Main Pancreatic Duct Stone Presenting with Acute Focal Pancreatitis.

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Introduction

A pancreatic stone is a solid formation of calcium salts and proteins that can develop in the pancreatic ducts [1,2]. They can vary in size and cause blockages or obstruction in the pancreatic ducts, leading to complications such as acute pancreatitis, abdominal pain, digestive difficulties, and sometimes infection. Chronic pancreatitis and excessive alcohol consumption are the most common causes of pancreatic stones [3]. In this study, we present a 36-year-old male patient with main pancreatic duct stone and focal pancreatitis.

Case Presentation

Patient was a 36-year-old male patient with history of alcohol use disorder and previous episodes of alcohol related acute pancreatitis presented to the emergency department for epigastric abdominal pain with radiation towards his back in the setting of nausea and vomiting. He denies any fevers, chills, or diarrhea. Patient stated that he is a current smoker and used to drink a lot of hard liquor on the weekends. On physical exam he had significant abdominal tenderness primarily in the epigastrium with no right upper quadrant tenderness, CVA tenderness, guarding or rigidity. Labs showed elevated ALT: 84 Units/Liter (normal range 7-52) and AST: 44 Units/Liter (normal range 13-39), consistent with the patient's history of alcohol use disorder. Lipase was elevated at 341 Units/Liter (normal range 11-82). CT abdomen/pelvis was performed and showed a 5 mm calcified stone in the main pancreatic duct with upstream dilatation of the duct and pancreatic and peripancreatic edema along the body and tail of the pancreas. Findings were compatible with obstructive main pancreatic duct stone resulting in focal acute pancreatitis of the body and tail of the pancreas. Ultrasound of the upper abdomen was also performed and demonstrated a subcentimeter echogenic focus in the body of the pancreas with posterior shadowing and twinkle artifact, corresponding to findings on the CT abdomen, compatible with main pancreatic duct stone.

Discussion

The main cause of pancreatic stone formation is the presence of high concentrations of calcium or other minerals in the pancreatic ducts, leading to the formation of solid deposits over time [4]. This can be associated with conditions such as chronic pancreatitis, where inflammation and damage to the pancreas can alter the composition of pancreatic secretions [4]. Other

contributing factors may include a history of recurrent pancreatitis, genetic predisposition, certain medications, metabolic disorders like hyperparathyroidism, or anatomical abnormalities in the pancreas or its ducts [5]. Additionally, excessive alcohol consumption may also play a role in the development of pancreatic stones [4].

Pancreatic stones can be visualized in abdominal imaging studies including CT, MRI, transabdominal ultrasound, or endoscopic ultrasound (EUS). On CT, pancreatic stones appear as dense, opaque structures within the pancreatic ducts [6]. MRI can also detect pancreatic stones, showing them as signal voids or areas of low signal intensity on T1 and T2 images [7]. In transabdominal ultrasound, the pancreatic stone appears as an echogenic focus with posterior shadowing and occasionally twinkle artifact. EUS is particularly effective for detecting smaller pancreatic stones that may not be clearly visible on other imaging modalities [8].

There are medical, endoscopic, and surgical approaches to the management of pancreatic stones. A low fat diet decreases the release of cholecystokinin, lowering pancreatic secretion and reducing hydrostatic pressure. Oral supplements of pancreatic enzymes and analgesics are also used. Endoscopic treatments include endoscopic sphincterotomy, and extraction. Surgery is considered the second line of management for patients that endoscopic therapy is not effective [9].

Figure 1. A and B) Axial soft tissue window at the level of the pancreas demonstrating a 5 mm calcified stone in the main pancreatic duct with upstream dilatation of the main pancreatic duct. C and D) Coronal reconstruction images also show hyperdense stone in the pancreatic duct with upstream dilatation and peripancreatic edema. Peripancreatic edema is only seen along the body and tail of the pancreas.

