

An Uncommon Complication of Post-ERCP Pancreatitis and Duodenal Perforation: Case Report

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Abstract

Introduction: Endoscopic retrograde cholangiopancreatography (ERCP) is a fundamental therapeutic procedure in biliopancreatic disease, although it is associated with potentially severe complications, including post-ERCP pancreatitis (PEP) and duodenal perforation. The latter is rare but carries a high mortality rate. **Case Presentation:** A 52-year-old previously healthy woman underwent ERCP for obstructive choledocholithiasis. Within the first 24 hours, she developed abdominal pain, distension, vomiting, and hemodynamic instability, with elevated serum amylase levels initially consistent with PEP. Due to clinical deterioration, contrast-enhanced computed tomography revealed pneumoretroperitoneum and extensive free fluid, findings suggestive of duodenal perforation. Emergency laparotomy confirmed a perforation in the second portion of the duodenum, which was managed with primary repair and abdominal lavage. The postoperative course was complicated, requiring reinterventions, open abdomen management, and intensive care support. **Discussion:** The coexistence of PEP and duodenal perforation is exceptional and significantly complicates early diagnosis due to overlapping clinical manifestations. Early computed tomography and timely surgical decision-making were decisive in management. **Conclusion:** This case highlights the need for high clinical suspicion and early imaging evaluation in patients with atypical post-ERCP evolution, as well as the importance of a staged, multidisciplinary management approach in highly complex clinical scenarios.

Keywords

Endoscopic retrograde cholangiopancreatography, pancreatitis, intestinal perforation.

INTRODUCTION

Endoscopic retrograde cholangiopancreatography (ERCP) is a hybrid diagnostic and therapeutic technique that combines endoscopy and fluoroscopy. It is widely used in the evaluation of biliary and pancreatic duct disorders. Since its introduction by McCune in 1968, ERCP has evolved into an indispensable tool, particularly for the management of choledocholithiasis, benign and malignant strictures, and

postoperative complications⁽¹⁾. According to the American Society for Gastrointestinal Endoscopy (ASGE) guidelines, ERCP is the treatment of choice for biliary obstruction secondary to lithiasis. Evidence-based recommendations support early intervention in selected cases, such as biliary pancreatitis complicated by cholangitis⁽²⁾. However, ERCP carries clinically significant risks. The most common complications include pancreatitis, hemorrhage, cholangitis, and duodenal perforation. The overall incidence ranges

from 4% to 16%⁽³⁾. Post-ERCP pancreatitis represents the most frequent complication, with reported rates ranging from 1% to 30%, particularly in younger patients, women, and individuals with difficult cannulation⁽⁴⁾. Early recognition is essential, and diagnosis is supported by biochemical markers such as serum amylase and lipase, which allow confirmation within the first six hours after the procedure⁽⁵⁾.

In contrast, duodenal perforation is an uncommon but highly lethal complication. Its estimated incidence ranges from 0.08% to 1.0%, according to multicenter retrospective studies⁽³⁾. Clinical presentation may be silent or nonspecific, which complicates early diagnosis. Current evidence emphasizes the importance of timely detection through contrast-enhanced computed tomography and prompt stratification between conservative and surgical management, depending on the type of perforation and the patient's hemodynamic status^(3,5). Furthermore, in patients with altered gastrointestinal anatomy, such as those with Billroth II or Roux-en-Y reconstructions, the use of double-balloon enteroscopy-assisted ERCP (DB-ERCP) has demonstrated effectiveness. However, it is associated with a non-negligible complication rate, particularly perforation, with an incidence of 3.2% and increased risk in the presence of a native papilla (odds ratio [OR]: 3.268; 95% confidence interval [CI]: 1.426–7.490)⁽⁶⁾.

This case report aims to illustrate an unusual presentation of two major complications following ERCP, namely acute pancreatitis and duodenal perforation, which occurred concomitantly and presented with attenuated clinical signs that hindered the initial diagnosis. Its value lies in highlighting how atypical clinical evolution may mask potentially life-threatening events. This underscores the importance of a comprehensive diagnostic approach guided by clinical suspicion, rigorous hemodynamic monitoring, and early use of advanced imaging. In addition, this case emphasizes the role of computed tomography as a critical tool for redirecting therapeutic strategy in ambiguous scenarios. From an academic perspective, the report contributes to understanding the clinical variability of post-ERCP complications. It also promotes a proactive approach among gastroenterologists, radiologists, and surgeons when facing similar situations, thereby fostering early interdisciplinary decision-making that may directly impact patient survival.

