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CASE REPORT

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# The great masquerader of pancreatic tuberculosis

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## Abstract

**Background:** Pancreatic tuberculosis is a rare clinical entity. It represents a diagnostic challenge as the clinical presentation may mimic pancreatic malignancy.

**Case presentation:** A 66-year-old gentleman presented with an incidental finding of a pancreatic tail mass on routine ultrasonography of the abdomen whilst working up on chronic kidney disease. He denied abdominal pain, fever, night sweats, constitutional symptoms or tuberculosis contact. On examination, there was no palpable mass per abdomen. The tumour marker of Ca 19-9 was normal. Ultrasonography revealed a lobulated heterogeneous hypovascular and hypoechoic mass at the tail of the pancreas. Contrast-enhanced computed tomography (CT) of the thorax and abdomen revealed a thickened right pleura, right pleural effusion with right lung collapsed consolidation and multiple mediastinal lymph nodes. There is an ill-defined hypodense mass seen in the tail and body of the pancreas measuring 3 × 7 × 3 cm with the presences of calcification within. The constellation of CT findings suggests a pancreatic malignancy with metastasis to the lungs. Endoscopic ultrasonography (EUS) assessment showed an irregular hypoechoic mass measuring 3.0 × 2.7 cm at the tail of the pancreas. Multiple rounded hypoechoic lesions were also seen scattered within the body of the pancreas with multiple enlarged para-aortic lymph nodes. A fine-needle aspiration biopsy of the lesion was consistent with granulomatous inflammation. The diagnosis of disseminated tuberculosis was made. The patient was subsequently started on antitubercular medication and recovered well.

**Conclusion:** A high index of suspicion is needed to diagnose pancreatic tuberculosis, especially in patients whose radiological imaging shows a pancreatic mass with necrotic peripancreatic lymphadenopathy in endemic countries. EUS-guided fine-needle aspiration is the diagnostic modality of choice, and vigorous attempts should be made at obtaining a preoperative histological or bacteriological diagnosis to avoid unnecessary surgery.

**Keywords:** Case report, Mycobacterium tuberculosis, Pancreas, Pancreatic neoplasms

## Background

Pancreatic tuberculosis is a rare clinical entity. It is a well-known masquerader, given its diverse clinical presentation and radiological picture. It may mimic other pancreatic pathology, such as pancreatic carcinoma. In view of the non-specific presentation and imaging characteristics, it is often difficult to diagnose and a high index of suspicion is required to obtain a preoperative diagnosis. The ileo-caecal junction is the most commonly affected area in abdominal tuberculosis, besides other hollow organs [1]. Solid organs such as the liver, spleen or kidneys occur more commonly than the pancreas [2]. Herein, we describe a case of disseminated tuberculosis involving the pancreas, mimicking a clinical presentation of advanced pancreatic carcinoma.

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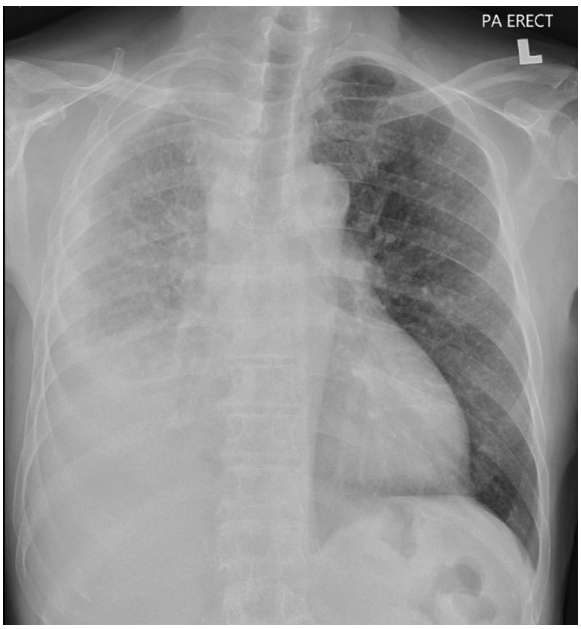


**Fig. 1** Chest radiograph showing right pleural effusion

## Case presentation

A 66-year-old gentleman presented to the surgical unit of a tertiary hospital in Sabah, Malaysia, with an incidental finding of a pancreatic tail mass on routine ultrasonography of the abdomen whilst routine workup for chronic kidney disease. He denies abdominal pain, fever, night sweats, constitutional symptoms or close contact with a patient with tuberculosis. He does not have a positive family history of pancreatic malignancy. Other than his CKD, he also has diabetes mellitus which is well-controlled. He is an ex-smoker of 30-pack years. On clinical examination, there was no palpable lymphadenopathy or abdominal mass. Chest examination revealed decreased air entry over the right lower zone with dullness to percussion. Routine blood investigations were relatively normal except for raised creatinine due to his chronic kidney disease. Tumour markers such as Ca 19-9 and CEA were normal.

