Emphysematous pancreatitis
Published on 18.09.2016

DOI: 10.1594/EURORAD/CASE.13661
ISSN: 1563-4086
Section: Abdominal imaging
Area of Interest: Abdomen
Procedure: Surgery
Imaging Technique: CT
Special Focus: Acute Case Type: Clinical Cases
Authors: Antonio Navarro Baño; Francisca Velázquez Marín; Juan Francisco Martínez Martínez; Santiago Ibáñez Caturla; Ana Azahara García Ortega.
Patient: 68 years, male

Clinical History:
A 68-year-old man without known allergies. No DM. No arterial hypertension. Non-smoker. Ischemic stroke 11 years ago. Peptic oesophagitis. No surgical history of interest. In the last year an ultrasound and gastroscopy was performed without pathological findings. The patient came to the emergency room with diffuse abdominal pain. At admission in Emergency room, he had no fever but he had very important laboratory abnormalities: Leukocytosis (21000), pancreatic amylase 2590 U/L (normal 13-53 U/L), RCP 23ng/mL.

Imaging Findings:
Pancreas presents irregular and not well-defined borders with adjacent mesenteric fat stranding with fluid collections (inflammatory changes), with gas presence at pancreatic regions, and also may be present in the minor sac, hepatic hilium, hepatic fissure, pararenal spaces, root of mesentery, etc. Multiple foci of gas in the necrotic pancreas with a large collection, containing both fluid and gas around the body of the pancreas (inside pancreatic cell).

Discussion:
Background: Emphysematous pancreatitis is a rare but serious complication of acute pancreatitis. Few cases have been described in the literature. It is characterized by total or subtotal destruction of the pancreas, with occupation with pancreatic cell gas. The evolution towards this type of pancreatitis may be suspected if the patient has fever and noticeable abdominal guarding in the course of acute pancreatitis [7].

Gas-forming organisms from the bowel may enter the pancreas to cause emphysematous pancreatitis [2]. Besides infection with gas-forming bacteria such as Escherichia coli, Clostridium, Staphylococcus, Streptococcus, Klebsiella, Candida and Pseudomonas, other possible sources include bland tissue infarction with necrosis, enteric fistula formation, and reflux from the adjacent hollow viscus [7]. Other clinical factors that contribute to the increased production or slowed removal of gas include a depressed cell-mediated immune response, local tissue necrosis and presence of atherosclerosis [3].

Clinical perspective: The initial clinical manifestation may be insidious, but rapid progression to sepsis will occur in the absence of early therapeutic intervention. Frequent symptoms: The patient may present epigastric and progressive abdominal pain, fullness and amylase levels >500 U/L. Hypotension, anuria and jaundice may be possible [6].

Imaging perspective: The abdominal x-ray study may show mottled air pattern in epigastrium. At US we can see
multiple echogenic images with reverberating acoustic posterior shadow [8].
The diagnostic technique of choice is MDCT (CT is both highly sensitive and specific in the detection of abnormal
gas) with which we can see gas collection drawing the outline of pancreatic parenchyma partially or completely [4].
The gas occupies necrotic areas.
Retropneumoperitoneum is the key factor in the diagnosis of this entity.
Also we can find air in the portal venous system and the presence of liquid collections [8]. In our case, in samples
taken during surgery, bacteriology studies showed an infection by Clostridium perfringens and Klebsiella oxytoca
(gram negative flora), so the cause in this case is a bacteriology infection of the pancreas.

Outcome: Management of emphysematous pancreatitis consists of fluid resuscitation and anti-microbial therapy to
control septic shock [6]. The prognosis for 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 is usually performed, and recovery is typically prolonged. [1, 3, 6, 7].

Teaching points: The presence of gas in the pancreatic bed doesn't necessarily means abscess, it could suggest
also grave emphysematous pancreatitis. The diagnosis of emphysematous pancreatitis involves a grim prognosis,
with high mortality. MDCT is the diagnostic technique of choice and crucial for early treatment [1, 3, 4, 5, 8].

Differential Diagnosis List:
Emphysematous pancreatitis, Atmospheric air introduced by recent instrumentation or
surgery (e.g. post ERCP), Enteric fistula formation and reflux from the adjacent hollow viscus

Final Diagnosis: Emphysematous pancreatitis

References:
Pag: A1499. (PMID: 21429258)
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Patel NB, Oto A, Thomas S. (2013) Multidetector CT of emergent biliary pathologic conditions. Radiographics 1867-
88. doi: 10.1148/rg.337125038. (PMID: 24224584)
Description: In cranial slices we begin to appreciate the extraluminal air in the abdominal cavity.

Origin: Hospital Virgen de la Arrixaca, Murcia, Spain.
Description: We can see the air in the pancreatic parenchyma, well-delimited. Fat stranding at the pancreas tail and mesenteric is present. Pancreas presenting irregular and not well-defined borders.

Origin: Hospital Virgen de la Arrixaca, Murcia, Spain.
Figure 3

Description: Destructuration of normal pancreactic architecture. Pancreas presenting irregular and not well-defined borders. Origin: Hospital Virgen de la Arrixaca, Murcia, Spain.
Description: Pancreatic head is enlarged with adjacent ill-defined peripancreatic inflammation with stranding fat and fluid collections in the peritoneal cavity. Retropneumoperitoneum at the left-anterior pararenal space. Origin: Hospital Virgen de la Arrixaca, Murcia, Spain.
Description: Pancreatic head is enlarged with adjacent ill-defined peripancreatic inflammation with stranding fat and fluid collections in the peritoneal cavity. Origin: Hospital Virgen de la Arrixaca, Murcia, Spain.