

# Emphysematous Pancreatitis Mimicking Bowel Perforation

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## ABSTRACT

Emphysematous pancreatitis is a rare complication of acute necrotizing pancreatitis, which carries a mortality rate of up to 70%. It has only been described in isolated case reports. We report a patient who presented with suspected bowel perforation and was subsequently found to have emphysematous pancreatitis that was managed successfully with multidisciplinary team involvement.

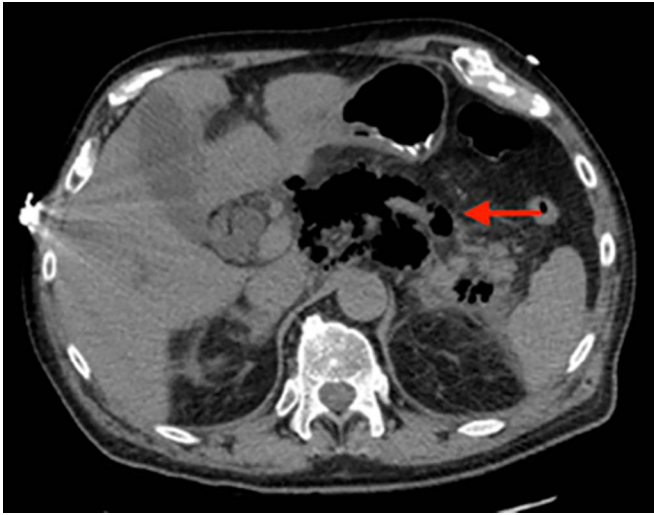
## INTRODUCTION

Acute pancreatitis is responsible for more than 1 million emergency department (ED) visits in the United States, and it is currently one of the most common gastrointestinal diagnoses for inpatient hospitalization.<sup>1</sup> Most cases are self-limited and resolve with supportive care alone.<sup>2</sup> Because the incidence of hospitalizations for acute pancreatitis has increased over the past decade, it is important for clinicians to appropriately recognize the acute complications that can arise from severe disease because this can enable them to initiate timely and appropriate treatment.<sup>1</sup> Severe acute pancreatitis can potentially lead to pancreatic necrosis and the development of acute necrotizing pancreatitis (ANP). The associated complications of multisystem organ failure can lead to a wide array of devastating manifestations. Up to 40% of patients with ANP can have a superimposed infection of the necrotic tissue.<sup>2</sup> Rarely, ANP can become infected with gas-forming bacteria, which leads to the development of gas in and around the pancreas, an entity known as emphysematous pancreatitis (EP). As an extremely rare and life-threatening variant of severe acute pancreatitis, EP has only been described in isolated case reports. It is mostly known to be caused by *Escherichia coli*, although *Pseudomonas aeruginosa*, *Klebsiella pneumoniae*, *Enterobacter*, and *Clostridium perfringens* are also associated organisms.<sup>3</sup> We report a patient who presented with suspected bowel perforation and was subsequently found to have EP that was managed successfully with multidisciplinary team involvement.

## CASE REPORT

A 73-year-old man with a history of alcohol dependence presented to the ED with complaints of 5 days of epigastric pain and fevers. A social history was remarkable for the consumption of 80 oz of beer daily. In the ED, his vitals were notable for a temperature of 103°F, blood pressure of 88/56 mm Hg, and a heart rate of 118 beats per minute. Physical examination was remarkable for altered mental status, epigastric tenderness to palpation and guarding, without rebound. Laboratory results were notable for white blood cells  $12 \times 10^9/L$  (with 5% bands), alanine transaminase 97 U/L, aspartate transaminase 179 U/L, alkaline phosphatase 120 U/L, total bilirubin 8.6 mg/dL, direct bilirubin 5.5 mg/dL, and lipase 901 IU/L. Abdominal computed tomography (CT) showed marked intrahepatic and extrahepatic biliary dilation with extensive retroperitoneal gas-containing fluid surrounding the pancreatic bed, which was initially concerning for bowel perforation (Figure 1). The collection overall measured  $6.8 \times 16.2 \times 18.8$  cm in anterior-posterior, transverse, and craniocaudal axis, respectively.

