifying a fistula during endoscopic examination. We present here the radiographic, sonographic, and endoscopic findings of this case.

Case Report

A 37-year-old man, diagnosed with Crohn's disease 6 years earlier, was admitted to the emergency department of our hospital due to abdominal pain associated with fever that had occurred a day before admission. Six years before, the patient was first admitted to our hospital for abdominal pain and melena. Subsequently, longitudinal ulceration and luminal narrowing at the terminal ileum were detected by colonoscopy and enterography, and the histological findings of the biopsies from the ileum lesion were compatible with those of Crohn's disease. Since then, he had been admitted several times to our hospital, because of bowel obstruction due to a luminal stricture at the ileum. Until this admission, no lesions had been detected by endoscopy in the colon and rectum, except for hemorrhoids, and there was no obvious abscess. He had no history of previous surgery. Prior to the admission, he had been treated with mesalazine at an outpatient clinic located very close to our hospital.

On admission, his abdomen was tender, indicating peritoneal irritation, predominantly in the right lower quadrant. Laboratory findings were as follows: white blood cell count $13,000/\text{mm}^3$ with 89.3% polymorphonuclear cells, C-reactive protein level 34.0 mg/l, and albumin level 2.3 g/dl; the other findings were within normal limits.

Immediately after obtaining the patient's history and conducting a physical examination, we performed a sonographic assessment, the results of which showed the presence of a relatively well-defined cystic lesion containing both fluid and gas in the right lower quadrant ([fig. 1](#)). Inflammatory changes such as thickening of the adjacent fat tissue were observed around the lesion; these findings suggested abscess formation. The results of subsequent computed tomography (CT) scan also agreed with the sonographic findings. On both cross-sectional modalities, segmental bowel wall thickening in several bowel loops was noted; however, the connection of the bowel loop with the abscess was not demonstrated.

Based on the above-mentioned findings, we suspected the abdominal abscess to be related with an enteric fistula. On extensive analysis and serious consultation, PAD under sonographic guidance was adopted as the treatment of the abscess; a single drain (7.2-F catheter) was inserted into the largest abscess cavity in the right lower abdomen ([fig. 2](#)). The culture of the drained fluid revealed *Enterobacter cloacae*. Fortunately, the patient recovered immediately after the initial PAD procedure.

Follow-up sinography depicted a narrow and long abscess cavity (maximum length approximately 20 cm) communicating with the intestine in the pelvic region ([fig. 3a](#)). Using the guidewire technique, the drainage catheter was repositioned adjacent to the entry site of the fistula ([fig. 3b](#)). A plain CT scan obtained subsequently demonstrated the pooling of the contrast medium, which was used during sinography, in the rectum ([fig. 4](#)).

Total colonoscopy was conducted. A small erosive lesion at the rectosigmoid junction (approximately 15 cm away from the anal verge) and a hemorrhoid at the anus was noted, sparing the remainder of the colon. However, the fistula could not be detected at the screening examination. Therefore, we injected a solution mixture (approximately 10 ml) of indigo carmine (20 mg/5 ml) and saline (15 ml) via the drainage catheter; dye leakage was observed from the small erosive lesion in the rectosigmoid junction ([fig. 5](#)). We also conducted enterography using a long tube; this investigation depicted several mild luminal narrowings without ulceration and fistula in the small bowel.

The presence of residual abscess adjacent to the rectal fistula necessitated frequent daily irrigation of the catheter with saline. Fortunately, after 2 months, the rectal fistula healed by conservative management including PAD, antibiotic therapy (meropenem trihydrate 1.5 g/day; intravenous administration for 3 weeks), and total parenteral nutrition therapy (approximately 2 months), without additional surgical treatment. The drainage catheter was subsequently removed.

During hospitalization, endoscopic biopsy of the fistula was not conducted because it was expected to close by conservative management. We believe that the erosive lesion and the etiology of fistula formation are consistent with the underlying Crohn's disease; however, there was no pathological proof to support this hypothesis.

At approximately 1 year since the discharge, the patient is symptom-free without any recurrence of abscess formation.

Discussion

Intra-abdominal and pelvic abscesses are well-known complications of Crohn's disease [1–5]. In patients with documented entero-abscess communication, performing abscess drainage as the only treatment is inadequate, irrespective of the drainage procedures initially employed (PAD or surgery) [1–5]. Nagler and Poticha reported that abscess drainage without the management of the problematic bowel fistula resulted in the recurrence of the abscess in all 11 patients [6]. Moreover, two reports on long-term analysis have suggested that fistula formation is a significant predictor of the need for surgery [2, 7].

