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Postoperative duodenal fistula: A diagnostic and therapeutic challenge

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Abstract
Postoperative duodenal fistulas are rare but serious complications, most often occurring after abdominal surgery.
They result in major fluid and electrolyte losses, a high risk of sepsis, and delayed wound healing. We report a case of postoperative duodenal fistula illustrating the diagnostic and therapeutic complexity of this condition. Diagnosis is based on the clinical finding of digestive fluid leakage through the surgical wound, and which is confirmed by imaging studies. Management combines drainage, nutritional support, antibiotic therapy, and, in some cases, surgical intervention. Recent advances, particularly enteral nutrition and the use of somatostatin, have significantly reduced mortality. A multidisciplinary approach remains essential to improve patient outcomes.

Keywords: Duodenal fistula, postoperative leak, sepsis, Drainage, somatostatin, surgical complication

Introduction
The term “fistula” generally refers to an abnormal communication between two epithelial surfaces, while a cutaneous fistula is defined as an abnormal connection between any part of the gastrointestinal tract and the skin, lined by epithelium or granulation tissue [1].
Cutaneous fistulas are associated with significant morbidity and mortality, with sepsis and malnutrition being the main causes of death [1].
Duodenal fistulas account for 3-14% of all enterocutaneous fistulas. Unlike other intestinal fistulas, duodenal fistulas present specific challenges related to their high enzyme output, anatomical location, and skin care requirements [2].
Duodenal fistulas can be classified as internal (duodeno-digestive, bilio-duodenal) or external (enterocutaneous fistulas involving the duodenum). They are rare but pose major clinical challenges, including corrosive digestive secretions, massive fluid and electrolyte losses, high risk of infection, and impaired wound healing [3].
The management of this condition requires a comprehensive understanding of its etiology and associated complications, while taking into account the patient’s comorbidities. Effective treatment generally relies on:
(1) control of sepsis, (2) adequate nutritional support, (3) skin protection, and (4) definitive closure of the fistula with restoration of intestinal continuity [2].

Case presentation
We report the case of a 63-year-old male patient who had undergone surgery one year earlier for acute appendicitis. Histopathological examination revealed a low-grade appendiceal mucinous neoplasm with clear surgical margins. Four months later, the patient underwent surgery for urothelial carcinoma of the upper urinary tract, for which a right nephroureterectomy was performed. One year after this intervention, the patient presented with a suspicious mass in the right renal fossa, for which he underwent a biopsy via right lumbotomy. The postoperative course was marked by the discharge of pus and digestive fluid through the right lumbotomy scar (Figure 1), associated with food vomiting and fever. On clinical examination, the patient was hemodynamically and respiratorily stable, with a soft, non-distended abdomen.

Fig 1: Postoperative view showing an infected right lumbotomy scar with discharge of digestive fluid.

Infectious work-up revealed normal white blood cell count but an elevated C-reactive protein (CRP) of 256 mg/L. An abdominopelvic CT scan with oral Gastrografin was performed, revealing an enterocutaneous fistula communicating with a collection in the right renal fossa, extending to the ipsilateral parieto-colic gutter, which contained air bubbles. (Figure 2)

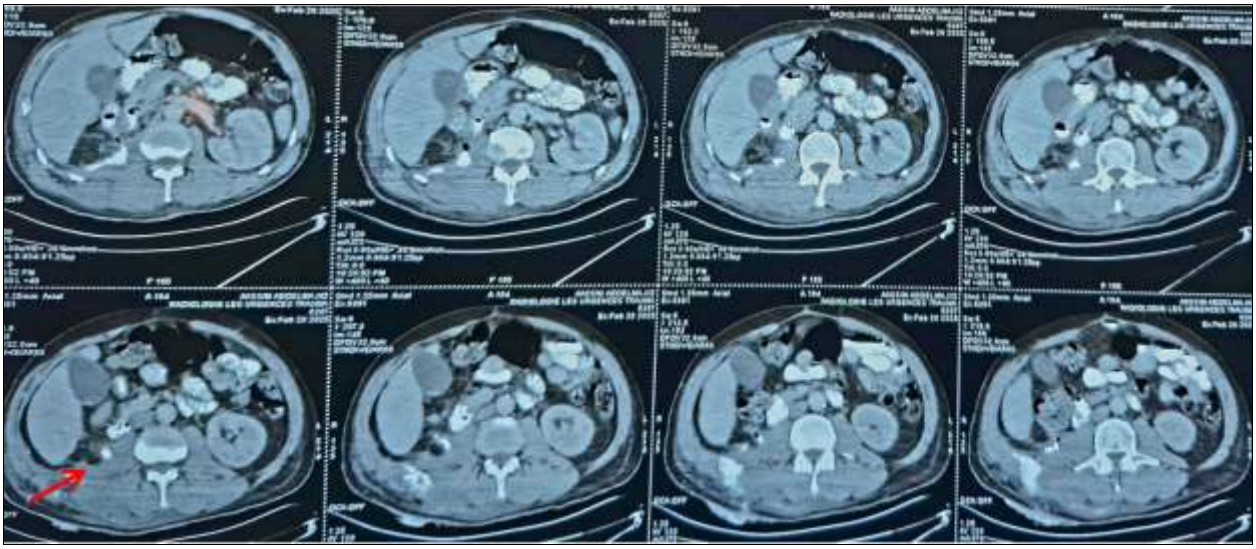

Fig 2: CT scan showing a collection in the right renal fossa containing air bubbles (red arrow).

