



Abdominal actinomycosis mimicking malignancy: A case report

Hany Eskarous^a, Adhvithi Pingili^{b,*}, Darshine Venugopal^c

^a Temple University Hospital, 3401 N Broad St, Philadelphia, PA 19140, USA

^b Prathima Institute of Medical Sciences, Karimnagar, Telangana 505417, India

^c Sri Muthukumaran Medical College Hospital and Research Institute, Chikkarayapuram, Chennai, Tamil Nadu 600069, India



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ABSTRACT

Actinomycosis is the infection caused by *Actinomyces* bacilli; subtypes include cervicofacial, pulmonary, and abdominal/pelvic actinomycosis. Abdominal actinomycosis can mimic intra-abdominal malignancies by causing manifestations like chronic lower abdominal pain, weight loss, and palpable mass(es). Treatment usually requires three to six months of high-dose penicillin G or amoxicillin. This report discusses an 88-year-old female who presented with chronic abdominal pain, weight loss, and other nonspecific symptoms without palpable abdominal mass. However, computed tomography (C.T.) imaging revealed multiple intra-abdominal soft tissue masses in the greater omentum, anterior abdominal wall, and small bowel mesentery. On biopsy, filamentous bacilli suspicious of *Actinomyces* was identified. The patient received prolonged antimicrobial treatment, underwent multiple CT-guided aspirations of recurrent abscesses, and had surgical intervention for sigmoid stricture. On subsequent imaging, the patient showed significant amelioration of omental and anterior abdominal wall masses. This case highlights the importance of prompt recognition and subsequent management of *Actinomyces* as an etiology of malignancy-like symptoms.

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Introduction

Actinomyces spp., gram-positive, anaerobic, microaerophilic, and filamentous bacilli are universal human commensals, colonizing oropharynx, gastrointestinal tract, and urogenital tract. These bacilli rarely cause actinomycosis, typically manifesting in three forms: cervicofacial (50%), pulmonary (15%), and abdominal (20%) [2]. Within the abdomen: liver, pancreas, gastrointestinal, perigastric, splenic, renal, and pelvic (primarily associated with increased use of intrauterine devices), involvement is frequently reported [9]. Abdominal actinomycosis is insidious; progression varying from one month to two years before diagnosis. Patients present with non-specific symptoms like abdominal pain, cramps, anorexia, weight loss, fever, and diarrhea [7]. Abdominal actinomycosis mimics malignancy, frequently after appendectomy or missed appendiceal perforation, and commonly leads to the emergence of abscesses, fistulae, granulation, and fibrosis [5]. Prolonged treatment with penicillin is the most common therapy [5]. In this case report, clinical and imaging findings mimicked an intra-abdominal malignancy. This

case report aims to discuss etiology, clinical, and imaging features and treatment of abdominal actinomycosis, mimicking malignancy.

Case report

Our patient is an 88-year-old female with a history of vitamin B12 and D deficiency, hypertension, hypercholesterolemia, bladder suspension surgery for prolapsed bladder, and peripheral arthritis with chief complaints of abdominal pain, lessened appetite, generalized fatigue, and 15-pound weight loss over one month. The patient denied having nausea, vomiting, or alteration of bowel habits. Physical examination revealed tenderness over the left lower quadrant of the abdomen without guarding, rigidity, or rebound tenderness.

The patient's initial laboratory evaluation reflected anemia (hemoglobin of 8.5 g/dl) and leukocytosis (white blood cell count of 26,000/mm³). The stool for occult blood was negative. C.T. imaging of the abdomen with intravenous contrast identified multiple intra-abdominal soft tissue masses in the greater omentum, anterior abdominal wall, and small bowel mesentery. The largest one was 4.1 × 2.5 cm. C.T. imaging also showed perforation of sigmoid colon diverticulitis, containing abscess in the left lower quadrant. Fig. 1 illustrates these findings below. At this point, the patient was hypothesized to have peritoneal carcinomatosis due to ovarian/unknown primary malignancy. Tumor markers were checked, and CA

* Correspondence to: Prathima Institute of Medical Sciences, Nagunur, Karimnagar, Telangana 505417, India.

