# Tuberculosis and the Pancreas: A Diagnostic Challenge Solved by Endoscopic Ultrasound. A Case Series

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## Abstract

Pancreatic tuberculosis is a rare disease. It can be easily confused with malignancy or pancreatitis on imaging. This could result in unnecessary surgery. As this is a treatable disease it is imperative to diagnose this condition pre-operatively. We report three cases of pancreatic tuberculosis that were diagnosed by endoscopic ultrasound. In conclusion, endoscopic ultrasound is the diagnostic modality of choice for pancreatic tuberculosis facilitating high resolution imaging, as well as sampling of tissue for staining, cytology, culture and polymerase chain reaction assay.

## Key Words

Pancreatic tuberculosis – endoscopic ultrasound – pancreatitis.

## Introduction

The incidence of tuberculosis (TB) is increasing worldwide. Despite this increasing trend, pancreatic involvement in tuberculosis remains uncommon. We describe a series of three cases and review current literature on clinical presentation, diagnostic dilemmas and the role of endoscopic ultrasound. All our cases were diagnosed by endoscopic ultrasound (EUS) guided fine needle aspiration (FNA).

## Case Report

### Patient 1

A 24 year old man was admitted with epigastric pain, vomiting and weight loss. Ultrasound scan of abdomen showed cholelithiasis with dilated common bile duct (CBD). A computed tomogram (CT) scan revealed enlarged oedematous head of pancreas which was initially thought to be acute pancreatitis. Repeat CT scan (Fig. 1) demonstrated a complex solid/cystic mass with gas in the region of the porta hepatis, encasing the CBD and portal vein and extending to the neck of the pancreas. Several large para-aortic lymph nodes, necrotic porta-caval node (1.5 cm), lymph node adjacent to inferior vene cava (IVC) (2 cm) and a large (5x3 cm) necrotic lymph node in the small bowel mesentery were noted. Magnetic Resonance Cholangio Pancreatogram (MRCP) scan (Fig. 2) revealed narrowed CBD in the region of head of pancreas. EUS (Fig. 3) revealed large hypoechoic lymph nodes with necrotic areas and heterogeneous green predominant pattern of the nodes on real time tissue elastography without an elevated strain ratio. This pattern is in keeping with an inflammatory process rather than malignant infiltration. EUS-FNA was performed. Zeil Nielson (ZN) staining was negative. Cytology demonstrated granuloma, acid-fast bacilli (AFB) culture was positive and quantiferon-Gold assay was also positive. Anti-tuberculous therapy (ATT) was initiated.

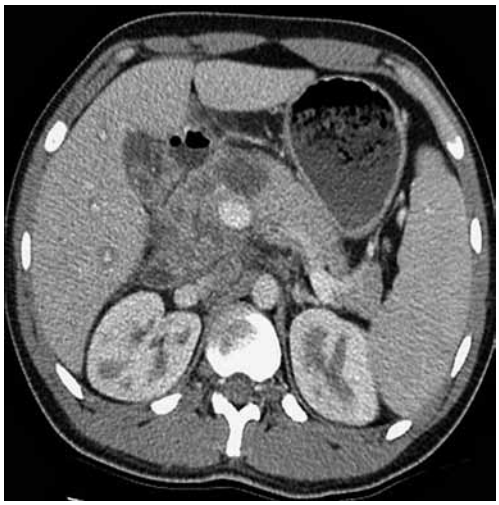

**Fig 1.** CT scan showing a complex solid / cystic mass encasing the portal vein and common bile duct and extending to the neck of pancreas.

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**Fig 2.** MRCP scan showing narrowed distal common bile duct due to oedematous pancreatic head.

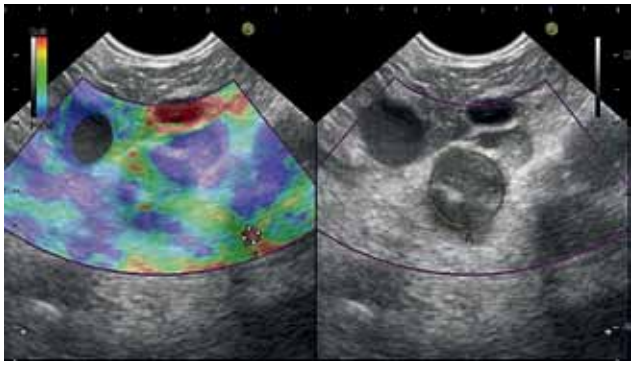

**Fig 3.** EUS showing large hypoechoic lymph nodes with areas of central necrosis (right) and real time tissue elastography (left) showing the nodes to have a heterogeneous green predominant pattern.

**Patient 2**

A 28 year old man presented with one year history of vague abdominal pain and weight loss. Ultrasound scan suggested portal lymphadenopathy. CT scan of abdomen demonstrated abnormal head of pancreas with peri-pancreatic lymphadenopathy. EUS demonstrated multiple homogeneous, round lymph nodes (2–4 cms size). The coeliac axis, body/tail of pancreas and the pancreatic duct were normal. EUS-FNA was obtained. ZN staining and AFB culture were negative. Cytology revealed granuloma. Anti-tuberculous therapy was initiated which resulted in complete resolution of lymphadenopathy and symptoms.

