

A technique to establish fistuloclysis for high-output jejunocutaneous fistula through percutaneous enterostomy

A case report

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Abstract

Rationale: Currently, fistuloclysis helps to establish intestinal nutrition and succus entericus reinfusion in the case of controllable mature high-output enterocutaneous fistula. However, if the tube cannot reach the distal limb of a fistula, fistuloclysis is not achieved. We proposed a strategy to establish succus entericus reinfusion for intractable intestinal fistula through percutaneous enterostomy.

Patient concerns: A 43-year-old man was transferred to our facility for postoperative enterocutaneous fistulae, sepsis, malnutrition, and electrolyte and fluid imbalance. The contrast X-ray demonstrated the breakdown of the primary anastomosis, with fistula output ranging from 1500 to 2000 mL/d, despite the administration of medications to reduce gastrointestinal secretions.

Diagnoses: The patient was diagnosed with high-output anastomosis fistula by gastrointestinal radiography.

Interventions: We used percutaneous enterostomy to establish fistuloclysis.

Outcomes: Fistuloclysis was established by percutaneous enterostomy successfully. No complications were found during the past 4-month follow-up after percutaneous enterostomy. He is waiting for reconstruction surgery after 6 months' enteral nutrition (EN).

Lessons: Fistuloclysis-assisted EN, if used appropriately, avoids the complications of long-term parenteral nutrition (PN) and may promote faster fistula healing.

Abbreviations: CT= computed tomography, EN = enteral nutrition, PE= percutaneous enterostomy, PN = parenteral nutrition.

Keywords: fistuloclysis, high-output fistula, percutaneous enterostomy

1. Introduction

Parenteral nutrition (PN) and enteral nutrition (EN) can provide nutrition support for high-output fistula patients.^[1] But EN is more beneficial in that it can protect gastrointestinal tract, lower infection risk, improve liver function, and maintain nutrition status.^[2] Fistuloclysis can help to establish EN and succus

entericus reinfusion. Fistuloclysis has been defined as “a technique of using fistula as the primary enteral portal for the access and infusion of food stuff, formula or gastrointestinal secretion.”^[3] In the case of intractable high-output fistula, fistuloclysis cannot be achieved by conventional methods. Here we presented a technique to establish fistuloclysis through percutaneous enterostomy (PE). Informed written consent was obtained from the patient for publication of this case report and accompanying images. Because of the retrospective nature of the study, ethics approval was not required.

2. Case presentation

A 43-year-old man was transferred to our facility for postoperative enterocutaneous fistulae, sepsis, malnutrition, accompanied by electrolyte and fluid imbalance. Two weeks before his admission, the patient underwent an emergency laparotomy at another hospital for abdominal trauma. The ruptured intestine (5 cm long) at the site 40 cm to Treitz ligament was resected followed by a primary anastomosis. The abdominal incision was closed. At postoperative day 5, bilious fluid was collected through his drainage. At postoperative day 7, a large central intra-abdominal abscess was noted on abdominal computed tomography (CT) scan. The sepsis remained uncontrollable even after percutaneous drainage. Then the patient was referred to our facility. At admission, he received standard treatment for intra-abdominal infection, including fluid resuscitation, electrolyte disturbance correction, organ support, infection source removal, effective

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Figure 1. (A) The contrast X-ray demonstrated the breakdown of the primary anastomosis, and no contrast agent spilling into the distal intestine. (B) CT scan showed the severe intra-abdominal adhesion and evaluated the puncture location preoperatively. CT=computed tomography.

drainage, total PN support, antibiotics administration. After 2 weeks' treatment, when the patient's condition became stable, contrast X-ray found the breakdown of the primary intestinal anastomosis (Fig. 1A). Fistula output ranged from 1500 to 2000 mL/d, though medications were administered to reduce gastrointestinal secretions. Even with interventional radiological effort and endoscopy, an enteral feeding tube failed to pass through the fistula. Immediate re-surgery was precluded for the presence of gross bowel edema, foreshortened mesentery, and a swollen and retracted abdominal wall.

Considering the severe intra-abdominal adhesion, we proposed PE to establish fistuloclysis. After evaluating the puncture

location by CT scan, the puncturing was performed by an experienced surgeon (Fig. 1B). Local anesthetic was infiltrated into the skin. Using the Seldinger technique and guided by transabdominal ultrasound, a 18-G needle was reached to the intestine.^[4] Then a metal guide wire was advanced into the intestine. A dilator was used to sequentially expand the tract. A 14-G catheter was then pushed into the intestine. After removal of the metal guide wire, the catheter was directly intubated into the intestine. By reinserting the contrast agent, the position was pinpointed, and no contrast agent spilled over (Fig. 2). Then we fixed catheter at the abdominal wall. One week later, no signs of peritonitis were observed. Ten days after puncture, 50mL of