E-mail addresses: hany.eskarous@tuhs.temple.edu (H. Eskarous), adhvithip@gmail.com (A. Pingili), darshine95@gmail.com (D. Venugopal).

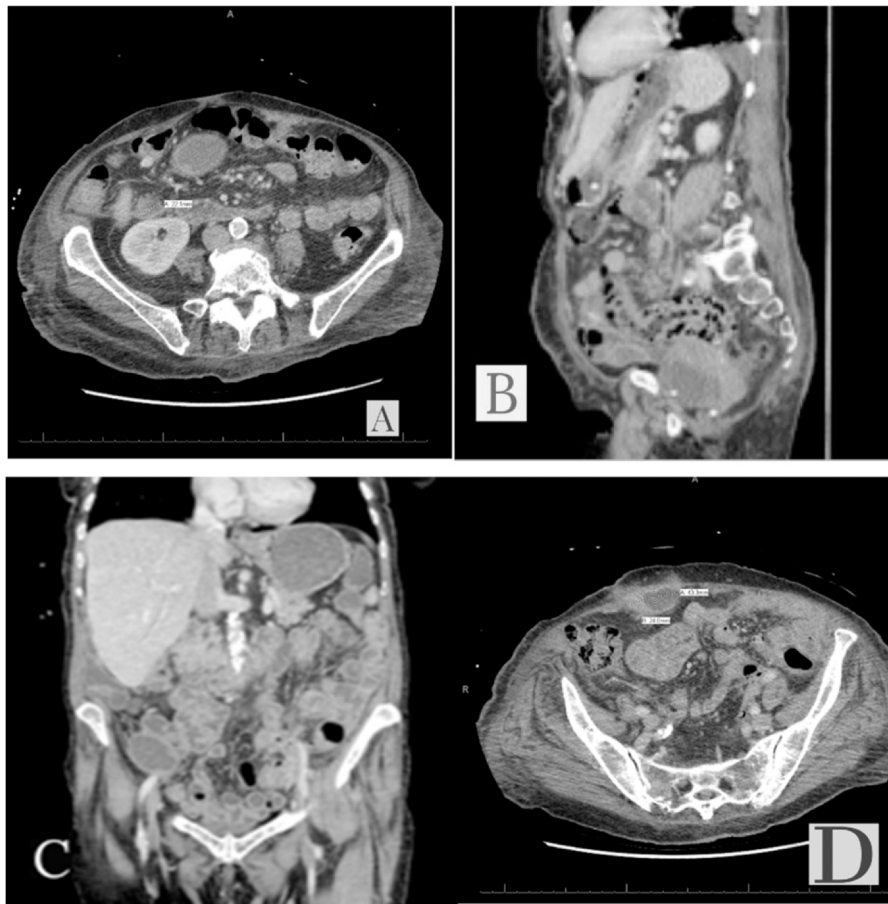


Fig. 1. CT. (A) Transverse, (B) Sagittal, (C) Coronal, (D) Transverse of the CT scan showing multiple soft tissue masses within the omentum anterior, abdominal wall, and small bowel mesentery.

125 was slightly elevated, with normal CA 19-9 and carcinoembryonic antigen (C.E.A.) levels.

For acute perforation of sigmoid diverticulitis with a localized abscess, the patient was initially treated conservatively with one gram of intravenous cefazolin and 0.5 g of intravenous metronidazole every eight hours. However, given increasing leukocytosis and no improvement in her symptoms, CT-guided percutaneous drainage of the abscess was done, which yielded foul-smelling cloudy fluid. The subsequent culture showed polymicrobial growth of *Escherichia coli*, beta-hemolytic group F streptococci, and alpha-hemolytic streptococci. Also, CT guided needle biopsy of right and left omental masses was done. While histopathological examination showed inflammation and fibrosis of adipose and dense connective tissue, it did not reveal any sign of malignancy. Grocott-Gomori's methenamine silver (G.M.S.) stain revealed filamentous organisms in the area suggestive of *Actinomyces* colonies on hematoxylin and eosin (H&E) analysis, and Periodic Acid-Schiff (P.A.S.) stain too highlighted occasional bacilli. Acid-fast (Fite) stain, though, was negative. Based on these findings, we diagnosed the patient with abdominal actinomycosis, a chronic granulomatous infection. The patient was initiated on six-hourly three grams of intravenous ampicillin/sulbactam and continued for four weeks. Later, we switched the patient to eight hourly 500 mg of oral amoxicillin for three months.

