

Early endoscopic management of an infected acute necrotic collection misdiagnosed as a pancreatic pseudocyst: A case report

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Abstract

BACKGROUND

Infected acute necrotic collection (ANC) is a fatal complication of acute pancreatitis with substantial morbidity and mortality. Drainage plays an exceedingly important role as the first step in invasive intervention for infected necrosis; however, there is great controversy about the optimal drainage time, and better treatment should be explored.

CASE SUMMARY

We report the case of a 43-year-old man who was admitted to the hospital with severe intake reduction due to early satiety 2 wk after treatment for acute pancreatitis; conservative treatment was ineffective, and a pancreatic pseudocyst was suspected on contrast-enhanced computed tomography (CT). Endoscopic ultrasonography (EUS) suggested hyperechoic necrotic tissue within the cyst cavity. The wall was not completely mature, and the culture of the puncture fluid was positive for A-haemolytic Streptococcus. Thus, the final diagnosis of ANC infection was made. The necrotic collection was not walled off and contained many solid components; therefore, the patient underwent EUS-guided aspiration and lavage. Two weeks after the collection was completely encapsulated, pancreatic duct stent drainage *via* endoscopic retrograde cholangiopancreatography (ERCP) was performed, and the patient was subsequently successfully discharged. On repeat CT, the pancreatic cysts had almost disappeared during the 6-month follow-up period after surgery.

CONCLUSION

Early EUS-guided aspiration and lavage combined with late ERCP catheter drainage may be effective methods for intervention in infected ANCs.

Key Words: Infected acute necrotic collection; Pancreatic pseudocyst; Endoscopic ultrasonography; Endoscopic retrograde cholangiopancreatography; Endoscopic ultrasound-guided fine-needle aspiration; Case report

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Core Tip: Infected acute necrotic collection (ANC) is a potentially fatal disease. Endoscopic ultrasound (EUS)-guided fine-needle aspiration is recommended when the diagnosis is unclear. Endoscopic drainage is the optimal treatment for infected necrosis and is generally performed 4 wk after onset. Herein, we present a case in which an infected ANC was misdiagnosed as a pancreatic pseudocyst and was successfully treated by early EUS-guided aspiration and lavage combined with late endoscopic retrograde cholangiopancreatography catheter drainage. EUS-guided aspiration and lavage may be used as a bridge while waiting for the necrotic collection to be fully encapsulated before draining.

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INTRODUCTION

Acute necrotic collections (ANCs) form within the first 4 wk of necrotizing pancreatitis and contain varying amounts of fluid and necrotic pancreas and peripancreatic tissue and are often accompanied by a rupture of the main pancreatic duct and increased susceptibility to infection[1]. Infection of ANCs can be diagnosed either by radiologically demonstrated 'bubbles' or by positive Gram staining or culture *via* fine-needle aspiration (FNA)[2]. Compared to imaging, FNA has a greater diagnostic yield, but its use for purely diagnostic purposes is not recommended, as it is adopted only when a definitive diagnosis cannot be made[3,4].

Drainage is the first step of invasive intervention for infected necrosis. However, there is a lack of consensus on the optimal timing of intervention, and the guidelines recommending delayed intervention are mainly drawn from studies in the era of surgical necrosectomy and lack evidence from prospective studies[5,6]. In this study, we present a case in which an infected ANC was misdiagnosed as a pancreatic pseudocyst (PPC), which was diagnosed by endoscopic ultrasound-guided FNA (EUS-FNA) and successfully treated by early EUS-guided aspiration and lavage combined with late endoscopic retrograde cholangiopancreatography (ERCP) pancreatic duct stent drainage. This endoscopic combination therapy is feasible for infected ANCs when the collection communicates with the pancreatic duct and has never been described before.

CASE PRESENTATION

Chief complaints

We report the case of a 43-year-old man who was admitted to our hospital with severe intake reduction due to early satiety.

History of present illness

The patient complained of severe abdominal pain, accompanied by nausea and vomiting, after heavy consumption of spirits with a high alcohol concentration 20 d prior. The local hospital diagnosed acute pancreatitis. After receiving medical treatment, such as medications to inhibit acid and inhibit pancreatic enzyme secretion, the patient was discharged with improvement. However, two weeks later, the patient experienced severe intake reduction due to early satiety and left upper abdominal pressure, and computed tomography (CT) showed multiple pseudocysts around the pancreas. The local hospital diagnosed PPC, and conservative treatment was ineffective.

History of past illness

He had no previous history of gallstones.

Personal and family history

The patient had a history of drinking more than 20 years and drank approximately 500 mL/d of high-concentration liquor.

