



# Emphysematous Pancreatitis: An Uncommon Cause of Intraperitoneal and Retroperitoneal Gas

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## Abstract

Acute Pancreatitis (AP) is a frequent abdominal emergency. Emphysematous Pancreatitis (EP) is an uncommon form of AP characterized by the destruction of the pancreatic parenchyma with diffuse air infiltration. We present the case of a 73-year-old woman with acute epigastric pain and epigastric tenderness. Lab workup showed elevated serum lipase, high C-reactive protein, and renal failure. Abdominal CT-scan was consistent with EP showing a marked distortion of the pancreas, a large amount of gas either in the pancreatic parenchyma as intraperitoneal and retroperitoneal spaces with. Intraoperative findings revealed diffuse necrosis of the pancreas. No digestive tract perforation was found. A cholecystectomy, an extensive pancreatic necrosectomy combined with open packing was performed. *Escherichia coli* was isolated from the peritoneal fluid. The patient died after four days of surgery.

EP is a severe life-threatening disease. Clinical symptoms are nonspecific, and diagnosis is often difficult. Abdominal CT-scan is the diagnostic imaging modality of choice. Conservative management strategy based on percutaneous drainage or medical management alone seems to be correlated with decreased mortality rate compared with surgery.

**Keywords:** Emphysematous Pancreatitis; Tomography; Necrotizing pancreatitis

## Introduction

Acute Pancreatitis (AP) may present diverse clinical forms with different degrees of severity. Acute Emphysematous Pancreatitis (EP) is a rare and severe form [1]. EP is characterized by the parenchymal destruction with diffuse air infiltration of the pancreas and peri-pancreatic spaces [2], mostly occurring among the diabetic or immunocompromised patients [3]. CT-scan is the diagnostic imaging modality of choice [1,3]. The rarity of this entity hampers the establishment of therapy of choice based on a large number of cases. This work aims to report a case of EP diagnosed with gas within the pancreatic parenchyma associated with intraperitoneal and retroperitoneal free gas.

## Case Presentation

A 73-year-old woman, with a past medical history of type 2 diabetes and high blood pressure, presented to our Emergency Department complaining of a 48-h epigastric pain associated with nausea and recurrent vomiting. She denied alcohol use. Physical examination revealed epigastric tenderness but no fever and no jaundice. The abdomen was distended. Biological exams showed elevated serum lipase of 713 U/l, C-reactive protein level of 40 mg/l and renal failure. The patient was found to have a metabolic acidosis with a base excess of -18. Abdominal CT-scan showed the presence of gas in the pancreatic bed that markedly distorted the pancreatic parenchyma (Figure 1) along with retroperitoneal gas extended to the lesser sac and free intraperitoneal gas. These imaging findings, the clinical features, and lab results raised the diagnosis of EP. A few hours later, the patient presented septic shock and a laparotomy was performed. The intraoperative findings revealed diffuse necrosis of the pancreas and the presence of intrapancreatic gas and in the lesser sac (Figure 2). There was no digestive tract fistula. The diagnosis of EP was confirmed. A cholecystectomy, extensive pancreatic necrosectomy, and multiple debridements were performed combined with open packing. *Escherichia Coli* was isolated from the peritoneal fluid. The patient died after four days of surgery.

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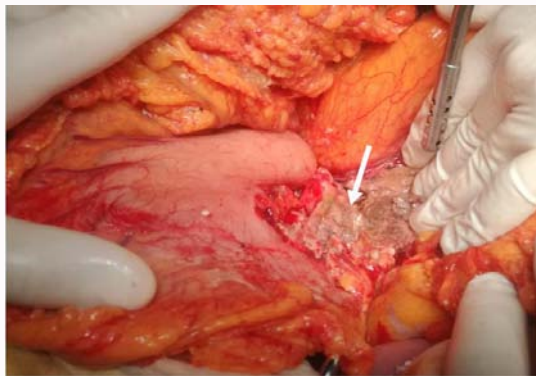
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**Figure 1:** Abdominal enhanced CT scan images showing emphysematous pancreatitis, gas in the pancreatic bed (star) within the portal vein, within the left kidney (red arrow) and free intraperitoneal gas (white arrow).



**Figure 2:** Intraoperative picture showing diffuse necrosis (white arrow) of the pancreas.

## Discussion

EP is a subtype of acute necrotizing pancreatitis characterized by a collection of gas within and surrounding the pancreatic tissue. It is considered a rare subtype of AP with a high rate of mortality [2,3]. The causes of EP are duodenal diverticulum, patulous ampulla of Vater, perforating duodenal ulcer; however, the most common cause is an infection [4]. The organisms usually associated with the EP are gram-negative anaerobes, the most common being *Escherichia Coli* and others being *Pseudomonas aeruginosa*, *Klebsiella pneumoniae*, *Acinetobacter baumannii* and *Clostridium perfringens* [5]. The way these infectious organisms reach the pancreatic parenchyma involves (i) translocation through enteropancreatic fistulas, (ii) via hematogenous or lymphatic dissemination, and (iii) biliopancreatic reflux [6]. AP is a life-threatening condition [1,7] imposing a rapid diagnosis, which is based on the presence of epigastric pain associated with serum lipase greater than 3 times the upper normal limit. EP has no specific clinical features; however, the abdominal CT scan is helpful for making the diagnosis, showing pancreatic necrosis with multiloculated gas [8]. Peritoneal gas could have many origins. The dilemma is essential with emphysematous infected pancreatic necrosis. However, this condition occurs essentially after seven to ten days of patient's history and CT-scan included typically a low-density center, rim of enhancement, and possible gas bubbles. Other conditions like intestinal pneumatosis, renal abscess, polycystic kidneys, and pancreatic fistula to the duodenum, jejunum, or colon should be ruled out to avoid unnecessary surgery.

Concerning the treatment, EP is considered as an infected pancreatic necrosis reason why the management should include broad-spectrum antibiotics, intravenous fluids, and pain control. The emergency surgical procedure depends on case-by-case [9]. For many

years, surgery was the first-line treatment for EP, but currently, some studies proved that a conservative management alone or associated with percutaneous drainage showed a decrease in the mortality rate [9-11].

In our patient, the severe hemodynamic instability and neurological function impairment guided the option for a surgical procedure. However, in stable patients, conservative management should be considered as the first-line treatment, and drainage should be done after the tissue liquefaction and the development of wall-off necrosis are established [1,9,10]. Further trials and guidelines are needed for the management of this type of pancreatitis. To date, probably due to the rarity of emphysematous pancreatitis, only a few studies address this entity exclusively.

## Conclusion

In conclusion, EP is uncommon pathological forms of AP. Clinical signs are often non-specific what may be responsible for misdiagnosis and unnecessary surgery. Abdominal CT-scan is the imaging diagnostic method of choice. In the case of clinical evidence of pancreatitis, or the presence of gas within the pancreatic parenchyma associated with retroperitoneal and intraperitoneal gas, the diagnosis of EP must be considered, and conservative treatment should be chosen as the first-line approach.

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