Abdominal ultrasonography revealed a lobulated heterogeneous hypovascular hypoechoic mass at the tail of the pancreas. Chest radiograph showed extensive right pleural effusion (Fig. 1). Contrast-enhanced computed tomography (CT) of the thorax and abdomen was done and showed thickened right pleura, right pleural effusion with right lung collapsed consolidation and multiple mediastinal lymph nodes (Fig. 2). The pancreatic body and tail were bulky with an ill-defined solid hypodense mass seen in the tail and body of the pancreas measuring $3 \times 7 \times 3$ cm with the presence of calcifications within (Fig. 3). The pancreatic duct was not dilated, and there were multiple peripancreatic nodes seen as well.

The constellation of CT findings suggests a primary differential of pancreatic carcinoma with metastasis to the lung/pleura. Disseminated or pancreatic tuberculosis was never an initial or differential diagnosis to be entertained. However, we decided to biopsy the pancreatic lesion in order to confirm the diagnosis of pancreatic carcinoma in preparation for neoadjuvant chemotherapy. Endoscopic ultrasonography (EUS) guided fine-needle aspiration biopsy was done. EUS assessment revealed an irregular hypoechoic solid mass measuring $3.0 \times 2.7$ cm at the tail of the pancreas (Fig. 4A). Multiple rounded hypoechoic lesions measuring up to 1.5 cm were also seen scattered within the body of the pancreas with multiple enlarged para-aortic and peripancreatic lymph nodes (Fig. 4B). The pancreatic duct was not dilated. The histopathological examination of the pancreatic lesion showed

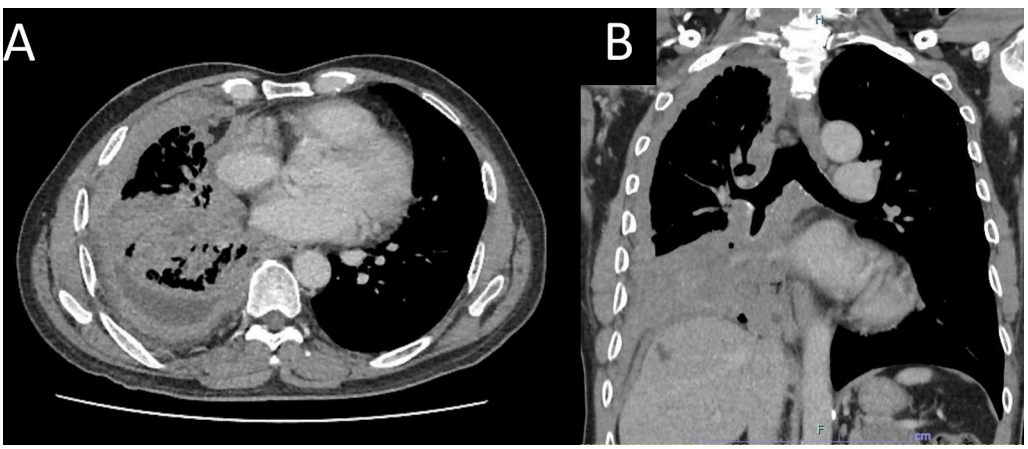


**Fig. 2** An axial (**A**) and coronal (**B**) view of CT images showing consolidative changes of the right lower lobe of the lung and right pleural effusion