A) B)

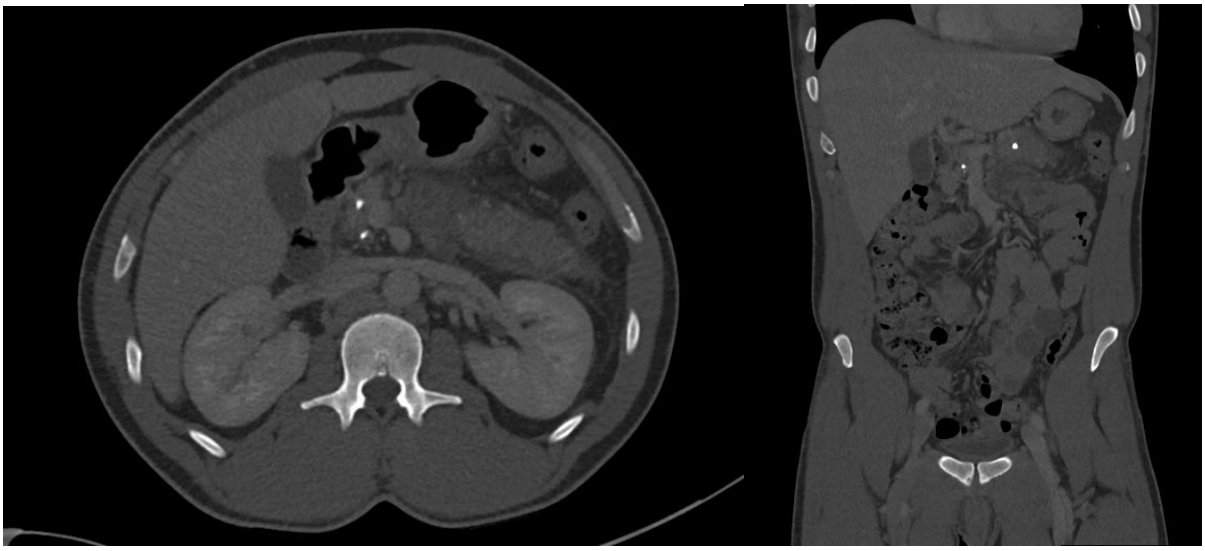

Figure 2. A) Axial bone window image showing focal calcification involving the head and uncinate process of the pancreas, as sequelae of chronic pancreatitis. B) Coronal bone window image demonstrating focal calcification in the uncinate process and pancreatic duct stone in the body of the pancreas.

A) B)

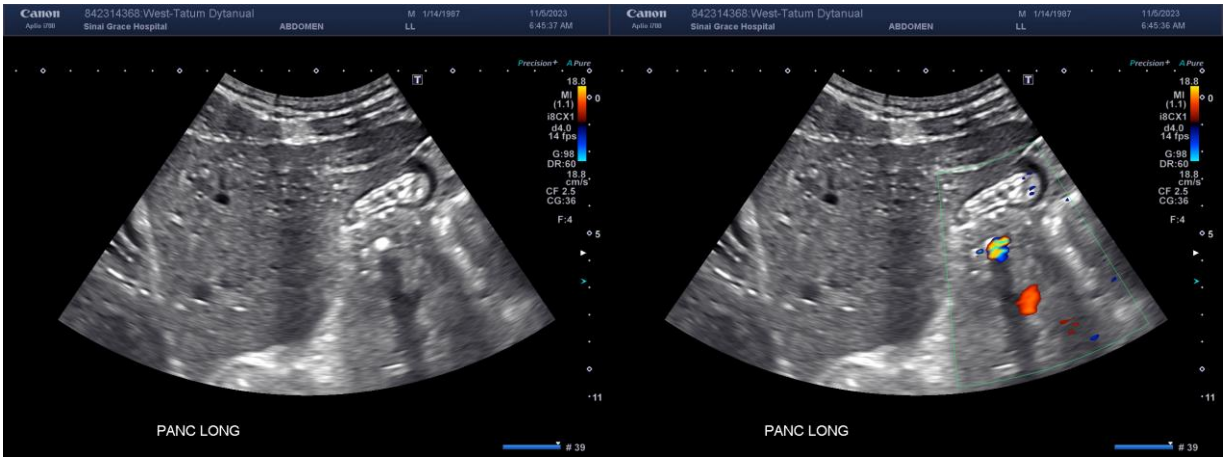

Figure 3. A and B) Transverse ultrasound view of the pancreas demonstrating echogenic focus in the body of the pancreas with posterior shadowing and twinkle artifact, corresponding to findings on the CT abdomen, compatible with main pancreatic duct stone.

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