

Ampullary Actinomycosis Mimicking Malignancy: A Case Report and Literature Review

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Abstract

This case discusses a 76-year-old female patient with a large mass at the major papilla of Vater, initially suspected to be an ampullary adenoma. The lesion, identified during an upper endoscopy for anemia and fatigue, showed chronic inflammation but no malignancy. The patient's medical history included breast cancer and a partial distal pancreatectomy for an intraductal papillary mucinous neoplasm. Further imaging and biopsies did not confirm malignancy or adenoma but suggested actinomycosis. Actinomycosis, caused by *Actinomyces* species, presents challenges due to its rarity, slow progression, and difficulty in diagnosis. It can mimic malignancies, especially occurs following surgery, and requires long-term antibiotic therapy. We present the first documented case of actinomycosis involving the ampulla of Vater and emphasize the importance of considering actinomycosis in the differential diagnosis of ampullary masses, particularly in post-surgical patients with granulomatous tissue. (*Acta gastroenterol belg.*, 2026, 89, 87-91).

Keywords: Actinomycosis, Ampulloma, Pancreatic Mass, Malignancy.

Introduction

Actinomycosis is a rare, slowly progressing, chronic, suppurative, and granulomatous infection primarily caused by *Actinomyces* species, anaerobic, Gram-positive bacteria that are part of the normal flora of the oral cavity, gastrointestinal tract, and genital tract (1,2). Among the various species, *Actinomyces israelii* is recognized as the most frequently implicated subspecies in clinical infections (1).

From a histopathological perspective, actinomycosis is characterized by granulomatous inflammation with progressive fibrosis, a combination that, if left untreated, can result in extensive tissue destruction and functional impairment (1, 3).

Clinically, actinomycosis manifests in several distinct forms depending on the involved anatomical region. Cervicofacial actinomycosis accounts for approximately 55% of cases and often occurs as a complication following dental infections. Pelvic actinomycosis, representing 20% of cases, is frequently associated with prolonged use of intrauterine devices (IUD) while pulmonary actinomycosis, seen in 15% of the cases, is more common in smokers with poor oral hygiene (1, 4). Importantly, actinomycosis often mimics malignancies, especially in postoperative settings where disruption of mucosal barriers facilitates invasion of the bacteria into surrounding tissues (1, 4). The infection may clinically

resemble not only malignancy but also tuberculosis or nocardiosis (2). The disease characteristically forms cold abscesses, an abscess that lacks the intense inflammation usually associated with infection, and tends to spread contiguously rather than via hematogenous routes (4).

Microbiological confirmation of actinomycosis is often challenging due to the very specific and demanding growth requirements of the organism, which can limit successful culture. *Actinomyces* species grow slowly, require enriched media and anaerobic or microaerophilic conditions and may be easily overgrown by faster-growing bacteria in the same sample (4). Therefore, the definitive diagnosis relies heavily on histopathological identification of 'sulfur' granules as the hallmark of the disease (4). These granules consist of a conglomeration of filamentous bacteria. The surrounding tissues show dense inflammatory infiltrates of neutrophils, lymphocytes, and foamy macrophages (4).

Treatment generally involves prolonged antibiotic therapy, most commonly with penicillin or amoxicillin for 6 to 12 months (4). In cases involving extensive masses, surgical resection may be necessary (1, 2).

Abdominal actinomycosis is particularly rare and diagnostically challenging due to the lack of specific clinical signs and its capacity to mimic gastrointestinal malignancies (3). Within this category, involvement of the ampulla of Vater or the pancreas is exceedingly uncommon as this report describes the first case of ampullary actinomycosis. To gain a better understanding of the nature and clinical presentation of this disease, we will review the sparse existing literature concerning pancreaticobiliary manifestations of actinomycosis (1–15).

Case History

We present the case of a 76-year-old female referred for evaluation of a mass at the major papilla of Vater,

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which was incidentally discovered during an upper endoscopy performed to investigate persistent fatigue and iron-deficiency anemia. Initially, the lesion was suspected to be an ampullary adenoma (Fig. 1A). However, subsequent endoscopic biopsies revealed only chronic active inflammation with no evidence of dysplasia, adenoma, or malignancy.