Physical examination

The left upper abdomen showed a large mass with clear boundaries and poor motion.

Laboratory examinations

The patient's leukocyte count was $9.72 \times 10^9/L$, his neutrophil ratio was 77.5%, and his C-reactive protein level was 73.49 mg/L. His pancreatic amylase level was slightly elevated ($84 \mu/L$), while his blood amylase level was within normal limits.

Imaging examinations

On 13 February 2023, contrast-enhanced CT showed multiple cystic foci in the abdominal cavity and low-attenuated, homogeneous fluid collections, with a maximum diameter of $89 \text{ mm} \times 76 \text{ mm}$ (Figure 1A).

EUS revealed multiple cystic masses with hyperechoic necrosis and arterial vessels, the maximum size of the cysts was $56 \text{ mm} \times 36 \text{ mm}$, and the necrotic collection was not completely wrapped (Figure 2A).

MULTIDISCIPLINARY EXPERT CONSULTATION

We invited the director of the Gastroenterology Department of the First Affiliated Hospital, Zhejiang University and the director of the Radiology Department of our hospital to participate in a multidisciplinary discussion. The onset time of acute pancreatitis was less than 4 wk, and EUS confirmed that the cystic cavity contained necrotic debris and that the collection was not completely wrapped; thus, ANC was performed. The patient had signs of gastrointestinal outlet obstruction, such as a severe eating disorder caused by early satiety. Conservative medical treatment was ineffective, so there were indications of invasive treatment intervention. The collection mixture was not completely encapsulated; therefore, EUS-guided aspiration and lavage were recommended to relieve the symptoms of compression. An unexpected finding was observed when the CT was reread, as the cyst was connected to the pancreatic duct (Figure 1A). Therefore, ERCP catheter drainage could be performed after the collection was completely encapsulated.

FINAL DIAGNOSIS

EUS-FNA revealed exudate, and his lactate dehydrogenase level was 16228.9 U/L. Culture revealed *A-haemolytic Streptococcus*, so he was ultimately diagnosed with ANC infection.

TREATMENT

On 19 February 2023, the first intervention was performed under intubation anaesthesia. EUS-guided puncture extracted a small amount of bloody fluid, approximately 50 mL in total, and the cystic cavity almost completely disappeared after several repeated rinses with sterile saline, and the procedure was considered a smooth procedure (Figure 2B).

The postoperative compression symptoms were significantly relieved without fever, bleeding or other discomfort. CT examination 3 d after surgery showed that the pancreatic cyst was substantially reduced, with a maximum diameter of approximately $40 \text{ mm} \times 59 \text{ mm}$ (Figure 1B).

Two weeks later, CT examination revealed that the cyst size was similar to that at the last examination (Figure 1C); therefore, we conducted another intervention, catheter drainage through ERCP. After intubation and general anaesthesia, the gastroscope was passed smoothly through the oesophageal and stomach cavities. The papilla was found on the medial part of the descending duodenum, and the guidewire was inserted into the pancreatic duct through an incision that was made with a knife. The pancreatic duct was not dilated under fluoroscopy, and a 5-7 Fr plastic pancreatic stent was placed on the main pancreatic duct. Endoscopic drainage was smooth, and the X-ray fluoroscopy stent was in a good position (Figure 3).

OUTCOME AND FOLLOW-UP

The patient recovered well and was successfully discharged 3 d later. The outpatient follow-up showed no obvious discomfort, and CT examination after 3 months indicated that the pancreatic cyst was substantially smaller than before, with a maximum diameter of $27 \text{ mm} \times 22 \text{ mm}$ (Figure 1D). CT reexamination at 6 months after surgery showed that the cyst had basically disappeared (Figure 1E).

DISCUSSION

Approximately 10%-20% of acute pancreatitis cases progress to necrotizing pancreatitis, and one-third of these patients develop secondary infections[2,7]. Infected necrosis is associated with high morbidity and mortality and usually occurs after 3-4 wk or earlier in acute pancreatitis but is rare within 1 wk[2,5,8]. The diagnosis of infected necrosis is critical. Signs of infectious necrosis include new or persistent sepsis, clinical worsening despite adequate support, and no other

