

Simultaneous Drainage of the Abscess Cavity and Intestinal Tract for an Intra-abdominal Abscess Secondary to Major Leakage: A Case Report

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Abstract

This case report describes a 72-year-old man who developed an intra-abdominal abscess and major postoperative anastomotic leakage. He reported a history of pancreaticoduodenectomy, partial hepatectomy, and segmental colectomy for hepatic and colonic invasion of extrahepatic cholangiocarcinoma. Three catheters, (one in the transverse colon and two in the abscess cavity) were placed simultaneously through the drainage tract formed by the intraoperatively placed Pleats drain. The intra-abdominal abscess resolved following this intervention and has not recurred since. Postoperative drainage and starvation were continued for 52 and 84 days, respectively. This case report describes a novel technique of catheter insertion from the abscess cavity into the intestine through the site of rupture to reduce intestinal pressure and partially block the enteric fistula.

Key words: drainage, abscess, leakage, peritonitis

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Introduction

Percutaneous drainage is an effective treatment strategy for intra-abdominal abscesses [1-4]. Anastomotic leakage following gastrointestinal surgery may cause peritonitis and severe postoperative infections. Patients who develop such major leakage require surgical intervention, including resection of anastomosis, loop ileostomy, and intraoperative washout [5-7]. Recent studies have reported that computed tomography (CT) and ultrasonography guided percutaneous catheter placement and drainage may effectively treat intra-abdominal abscesses secondary to gastrointestinal perforation; however, patients described by previous studies did not present with major leakage [8, 9].

We report the case of a patient with major leakage who underwent successful imaging-guided simultaneous drainage of the abscess cavity and the intestine. This strategy successfully reduced the intestinal pressure and partially blocked

the enteric fistula to control leakage.

Case Report

A 72-year-old man underwent pancreaticoduodenectomy, partial hepatectomy, and segmental colectomy for hepatic and colonic invasion of extrahepatic cholangiocarcinoma. Laboratory tests on postoperative day (POD) 7 showed an elevated white blood cell count (151×10^3 cells/ μ L) and increased serum C-reactive protein (5.0 mg/dL). Leakage of intestinal content was observed from the Pleats drain (Sumitomo Bakelite Co., Ltd., Akita, Japan) that was placed intraoperatively, and the patient was diagnosed with an intra-abdominal abscess secondary to anastomotic leakage between the small intestine and the transverse colon. Surgical wound dehiscence that occurred on POD 9 led to massive leakage of intestinal content. Non-contrast CT confirmed an intra-abdominal abscess and peritonitis (**Fig. 1A**). Additional surgery was contraindicated owing to the patient's poor gen-

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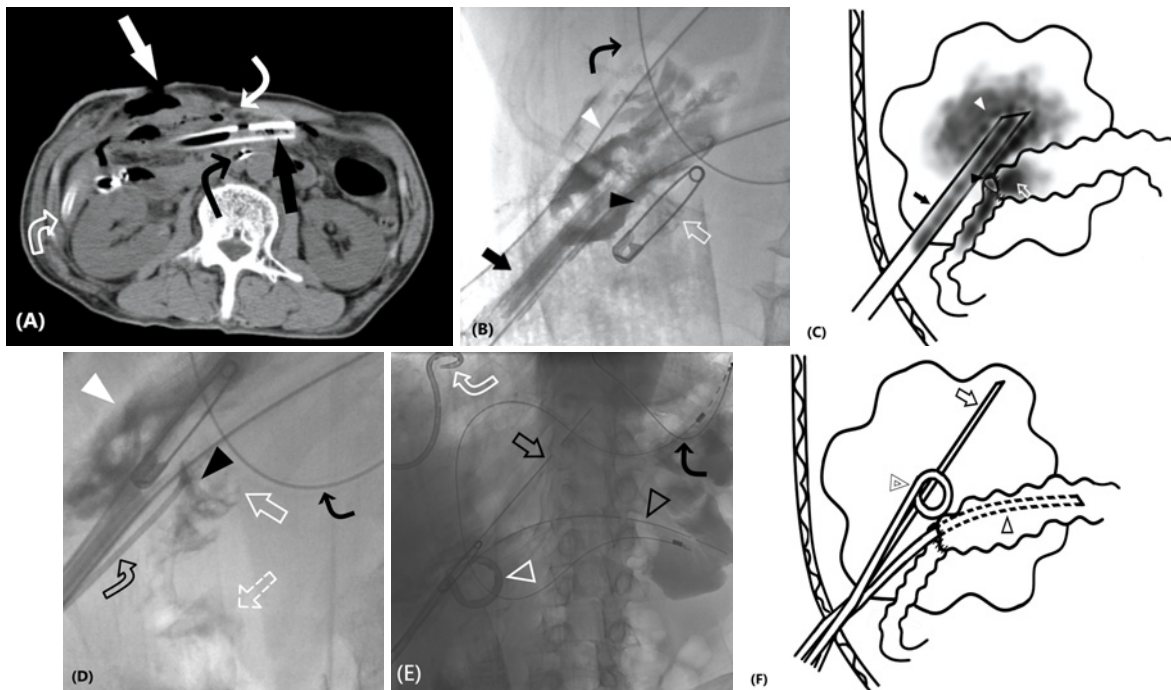