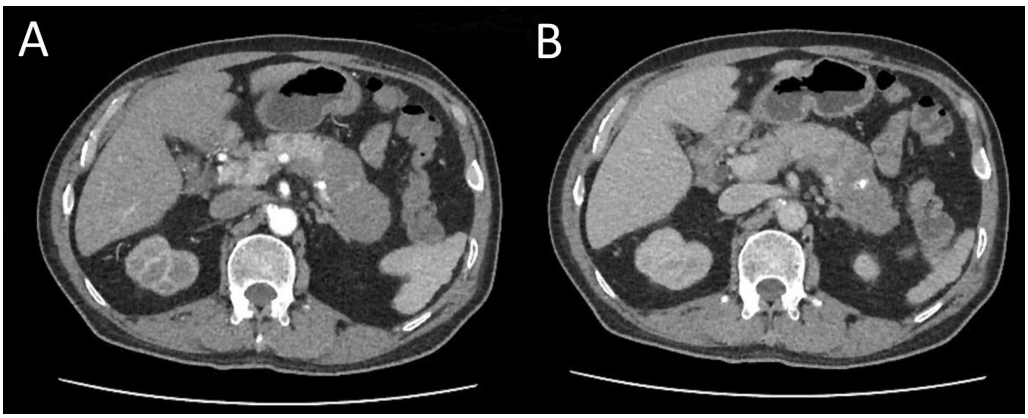


**Fig. 3** Axial CT in the arterial (**A**) and venous (**B**) phase showing an irregular hypodense lesion at the body and tail of the pancreas with calcifications

multiple granuloma with multinucleated giant cells suggestive of granulomatous inflammation. The diagnosis of disseminated tuberculosis was made. The patient was subsequently started on antitubercular medication and abdominal ultrasonography performed 6 months later showed resolved pancreatic lesion. He has no complications with the medications.

## Discussion

The pancreas is relatively resistant to tuberculosis as the pancreatic enzymes are able to destroy the mycobacteria [3, 4]. Only 1% of all abdominal tuberculosis cases involved the biliary tree or the pancreas due to this antimicrobial effect [4]. The most common route of spread of tuberculosis to solid abdominal organs is through haematogenous spread or less likely via the lymphatic spread. Pancreatic tuberculosis is most often the result of haematogenous, lymphatic dissemination or direct spread from adjacent organs. Three forms of pancreatic tuberculosis have been described: as part of miliary tuberculosis which is the most common type, spread to the pancreas via retroperitoneal lymph nodes, or isolated pancreatic tuberculosis [3]. Our reported patient likely obtained it via military tuberculosis.

The majority of pancreatic tuberculosis involved either the head or the body of the pancreas. The most common presenting symptom is an incidental finding of a pancreatic mass on radiological imaging for other pathology, which may resemble a carcinoma. This presentation is similar to our reported case in which the pancreatic mass was diagnosed based on routine abdominal ultrasonography. Other symptoms include abdominal pain, lymphadenopathy, fever, constitutional symptoms or jaundice. Acute or chronic pancreatitis, abscess mass, cystic lesions, calcifications, retroperitoneal lymphadenopathy and portal hypertension can occur as well, however, less commonly [3, 4].

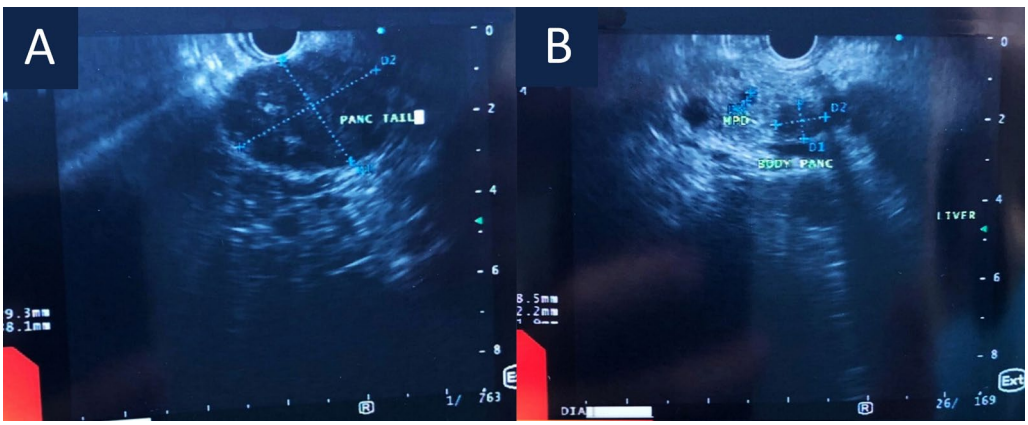


**Fig. 4** EUS image showing an irregular heterogeneous hypoechoic mass at the tail (**A**) and body (**B**) of the pancreas

Confirming the diagnosis of pancreatic tuberculosis is important as it avoids unnecessary major surgery and its associated morbidities. However, it is challenging to diagnose pancreatic tuberculosis based on radiological imaging alone as there are no pathognomonic features of pancreatic tuberculosis. It is often non-specific and may present as a mass lesion in most cases, cystic lesions or abscesses. Nevertheless, pancreatic tuberculosis should be suspected in patients with a large space-occupying lesions associated with necrotic peripancreatic lymph nodes, especially with constitutional symptoms and a previous history of tuberculosis or current tuberculosis infection [3].