The patient had a significant medical history including breast cancer treated 21 years earlier. Additionally, she underwent a distal pancreatectomy seven years prior for an intraductal papillary mucinous neoplasm (IPMN) with focal high-grade dysplasia. Given this background and the endoscopic findings, a repeat upper endoscopy with endoscopic ultrasound (EUS) was performed (Fig. 1B). EUS revealed a five cm hypoechoic mass at the ampulla with intraductal extension into the common bile duct (CBD) and pancreatic duct (PD) with retrograde dilation of both ducts. There was no deep invasion, vascular encasement, or lymphadenopathy. Both conventional biopsies and fine-needle biopsy (FNB) were non-diagnostic, showing no evidence of malignancy.

Computed Tomography images of the abdomen confirmed the ampullary mass with obstruction of PD and CBD. (Fig. 1C). Blood analysis showed liver enzymes, bilirubin, lipase and tumor markers (CA 19-9, CA 15-3, and CEA) to be all within normal limits. Additionally, a fluorodeoxyglucose positron emission tomography/computed tomography (FDG-PET/CT) scan showed a hypermetabolic duodenal mass (Fig. 1D). Considering her oncological history and the expansion of the lesion, interventional options were discussed with the patient.

However, she declined further evaluation, citing her previous experience with prolonged hospitalization and the significant postoperative challenges she faced following the pancreatectomy seven years earlier.

Subsequently, she agreed to an additional endoscopic assessment for possible endoscopic ampullectomy. A repeat EUS showed stable findings, but the lesion was deemed unsuitable for ampullectomy due to its considerable size and extensive intraductal growth. Although microbiological cultures remained negative, histopathological evaluation revealed *Actinomyces* colonies (Fig. 2A, 2B). As a result, a 12-month course of oral amoxicillin therapy was initiated.

At four months of follow-up, EUS showed continued but slow expansion of the lesion. By 12 months, the lesion had stabilized, with only mild progression of CBD and PD dilation. Repeated histology confirmed persistent *Actinomyces* colonies, with no dysplasia or malignancy. The patient remained asymptomatic, with normal cholestatic and inflammatory markers. Given her prior adverse experience with surgery, she opted for continued conservative management.

Discussion

To our knowledge, this is the first reported case of actinomycosis involving the ampulla of Vater. A comprehensive PubMed search (conducted on April 22, 2025) using the terms “actinomycosis” AND “ampulla of Vater” OR “hepatopancreatic ampulla” OR “hepatopancreatic duct” yielded no prior reports involving this specific anatomical site. However, two analogous

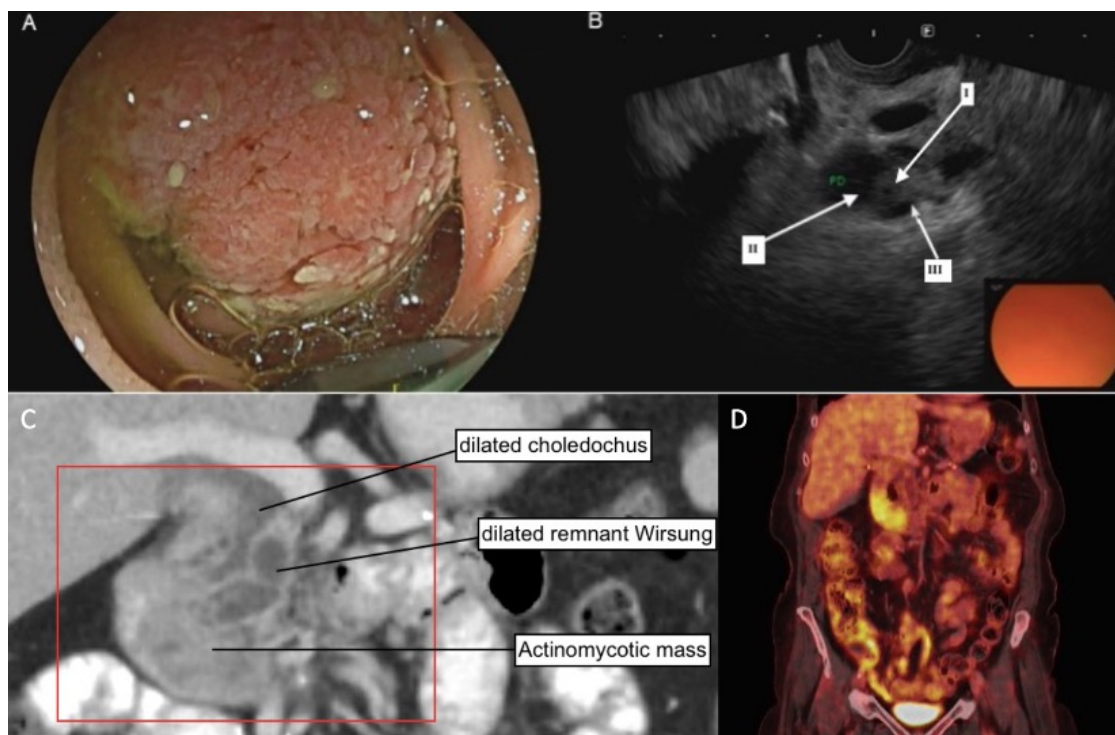


Figure 1.

