

Definite surgery with small incision through an external orifice of the fistula successful in treating a special intestinal fistula secondary to Richter-type femoral hernia: A case report and literature review

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Abstract

Background: Enterocutaneous fistula (ECF) caused by femoral hernia is very rare. Inflammation and adhesions in the abdominal cavity are typical pathological features of ECF. ECF without intra-abdominal adhesions which caused by necrosis and perforation of the small intestinal wall caused by Richter-type femoral hernia is a special type of enterocutaneous fistula.

Case presentation: A 56-year-old man complaining of incision disunion and bowel flow after right inguinal abscess incision drainage for months was referred to our hospital. He was a poor, deaf, and mute man who lived alone. Half a year prior, his relatives accidentally discovered a red, swollen, and hot mass in the groin area on his right side, for which he was sent to the local hospital. He was diagnosed with "right inguinal abscess" and underwent operative drainage, after the operation, the incision did not heal for a long time; subsequently, a fistula was formed with the contents of the small intestine flowed out of it. Angiography of the right inguinal fistula revealed a sinus tract in the right inguinal area, which communicated with the small intestinal cavity, and abdominal computed tomography (CT) revealed a sinus tract in the right groin area, with an unclear boundary between the inner opening and the small intestine. He was diagnosed with an intestinal fistula. To avoid intestinal adhesions caused by open surgery, definitive surgery was conducted via a small incision through the fistula. An occult femoral hernia on the left side was accidentally found during laparoscopy performed to examine the abdominal cavity during the operation, and this was repaired at the same time. The patient recovered uneventfully, and was discharged after 8 days.

Conclusion: Intestinal fistula caused by Richter-type hernia is a special type of fistula without inflammation and adhesions in the abdominal cavity. A small incision through the orifice of fistula instead of an open incision through the abdominal cavity can be used to prevent postoperative intestinal adhesions when performing definitive surgery for this type of intestinal fistula, and the combined use of laparoscopy during surgery can help clarify the condition of the abdominal cavity.

Keywords: richter-type femoral hernia; Special enterocutaneous fistula; laparoscopy; small incision through external orifice of the fistula; occult femoral hernia; case report.

Background

Enterocutaneous fistula (ECF) is an abnormal connection between the gastrointestinal tract and skin or wound [1], and approximately 75%–85% of ECFs are caused by inadvertent damage to the gastrointestinal tract during abdominal surgery or postoperative anastomotic leakage, while a small number are caused by intestinal malignant tumors or inflammatory diseases, intestinal diverticula, infections, and other diseases after penetrating the intestinal wall [2,3]. The typical pathological changes in ECFs include the loss of integrity of the intestinal wall for various reasons. Intestinal juice overflows into the abdominal cavity and causes local inflammation. Inflammatory stimulation induces the momentum to wrap around, which limits the intestinal juice and wraps to form an abdominal abscess that destroys the surrounding tissue, which eventually erodes to the skin and forms three structures: internal orifice of fistula, fistula, and external orifice of fistula, eventually leading to the formation of abnormal connections between the gastrointestinal tract and the skin/wound [4]. Because of inflammation in the abdominal cavity, the occurrence of ECFs is usually accompanied by the formation of intra-abdominal adhesions [5].

Case presentation

A 56-year-old man was admitted to our hospital with an abscess in the right groin area that had not healed after incision and drainage with bowel content flowing out for half a year. The patient was found with a painful face by his relatives six months ago. On examination, it was found that there was a red, swollen, and feverish mass in his right

groin area, and he was subsequently sent to the local hospital. He was diagnosed with "right inguinal abscess" and underwent incision and drainage. After the operation, the incision did not heal for a long time, and a fistula was formed, from which the contents of the small intestine leaked; the amount of outflow per day varied from a few milliliters to tens of milliliters, and there was no improvement for half a year. His relatives again took him to the local primary hospital. Radiography of the right inguinal fistula revealed a sinus tract in the right inguinal area, which communicated with the small intestinal cavity (Figure 1A). The patient was then referred to our hospital. Physical examination showed that his abdomen was flat and soft, and a 0.5×0.5 cm external fistula was seen in the right groin area (Figure 1B). A small amount of intestinal content was seen flowing out of the fistula, and the skin