Because of the concern for perforated viscus, a stat CT with oral gastrografin was obtained; however, it failed to show perforation. Although a diagnostic endoscopic ultrasound (EUS) could have been performed to further evaluate the dilated common bile duct



**Figure 1.** Abdominal computed tomography showing significant pancreatic and peripancreatic gas-containing fluid collection, initially concerning for perforated viscus.

(CBD) for stones or sludge, given the high clinical suspicion for acute cholangitis with hemodynamic instability meeting 5 of the 5 Reynolds pentad criteria and high probability of requiring biliary drainage, urgent endoscopic retrograde cholangiopancreatography (ERCP) was performed. ERCP showed proximal CBD and intrahepatic biliary dilation with the suggestion of a focal biliary stricture at the major papilla during cineradiography, without evidence of biliary stones (Figure 2). A biliary stent was placed, and the patient clinically improved and had a downtrend of liver function tests. Distal CBD biopsies returned as benign. The patient was managed and followed by

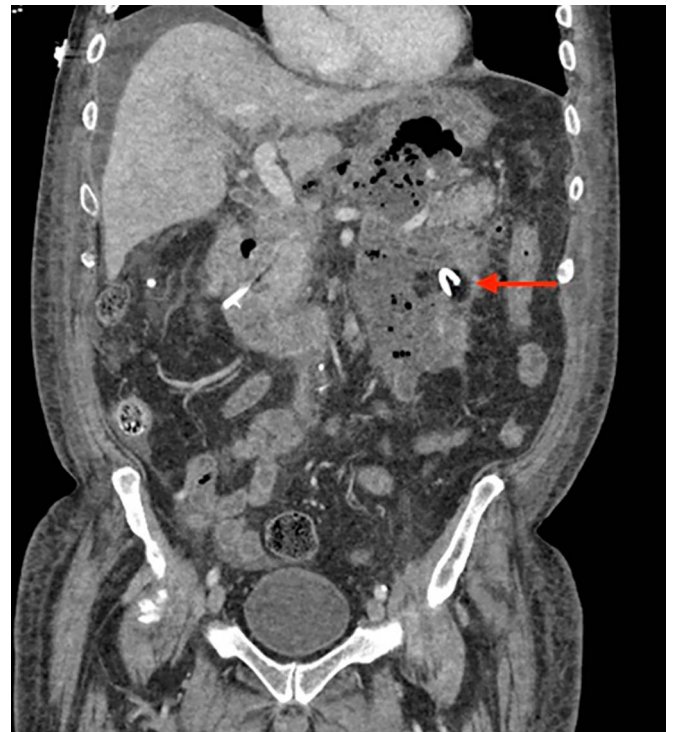


**Figure 2.** Endoscopic retrograde cholangiopancreatography showing marked intrahepatic and extrahepatic biliary dilation and no filling defect in the common bile duct.