In septic conditions, surgical intervention, which is more invasive than PAD, should be avoided as far as possible. Even if surgical intervention is initially required in this entity, in most cases, only abscess drainage is carried out without the management of the fistula lesion because of the following reasons: (1) the presence of the fistula is rarely confirmed during emergent surgery, and (2) bowel resection should be avoided if possible because of the recurrent nature of Crohn's disease. Moreover, the formation of an enterocutaneous fistula and a luminal stricture or leakage at the bowel anastomosis as a result of surgical intervention is not uncommon [3].

Based on the above-mentioned reasons, we conclude that PAD rather than surgical drainage should be the first choice for the initial procedure in this case. There are several reports that discuss the advantages of PAD over emergent surgery [1–5, 7].

In our case, PAD combined with medical management such as total parenteral nutrition was fortunately successful not only in treating the abscess, but also in attaining fistula closure without additional surgical treatment. Anti-TNF-alpha treatment such as infliximab was not administered. The following are the plausible reasons for the permanent closure of the enteric communication by PAD: First, the fistula itself was very small; the lesion could hardly be identified at screening colonoscopy. Second, the PAD catheter could be placed adjacent to the fistula; therefore, we could adequately control the local adverse effect of the diseased intestine caused directly by the surrounding abscess.

As mentioned above, demonstration and evaluation of the entero-abscess communication are essential for deciding the further management and preventing abscess recurrence; however, this management is not necessarily simple. In particular, in the field of urology, enteral administration (oral or rectal use) of dye (indigo carmine, methylene blue, etc.) has been reported to be helpful in identifying occult enterovesical fistula in patients with Crohn's disease [8, 9]. This practice facilitates the demonstration of an enteric communication; however, it is not useful in identifying the location of the enteric fistula.

To our knowledge, no previous report has discussed the technique of dye injection via a drainage catheter for identifying an obscure enteric fistula. In our case, the fistula could not be found at screening colonoscopy despite previous radiographic findings indicating a rectal fistula. Injection of indigo carmine via the drainage catheter enabled us to not only identify and evaluate the enteric fistula by colonoscopy, but also to confirm fistula closure. In our case, an entero-abscess communication was found at the rectum. We assume that the technique employed in our case may also be suitable for patients with fistula in the small intestine, which is a more common site than the colon, by using the double-balloon endoscopy.

As is the case in other gastrointestinal diseases, we believe that endoscopic evaluation is essential in this entity to obtain a qualitative diagnosis and to study the etiology of the fistula and the underlying disease activity. However, it is not easy to demonstrate the site of the fistula by endoscopy, especially when the lesion is small, or when multiple ulcerative lesions exist, or when the lesion is situated in the small bowel loop.

During surgery, an accurate confirmation of the location of the fistula makes minimal resection of the diseased bowel loop possible. With regard to the significance of the technique of dye injection via the drainage catheter, we believe that it may be useful for preoperative endoscopic marking such as tattooing or clipping. With this technique, simple and definitive endoscopic demonstration and preoperative marking can be achieved.

With regard to the safety of dye injection into the abdominal cavity, gynecologists frequently use several dyes (indigo carmine, methylene blue, etc.) during laparoscopy and tuboplasty to demonstrate tubal patency in women; this practice has been recognized to be clinically safe [10, 11]. On the other hand, Prien et al. reported that macrophage activation is induced after in vivo exposure to these dye solutions [10]. Therefore, such dyes should be administered cautiously into the open abscess cavity.

In conclusion, we report a case of abdominal abscess communicating with the rectal fistula in a patient with Crohn's disease. In this case, PAD was a valuable technique not only for treating the abscess, but also for endoscopic demonstration of the fistula and its closure by injecting the dye via the drainage catheter.

Fig. 1. Sonogram (with 3.5 MHz convex probe) of the abdominal abscess shows a hypoechoic mass containing gases, mostly at the surface.

Fig. 2. A 7.2-F drainage catheter was inserted into the largest abscess cavity.

Fig. 3. **a** Sinogram depicting a narrow and long abscess cavity (fistula) communicating with the bowel in the pelvis. **b** The drainage catheter was repositioned adjacent to the entry site of the fistula.

Fig. 4. Plain CT scan after sinography demonstrates pooling of the contrast medium, which was used during sinography, in the rectum.

Fig. 5. Colonoscopic view after injection of indigo carmine via the drainage catheter demonstrates dye leakage from an erosive lesion in the rectum.

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