

Concurrent Emphysematous Cholecystitis and Emphysematous Pancreatitis: A Case Report¹

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Emphysematous infections of the abdomen and pelvis are potentially life-threatening conditions which require aggressive medical and surgical management. Therefore, early radiographic detection is important in the management of these conditions. Concurrent emphysematous infections involving different organs have been rarely reported, and primarily occur in immunocompromised patients. Here, we report a rare case of concurrent emphysematous cholecystitis and emphysematous pancreatitis in a 97 year old male patient.

Index words : Emphysematous cholecystitis
Pancreatitis
Tomography, X-ray computed

Emphysematous infections of the abdomen and pelvis are gas-forming infections within the parenchyma of solid organs or the walls of the hollow viscera. Some well known emphysematous infections include emphysematous cholecystitis, emphysematous gastritis, emphysematous pancreatitis, emphysematous pyelonephritis, and emphysematous cystitis (1). An emphysematous infection in more than one organ is very rare (2) and, to the best of our knowledge, no previous reports exist pertaining to the radiologically demonstrated simultaneous occurrence of emphysematous cholecystitis and emphysematous pancreatitis. We report a rare case of concurrent emphysematous infection of the gallbladder and the pancreas.

Case Report

A 97-year-old man visited the emergency room at our hospital, complaining of abdominal pain, nausea, and vomiting for the last 2 days. The patient denied having any previous medical disease or alcohol abuse. Upon physical examination the patient's body temperature and blood pressure was 36.9 °C and 110/70 mmHg, respectively. Furthermore, the patient's abdomen was distended with increasing bowel sounds. The laboratory data revealed leukocytosis ($13.5 \times 10^3 / \mu\text{L}$), mild anemia (12.3 g/dL), mild thrombocytopenia ($102 \times 10^3 / \mu\text{L}$), increased serum creatinine (2.8 mg/dL), and fasting hyperglycemia (fasting glucose, 171 mg/dL, reference range: 70 - 110 mg/dL). The serum concentrations of amylase and lipase were 525 U/L (reference range: 28 - 100 U/L) and 194 U/L (reference range: 22 - 51 U/L), respectively. Moreover, an electrocardiography revealed an atrial fibrillation with a slow ventricular response.

A supine abdominal radiograph, performed upon hospital admission, revealed the gaseous distension of the

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stomach and duodenum, gas collection around the gallbladder shadow, and mottled gas bubbles in the upper middle abdomen (Fig. 1A).

Computed tomography (CT, Somatom Sensation 64, Siemens, Erlangen, Germany) scan of the abdomen (Fig. 1B, D) and coronal reformatted images (Fig. 1C) were obtained with slice thicknesses of 5 mm and reconstructed intervals of 5 mm, without intravenous contrast media because of the patient's decreased renal function. The CT images revealed gas bubbles in the distended gallbladder wall and pancreatic parenchyma with peripancreatic inflammation.

An emergency percutaneous cholecystostomy was performed and a large amount of thick yellowish pus and small gallstones were drained. In addition,

Enterococcus faecium and *Citrobacter freundii* were isolated from the pus and the leukocytosis persisted despite intensive antibiotic therapy. Moreover, surgical treatment could not be performed due to the patient's severely debilitated condition.

Despite intensive treatment, the patient's condition progressively worsened and resulted in death after a 6 week hospitalization period.

Discussion

Emphysematous cholecystitis is a rare and severe form of acute cholecystitis caused by gas-forming organisms. High proportions of patients afflicted with this condition are between 50 and 70 years of age and have