**Patient 3**

A 29 year old man presented with epigastric discomfort. He had been experiencing chronic diarrhoea for 6 months, intermittent low grade fever and weight loss for one year prior to admission. CT scan revealed enlarged head of pancreas and peri-pancreatic lymph nodes. EUS revealed lymph nodes around head of pancreas and adjacent to the inferior vena cava. These nodes had hypoechoic foci, consistent with areas of necrosis. He also had a 1x2 cm mediastinal lymph node. EUS-FNA was performed from both the areas. ZN stain was negative, cytology revealed the presence of granuloma, AFB culture and quantiferon-Gold test were positive. Anti-tuberculous therapy was started which resulted in the complete resolution of symptoms and radiological abnormalities.

## Discussion

Tuberculosis is a major health problem worldwide [1]. Pancreatic TB is uncommon even in endemic areas. In a large series of 300 cases from India with abdominal TB, there were none with pancreatic TB [2]. A recent review reported that 23% of the 62 reported cases of pancreatic TB occurred in patients who were HIV positive [3].

The clinical features of pancreatic TB are protean and include weight loss (69%), anorexia, abdominal pain (75%), fever, night sweats, back pain and jaundice (31- 40%) [3, 4, 5-11]. Patients may present with obstructive jaundice and a pancreatic mass lesion that is clinically indistinguishable from a pancreatic neoplasm [3,8]. Some patients may present with a pancreatic cyst or an abscess which can be mistaken for a cystic neoplasm [7] or an infected pseudocyst. Pancreatic TB has also been reported to cause acute pancreatitis [10], portal hypertension [6,11] intra-abdominal haemorrhage via direct invasion of a peripancreatic artery[12], chronic pancreatitis and diabetes [13]. A case report of pancreatic TB presenting as a head mass along with a pancreatico-biliary fistula has also been reported [14].

There are no pathognomic radiological features of pancreatic TB. CT findings include hypodense lesions with irregular borders usually in the head of the pancreas, diffuse enlargement of the pancreas or enlarged peri-pancreatic lymph nodes [15]. Magnetic resonance imaging (MRI) findings of focal pancreatic TB include a sharply delineated mass usually located in the pancreatic head, showing heterogenous enhancement. These lesions are characteristically hypointense on fat-suppressed T1-weighted images and show a mixture of hypo/hyper intensity on T2-weighted images [16]. The common bile duct and the pancreatic duct have been reported to be normal in patients with pancreatic TB, even if the mass is positioned centrally in the head of the pancreas[16]. This is in sharp contrast to adenocarcinoma of the pancreas where the pancreatic duct is dilated in centrally located tumours of the pancreatic head [15]. The diffuse form of pancreatic TB is characterized by pancreatic enlargement with narrowing of the main pancreatic duct and heterogeneous enhancement [15]. Endoscopic retrograde cholangio-pancreatography is usually not helpful, although there have been case reports of biliary cytology confirming the diagnosis [17].

Due to the lack of pathognomic radiological features for pancreatic TB, most cases have been diagnosed in the past at laparotomy performed for a suspicion of pancreatic malignancy. Few cases have been diagnosed by fine needle aspiration cytology/biopsy with a success rate ranging from 50 to 62% [4, 8, 18, 19].

EUS has emerged as an important tool for imaging and sampling pancreatic lesions. Linear EUS allows high

resolution imaging that can readily differentiate pancreatic and peri pancreatic masses as well as identifying abdominal and mediastinal lymphadenopathy that may have been missed on cross sectional imaging. In addition, EUS guided FNA, fine needle biopsy (FNB) or tru-cut biopsy can also be performed. The diagnostic accuracy of EUS-FNA in pancreatic TB is difficult to determine due to the rarity of this entity. EUS-FNA has been noted to be 76% to 95% accurate for diagnosis of pancreatic cancer and 46% for focal inflammation [20]. In a recent series by Song et al, EUS-FNA was able to diagnose pancreatic/peri-pancreatic TB in 76.2% of patients [21].

Polymerase chain reaction (PCR) assay is now being increasingly used to detect Mycobacterium TB and has a sensitivity of 64% [22]. Thus TB – PCR assay in conjunction with the other histologic and microbiologic examinations may be helpful in diagnosing pancreatic TB [21]. However, as drug susceptibility cannot be determined by PCR assay, standard cultures also need to be performed. We feel that the lack of a combination of all these investigations because of a low index of suspicion might be the reason for the relatively low yield of EUS-FNA in pancreatic TB. We recommend, that current practice should be to submit samples for cytology, histology along with dedicated aspirate in a sterile container for microbiology (ZN staining, AFB culture) and PCR assay in all cases where pancreatic TB is suspected.

## Conclusion

The case series highlights the rarity of pancreatic TB, which with its non-specific presentations mimics pancreatic malignancy. It emphasises the need for pre-operative diagnosis of this treatable condition. EUS can play a pivotal role in securing a diagnosis of pancreatic TB. The high resolution images enable malignancy to be excluded, whilst there are morphological features that favour a diagnosis of TB. EUS-FNA should be performed and samples submitted for cytology, AFB staining, AFB cultures and PCR assay to maximise the diagnostic yield.

## Conflicts of interest

None to declare.

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