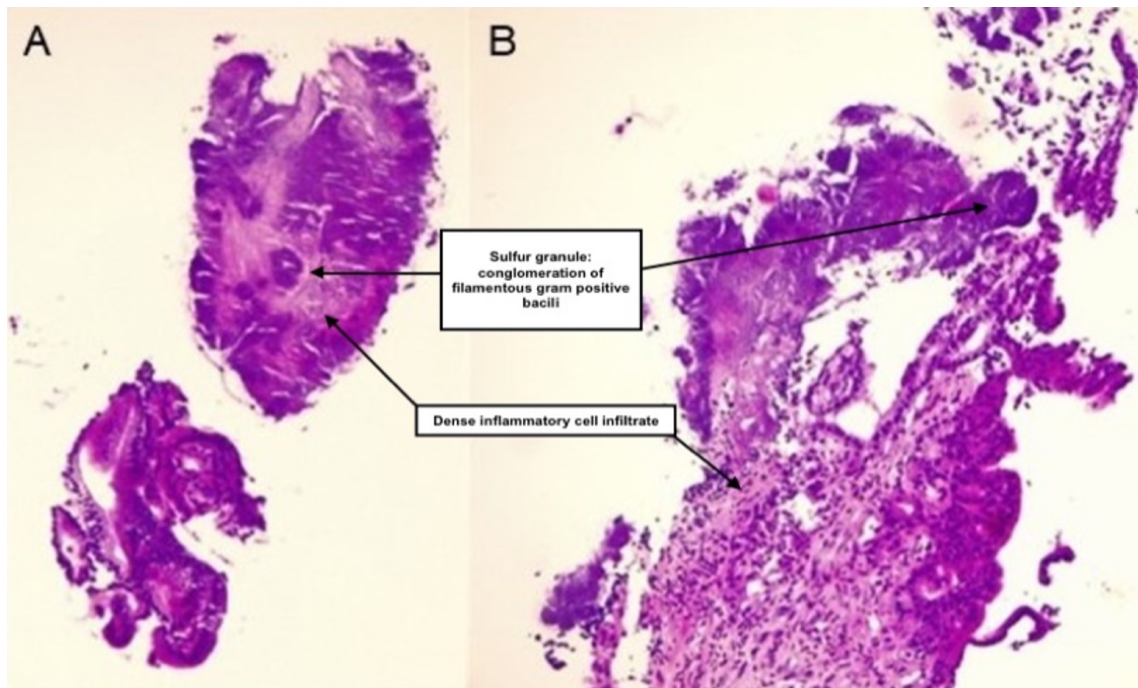


Figure 2.

cases were found, describing actinomycosis involving the pancreaticojejunostomy after Whipple procedures (1, 2). Extending our PubMed search to include pancreatic actinomycosis identified 13 published cases spanning from 1987 to 2024 (3–15), underscoring the exceptional rarity of pancreatic and periampullary actinomycosis. The results of this literature review are summarized in Table 1. We extended our literature search to Embase, Cochrane Library and Web of Science (on August 8, 2025) resulting in no additional papers. An important and recurrent observation across these published reports is the predominant history of prior abdominal surgery or instrumentation, including pancreatic resections, manipulation or stenting of the pancreatic duct (Table 1). Such interventions likely disrupt the mucosal integrity, thereby permitting pathogenic invasion by *Actinomyces* species, which are otherwise commensal organisms within the gastrointestinal tract (1). In the presented case of this paper, a distal pancreatectomy performed seven years earlier, likely served as a similar predisposing factor for infection.