CASE PRESENTATION

A 52-year-old previously healthy female patient was referred for ERCP after obstructive choledocholithiasis was documented by magnetic resonance cholangiography. During the procedure, successful extraction of the stone into the duodenal lumen was achieved, with no immediate adverse events. Twenty-four hours after the procedure,

during hospitalization, the patient developed moderate-intensity abdominal pain (visual analog scale [VAS]: 7/10), progressive abdominal distension, recurrent emesis, and fever. Physical examination revealed tenderness on palpation of the right upper quadrant and right flank, without signs of peritoneal irritation. Empirical treatment with ampicillin/sulbactam was initiated. However, due to the onset of hemodynamic instability, persistent tachycardia, hypotension, and oxygen saturation below 90%, urgent transfer to a high-complexity referral center in southwestern Colombia was undertaken.

Upon admission, inflammatory parameters were not strongly suggestive of severe sepsis (leukocyte count 5,260/ μ L, relative neutrophilia 75.1%). Hemoglobin was 15.5 g/dL. However, a significant elevation in serum amylase was observed (809 U/L). The absence of clinical signs of peritonitis initially supported suspicion of post-ERCP pancreatitis, with an APACHE II score of 11, corresponding to an estimated mortality of 7%–15%. The patient was admitted to the intensive care unit (ICU), where severe metabolic acidosis, hyperlactatemia (7.33 mmol/L), and marked deterioration in the PaO₂/FiO₂ ratio (86 with FiO₂ at 100%) were documented, findings consistent with systemic hypoxic respiratory failure.

Given the clinical severity and atypical disease course, contrast-enhanced computed tomography of the abdomen and pelvis was performed (**Figure 1**). Imaging revealed radiological findings highly suggestive of intestinal perforation, including pneumoretroperitoneum, abundant free fluid, and air within the peripancreatic, right perirenal, right paracolic, subhepatic, subphrenic, and pelvic spaces. The pancreatic gland did not demonstrate major structural abnormalities. Only mild inflammatory changes and peripancreatic fluid involving the body and tail were observed, findings consistent with mild pancreatitis. Based on these tomographic findings, an emergency surgical protocol was activated. During midline supra- and infraumbilical laparotomy, a pinpoint perforation measuring approximately 1 cm was identified in the second portion of the duodenum. The duodenum appeared edematous and friable. Severe peritonitis and right-sided retroperitonitis were also observed. Primary repair of the defect was performed, followed by extensive lavage of the abdominal cavity.

The postoperative course was complex. Continuous vasopressor support was required. Antibiotic therapy was escalated to meropenem and vancomycin. Multiple surgical reinterventions were performed. During one procedure, localized necrosis of the omentum applied over the repaired duodenal area was identified, along with a biliopurulent collection and a new posterior duodenal leak. This was managed with placement of a healthy omental patch and insertion of an ABTHERA® system for temporary abdomi-