The common features of pancreatic tuberculosis on ultrasonography include a bulky heterogeneous pancreas, cystic lesions, solid hypoechoic masses, peripancreatic lymph nodes or ascites. On CT, the feature includes hypodense, hypovascular masses, irregular margins and peripheral enhancement or areas of central enhancement, with adjacent necrotic or non-necrotic lymphadenopathy. These features often represent or mimic inflammatory or neoplastic cystic lesions of the pancreas [5]. A study by Xia et al. revealed CT findings of pancreatic mass with heterogeneous hypodensity focus with calcifications with peripancreatic nodules [6]. The presence of calcifications is reported in up to 56% of cases [7]. Common bile duct and intrahepatic duct dilatation are rare, even with pancreatic tuberculosis masses that are centrally located in the head of the pancreas. Thus far, there are no reported cases of vascular invasion or pancreatic duct dilatation.

The diagnosis of pancreatic tuberculosis used to be established during laparotomy or postoperatively. However, the paradigm had shifted to preoperative diagnosis instead through the introduction of EUS. Malikowski et al. recommended that EUS with fine-needle aspiration (FNA) is the diagnostic tool of choice for confirming the diagnosis of pancreatic tuberculosis [8]. EUS allows high-resolution imaging that can differentiate pancreatic and peripancreatic masses as well as identify abdominal and mediastinal lymphadenopathy. EUS-guided FNA or fine-needle biopsy can be performed on the pancreatic masses or lymphadenopathy for diagnostic purposes. It has a diagnostic yield of up to 95% for diagnosing pancreatic cancer, and up to 76% for diagnosing pancreatic tuberculosis [9]. Samples obtained could be sent for histology and microbiology using Ziehl–Neelsen staining and acid-fast bacilli culture and polymerase chain reaction assay [10]. On histopathological examination, the criteria for diagnosis include findings of granulomas with caseation necrosis and multinucleated giant cells or the identification of acid-fast bacilli. These histological findings were present in our reported case that confirmed the diagnosis of pancreatic tuberculosis.

The treatment of pancreatic tuberculosis is the same as any other type of extrapulmonary tuberculosis, which involves at least four drugs of antitubercular medications. The literature recommends the duration of at least 6–12 months of anti-tuberculous medications [3]. CT imaging is helpful in guiding the progression or resolution of the disease. Invasive interventions are reserved for selected complications such as biliary obstruction or for drainage of abscesses.

## Conclusions

Pancreatic tuberculosis is a rare disease. A high index of suspicion is needed to diagnose pancreatic tuberculosis, especially in patients whose radiological imaging shows a pancreatic mass with necrotic peripancreatic lymphadenopathy in endemic countries. EUS-guided FNA is the diagnostic modality of choice, and vigorous attempts should be made at obtaining a preoperative histological or bacteriological diagnosis to avoid unnecessary surgery.

#### Abbreviations

CT: Computed tomography; EUS: Endoscopic ultrasonography; FNA: Fine-needle aspiration.

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#### Author contributions

KHC and TKM were involved in substantial contributions to the manuscript draft, and analysis of the data and interpretation. HS contributed to substantial contributions to the conception provided and revision of the manuscript. AA was involved in substantial contributions to the conception provided, design of the work, interpretation of the data, and substantial revision of the manuscript. FH contributed to substantial contributions to the conception provided, design of the work, and interpretation of the data. The authors read and approved the final manuscript.

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#### Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

## Declarations

#### Ethics approval and consent to participate

The patient included in this study provided the written informed consent to participate in this research.

#### Consent for publication

The patient included in this research gave a written and informed consent to publish the data contained within this study.

#### Competing interests

The authors declare that they have no competing interests.

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## Publisher's Note