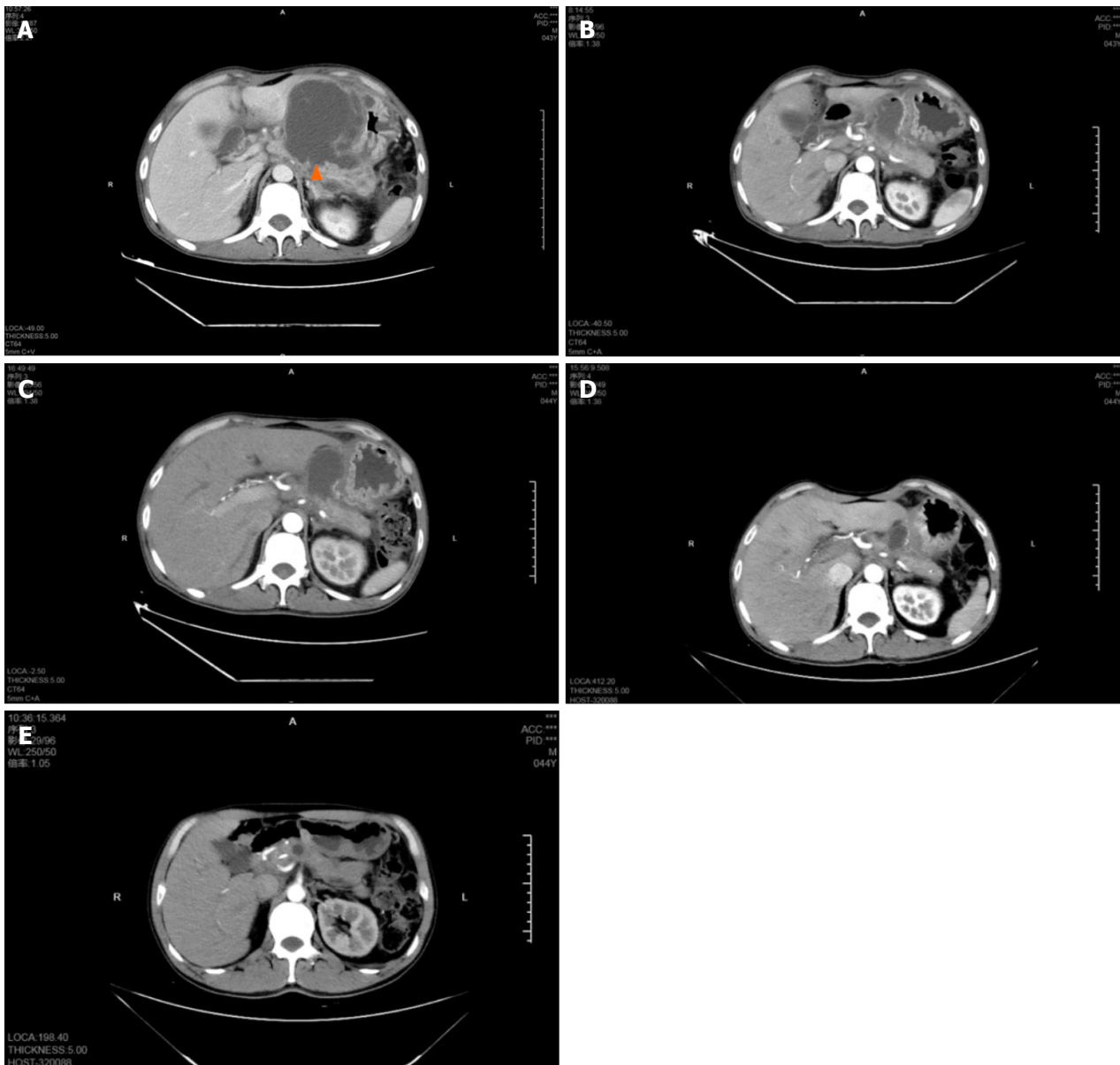


Figure 1 Contrast-enhanced computed tomography. A: On February 13, 2023, multiple cysts were seen in the hepato-gastric space, low-attenuated, homogeneous fluid collections, with a maximum diameter of 89 mm × 76 mm, the cyst was communicates with the pancreatic duct (orange triangle); B: The cyst size was about 40 mm × 59 mm after 3 d of the first intervention; C: Two weeks later, computed tomography examination before the second intervention showed that the cyst size was similar to the last check; D: After 3 months of follow-up, the size of the cyst was about 27 mm × 22 mm; E: After 6 months of follow-up, the size of the cyst was about 6 mm × 8 mm.

source of infection[1]. CT or magnetic resonance imaging occasionally reveals gas within (peri-) pancreatic collections, which is present in almost 42% of patients[9]. For patients whose imaging diagnosis is difficult, EUS-FNA can be used, but it is not recommended for diagnosis only and is usually performed before endoscopic drainage[3,4]. In our case, the patient had no fever, his inflammatory serum markers were slightly elevated, and there was a lack of bubble signs on CT, making it easy to misdiagnose. Therefore, in patients with atypical clinical symptoms and CT findings suggestive of PPC, physicians should be alert to infected necrosis when conservative medical treatment is ineffective, and EUS-FNA is recommended for definitive diagnosis.