Intraoperative exploration revealed a 50 mL purulent collection in the right renal fossa with an extensive retroperitoneal tumor-like thickening involving the second portion of the duodenum. After careful dissection, a 1 cm fistula was identified on the lateral wall of the superior genu, with sclerotic edges (Figure 3). The duodenal fistula was catheterized using an 18 Fr Pezzer tube without complications, and a feeding jejunostomy according to the Witzel technique was performed.

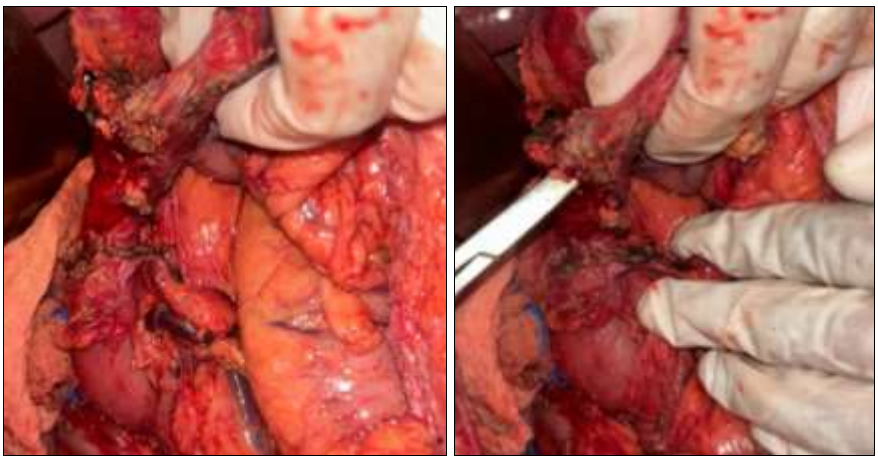

Fig 3: Intraoperative view showing a duodenal fistula on the lateral wall of the superior genu with sclerotic edges

The postoperative course was uneventful. Enteral feeding was initiated on postoperative day 2 via the jejunostomy, with resumption of bowel transit on the same day. The Pezzer tube initially drained approximately 250 mL/day during the first week, with the output gradually decreasing until complete cessation after one month.

A follow-up abdominal ultrasound performed at this time showed no abnormalities. The patient was reviewed one month after surgery for Pezzer tube removal. At six months postoperatively, the patient was in good general condition, with no local complications, and continued management for urothelial carcinoma in the oncology department.

Discussion

Duodenal leaks occur primarily in the postoperative setting, particularly at duodenal suture lines or anastomoses following duodenal repair or resection, and in some cases after a persistent external duodenal fistula following percutaneous management of iatrogenic duodenal injuries. The leak may be contained within the retroperitoneum, but it is generally intraperitoneal [4].

A common feature of external duodenal fistulas is the devastating effect of duodenal contents, rich in bile and pancreatic juice, on surrounding tissues, leading to local and systemic complications that are often resistant to treatment [4].

The majority of duodenal fistulas are surgical complications related to inadequate closure or devascularization of the duodenum. Other predisposing factors include Crohn's disease, trauma, gastroduodenal ulcer, pancreatitis, and cancer [5].

A study conducted in the Department of Surgery at Milton S. Hershey Medical Center over a 12-year period (1973-1984) included eighteen patients with external duodenal fistulas: 14 patients developed the fistula as a postoperative complication, 2 following trauma, while chronic perforation of a duodenal ulcer and metastatic pancreatic cancer each caused one fistula [6]. These results highlight the frequency of this complication in certain high-risk surgical contexts. Our case is consistent with these findings, as the patient also presented with a postoperative duodenal fistula. Although our report involves a single case, it illustrates the diagnostic and therapeutic challenges associated with this complication, in line with the previously published series.

Clinically, the same study reported that the most common sign of an external duodenal fistula was copious intestinal fluid discharge through the abdominal wall, often associated with perifistular skin irritation or excoriation, observed in 11 patients. Additionally, 7 patients showed signs of sepsis, highlighting the severity of the infectious presentation [6]. In our observation, the patient similarly presented with postoperative digestive fluid leakage, consistent with the clinical features described in this series.

Delayed diagnosis and intervention of duodenal perforation may lead to sepsis and multiorgan failure, resulting in high mortality rates (8-23%) [5]. The presence of digestive fluid or gas in a surgical drain postoperatively may also indicate a duodenal injury and external fistula [7]. Further confirmation can be obtained by measuring amylase in the drain fluid, performing CT with oral iodinated contrast, or retrograde imaging with contrast through the fistula [7].

In recent years, the management of duodenal fistulas has improved significantly due to the use of parenteral and enteral nutrition, somatostatin, and broad-spectrum antibiotics, with mortality rates decreasing from 38-75% to 7-40% [7].

The surgical management described consisted of inserting a spiral drain into the duodenum at the leak site, with the intraluminal end directed distally, combined with external drainage and a feeding jejunostomy. A 2000 mL/24 h infusion of normal saline (containing thrombin, tranexamic acid, and rifampicin) was initiated at the end of the operation and continued for an average of 21 days. The spiral drain was then replaced by a 12 Fr silicone drain, which was gradually removed to allow fistula closure [4].

Postoperative duodenal leak rates after emergency repair range from 2-12%, with high mortality. No standardized high-risk management protocol exists to date [8].

Conclusion

External duodenal fistulas are rare, but when they occur, they present a significant surgical challenge. Optimal management relies on a multidisciplinary approach, including sepsis control, nutritional support, skin protection, and, when feasible, prompt surgical intervention—often the best option before the deleterious effects of duodenal contents on surrounding tissues fully manifest.

A thorough understanding of the etiology, comorbid factors, and associated complications remains essential to improve prognosis and quality of life for affected patients.

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Author's Contribution

Not available

Conflict of Interest

Not available

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