

CASE REPORT

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# Isolated tuberculosis of the pancreas mimicking a pancreatic tumor with concomitant choledocholithiasis

Ramesh Wijaya, Chee Hoe Koo, Adrian Kah Heng Chiow,  
Siong San Tan, Su-Ming Tan

## ABSTRACT

**Introduction:** Isolated pancreatic tuberculosis is an extremely rare condition, especially in immunocompetent individuals. Its presenting features are vague and non-specific. In addition, its radiological features often mimic pancreatic malignancy. The diagnosis is often made after surgery with its resultant morbidity. Isolated pancreatic tuberculosis, therefore, poses a great diagnostic and management challenge. **Case Report:** We describe the first case report of primary pancreatic tuberculosis mimicking a cystic tumor of the pancreas with concomitant choledocholithiasis in an immunocompetent young woman. She had no known exposure history or demonstrable extra-pancreatic involvement. **Diagnosis of pancreatic tuberculosis was established by endoscopic ultrasound (EUS)-guided fine-needle aspiration cytology (FNAC) and she responded to anti-tuberculous chemotherapy. Endoscopic stenting**

**of the biliary system was performed in view of concomitant choledocholithiasis. We propose definitive choledocholithiasis clearance and surgery for biliary stone disease after completion of the standard course of medical therapy for pancreatic tuberculosis. Conclusion:** We recommend that tuberculosis should be included in the differential diagnosis of a pancreatic mass, especially in a younger patient coming from an endemic region. With heightened awareness of the features of this disease and the utility of novel endoscopic invasive diagnostic and therapeutic tools like EUS-guided FNAC and endoscopic stenting, the role of diagnostic surgery and its associated morbidity can be avoided in a similar clinical situation.

**Keywords:** Pancreatic tuberculosis, Endoscopy, Fine-needle aspiration cytology, Choledocholithiasis

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Ramesh Wijaya<sup>1</sup>, Chee Hoe Koo<sup>2</sup>, Adrian Kah Heng Chiow<sup>3</sup>, Siong San Tan<sup>4</sup>, Su-Ming Tan<sup>5</sup>

**Affiliations:** <sup>1</sup>MBBS, MRCS (Edin), Department of General Surgery, Changi General Hospital, Singapore; <sup>2</sup>MBBS, Department of General Surgery, Changi General Hospital, Singapore; <sup>3</sup>MBBS (Melb), MRCS (Edin), MMed (Surgery), Department of General Surgery, Changi General Hospital, Singapore; <sup>4</sup>MBBS, MMed (Surgery), FRCS (Edin), Department of General Surgery, Changi General Hospital, Singapore; <sup>5</sup>MBBS, FRCS (Edin), FRCS (Glasg), MMed (Surgery), FAMS, Department of General Surgery, Changi General Hospital, Singapore.

**Corresponding Author:** Ramesh Wijaya, Department of General Surgery, Changi General Hospital, 2 Simei Street 3, Singapore. 529889; Tel: +65 6850-3607, Fax No: +65 6260-1709; Email: ramesh\_wijaya@cgh.com.sg

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## INTRODUCTION

Abdominal tuberculosis is uncommon, with isolated pancreatic tuberculosis being extremely rare. Clinically,

it is very difficult to differentiate pancreatic tuberculosis from carcinoma of the pancreas. Pancreatic tuberculosis, like other forms of abdominal tuberculosis, run an indolent course and present with vague symptomatology. Its radiological features have the typical presentation of an enhancing hypodense mass with irregular borders, often mimicking pancreatic carcinoma [1, 2]. Clinical suspicion of pancreatic malignancy often leads to the unnecessary risks of morbidity and mortality of major surgery. This creates a diagnostic and management dilemma. In a review of literature between 1966 and 2002, only six of the 73 reported cases of isolated pancreatic tuberculosis were diagnosed with cytology/biopsy without surgery [3]. We present the first case of isolated pancreatic tuberculosis in a young immunocompetent lady with concomitant biliary stone disease who presented with a solid-cystic pancreatic mass on radiological imaging typically suggestive of a pancreatic tumor. We thereafter present and discuss the utility of endoscopic modalities for diagnosis of pancreatic tuberculosis using endoscopic ultrasound (EUS)-guided fine-needle aspiration cytology (FNAC) and treatment of concomitant biliary stone disease with endoscopic stenting of the biliary system. This allowed the patient proper treatment of isolated pancreatic tubercular with appropriate anti-tuberculosis medications and avoided morbidity of surgery.

