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Case report

# Actinomycosis mimicking a pancreatic head neoplasm: A case report

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ABSTRACT

*Introduction:* Actinomycosis is a chronic suppurative disease caused by a filamentous, Gram-positive, facultative anaerobic bacterium *Actinomyces*. Abdominal actinomycosis accounts for 10 to 20% of reported *Actinomyces* infections and pancreatic involvement is extremely rare.

*Presentation of case:* We report the case of a 64-year-old man who presented with a 3-week history of abdominal pain, nausea, weight loss, and icterus. Abdominal CT scan revealed a 3.5 cm heterogeneously enhanced mass of the pancreatic head, associated with mild dilation of the main bile duct and the Wirsung duct. The diagnosis of pancreatic head malignancy was highly suspected and surgical management was decided. Intraoperatively, a 3 cm indurated mass of the pancreatic head was found. Whipple's procedure was performed. Histopathological examination revealed pancreatic actinomycosis.

*Discussion:* Pancreatic actinomycosis is extremely rare. To our knowledge, only 18 cases have been reported in the English literature to date. It commonly presents as a slow-growing mass with bile and pancreatic ducts obstruction, which can mimic malignancy. Therefore, it has often been misdiagnosed and over-treated with futile surgery, when medical treatment based on antibiotherapy is the only required treatment.

*Conclusion:* We reported a rare observation of surgical management of actinomycosis mimicking a pancreatic head neoplasm. As clinical and radiological findings are nonspecific, the accurate diagnosis can only be made by histology. Through our case, we aim to highlight the importance of preoperative suspicion of pancreatic actinomycosis, given the still relevant morbidity of pancreatic resections.

## 1. Introduction

Actinomycosis is a rare chronic granulomatous disease caused by a gram-positive anaerobic bacterium *Actinomyces* [1,2]. Abdominal actinomycosis accounts for 10 to 20% of reported *Actinomyces* infections and usually concerns the ileocaecal region, the colon, and the pelvis [3]. Pancreatic involvement is extremely rare. It causes chronic inflammation which may lead to mass-forming fibrosis, making diagnosis and management challenging [4,5]. We report here a rare case of surgical management of actinomycosis mimicking a pancreatic malignancy. This work has been reported in line with the SCARE 2020 criteria [6].

## 2. Case presentation

A 64-year-old man presented with a 3-week history of abdominal pain, nausea, weight loss, and icterus. He had diabetes and arterial hypertension in his past medical history. He had no family medical history. On examination, he was icteric, afebrile, and had mild epigastric tenderness without palpable mass. His body mass index was 17.1 kg/m$^2$. Laboratory tests revealed elevated serum total bilirubin (120 μmol/l), direct fraction (88 μmol/l), gamma-glutamyl-transferase (320 U/l), alkaline phosphatase (440 U/l) and liver enzymes (AST: 180 U/l, ALT: 220 U/l). Abdominal ultrasonography showed a 2.5 cm mass of the pancreatic head. Computed tomography of the abdomen revealed a 3.5 × 2.5 × 2.0 cm heterogeneously enhanced mass of the pancreatic head without invasion of vascular structures, associated with mild dilation of the main bile duct and the Wirsung duct (Fig. 1). Tumoral markers (Carbohydrate antigen 19-9 and carcinoembryonic antigen) were within normal ranges. The diagnosis of pancreatic head malignancy was highly suspected and surgical management was decided after preoperative parenteral nutrition. Intraoperatively, a 3 cm indurated mass of the pancreatic head was found. Whipple's procedure was performed by an associate professor in general surgery (Fig. 2). The postoperative course was uneventful. Gross examination of the specimen showed a poorly-circumscribed white pancreatic mass firmly attached to the duodenum (Fig. 3). Histopathological examination revealed filamentous