According to the 2012 revised Atlanta Classification, pancreatic fluid collections (PFCs) are classified into 4 categories according to the time of onset and histological features: Acute peripancreatic fluid collections, ANCs, PPCs and walled-off necrosis[2]. Most aseptic PFCs resolve spontaneously without intervention. However, when the patient has refractory abdominal pain; symptoms of gastrointestinal obstruction, such as nausea, vomiting, or early satiety; signs of infection; or signs of obstruction of the biliary tract, drainage is recommended[10].

The treatment strategies for infected necrosis have undergone a shift from open surgery to minimally invasive surgery to step-up therapy[11,12]. Drainage is an extremely important first step in invasive intervention, and studies have shown that approximately half of patients recover with drainage, avoiding the need for necrosectomy[13]. However, the optimal drainage procedure is controversial, and prospective studies are lacking. International guidelines recommend that drainage, either percutaneous or transluminal, be performed after 4 wk when the collection is walled off[6,14]. A

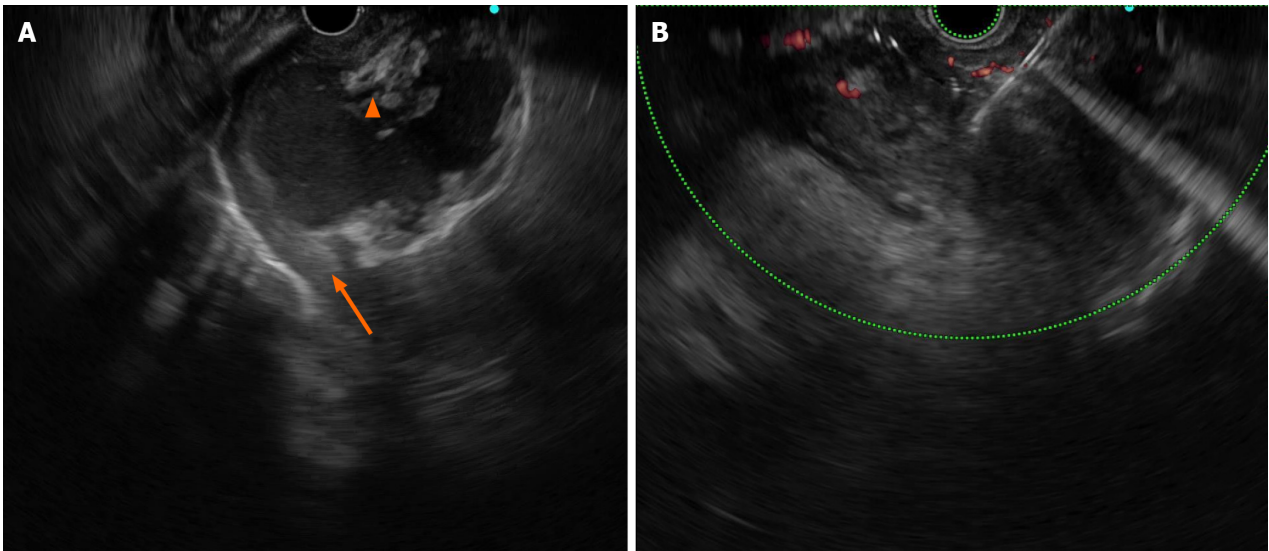


Figure 2 Endoscopic ultrasound-guided aspiration and lavage. A: The size of the cyst cavity was 56 mm × 36 mm, with necrotic debris (orange triangle), and the necrotic collection was not walled-off (orange arrows); B: The cystic cavity almost disappeared after intervention.

