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Emphysematous pancreatitis associated with penetrating duodenal ulcer

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Abstract

In the "proton pump inhibitors era", a penetrating peptic ulcer (PPU) represents an exceptional cause of abdominal pain, and was more frequently observed in the past where there was not an effective antacid treatment. Ulcer-induced pancreatitis is very rare, too, and manifests with persistent, intense pain radiating to the back. A mild to severe pancreatitis with peripancreatic fluid collection can be observed at imaging. However, only a few cases of association between PPU and emphysematous pancreatitis (EP) have been published in the literature. EP is a rare but potentially fatal form of acute necrotizing pancreatitis in which gas grows in and outside the pancreas, and typically involves the whole parenchyma in diabetic individuals.

Here we report an extremely rare case of a duodenal ulcer penetrating the pancreas and complicated with EP.

Unlike the classic form of EP, which involves the whole parenchyma and has a poor prognosis, we found that the emphysematous involvement of the pancreas by PPU has a benign course if a conservative therapy is promptly established. Gas is confined to the site of penetration, usually the pancreatic head, and ulcers most often involve the duodenum.

Key words: Acute; Pancreatitis; Emergency department; Gas-forming bacteria

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Core tip: Penetrating peptic ulcers (PPU) represent an extremely rare cause of abdominal pain, and can sometimes manifest with mild to severe acute pancreatitis. However, only a few cases of association between PPU and emphysematous pancreatitis (EP) have been published so far in the literature. Here we report an extremely rare case of a duodenal ulcer penetrating the pancreas and complicated with EP. Unlike the classic form of EP, which involves the whole parenchyma and has a poor prognosis, we found that the focal emphysematous involvement of the pancreas by PPU has a benign clinical course if an appropriate therapy is promptly established.

Tana C, Silingardi M, Giamberardino MA, Cipollone F, Meschi T, Schiavone C. Emphysematous pancreatitis associated with penetrating duodenal ulcer. *World J Gastroenterol* 2017; 23(48): 8666-8670 Available from: URL: <http://www.wjgnet.com/1007-9327/full/v23/i48/8666.htm> DOI: <http://dx.doi.org/10.3748/wjg.v23.i48.8666>

INTRODUCTION

In the "proton pump inhibitors era", a penetrating peptic ulcer (PPU) represents an exceptional cause of abdominal pain, and was more frequently observed in the past where there was not an effective antacid treatment. Ulcer-induced pancreatitis is very rare too, and manifests with persistent, intense pain radiating to the back^[1-3]. A mild to severe pancreatitis with peripancreatic fluid collection can be observed at imaging^[4]. However, only a few cases of association between PPU and emphysematous pancreatitis (EP) have been published in the literature, and complete information regarding epidemiology are unknown. Here we report an extremely rare case of a duodenal ulcer penetrating the pancreas and complicated with EP.

CASE REPORT

A 49-year-old man presented with an acute complaint of epigastric pain radiating to the back 30 min

after an excessive intake of fried, high fat food. He also reported a daily intake of nonsteroidal anti-inflammatory drugs for low back pain for over a year. There was no history of alcohol consumption. Physical examination revealed fever (38 °C), abdominal rigidity, tenderness and torpid peristalsis. Laboratory exams showed an increase in erythrocyte sedimentation rate (46 mm/h), c-reactive protein (27.01 mg/dL), lipase (226 U/L), and leucocytosis with neutrophilia (20.1 and $18.4 \times 10^3/\mu\text{L}$, respectively). Hemoglobin, amylase and liver tests were normal. Procalcitonin was 1.45 ng/mL. Abdominal X-ray was negative. Ultrasound (US) did not reveal gallstones or free fluids; bile ducts were not dilated. Pancreas was not evaluable due to meteorism. Blood cultures were collected. Abdominal contrast-enhanced computed tomography (CECT) showed the presence of gas within the pancreatic head, suggestive of focal EP (Figure 1A), and oedema of the duodenum (Figure 1B). There was no free air suggestive of perforation. Clinical examination, laboratory tests and imaging did not reveal signs of obstructive jaundice; there was therefore no indication for an early endoscopic retrograde cholangiopancreatography. The mild oedema of the duodenum in close relation to the damaged pancreas suggested a duodenal origin of the pancreatic gas, we therefore suspected a PPU as the cause of symptoms. Esophagogastroduodenoscopy (EGD) revealed a small duodenal ulcer with the hole at the bottom, confirming the diagnosis of PPU. The surgeon indicated conservative therapy (IV rehydration, bowel rest, proton pump inhibitors, antibiotics), and clinical, laboratory and imaging findings progressively improved. After 4 wk, symptoms resolved and we observed a clear improvement of the pancreatic damage at CECT follow-up.