Figure 1. Representative case of a 72-year-old man who underwent surgery for cholangiocarcinoma and developed an intra-abdominal abscess and peritonitis secondary to anastomotic leakage between the small intestine and transverse colon. Catheters were placed in the abscess cavity and the small intestine, and percutaneous drainage was performed.

(A) Non-enhanced computed tomography scan obtained on postoperative day 10. Right-sided anterior abdominal wall wound dehiscence is observed (white arrow). An intraoperatively placed Pleats drain is visualized (black arrow). The intra-abdominal abscess is observed immediately beneath the wound (white curved arrow). A nasogastric tube (black curved arrow) and an inferior hepatic drainage catheter (white hollow curved arrow) placed at this site are unrelated to the intestinal anastomotic leakage.

(B) Fistulogram, (C) Schematic representation of the sinogram. (B, C) Contrast agent is injected through the pleats drainage tube placed intraoperatively (black arrow). The site of rupture (black arrowhead) that caused anastomotic leakage between the small intestine and transverse colon and the transverse colon (white hollow arrow) are observed from the abscess cavity (white arrowhead). A nasogastric tube (black curved arrow) is visualized.

(D) Fistulogram. A 5-Fr Cobra catheter (black hollow curved arrow) is inserted into the abscess cavity to direct the guide wire to the site of anastomotic leakage. The contrast agent is injected through the Cobra catheter. The site of rupture (black arrowhead), the transverse colon (white hollow arrow), the small intestine (white dotted hollow arrow), and the abscess cavity (white arrowhead) are observed in this image.

(E) Fistulogram, (F) Schematic representation of the sinogram. (E, F) The pleats drainage tube placed intraoperatively is replaced with three drainage catheters: an 8-Fr straight catheter (black hollow arrow) is placed distal to the abscess cavity, a 16-Fr pigtail catheter (white hollow arrowhead) is placed proximal to the abscess cavity, and a 16-Fr straight catheter (black hollow arrowhead) is placed in the transverse colon. A nasogastric tube (black curved arrow) and an inferior hepatic drainage catheter (white hollow curved arrow) are also visualized in this image.

eral health condition; therefore, he underwent conservative management with percutaneous drainage.

A fistulogram was performed on POD 17 through the pleats drainage tube that was placed intraoperatively and showed flow of the contrast agent from the abscess cavity into the transverse colon (Fig. 1B, Fig. 1C).

Drainage catheters were placed to drain pus from the abscess cavity. Additionally, another percutaneous drainage

catheter was placed into the intestinal tract through the enteric fistula that had developed secondary to anastomotic leakage between the small intestine and transverse colon. The second catheter was placed to drain intestinal content, reduce intestinal pressure, and partially block the enteric fistula to reduce leakage. The drainage catheters were placed as follows: Initially, three 0.035-inch guide wires (Radifocus Guidewire M, Terumo Co., Ltd., Tokyo, Japan and Fixed-

