Endoscopic ultrasound (EUS) in pancreatic masses with inconclusive radiologic workup – a case series and short review of the literature

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Introduction

Endoscopic ultrasound (EUS) is known as a highly sensitive diagnostic technique for pancreaticobiliary and gastrointestinal disorders [1]. In some clinical situations it could be more accurate in establishing the correct diagnosis than computer tomography (CT) or magnet resonance imaging (MRI), especially for the detection of microlithiasis and small pancreatic tumors.

Our aim was to present how EUS was decisive in establishing the correct diagnosis in a series of patients.

Abstract

Endoscopic ultrasound (EUS) is a very sensitive examination to detect pancreatic masses and can provide useful information in cases where conventional radiologic workup remains inconclusive. We present three cases in which EUS was decisive in establishing the correct diagnosis. Case 1: A 74-year-old female was hospitalized because of acute pancreatitis. Medical history, CT and MRI gave no clue to etiology, but EUS diagnosed a small pancreatic tumor. Case 2: A female patient was admitted because of abdominal pain and weight loss. While MRI suspected a pancreatic tumor, EUS showed typical features of autoimmune pancreatitis. Case 3: A 50-year-old patient was hospitalized with cachexia, ascites and pulmonary embolism. At first, a pancreatic tumor was suspected, but EUS showed a cystic lesion with a solid component (pancreatic pseudocyst).

Keywords: endoscopic ultrasound; pancreas tumor; pancreatitis; pancreatic cyst

Case report

Case 1. A 74-year-old female presented with vomiting and mild epigastric pain. The patient denied alcohol or nicotine use. Except for mildly increased total bilirubin (1.45 mg/dL) and a clearly elevated lipase (1436 U/L), all other parameters were within the normal range. Contrast-enhanced CT of the abdomen showed only peri-pancreatic fluid collections (fig 1a). MRI described focal pancreatitis (fig 1b). EUS ruled out the biliary etiology, but a well-defined 1.8x1.2 cm hypoechoic mass in the pancreas head (fig 1c) was identified. EUS-FNA was performed and histological examination revealed atypical biliary epithelial cells with severe dysplasia. Surgery was performed with histology showing pancreatic adenocarcinoma.

Case 2. A 56-year-old female presented with postprandial nausea and weight loss. On clinical examination she experienced a moderate epigastric discomfort. She denied any history of alcohol consumption. Her medication was limited to thyroid hormone replacement therapy due to Hashimoto hypothyroidism. Laboratory
evaluation showed mild leukocytosis, lipase of 127 U/L and slightly elevated liver enzymes. On MRI, a pancreatic mass was suspected (fig 2a). Further evaluation with EUS revealed a hypoechoic, 1.7 cm mass in the pancreas corpus, focal gland enlargement and echogenic interlobar septa, features typical for AIP (fig 2b). Fibrotic changes with lymphocyte infiltration were present in the histology obtained through EUS-FNA. Even though serum IgG4 was not elevated, an AIP was suspected and steroid therapy started. After 3 months, no pathologic evidence on MRI was found (fig 2c).

Case 3. A 50-year-old male patient with a history of alcohol abuse was hospitalized because of deep vein thrombosis and pulmonary embolism. On physical examination he had cachexia and moderate ascites. The initial blood tests showed normochromic anemia, normal lipase and bilirubin values, lightly elevated GOT, GGT and CRP. CT scan raised the suspicion of a pancreatic mass and liver metastasis (fig 3a), but the following MRI showed no evidence of a solid mass, rather a pancreatic cyst was described. No signs of portal hypertension or liver metastasis were observed and liver cirrhosis was ruled out by transient elastography. EUS was performed and a 2.2x1.8 cm large cystic lesion in the body of the pancreas with solid structures (fig 3b) was found. FNA was performed and the fluid analysis was typical for a pancreatic pseudocyst (lipase>120000 U/L, CEA=26.4 U/L).

Fig 1. a) normal pancreas on CT; b) focal pancreatitis described on MRI; c) pancreatic tumor detected by EUS.

Fig 2. a) MRI suspected a mass in the pancreas neck (arrow); b) EUS shows a 1.7 cm large mass in the corpus of pancreas, focal gland enlargement and echogenic interlobar septa, features typical for autoimmune pancreatitis; c) normal pancreas on MRI after steroid therapy.

Fig 3. a) CT scan with suspicion of pancreatic tumor (arrow); b) pancreatic cyst with some solid content in EUS; c) pancreatic fistula in ERCP (arrow).
patients. While type 2 AIP affects mainly young patients without a gender predilection, type 1 is more prevalent among older males with possibly systemic IgG4-related autoimmune effects [11].

A definitive diagnosis of AIP can be challenging and is based on a combination of clinical presentation (organ involvement), imaging features, histology, elevated serum IgG4 levels and response to steroids [12]. Typical EUS findings, which suggest an autoimmune process are focal or diffuse “sausage-shaped” enlargement of the pancreas, homogeneous echo pattern, stranding and calcifications. Irregular pancreatic duct with multiple strictures and without associated dilatation can also be present [13].

It is crucial to differentiate AIP from adenocarcinoma, but sometimes it can be challenging [14]. It is very important to evaluate all patients with AIP carefully to rule out an underlying neoplasm. AIP is highly responsive to steroid therapy [15] and in the case of non-response, careful reconsideration of a potential underlying malignancy is recommended.

In general, MRI is the preferred method for the first evaluation of pancreatic cysts. CT scan can be useful when calcifications are present, to differentiate pseudocysts associated with chronic pancreatitis from other etiologies, and to assess vascular involvement and metastases in advanced disease stages [16]. None of the imaging methods is perfect for differentiating between pancreas cysts. EUS is not the first-line examination in these patients but can reveal some additional information and can have a significant impact on the therapeutic concept [17]. CEUS can be performed for assessing the vascularization of the solid components (mural nodule, septa) high vascularization raising the suspicion of malignant transformation within the cyst. In cases of uncertainty and if surgery is planned, FNA should be performed. Cytological analysis of cyst fluid had a low sensitivity (42%) and high specificity (99%) and should be used only in combination with other tests. CEA helps to determine the presence of mucinous cysts but has poor accuracy in distinguishing between benign and malignant cysts [18]. High level of lipase is typically found in pseudocysts. Case 3 presents the importance of the multimodal approach in order to provide optimal care for the patients.

In conclusion, EUS is a useful technique in the clinical practice to establish a correct diagnosis in cases where radiology is inconclusive.
References