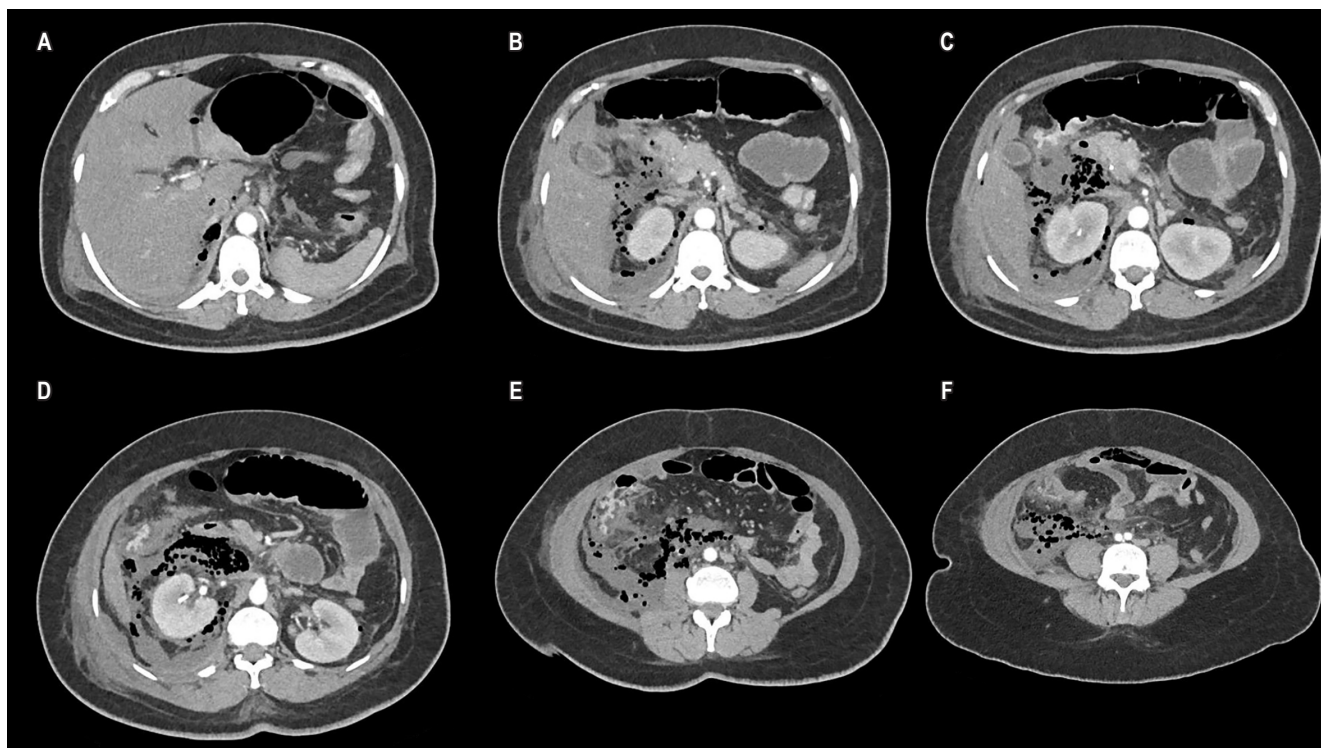


Figure 1. Contrast-enhanced computed tomography of the abdomen and pelvis in the present clinical case. **A-F.** Sequential images in cephalocaudal order demonstrate free air and fluid within the retroperitoneal space, evidenced by involvement of the bilateral perirenal spaces (greater involvement on the right), the right paracolic space, and the subphrenic, subhepatic, and pelvic spaces. These findings demonstrate inflammatory involvement of both the peritoneal and retroperitoneal compartments. Images obtained from the patient's medical record archive.

nal closure. Subsequent procedures demonstrated progression of retroperitoneal necrosis with compartmental involvement: 60% of the intestines, 90% of the retroperitoneum, and 60% of the paracolic gutters. In addition, lateral retraction of the abdominal fascia of approximately 10 cm was observed. Management included traction technique and placement of a temporary mesh. At the time of this publication, the patient remains in the ICU under vasopressor support, with multidisciplinary monitoring by general surgery, infectious diseases, and critical care teams.

DISCUSSION

The coexistence of post-ERCP pancreatitis and duodenal perforation is an uncommon clinical event. It is of particular interest due to its diagnostic and therapeutic implications. Concomitant presentation represents a considerable challenge because of symptom overlap, the possibility of false-negative findings during initial evaluation, and the need for urgent clinical decision-making involving multiple specialties. In this case, progressive clinical deterioration occurred without evident peritoneal signs. This finding underscores

the importance of active surveillance and early integration of imaging studies to reassess initial diagnostic impressions^(7,8).

Although there is a growing trend toward conservative management of certain post-ERCP duodenal perforations, particularly Stapfer type II and IV lesions^(7,9,10), this strategy is not applicable in all clinical settings. Reyes et al. and Dufera et al. documented successful non-surgical management in cases of contained perforations without sepsis or extensive radiological findings^(7,10). In contrast, our patient demonstrated tomographic evidence of pneumoretroperitoneum, periduodenal collection, and free fluid across multiple compartments. These findings, together with hemodynamic instability, justified urgent laparotomy. The radiological profile was consistent with Stapfer type I or II perforation, for which surgical management is clearly indicated⁽⁹⁾.