## CASE REPORT

A 26-year-old Filipino female presented to our institution with a four-day history of epigastric pain associated with vomiting. She also complained of having tea-colored urine and pale stools. She did not have any history of fever and did not report any loss of weight. On physical examination, she was afebrile and had scleral icterus with epigastric and right hypochondrial tenderness. There was no palpable mass in her abdomen. On admission, the patient's blood count was normal. Liver

function test, revealed a picture typical of obstructive jaundice (Table 1). Serology for hepatitis virus and human immunodeficiency virus (HIV) were negative.

Computed tomography (CT) scan of her abdomen and pelvis revealed a 3.1x3.7x3.7 cm sized heterogeneous, multicystic mass in the head of pancreas that was compressing on the distal common bile duct (CBD) with upstream dilatation of the CBD, common hepatic duct and intrahepatic biliary tree. The body and the tail of the pancreas appeared normal. Liver was unremarkable and there was no evidence of inflammation of the gallbladder. There was also no evidence of local invasion, lymphatic or metastatic disease (Figure 1).

In view of the possibility of a cystic neoplasm of the pancreas, magnetic resonance imaging (MRI) scan of the pancreas was performed which revealed the same 3.6x3.0 cm heterogeneously enhancing multicystic lesion in the proximal body that extended superiorly to the level of celiac axis. Additionally, there were multiple stones in the CBD that caused obstructive upstream dilatation of the biliary tree. There was no evidence of cholecystitis and any hepatic focal mass lesion or abscesses (Figure 2). There was no evidence of pulmonary or miliary tuberculosis in any further imaging studies.

Endoscopic ultrasound guided FNAC was performed to obtain a cytological sample. The FNAC revealed extensive granulomatous inflammation with necrosis, neutrophilic infiltrates and multinucleated giant cells, which was suggestive of tuberculosis. No malignant cells were present. A repeat FNA performed three days later showed similar results. However, microscopic examination for acid-fast bacilli using Ziehl-Neelsen stain was negative in both samples.

Subsequently, in view of patient's choledocholithiasis, endoscopic retrograde cholangiopancreatography (ERCP) was performed. A sphincterotomy, removal of CBD stones and stenting were performed (Figure 3). Three 10Fr 11 cm biliary stents were placed within the CBD, right and left hepatic ducts. There was good drainage post-stent insertion.

Table 1: Summary of liver function test results

Liver Function Test	Values					
	On Admission	Post-1 <sup>st</sup> EUS	Post-ERCP	Start of tuberculosis treatment	2 weeks into tuberculosis treatment	Reference Ranges
Bilirubin (µmol/L)	156.4	249.8	218.5	139	38.5	5-30
ALP (U/L)	322	256	258	204	179	32-103
ALT (U/L)	296	159	126	105	101	10-55
AST (U/L)	163	139	92	92	60	10-45

Abbreviations: ALP Alkaline phosphatase, ALT Alanine transaminase, AST Aspartate transaminase, EUS Endoscopic ultrasound, ERCP Endoscopic retrograde cholangiopancreatography

In view of the FNA findings, pancreatic tuberculosis was suspected. Patient was started on anti-tubercular treatment of ethambutol, moxifloxacin and streptomycin. Isoniazid was not started in view of her deranged liver function tests. Following two weeks of treatment, her symptoms and serial liver function test showed marked improvement (Table 1). Acid-fast bacilli culture obtained from cytological samples was positive for mycobacterium tuberculosis complex six weeks later.

Subsequently, the patient chose to seek further treatment in her native country and was discharged well, with advice for further definitive treatment of cholelithiasis with laparoscopic cholecystectomy after completion of her anti-tubercular treatment.