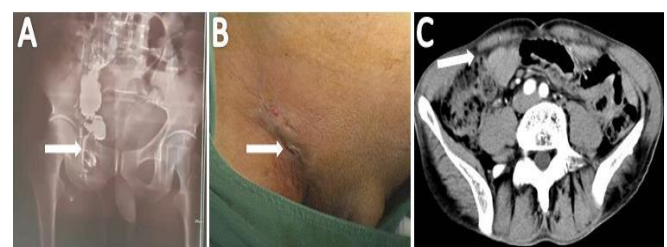


Figure 1: Preoperative examination data of the patients. (A) Radiography of the right inguinal fistula showed a sinus tract in the right inguinal area, which communicated with the small intestinal cavity. (B) Physical examination showed that his abdomen was flat and soft, and a 0.5×0.5 cm external fistula was seen in the right groin area. (C) Abdominal computed tomography (CT) showed a sinus tract in the right groin area, with an unclear boundary between the inner opening and the small intestine.

around the fistula was intact. In auxiliary examination, abdominal computed tomography (CT) showed a sinus tract in the right groin area, with an unclear boundary between the inner opening and the small intestine (Figure 1C). Blood tests results showed a WBC $5.32 \times 10^9/L$ (normal range $3.5 \times 10^9/L - 9.5 \times 10^9/L$), N 0.75 (normal range 0.4–0.75), CRP 2 mg/L (normal range 0.068–8.2). Initial diagnoses was of an enterocutaneous fistula (small intestinal fistula), treated by incision and drainage of the abscess in the right groin area.

Considering that the fistula had not healed for half a year, and the possibility of self-healing was small, we decided to perform definitive surgery. A small oblique incision of approximately 5 cm in length was made through the external orifice of the fistula, and the incision was separated layer by layer; after cutting the right inguinal ligament, we found that part of the small intestinal wall was inserted into the femoral ring with necrosis and perforation. Therefore, we conclude that the intestinal fistula was caused by small intestinal necrosis and perforation after Richter-type femoral hernia strangulation.

To determine the condition of the abdominal cavity, we used laparoscopy, in which part of the small intestinal wall was embedded in the right femoral ring (Figure 2A), and there were no local adhesions, obstruction, adhesions, or tumors in the distal bowel. In addition, an occult femoral hernia was accidentally found on the left side by laparoscopy (Figure 2C). We pulled the incarcerated small intestine out of the abdominal cavity through a small incision, with wedge excision of the necrotic small intestine wall 0.5 cm from the edge of the perforation, and then anastomosed the small intestine wall (Figure 2B). Under the guidance of the laparoscope, the small intestine was returned to the abdominal cavity, and the right femoral hernia was repaired using the McVay method. Considering that the incision on the right was contaminated, we did not repair the left occult femoral hernia with the patch, but instead also repaired it according to the McVay method. Since an incision through the external orifice of the fistula may cause infection of the surgical site, anti-infective treatment was administered after the operation. Postoperative recovery was smooth, and the patient was discharged from the hospital 8 days later. There was no adhesive intestinal obstruction occurred and no recurrence of femoral hernia and intestinal fistula after 1 year of follow-up.

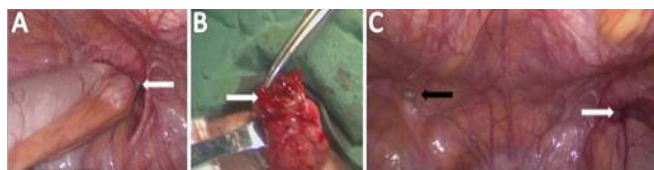


Figure 2: Surgical findings. (A) Part of the small intestinal wall was embedded in the right 290 femoral ring. (B) The incarcerated small intestine was pulled out of the abdominal cavity through a small incision, with wedge excision of the necrotic small intestine wall 0.5 cm from the edge of the perforation. (C) An occult femoral hernia on the left side (black arrow); Part of the small intestinal wall was embedded in the right femoral ring (white arrow).

ECF: Enterocutaneous Fistula; CT: Computed Tomography

Discussion and Conclusions

In addition to typical ECFs, there are some atypical ECFs in clinical practice, one of which is the enteroatmospheric fistula (EAF), which usually occurs after open abdominal surgery, when the fistula lacks soft tissue coverage, and the internal orifice of the fistula is directly exposed to the air [1]; therefore, it is a special type of ECF without a real fistula [6]. Almost all EAFs require close surgical treatment, because the possibility of spontaneous healing is very small [7]. The intestinal fistula in this patient also exhibited atypical features. It was secondary to necrosis and perforation of the small intestinal wall caused by a strangulated Richter-type femoral hernia; the intestinal juice flows directly through the perforated intestinal wall and femoral ring to the body surface, which does not overflow into the abdominal

cavity and causes inflammation or adhesion in the abdominal cavity. Therefore, we believe that this is another special intestinal fistula caused by a rare cause.