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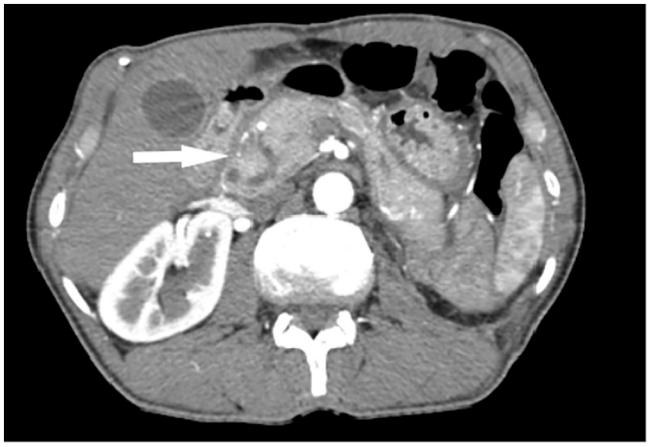

**Fig. 1.** Abdominal CT scan showing a 3.5 cm heterogeneously enhanced mass of the pancreatic head (white arrow).

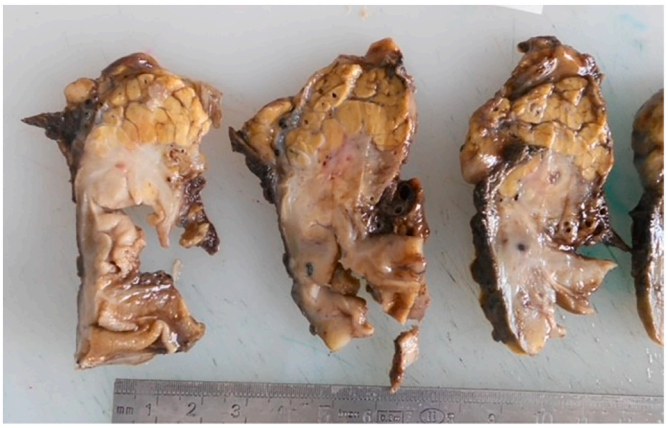

**Fig. 3.** Gross examination of the surgical specimen showing a poorly-circumscribed white pancreatic mass.

microscopic colonies of *Actinomyces*. The surrounding tissues showed dense inflammatory infiltrates of neutrophils. Malignant tissues were not detected (Fig. 4). The diagnosis of pancreatic actinomycosis was established. Currently, the patient is doing well. He is symptom-free at 1 year of follow-up.

## 3. Discussion

Actinomycosis is a chronic suppurative disease caused by a filamentous, Gram-positive, facultative anaerobic bacterium *Actinomyces* [1,2].

These pathogens are commensals of the oropharynx, gastrointestinal and female genital tract. They can acquire pathogenicity after penetration of tissues favored by disruption of the normal mucosal integrity [2,4].

Pancreatic involvement is extremely rare. To the best of our knowledge, only 18 cases have been reported in the English literature to date [1,2,4,5,7–20].

The main cause of pancreatic actinomycosis is a retrograde infection of the pancreatic duct [4]. Indeed, it has been predominantly described in the context of previous pancreatic surgeries or endoscopic stenting [2,8,14]. Nevertheless, none of these procedures have been performed neither in our case nor in the case reported by Miyamoto et al. [2]. The common factor between our 2 patients is severe undernutrition, which is most likely the predisposing factor.

The clinical presentation is nonspecific. It can include fatigue, weight loss, low-grade fever, vague abdominal pain, nausea, and vomiting [1,2].

The definitive diagnosis is made by histology. It shows the presence of sulfur granules, with colonies of actinomyces, in a background of inflammatory infiltrates of neutrophils, lymphocytes, and foamy macrophages [1,8].

Anaerobic culture is necessary for the isolation of *Actinomyces* species. It has been performed in only 2 cases of the 18 reported cases [2,8], and *Actinomyces meyeri* was identified. Yet, *Actinomyces israelii* has been the most commonly isolated pathogen in the past reports of abdominal actinomycosis [8].