Diagnosing actinomycosis remains challenging. Its slow, indolent progression coupled with nonspecific symptoms often leads to misdiagnosis or delayed detection (2, 4). Moreover, in most reviewed cases, imaging was initially suspicious for malignancy, emphasizing how actinomycosis can closely mimic neoplastic disease (1–15). Furthermore, in almost half of the evaluated cases, microbiological cultures or histopathological analysis remained inconclusive or were not feasible, and diagnosis was only established postoperatively (Table 1)(1–2, 4, 6–8,

10). The low diagnostic yield of cultures, combined with non-specific clinical features and radiological findings, contributes to frequent misdiagnosis of this condition. Histopathology, however, remains the cornerstone of diagnosis, with sulfur granules and filamentous bacterial colonies, as mentioned earlier, as defining features (4). In our case, the diagnosis was achieved via repeated EUS-guided biopsies despite negative cultures. This highlights the importance of repeated sampling and thorough histological examination in suspected cases. Additionally, special staining techniques such as Grocott Methenamine silver coloring may further improve diagnostic sensitivity (4).

Actinomycosis is frequently diagnosed only after surgical resection, as reported in more than half of the pancreatic cases described in the literature. However, several reports describe successful outcomes with conservative treatment if diagnosis was established preoperatively. Treatment regimens vary: most commonly, patients receive penicillin or amoxicillin for 6–12 months, (3, 9, 13–15). In two cases, intravenous antibiotic treatment was employed (11, 12), and in one case adjunctive sulfamethoxazole and trimethoprim therapy was also employed (5).

These data suggest that early recognition of actinomycosis can obviate the need for invasive procedures and their associated morbidity. In our case, stabilization of the mass was achieved without complete resolution. To avoid surgery, an IV course or adjunctive treatment with sulfamethoxazole and trimethoprim might be considered.

Table 1. — Overview of the literature review.

| | Sex, age and clinical presentation | Location of Actinomycosis | Previous surgery | Treatment |
|----------------------|---|---------------------------|---|-------------|
| Hsu et al (1) | Male, 69 Abdominal cramping, fatigue, anorexia, weight loss | Pancreatico-jejunostomy | Whipple for ampullary carcinoma | Resection |
| Khamaysi et al (2) | Male, 66 Abdominal pain, nausea, weight loss | Pancreatico-jejunostomy | Whipple for ampullary carcinoma | Resection |
| Yeo et al (3) | Male, 44 Fever, abdominal pain, weight loss, leukocytosis | Pancreas tail | Intestinal perforation | Antibiotics |
| Jha et al (4) | Male, 66 Epigastric pain, weight loss, acute pancreatitis episodes | Pancreatic remnant | Whipple for IPMN | Resection |
| Halevy et al (5) | Male, 57 Right hypochondrial pain, fever, weight loss | Pancreas | Appendectomy | Antibiotics |
| Hajri et al (6) | Male, 64 Abdominal pain, nausea, weight loss, jaundice | Pancreatic head | None | Resection |
| Addeo et al (7) | Male, 72 Abdominal pain, anorexia, nausea, weight loss | Pancreatic head | None | Resection |
| Kuesters et al (8) | Male, 47 asymptomatic | Pancreatic head | Pancreatic duct drainage | Resection |
| Poche et al (9) | Female, 26 Epigastric pain, nausea | Pancreatic head | None | Antibiotics |
| De Clerck et al (10) | Male, 64 Abdominal pain, weight loss, fever | Pancreatic resection | Pancreatic duct stenting | Resection |
| Sahay et al (11) | Male, 50 Pain, weight loss | Pancreatic head | Cholecystectomy, cystogastrostomy, pancreaticojejunostomy | Antibiotics |
| Lee et al (12) | Female, 39 Asymptomatic | Pancreas and Psoas | None (Accupuncture) | Antibiotics |
| Maestro et al (13) | Male, 66 Abdominal pain, fever | Pancreatic body | None | Antibiotics |
| Thomas et al (14) | Male, 57 Abdominal pain, vomiting | Pancreatic head | Pancreatic duct stenting | Antibiotics |
| Hayashi et al (15) | Male, 60 No symptoms reported | Pancreatic head | Pancreatic duct stenting | Antibiotics |

Conclusion

This case underscores the critical importance of considering actinomycosis in the differential diagnosis of ampullary and peripancreatic masses, particularly in patients with a history of abdominal surgery or instrumentation. Given its rarity and propensity to mimic malignancy, a high index of suspicion is essential. Early histopathological identification, can facilitate timely

and effective antibiotic treatment, thereby potentially avoiding unnecessary surgical interventions.

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