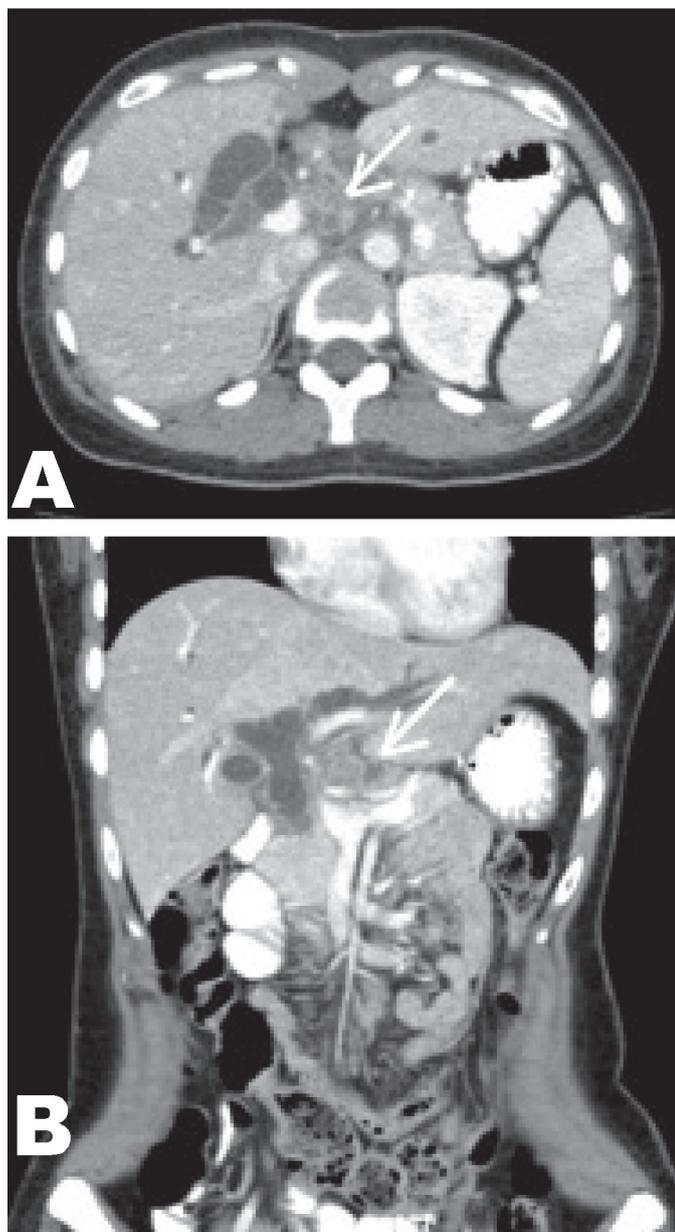


Figure 1: Computed tomography of abdomen and pelvis showing a heterogenous, multicystic pancreatic head mass (white arrow) (A) Axial section, (B) Coronal section.



Figure 2: Magnetic resonance imaging scan of pancreas showing a heterogeneously enhancing, multicystic pancreatic head mass (white arrow) and gallstones (blue arrow).



Figure 3: Endoscopic retrograde cholangiopancreatography (ERCP) showing a common bile duct stones (white arrow) and distal common bile duct stricture (blue arrow).

## DISCUSSION

**Epidemiology:** Isolated tuberculosis of the pancreas is an extremely rare condition with most published literature in the form of case reports or small case series. Pancreatic tuberculosis was first reported in 1944 by Auerbach et al. in [3]. In his series of 1656 autopsies of tuberculous patients, only 14 cases had direct pancreatic involvement with acute generalized tuberculosis, but none had isolated involvement of the pancreas.

**Pathogenesis:** Pancreatic involvement in tuberculosis usually occurs in the setting of miliary or widely disseminated tuberculosis, often in immunocompromised hosts. The pathogenesis of

pancreatic tuberculosis is not well known. Currently the following three mechanisms of spread for pancreatic tuberculosis have been postulated [4, 5]:

- (i) hematogenous or direct lymphatic contiguous spread via respiratory or gastrointestinal tract
- (ii) toxic-allergic reaction of the pancreas in response to generalized tuberculosis
- (iii) reactivation of dormant bacilli in an old lesion, particularly intra-abdominal or during an immunosuppressed state

The reason why tuberculosis rarely affects the pancreas can be attributed to the fact that the pancreas is biologically protected from infection by *Mycobacterium tuberculosis*. This is likely due to the presence of pancreatic enzymes such as lipases and deoxyribonucleases that interfere with seeding of the *Mycobacterium* [6].

**Presentation:** Due to the rarity and the insidious clinical presentations of pancreatic tuberculosis, diagnosis of pancreatic tuberculosis poses a great challenge. Clinical features of pancreatic tuberculosis are non-specific. In a meta-analysis of 12 published case reports, constitutional symptoms (e.g. weight loss, fever, malaise, night sweats), epigastric pain, nausea, vomiting, diarrhea, right upper quadrant pain and obstructive jaundice have been mentioned as its most common presenting manifestations [7].

The main features of pancreatic tuberculosis are summarized in Table 2 [8]:

Table 2: Clinical features of pancreatic tuberculosis

Gender	Occurs mainly in young females
Past history	<ul style="list-style-type: none"> <li>• Residing or previously residing in a country where tuberculosis is endemic</li> <li>• History of tuberculosis infection</li> </ul>
Symptoms	<ul style="list-style-type: none"> <li>• Commonly presents with epigastric pain, fever and weight loss</li> </ul>
Radiological imaging (Ultrasound and CT scan)	<ul style="list-style-type: none"> <li>• Pancreatic mass and peripancreatic nodules, with possible focal calcification</li> </ul>

The this case, our patient presented with all of the above stated characteristics along with obstructive jaundice secondary to concomitant choledocholithiasis.