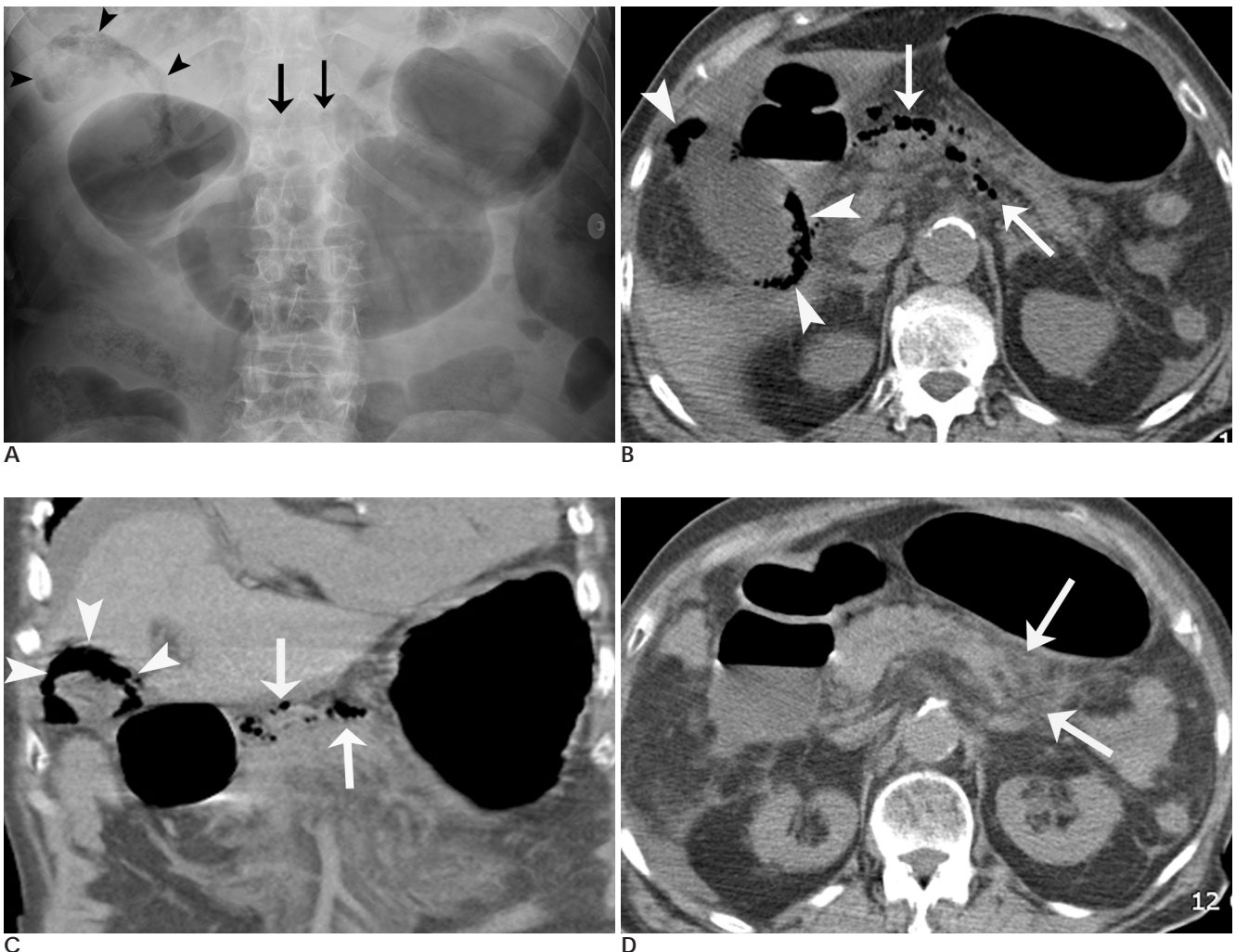


Fig. 1. A 97-year-old man with concurrent emphysematous cholecystitis and emphysematous pancreatitis. **A.** A supine abdominal radiograph performed upon hospital admission revealed gas collection around the gallbladder shadow (arrowheads) and mottled gas bubbles in the upper middle abdomen (arrows). The stomach and duodenum are distended with gas. **B, C and D.** An axial CT scan (Fig. B) without intravenous contrast media and a coronal reformatted image (Fig. C) show gas collections (arrowheads) in the wall of the distended gallbladder and mottled gas bubbles (arrows) in the head and body of the pancreas. An axial CT scan (Fig. D) shows peripancreatic inflammatory changes (arrows).

underlying diabetes mellitus as well as peripheral atherosclerotic disease. Vascular compromise of the cystic artery is thought to play an important role in the evolution towards the emphysematous form of this disease. Compared to all the cases of acute cholecystitis, emphysematous cholecystitis is associated with an increased prevalence of acalculous disease and gallbladder perforation (1, 3). In the present case study, the patient had small gallstones that were drained out through the cholecystostomy tube which were undetected in the CT scan. Emphysematous cholecystitis can definitely be treated with a cholecystectomy, although a percutaneous cholecystostomy may be used as an initial temporizing procedure. The overall mortality rate for patients with emphysematous cholecystitis is higher (up to 15%) than uncomplicated acute cholecystitis (1, 3).

The staging of emphysematous cholecystitis with conventional radiography has been characterized. Stage 1: the presence of gas within the gallbladder lumen; stage 2: the presence of gas within the gallbladder wall; stage 3, the presence of gas within the pericholecystic tissues. A liver abscess, retroperitoneal air, overlying bowel gas, enterobiliary fistula, gallstone ileus, and incompetent sphincter of Oddi should be included in the differential diagnoses for hyperlucency of the right upper quadrant at conventional radiography. CT is the most sensitive and specific imaging modality, which allows for the identification of gas within the gallbladder lumen or wall (1, 4).

Emphysematous pancreatitis is a rare form of pancreatitis where gas is seen in the pancreatic parenchyma coexisting with pancreatitis. The infected organisms may reach the pancreas by way of the bloodstream or lymphatic channels, a fistula from an adjacent bowel, transmural passage from the transverse colon or reflux of enteric organisms into the pancreatic duct or biliary tree via a patulous ampulla of Vater. The early radiographic detection of retroperitoneal gas is critical for the evaluation of the superimposed emphysematous infection of the pancreas. Although the conventional abdominal radiography may demonstrate the mottled gas overlying the midabdomen, CT is considered the modality of choice for detecting parenchymal gas as well as evaluating its location and extent (1, 2, 5). However, the presence of pancreatic gas alone is not specific for em-

physematous pancreatitis. Other sources of pancreatic gas include reflux from the duodenum, following a sphincterotomy and enteric fistula without inflammation (6). The prognosis of emphysematous pancreatitis is grave, and successful treatment requires aggressive management of the infection with systemic antimicrobial therapy and control of septic shock. Early surgical debridement or percutaneous drainage is usually performed (1, 2, 7).

An emphysematous infection in one organ is rarely accompanied by emphysematous infection in other organs (2, 8). Emphysematous pancreatitis has been rarely reported together with emphysematous cholecystitis and emphysematous cystitis, usually in debilitated and immunocompromised patients with underlying diabetes mellitus or renal failure. They usually have a poor prognosis (2, 8). In our case, reflux of enteric organisms into the biliary tree and the pancreatic duct associated with gallstones may be responsible for concurrent emphysematous pancreatitis and cholecystitis.

In summary, concurrent emphysematous cholecystitis and emphysematous pancreatitis is a rare but life-threatening condition which requires an early radiologic diagnosis for successful treatment and improved prognosis.

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