DISCUSSION

EP is a rare but potentially fatal form of acute necrotizing pancreatitis in which gas grows in and outside the pancreas, and typically involves the whole parenchyma in diabetic individuals^[5]. Acute pancreatitis is classified as oedematous and necrotizing, and most common causes are gallstones and alcohol use. Less frequently, metabolic causes (hypertriglyceridemia, hypercalcemia), drugs, trauma, infections, auto-immune and genetic causes can be found^[6-11]. Rarely, peptic ulcers can penetrate the pancreas and cause pancreatitis, which usually manifests with mild to severe pancreatitis with peripancreatic fluid collections. In the last few years, the incidence of complicated peptic ulcers has decreased by one-half and one-third in males and females, respectively. However, complete information regarding epidemiology of association between PPU and EP is still lacking^[12]. The overall mortality of EP is high, estimated around 32.8%. The presence of advanced age, hypotension, gas outside the pancreas on CT, multiorgan failure and

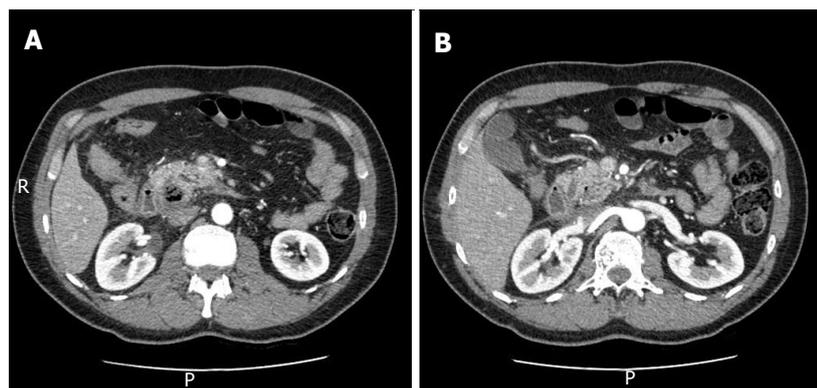


Figure 1 Abdominal contrast-enhanced computed tomography showing the presence of gas within the pancreatic head. A: Suggestive of focal emphysematous pancreatitis; B: Oedema of the duodenum. There was no free air suggestive of perforation.

initial surgical evacuation is associated with higher mortality. Therefore, less invasive approaches have been replacing surgery for their better outcome^[13]. Percutaneous or endoscopic aspirations are indeed useful to drain collections and to isolate bacteria by aerobic/anaerobic cultures^[5].

The clinical picture is characterized by epigastric pain, nausea, vomiting, and development of multi-organ failure in severe cases^[14]. Laboratory tests are non-specific; only a slight elevation of amylase and lipase can be found, and the presence of pancreatic enzyme elevation does not correlate with the severity of the disease^[14]. US evaluation can hardly detect a focal emphysematous involvement and, unlike other abdominal inflammatory processes^[15-22], cannot be used alone to achieve the correct diagnosis. CECT is useful to reveal the presence and severity of gas in and outside the parenchyma^[23], and gas-forming microorganisms may enter from the bowel by haematogenous and lymphatic routes, through the ampulla of Vater or by transmural passage from the adjacent colon. Endoscopy or sphincterotomy can be associated with EP, and a causal relation between EP and PPU has also been hypothesized^[24]. Only a few cases have been documented so far, and gas is confined to the site of penetration, usually the pancreatic head, and ulcers most often involve the duodenum^[25].

The diagnosis of PPU is made with EGD, which reveals an ulcer with the hole at the bottom^[3]. Imaging, such as CECT, is useful to reveal the focal presence of gas within the pancreatic parenchyma but is less useful to reveal peptic ulcers, in particular if they are small and posterior^[14,26,27]. In our case, CECT showed focal emphysema of the pancreatic head and also mild oedema of the duodenum, suggesting the intestinal origin of the gas.

Unlike the classic form of EP, which involves the whole parenchyma and has a poor prognosis, we found that the focal involvement of the pancreas by PPU has a benign clinical course if a conservative

therapy is promptly established. In view of the clinical and laboratory stability of this patient and the absence of signs of perforation, we in fact preferred to treat him conservatively obtaining a clinical and imaging improvement over time, as documented by CECT follow-up.

In conclusion, the focal presence of gas within the pancreas is a rare condition which should be carefully investigated because it can be associated with an underlying condition not evident on imaging. PPU can be suspected as the cause of EP when the pancreas is involved focally without any other apparent cause of inflammation. A prompt conservative treatment is associated with a good outcome if established promptly, especially if the parenchymal involvement is mild and the patient is hemodynamically stable.

COMMENTS

Case characteristics

A 49-year-old man presented with an acute complaint of epigastric pain radiating to the back after an excessive intake of fried, high fat food and of nonsteroidal anti-inflammatory drugs for low back pain.

Clinical diagnosis

A focal emphysematous pancreatitis due to a penetrating duodenal ulcer was observed.

Differential diagnosis

Perforated ulcer.

Laboratory diagnosis

Laboratory tests are non-specific; only a slight elevation of amylase and lipase can be found, and the presence of pancreatic enzyme elevation does not correlate with the severity of the disease.

Imaging diagnosis

Contrast-enhanced computed tomography is useful to reveal the presence and severity of gas in and outside the pancreatic parenchyma.

Treatment

A prompt conservative treatment is associated with a good outcome if

established promptly, especially if the parenchymal involvement is mild and the patient is hemodynamically stable.

Related reports

Very few cases of association between penetrating ulcers and emphysematous pancreatitis have been published in the literature. This case shows that the focal presence of gas within the pancreas is a rare condition which should be carefully investigated because it can be associated with an underlying condition not evident on imaging.

Term explanation

A penetrating peptic ulcer represents an exceptional cause of abdominal pain and was more frequently observed in the past where there was not an effective antacid treatment.

Experiences and lessons

Focal emphysematous pancreatitis is a rare condition that could be associated with penetrating ulcers and has a benign clinical course if a conservative therapy is promptly established.

Peer-review

This is a nice case report on a rare case of a duodenal ulcer penetrating the pancreas and complicated with emphysematous pancreatitis. This manuscript is generally of interest. The authors provided the complete review of this issue.

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