The literature indicates that the decision between surgical and conservative management should be based on multiple variables, including clinical stability, radiological extent, perforation type, and initial response to treatment^(7,9). Stapfer et al. proposed a topographic classification that has proven useful not only for prognostic stratification but also for therapeutic decision-making⁽⁹⁾. Early surgical interven-

tion in this case likely prevented catastrophic complications such as mediastinitis, refractory sepsis, or extensive tissue necrosis.

An unusual finding in this case was subsequent necrosis of the omental patch used to cover the initial duodenal leak. Although the omentum is generally considered reliable due to its angiogenic and anti-inflammatory properties, its viability may be compromised in the context of persistent biliary leakage, bacterial colonization, and enzymatic pancreatic dissemination. Sánchez-Tembleque et al. previously warned of complications related to malpositioned biliary prostheses that may induce distal duodenal trauma and localized necrosis⁽¹¹⁾. This observation reinforces the need for meticulous intraoperative assessment of tissue used for primary repair or reinforcement.

The use of open abdomen therapy with the ABTHERA® system in this patient represents another distinctive aspect. Although widely employed in trauma surgery and abdominal sepsis, its use in post-ERCP complications has not been extensively documented. In this case, it facilitated access for sequential reinterventions, containment of the septic focus, and progressive management of fascial closure. This strategy may be considered part of the therapeutic armamentarium in cases of severe retroperitonitis, as suggested by prior reports of catastrophic abdomen secondary to ERCP⁽¹²⁾.

From a radiological perspective, the findings of pneumoretroperitoneum, peripancreatic free air, and non-encapsulated intraperitoneal free fluid were critical in directing the diagnosis toward perforation. This is particularly relevant when the clinical presentation overlaps with that of post-ERCP pancreatitis, as described by Peña-Portillo et al. and Cahyadi et al., who emphasized that classical diagnostic criteria for post-ERCP pancreatitis may delay identification of perforation if early imaging findings are not adequately considered^(8,13).

This case presents clinically relevant particularities due to the simultaneous coexistence of post-ERCP pancreatitis and duodenal perforation, accompanied by atypical progression and attenuated clinical signs. This presentation contrasts with most national and international reports, in which these complications occur independently and with a more evident clinical picture. In a recent Colombian study conducted by Del Castillo et al., the incidence of post-ERCP pancreatitis was 2%, consistent with the lower rates reported in high-volume, experienced centers. However, asymptomatic hyperamylasemia reached 30%, highlighting the importance of correlating biochemical findings with the clinical context in order to avoid misdiagnosis and delays in identifying severe complications such as perforation⁽¹⁴⁾.

A critical reassessment of surveillance protocols in post-ERCP patients is warranted, particularly in cases involving prolonged procedures, difficult cannulation, or retracted papilla. Elevation of pancreatic enzymes alone should not

automatically lead to the diagnosis of post-ERCP pancreatitis when progressive clinical deterioration is present. This case underscores the need for a rigorous and multidisciplinary clinical approach to post-ERCP complications, especially when presentation is atypical or when multiple adverse events, such as pancreatitis and duodenal perforation, coexist. In clinical practice, a high level of diagnostic suspicion should be maintained in the presence of any hemodynamic deterioration or progressive abdominal symptoms, even when classical signs of peritonitis are absent or minimal.

Early imaging studies, particularly contrast-enhanced computed tomography, should be considered essential for confirming or excluding perforation and defining the anatomical extent of involvement. Interdisciplinary coordination is fundamental for timely decision-making. Clinical management must balance conservative and surgical approaches according to the patient's clinical and radiological status. Furthermore, the endoscopist's experience and technical approach, including prudent pancreatic duct cannulation and cautious use of balloon dilation techniques, represent modifiable factors that may reduce the incidence of complications. In accordance with local evidence, including that reported by Del Castillo et al., routine measurement of amylase levels in asymptomatic patients should be avoided in order to prevent diagnostic confusion and unnecessary management. Interpretation of biochemical markers should always be contextualized within the comprehensive clinical picture⁽¹⁴⁾. Timely use of computed tomography, multidisciplinary collaboration, and up-to-date knowledge of anatomical and clinical classification systems support improved decision-making in highly complex scenarios^(7,9,13). This approach may be graphically summarized as a sequential pathway from clinical suspicion to surgical resolution, structured around five critical axes: recognition of clinical risk, implementation of dynamic monitoring, stratified assessment of tissue injury, stepwise surgical intervention, and prevention of major complications (**Figure 2**).