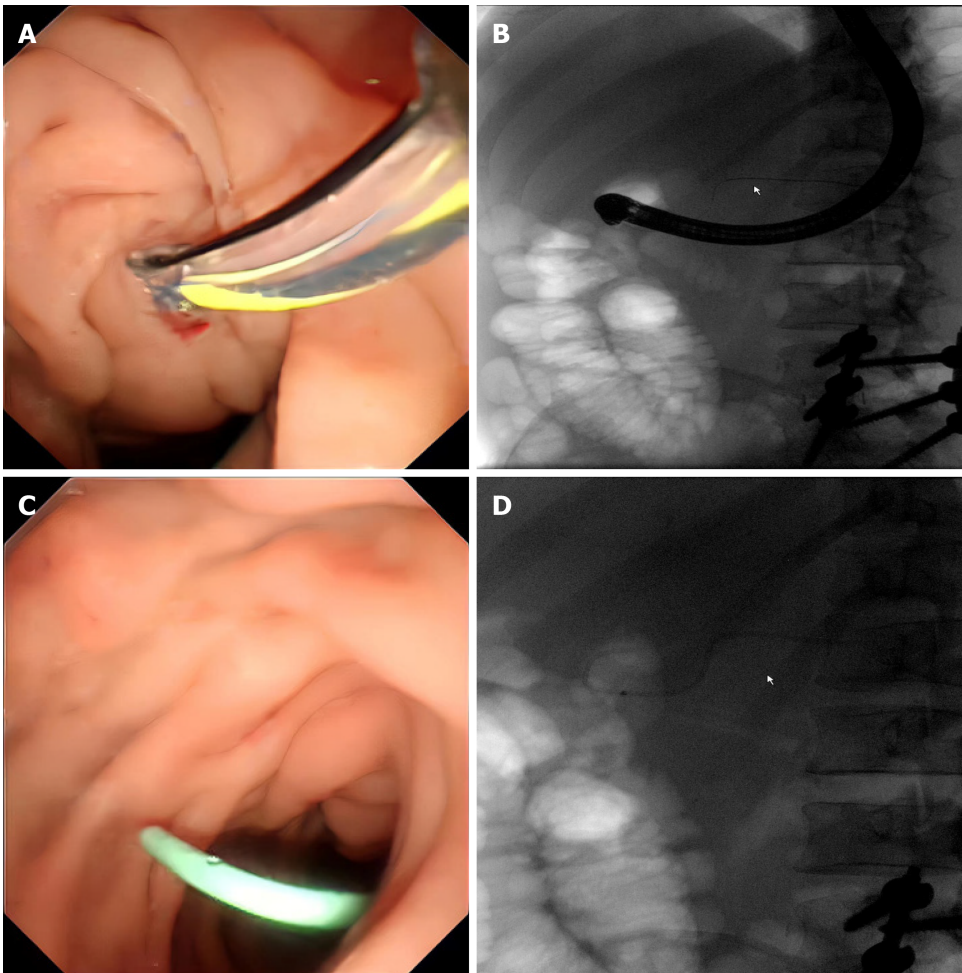


Figure 3 Endoscopic retrograde cholangiopancreatography pancreatic duct stent drainage. A: The guidewire was inserted into the pancreatic duct through an incision knife; B: Iodophor angiography; C: A 5-7 Fr plastic pancreatic stent was placed in the main pancreatic duct under fluoroscopy; D: X-ray fluoroscopy stent was in a good position.

systematic review and meta-analysis showed that early intervention is associated with increased mortality[15]. Nevertheless, the American College of Gastroenterology recommends that drainage be performed when infected necrosis is confirmed, and percutaneous drainage should be given priority in the acute stage (first 2 wk)[16].

Both percutaneous drainage and endoscopic drainage are first-line treatments for fluid collection[5]. In this patient, the pancreatic cyst was close to the gastric wall, so endoscopic transmural drainage was preferred. However, EUS revealed that the collections were not completely encapsulated or liquefied; therefore, drainage was abandoned, and aspiration and lavage were performed as transitional treatments. These interventions help to relieve symptoms, control infection and lay the foundation for subsequent treatment.

Pancreatic cysts are classified into seven types based on their anatomical location in relation to the main pancreatic duct[17]. ERCP drainage can be performed only in patients with small (< 5 cm) cysts communicating with the pancreatic duct[18]. ERCP pancreatic duct stent placement is the cornerstone of treatment for pancreatic duct leakage. Many studies have suggested the effectiveness of transpapillary drainage for the treatment of pancreatic cysts, and this approach is conducive to promoting leakage closure[19,20]. The most common complications were acute pancreatitis, stent-induced scarring of the main pancreatic duct and infection[1]. In our case, the collection was connected to the pancreatic duct and was significantly reduced by the first intervention; therefore, we adopted ERCP catheter drainage after the collection was fully walled off, avoiding pancreatic fistula and puncture bleeding compared to percutaneous and transmural drainage.

CONCLUSION

Early endoscopic diagnosis and treatment play important roles in the prognosis of infected patients with necrosis. For the first time, we successfully used EUS-guided aspiration and lavage combined with ERCP catheter drainage for the treatment of infected ANCs, avoiding debridement and poor outcomes. EUS-guided aspiration and lavage may be used as a bridge before drainage and provide clinicians with a new idea for the management of infected necrosis.

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