**Diagnosis:** Pancreatic tuberculosis closely mimics pancreatic carcinoma both in clinical presentation and radiological appearance. From clinical reviews, between 60–100% cases of pancreatic tuberculosis were initially diagnosed as having pancreatic cancer [8, 9] and between 45–86% required surgery to confirm the diagnosis [10, 11].

Non-invasive imaging studies such as ultrasonography, CT and MRI scan can localize a mass lesion in the pancreas but are unable to rule out malignancy or help establish a precise diagnosis. Even the use of fluorodeoxyglucose-

positron emission tomography (FDG-PET) CT scan is non-specific for distinguishing between malignancy and tuberculosis, with both lesions exhibiting high uptake of FDG [12]. The most common associated CT features suggestive of pancreatic tuberculosis are peritoneal involvement and lymph nodes demonstrating ring enhancement and low-density areas within enlarged lymph nodes pathognomonic of tuberculous lymphadenopathy [2]. Routine investigations are usually non-specific. Our patient's full blood count, sputum examinations and chest X-ray were unremarkable in this case.

In contrast to non-invasive techniques, invasive diagnostic techniques are more reliable and definitive as tissue samples are obtained and are subjected to microbiological and histopathological examination. Microscopic features suggestive of tuberculosis include presence of caseating granulomatous inflammation and positive Ziehl-Neelsen stain for acid-fast bacilli. The diagnosis is established by positive mycobacterial culture, which may take up to six weeks to grow. Hence, bacteriological confirmation may not be attained in the early clinical course [13]. However, with the emergence of new technology such as polymerase chain reaction-based assay, a positive result can be obtained earlier even when microscopic examination and cultures of these tissues are negative [14].

These invasive techniques include CT/US-guided percutaneous biopsy, EUS-guided FNAC or surgical biopsy that can be either laparoscopic or open. EUS-guided FNAC has both the benefits of further characterization of the pancreatic mass with high-resolution imaging and the ability to obtain tissue samples for both microbiological and histopathological examinations. There are an increasing number of recent case reports describing this diagnostic technique in the setting of pancreatic tuberculosis. Diagnosis from positive yield of bile cytology for AFB is however, low at a reported rate of 20% [15].

In this case, preliminary CT and MRI scans revealed a solid-cystic heterogeneous tumor in the head of the pancreas that was highly suggestive of malignancy, along with concomitant choledocholithiasis. A diagnostic EUS-guided FNAC was performed which revealed confluent granulomas composed of epithelioid histiocytes mixed with lymphocytes with background necrosis. This was highly suspicious of tuberculosis even though the patient's Acid-fast bacilli stain was negative. Acid-fast bacilli cultures were eventually positive for tuberculosis. Hence we avoided an unnecessary laparotomy for the patient and commenced her on medical therapy immediately.

**Treatment:** Although diagnosis of pancreatic tuberculosis is difficult, majority of patients with pancreatic tuberculosis respond favorably to anti-tubercular treatment. This comprises multi-drug anti-tuberculous chemotherapy for six months as recommended by the World Health Organization (WHO) guidelines [16]. Prognosis of the disease is good with a reported low mortality rate of 5.4% in 73 cases reviewed

in literature [10].

Our patient responded well to anti-tubercular treatment. Interestingly, in addition to pancreatic tuberculosis, this case was also complicated by choledocholithiasis. There has been no previous literature published for such a unique clinical situation. In such a scenario, we propose that biliary stenting should be performed first, followed by the recommended six-month course of anti-tubercular treatment. Subsequently, with resolution of pancreatic tuberculosis, surgery should be offered as definitive treatment for biliary stone disease.

## CONCLUSION

Although pancreatic tuberculosis is a rare disease, it should be considered as a possible differential, especially in patients coming from an endemic country presenting with an isolated pancreatic mass coupled with vague symptoms. With an appropriate diagnostic approach and multi-disciplinary management, unnecessary surgery can be avoided with excellent outcomes attained in these patients.

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## Author Contributions

Ramesh Wijaya – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Critical revision of the article, Final approval of the version to be published

Chee Hoe Koo – Analysis and interpretation of data, Revising it critically for important intellectual content, Final approval of the version to be published

Adrian Chiow – Substantial contributions to conception and design, Revising it critically for important intellectual content, Final approval of the version to be published

Siong San Tan – Substantial contributions to conception and design, Revising it critically for important intellectual content, Final approval of the version to be published

Su-Ming Tan – Substantial contributions to conception and design, Revising it critically for important intellectual content, Final approval of the version to be published

## Guarantor

The corresponding author is the guarantor of submission.

## Conflict of Interest

Authors declare no conflict of interest.

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