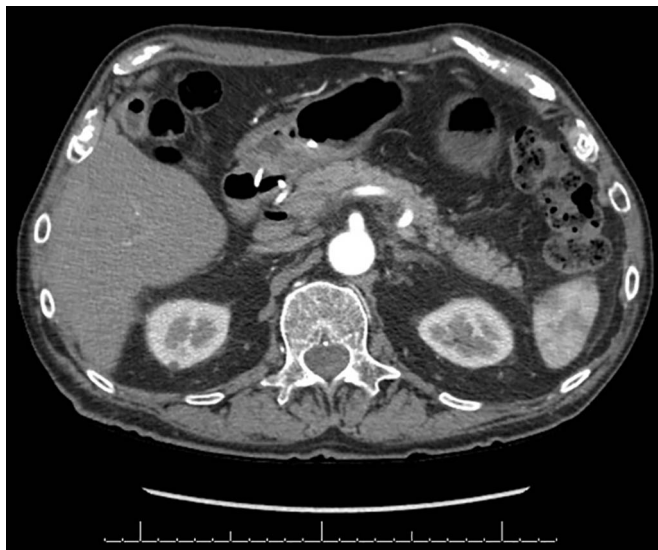
both interventional gastroenterology and hepatobiliary surgery services and was initially treated with medical management and IV antibiotics. On hospital day 6, because of worsening sepsis and concern for inadequate source control, a retroperitoneal drain was placed into the acute necrotic collection (ANC) with purulent drainage (Figure 3). Due to a high concern for infection in the setting of ANC which was not walled off, the decision was made to pursue a percutaneous approach instead of an EUS-guided cyst gastrostomy. Both drain and blood cultures grew *K. pneumoniae*. The patient was continued on IV antibiotics with progressive clinical improvement and was discharged home in stable condition. He presented 3 weeks later with dislodgement of the percutaneous drain, and an EUS-guided cyst gastrostomy stent was placed into the walled-off pancreatic necrosis. Follow-up CT scan 12 weeks later showed complete resolution of the walled-off pancreatic necrosis (Figure 4). The cyst gastrostomy stent was removed, and the patient remained asymptomatic.

## DISCUSSION

EP is a rare complication of ANP and carries a mortality rate of up to 70%.<sup>2</sup> Diagnosis is established typically by CT scan in the appropriate clinical setting, which reveals characteristic findings of parenchymal nonenhancement with intrapancreatic or peripancreatic gas and fluid collections. Although not necessary, diagnosis can be confirmed by isolation of the offending organism through peripancreatic fluid aspiration. Given its infrequent occurrence, however, imaging findings can easily be



**Figure 3.** Computed tomography demonstrating the tip of the drain in the fluid collection.



**Figure 4.** Computed tomography at 12 week follow-up demonstrates catheter between gastric antrum and collapsed cystic cavity posterior to the antrum of stomach, with resolution of air and fluid collections seen previously.

mistaken with other more common pathologies, such as bowel perforation. Alcohol use is the most common etiology and accounts for about 54% of reported cases of EP.<sup>4</sup> Our patient likely developed severe acute pancreatitis because of significant ongoing alcohol use, which was complicated by the progression of necrosis to EP. The etiology of the suspected distal CBD stricture and biliary dilation on ERCP was not clear, and this can be related to a passed CBD stone or papillary stenosis. Given the paucity of reported cases, the guidelines for the treatment of EP are limited. Although conservative management for typical acute pancreatitis is a well-known appropriate treatment strategy, the combination of both pancreatic necrosis and infection with gas-forming bacteria in EP necessitates a more aggressive approach, including potentially performing percutaneous drainage. In our patient, because of high clinical suspicion of acute cholangitis, it was felt that the benefit of performing ERCP with biliary drainage outweighed the risk of introducing infection into the ANC. Although the presence of peripancreatic gas was historically thought to be an indication for emergent surgery, data in the past 2 decades have shown that percutaneous drainage has been associated with decreased mortality rates.<sup>5,6</sup>

A stepwise approach to techniques described in the literature is typically appropriate and ranges from conservative with IV antibiotics to percutaneous or endoscopic drainage and surgical necrosectomy. In our patient, after multidisciplinary discussions with the interventional radiology and hepatobiliary

surgery team, a EUS-guided cyst gastrostomy was not performed initially because the acute necrotic fluid collection was not walled off. However, because of high clinical concern for infection, it was felt that drainage through the percutaneous approach was necessary. Once the fluid collection was walled off 3 weeks later, an EUS-guided cyst gastrostomy was performed. Given its associated high mortality rate, early and prompt treatment of EP is crucial and requires individualized treatment with multidisciplinary team involvement.

## DISCLOSURES

**Author contributions:** S. Sandhu wrote the article, reviewed the literature, revised it for intellectual content, approved the final article, and is the guarantor of the article. D. Alhankawi, J. Chintanaboina, and D. Prajapati revised the article for intellectual content and approved the final article.

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**Informed consent** was obtained for this case report.

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