The formation process of this special intestinal fistula is related to the patient's special living conditions; he was a poor, deaf-mute person who lived alone, who subsequently chose to endure the pain rather than seeking medical attention because of financial constraints living alone caused no one to know his condition and his condition developed further, his relatives were not aware of his pain until the small intestine wall developed strangulated necrosis and formed an abscess in the right inguinal area. When his relatives took him to a local primary hospital, the patient not provide a detailed medical history due to his deaf-mute condition, which led primary doctors to fail to find the root cause of the abscess in the right inguinal area; only incision and drainage of the right inguinal abscess was performed; the incision remained unhealed for a long time after the operation, and the perforated small intestine was connected to the skin through the femoral ring and an unhealed incision, eventually forming an intestinal fistula.

The treatment of ECFs includes non-surgical treatment, interventional endoscopic treatment, and definitive surgery [8–11]. When an ECF occurs, non-surgical treatment, including active control of infection, water, electrolytes and nutritional disorders, and other complications, and reducing the output is usually performed first [12]. After active non-surgical treatment, approximately 30% of ECFs can heal spontaneously within 4–8 weeks [13], although some low-output fistulas may heal spontaneously within 3–6 months [14]. Interventional endoscopic treatment or definitive surgery should be considered if fistulas do not heal spontaneously after 6 to 8 weeks of non-surgical treatment [2]. Interventional endoscopic treatment of ECFs mainly includes the application of fibrin glue to close the fistula, application of an OTSC anastomosis clip to clip the internal orifice of fistula, and stent implantation in the intestine to isolate the fistula [15–17]. However, each interventional endoscopic treatment method requires the use of special equipment and has disadvantages such as a high failure rate and high treatment cost, and their application has not been widely recognized. A definitive operation for the purpose of resecting the fistula, anastomosing the intestine, restoring gastrointestinal function, and reconstructing the abdominal wall is the only way to cure ECFs when non-surgical treatment or interventional endoscopic treatment fails. Due to the restriction of the narrow femoral ring and the squeezing of the edema around the fistula, the patient's fistula was very small. Because only part of the intestinal wall was embedded in the femoral ring, and the site was necrotic and perforated, the internal fistula was also very small. This resulted in the patient's intestinal fistula being a low-output fistula. Despite its low-flow rate, the fistula had not healed for half a year, and the possibility of self-healing was small. Therefore, definitive surgery was the patient's only choice.

Cases of intestinal fistula caused by strangulation of abdominal wall hernia reported in the previous literature were all cases of intestinal fistula in the acute stage. Due to the heavy inflammation in the tissues around the fistula in the acute stage, definitive surgery was performed by transabdominal opening [18–21]. However, for this patient, because of the long time for the formation of the intestinal fistula, the peripheral inflammatory response had subsided, and the fistula had matures; additionally, it is a special intestinal fistula without intra-abdominal adhesions, and there is no need to separate intra-abdominal adhesions during definitive surgery; therefore, the appropriate surgical method should be selected based on its unique characteristics. In view of the literature reports that open abdominal surgery can cause intestinal adhesions in 93% of patients after surgery

[22], and up to 9% of patients have postoperative adhesive intestinal obstruction [23,24], we surmised that the increased pressure in the intestinal cavity after adhesive intestinal obstruction may also lead to the recurrence of the intestinal fistula. Considering these circumstances, we finally chose to perform definitive surgery for the intestinal fistula through a small incision through the orifice of fistula.

A small incision through the orifice of fistula can avoid postoperative intestinal adhesions caused by open abdominal surgery; however, when restricted by the narrow femoral ring, it is impossible to explore the abdominal cavity and determine whether there are other lesions in the distal bowel. Therefore, laparoscopy was used to clarify the condition of the abdominal cavity during surgery. Through laparoscopy, we confirmed that the intestinal fistula was located in the jejunum, and there was no adhesion or obstruction in the distal bowel; however, we accidentally discovered a hidden femoral hernia on the left side. After pulling the diseased small intestine out of the abdominal cavity through the small incision, we chose to perform wedge resection and suture of the intestine as the internal fistula was very small, while the bilateral femoral hernia was repaired according to the McVay method. The patient's postoperative recovery was smooth. There was no recurrence of external intestinal fistula or femoral hernia during the 1-year follow-up, and no adhesive intestinal obstruction occurred.

To summarize, intestinal fistula caused by Richter-type hernia is a special type of fistula without inflammation and adhesions in the abdominal cavity. A small incision through the orifice of fistula instead of an open incision through the abdominal cavity can be used to prevent postoperative intestinal adhesions when performing definitive surgery for this type of intestinal fistula, and the combined use of laparoscopy during surgery can help clarify the condition of the abdominal cavity.

Declarations

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Authors' contributions: KW carried out the surgical intervention; SL and XH collected, analyzed, and interpreted patients' data. SL drafted the manuscript. KW undertook a critical revision of the manuscript. All authors have read and approved the final version of the manuscript.

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