Core Wire Guide Safe-T-J Tip, Cook Japan Co., Ltd., Tokyo, Japan) were inserted through the pleats drainage tube placed intraoperatively and these were replaced with three drainage catheters over the wire. Of these three, one 16-Fr straight catheter (CLINY PTCO Kit, Create Medic Co., Ltd., Kawasaki, Japan) was inserted from the abscess cavity into the transverse colon through the site of rupture that led to anastomotic leakage between the small intestine and transverse colon. A 0.035-inch guide wire (Radifocus Guide wire M) and a 5-Fr Cobra catheter (C2, Medikit Co., Ltd., Miyazaki, Japan) were inserted under fluoroscopic guidance to direct the 16-Fr straight catheter into the transverse colon through the site of rupture that led to anastomotic leakage between the small intestine and the transverse colon. A 16-Fr pigtail catheter (UreSil Origin Drainage Catheter, Sheen Man Co., Ltd., Osaka, Japan) was placed in the abscess cavity proximal to the site of rupture, and an 8-Fr straight catheter (CLINY PTCO Kit, Create Medic Co., Ltd., Kawasaki, Japan) was placed in the abscess cavity distal to the site of rupture (**Fig. 1D**, **Fig. 1E**, **Fig. 1F**). Using the catheter exchange technique, three catheters (one in the transverse colon and two in the abscess cavity) were placed simultaneously through the tract of the removed pleats drainage tube.

The quantity of leakage of intestinal content from the open wound decreased following this intervention, and the wound healed spontaneously 39 days after placement of the drainage catheters. Although 40 mL/day of fluid drained from the two drainage catheters in the abscess cavity immediately after placement of the catheters, the quantity of fluid decreased gradually followed by a reduction in the size of the intra-abdominal abscess. Notably, drainage of fluid ceased completely with resolution of the abscess cavity 53 days after placement of the catheters. With regard to the two drainage catheters placed in the abscess cavity, the catheter placed distal to the anastomotic leakage site was removed 4 days after placement, and the catheter placed proximal to the rupture site was removed 53 days after placement. The catheter in the transverse colon was removed 67 days after placement, after confirming that a fistula had developed between the site of insertion of the catheter on the skin and the site of rupture in the intestine. The intra-abdominal abscess has not recurred since the procedure.

Discussion

Major anastomotic leakage following gastrointestinal surgery necessitates surgical interventions, such as resection of anastomosis, loop ileostomy, and intraoperative washout [5-7]. However, our patient was treated with percutaneous drainage alone. The success of this procedure in this case can be attributed to the following factors: (1) Reduction in intestinal pressure reduced the quantity of leakage of intestinal content from the site of rupture between the small intestine and the transverse colon where the anastomotic leakage occurred. (2) Partial blockage of the enteric fistula at the site

of rupture following insertion of the intestinal catheter reduced the quantity of leakage of intestinal content. (3) Formation of a fistula along the tract of the intestinal catheter provided a route of drainage from the abscess cavity that was walled off from the drainage from the site of rupture. Therefore, the abscess cavity was separated from the enteric fistula, leading to early resolution of intestinal content leakage into the abscess cavity. This also helped to reduce the size of the abscess cavity. This procedure ensured that only the enterocutaneous fistula where the intestinal catheter was placed remained patent after evacuation of the abscess cavity and removal of the catheter from the cavity. Catheters can be removed after complete fistula formation, and the site of rupture usually closes spontaneously.

Ballard et al. reported that placement of drainage catheters in the abscess cavity and intestine effectively treated abscesses by partially blocking the enteric fistula and creating a low-pressure intestinal pathway to reduce leakage of intestinal content [9]. In this study, we inserted two catheters separately in the abscess cavity and in the intestinal lumen via a percutaneous approach. In contrast to the study reported by Ballard et al., the tract created by the removed pleats drainage tube was used to insert multiple catheters into the abscess cavity and the intestine under imaging guidance. The catheters were placed simultaneously at the aforementioned sites in this case.

In conclusion, simultaneous drainage of an intra-abdominal abscess associated with major postoperative anastomotic leakage was successfully performed by inserting multiple catheters through the tract of a removed pleats drainage tube into the abscess cavity and the intestine under imaging guidance.

Conflict of interest: The authors declare that they have no conflicts of interest to report.

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