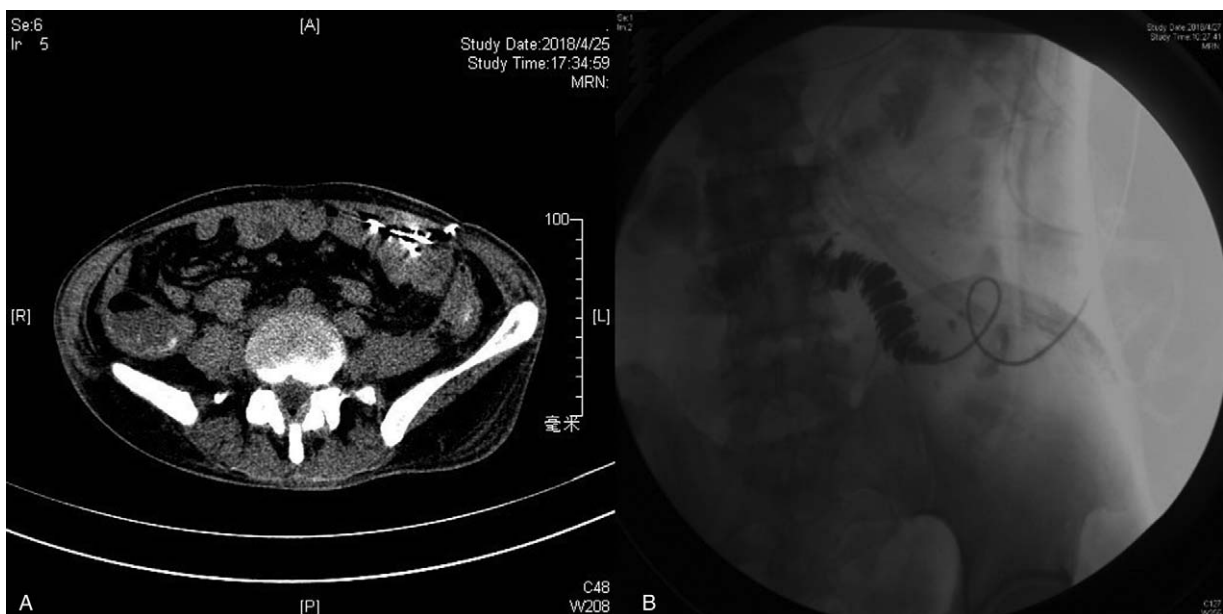


Figure 2. (A) CT scan showed the position was pinpointed. (B) After reinsertion of contrast agent, no contrast agent spilled over. CT=computed tomography.

intestinal fluid was reinfused. The patient showed no discomfort, and the dose of reinfused fluid was gradually increased to the amount of all the collected intestinal fluid. He stoolled per rectum at day 7 after PE. Three weeks after puncture, EN was reinfused with a rate of 10 mL/h (gradually increasing to 80 mL/h), while PN was decreased and interrupted 5 weeks after puncture. There was no significantly change in the fistula output. After his weight became stable, he was discharged to a long-term care facility, receiving full EN via the catheter with a fistula output of 1500 mL/d and EN with a rate of 80 mL/h 8 weeks after PE. No complications were found during the past 4-month follow-up after PE. He is waiting for reconstruction surgery after 6 months' EN.

3. Discussion

Fistuloclysis helps to establish intestinal nutrition and succus entericus reinfusion in the case of controllable mature high-output enterocutaneous fistula. Fistuloclysis can decrease the volume of the fistula output, relieve abdominal pain and distention, improve liver function and nutritional status.^[5] Fistuloclysis-assisted EN, if used appropriately, avoids the complications of long-term PN and may promote fistula healing. In high-output enterocutaneous fistula patients, fistuloclysis can be directly established if an open visual field is available, but sometimes radiological intervention or surgical operation is also needed. Challenges can also arise in case of disturbed vision or abnormal abdominal condition. If the tube cannot reach the distal limb of a fistula, fistuloclysis is not achieved. In this case, we used PE to establish fistuloclysis. The PE is a minimally invasive procedure to establish fistuloclysis for high-output fistula patients with failures in conventional treatment and surgical contradictions. The procedure acts as an irrigation channel that provides succus entericus reinfusion. This method can be limitedly replicated for high-output fistula when fistuloclysis cannot be accomplished with conventional methods.

The Seldinger technique is commonly applied for percutaneous drainage in patients with intra-abdominal abscess.^[6,7] In this emergency, we adopted this technique to establish fistuloclysis and intestinal nutrition since there was no better option. The patients who need PE normally meet the following criteria: First, having high-output enterocutaneous fistula. Second, being physically too vulnerable to go through another surgery while effective fistuloclysis cannot be established via non-surgical methods. Third, having partial recovery of the intestinal function without signs of distal intestinal obstruction. Fourth, having intra-abdominal adhesion (mostly in the puncture sites). The advantage of PE lies in its effectiveness of establishing fistuloclysis with minimized trauma, which can help to restore the functions the bodily organs and avoid the complications of long-term parenteral nutrition. However, this technique also poses some possible challenges: First, puncturing may trigger new intestinal

fistula and complicate the patient's condition. Second, the narrowness of the nutrition tube (14-G single-lumen medical central venous catheter) may potentially lead to clogged tube, which is hard to be replaced. Third, the catheter may escape with the restoration of the intestinal function and decline of the edema and adhesion. Fortunately, these complications didn't occur in this patient due to our cautiousness.

Fistuloclysis can be achieved by diverse methods. For some complicated cases of intestinal fistula, the conventional methods cannot establish the reinfusion channel. In this case, we employed PE to establish the reinfusion channel, making the intestinal tract unobstructed. In this way, the supply of EN was ensured, which led to simplified treatment of this intractable and high output fistula. The application of this technique needs accurate evaluation of the patient's condition and puncture site, infection control, partial recovery of the intestinal function, effective collection of the intestinal fluid. We are confident that with the application of minimally invasive techniques, the suffering of the intestinal fistula patients can be gradually alleviated, and their quality of life can be greatly improved.

Author contributions

Niu DG and Yang F wrote the manuscript. Zhao YZ and Tian WL contributed to the collection and analysis of data. Ding LA, Fang HC and Li C were responsible for the revision of the manuscript. The corresponding author was Huang Q.

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