Pancreatic actinomycosis commonly presents as a slow-growing mass with bile and pancreatic ducts obstruction, which can mimic malignancy [20]. Therefore, it has often been misdiagnosed and over-treated with futile surgery, when medical treatment is the only required therapy [11,19]. It is based on intravenous penicillin followed by oral penicillin for 6 to 12 months [2,11,20]. Surgery is reserved for

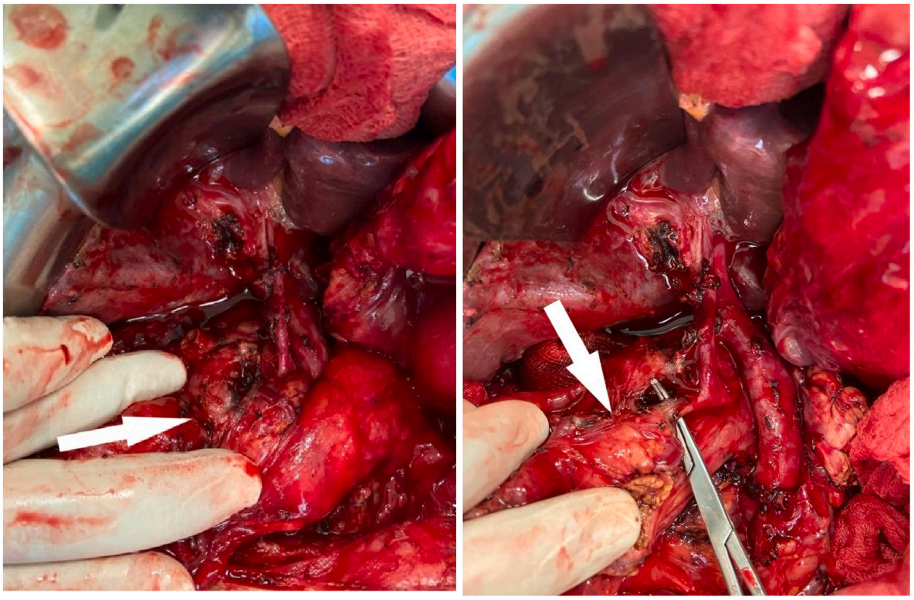

**Fig. 2.** Intraoperative view after pancreatic section showing an indurated mass of the pancreatic head (white arrows).

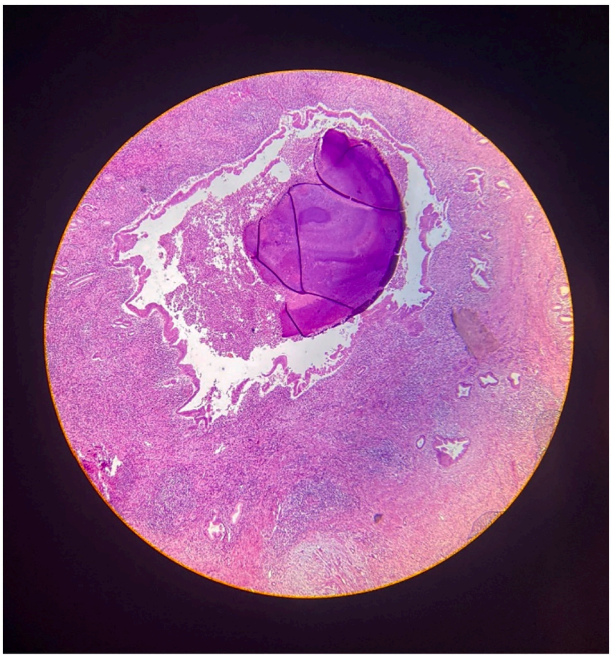

**Fig. 4.** Histopathological examination revealing filamentous microscopic colonies of *Actinomyces* with dense inflammatory infiltrates of neutrophils in the surrounding tissues.

selected cases to drain unhealing abscesses and remove necrotic tissues. Prognosis is generally good when actinomycosis is adequately diagnosed and treated [1,19].

In our case, surgical resection was performed because of the high suspicion of a malignant tumor and the unavailability of endoscopic and biopsy materials in our institution.

## 4. Conclusion

We reported a rare observation of surgical management of actinomycosis mimicking a pancreatic head neoplasm. As clinical and radiological findings are nonspecific, the accurate diagnosis can only be made by histology. Through our case, we aim to highlight the importance of preoperative suspicion of pancreatic actinomycosis, given the still relevant morbidity of pancreatic resections.

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This study was not supported by any institution or company.

## Ethical approval

The patient has provided both verbal and written consent for the publication of this article. It was made sure that his identity will be kept a secret at all levels.

## Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

## Authors' contribution

All authors were involved in the researching, writing, and editing of the manuscript.

## Registration of research studies

Not applicable.

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## Declaration of competing interest

The authors declare no conflict of interest.

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