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VIDEO | PANCREAS

Crystals Identified by Endoscopic Ultrasound–Guided Needle-Based Confocal Laser Endomicroscopy in a Pancreatic Pseudocyst

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CASE REPORT

A 51-year-old man with metastatic squamous cell cancer of the tongue underwent surveillance computed tomography imaging, which revealed an incidental exophytic and complex pancreatic tail cystic lesion (PCL) with internal debris. Subsequent magnetic resonance imaging confirmed a 2.3 × 2-cm PCL with thin wall and debris in the pancreatic tail (Figure 1). The patient denied any history of pancreatitis or excessive alcohol use, had a 15-pack-year smoking history, and his cancer was in remission. Endoscopic ultrasound (EUS) was performed, showing an anechoic lesion with internal debris, thin walls, and no septations or communication with pancreatic ducts (Figure 1). EUS-guided needle-based confocal laser endomicroscopy (nCLE) revealed rectangular clear crystals, a dark background with bright particles and inflammatory debris (Figure 1; Video 1). These findings were suggestive of a pancreatic pseudocyst. EUS fine-needle aspiration was performed, and fluid analysis revealed an amylase of 82 U/L and carcinoembryonic antigen levels of 17.4 ng/mL. Cytology revealed abundant cellular and inflammatory debris without mucin or malignant cells. Three years into follow-up, magnetic resonance imaging revealed decrease and eventual resolution of the PCL, providing further support for the initial diagnosis of pseudocyst (Figure 1).

The highlight of this case is the first-time report of using EUS-nCLE to characterize intracystic crystals. Crystals are observed in benign PCLs such as cholesterol granulomas, pseudocysts, and squamous-lined cysts (lymphoepithelial cysts).[1–5] Cholesterol crystals are the most prevalent among these, but reports also describe the presence of needle-shaped negatively birefringent crystals, bile-containing crystals, Charcot-Leyden crystals, and Reinke-like crystals.[1–5] The pathophysiology of crystal formation remains largely unclear, but it is likely associated with both the crystal composition and underlying pancreatic disease. For instance, cholesterol crystals are believed to develop through the breakdown of blood within and around the pancreas, resulting in an accumulation of cholesterol in the affected area.[1]

The clinical implications of crystals observed in pancreatic lesions remain largely undefined. As per current knowledge, crystals have not been detected in mucinous PCLs or pancreatic cancer. Consequently, their presence, when coupled with supportive imaging, EUS-defined morphology, and cyst fluid features, may suggest a benign process. EUS-guided in vivo visualization of intracystic crystals can play a critical role in preventing misdiagnoses of PCLs. This information adds to our ability to accurately assess and manage such cases, leading to improved patient outcomes.

DISCLOSURES

Author contributions: T. Cao led and performed the literature search and writing. SG Krishna performed the procedure, manuscript editing and reviewed the final manuscript, and is the article guarantor.

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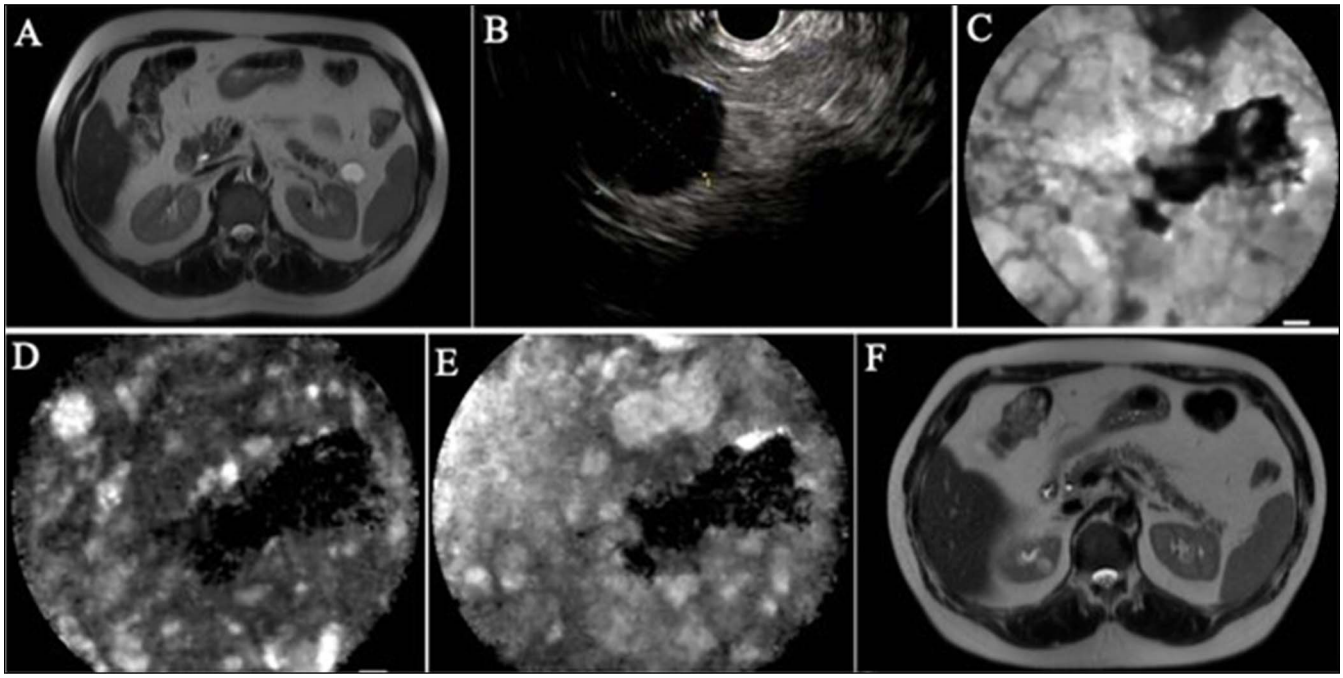

Figure 1. (A) Abdominal MRI on initial presentation, (B) EUS image on initial presentation, (C) EUS-nCLE video frame showing rectangular clear crystals, (D) EUS-nCLE video frame showing dark background with bright particles, (E) EUS-nCLE video frame showing bright round particles of inflammatory debris, and (F) resolution of cyst during follow-up MRI. EUS, esophageal ultrasound; MRI, magnetic resonance imaging; nCLE, EUS-guided needle-based confocal laser endomicroscopy.

Informed consent was obtained for this case report.

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