CONCLUSION

Beyond statistics and classification systems, this case highlights the need to recognize ERCP as a highly precise but also high-risk procedure, whose complications may exceed any initial prediction. The insidious clinical course observed in this patient and the complex sequence of subsequent events demonstrate that potentially lethal injuries may coexist even after an apparently successful technique. This scenario reinforces the need to move beyond conventional linear diagnostic reasoning and to adopt active and sustained surveillance based on clinical judgment, radiological criteria, and readiness to reintervene when

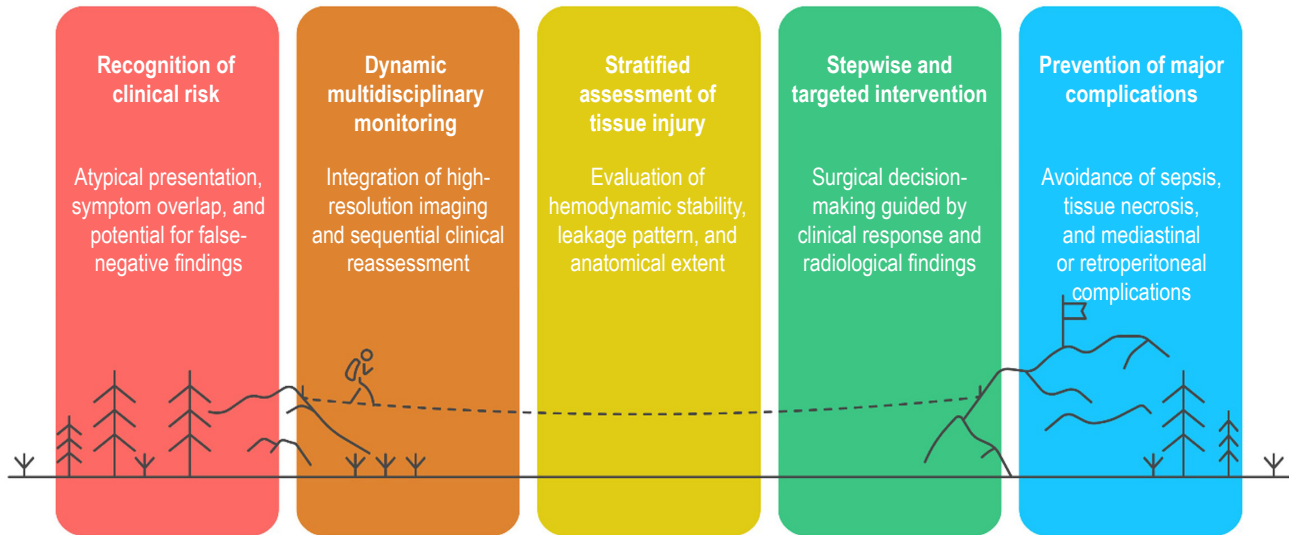


Figure 2. Stepwise resolution pathway in severe post-ERCP complications. Diagram illustrating a five-stage progressive framework for the clinical and radiological management of post-ERCP complications, particularly duodenal perforation associated with pancreatitis. The figure emphasizes the need for a dynamic and interdisciplinary approach that begins with early recognition of clinical risk and culminates in the prevention of catastrophic outcomes. This model integrates clinical judgment, advanced imaging, anatomical stratification of injury, stepwise surgical decision-making, and surveillance of retroperitoneal or mediastinal complications. Image property of the authors.

clinical progression demands it. More than an unusual presentation, this report invites reconsideration of how risk is interpreted in therapeutic endoscopy. In certain contexts, success lies not only in preventing complications but also in detecting them before they become fully manifest.

Conflicts of interest

The authors declare no conflicts of interest. This manuscript was funded with personal resources.

Ethical considerations

Publication of this case was conducted with the patient's authorization for dissemination of clinical, paraclinical,

and imaging data derived from the medical record. The principles of beneficence, nonmaleficence, and justice were upheld. Informed consent was duly obtained from the participant, ensuring confidentiality and privacy, with preservation of anonymity.

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Authors' contributions

All authors contributed to the study conception, drafting of the manuscript, preparation of the final version, revision, and approval of the manuscript.

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