During follow-up over the next few months, the patient developed recurrent abdominal pain with left lower quadrant swelling. C.T. imaging with intravenous contrast revealed a new intra-abdominal abscess despite being on oral amoxicillin therapy. CT-guided percutaneous drainage of the abscess was the primary

intervention done. Since we did not culture the abscess, the presence of *Actinomyces* bacilli could not be confirmed. The patient subsequently developed a sigmoid stricture, for which the patient underwent an exploratory laparotomy with loop colostomy. However, CT imaging demonstrated significant interval improvement of the omental and anterior abdominal wall masses during the follow-up period, pointing towards abdominal actinomycosis.

Discussion

While the patient was started on a recommended antimicrobial regimen for actinomycosis, the response was less effective than expected. The patient kept experiencing recurrent abscesses, the rationale for which could not be discerned, owing to a lack of repeat cultures. Nevertheless, considerable symptom amelioration validated our treatment.

Abdominal actinomycosis is an infrequent infection in humans, most commonly caused by *Actinomyces israelii* [8]. Barring pelvic actinomycosis, men are commonly affected than women due to unknown reasons [8]. A high index of suspicion must be maintained in age groups ranging from middle age to the elderly population as abdominal actinomycosis has been reported in these age groups [1-3]. The most prevalent gastrointestinal sites of actinomycosis are the appendix, cecum, and transverse colon. The disease can ensue weeks to years after disruption of the gastrointestinal mucosa [6].

With pathogenesis being unclear, *A. israelii* is considered a saprophyte in various organs of the human body. In the presence of low oxygen and mucosal lesions, it becomes pathogenic [7]. The

mucosal disruption and oxygen-deprived milieu allow penetration of the organism, leading to a suppurative pseudo tumoral disease [1], with an initial stage of a localized abscess to eventual extensive peritoneal spread. The pathogen can grow on implanted intrauterine devices. The disruption caused during implantation of the device and device itself can act as destabilizing factors giving rise to pelvic actinomycosis [3]. The disease can later extend into the final stage of both internal and cutaneous fistulization [1]. Some conditions precipitate quick disease spread like previous bowel surgeries, pancreatitis, appendicitis, perforated gastric ulcers, and diverticulitis (likely in our patient's case) [3].

There are delays in diagnosing actinomycosis because infection mimics "mass lesion" and is often confused with intestinal tuberculosis, helminthic infestation, chronic appendicitis, diverticulosis, and Crohn's disease [7]. C.T. findings of an infiltrative abdominal mass with heterogeneous contrast enhancement can suggest actinomycosis, especially in patients with fever, leukocytosis, or long-term use of intrauterine contraceptive devices. In the case of an abdominal mass, diagnosis can be confirmed by percutaneous imaging-guided fine-needle aspiration, as was done in our patient's case [4]. Diagnostic gold standard microbial culture is especially laborious, requiring fresh material, like pus or tissue, to be transported in specific anaerobic conditions and could still have a negative result 76% of the time [10]. While granules found in pus regularly show a positive reaction to Periodic Acid Schiff and Grocott's dye, the Von Kossa test is often negative [11]. The recommended regimen for treating actinomycosis is four months of daily 20 million I.U. of intravenous penicillin G and oral penicillin V (two to four grams/kg/day) for a variable period. Concomitant gram-negative flora often responds to metronidazole. Concurrent drainage of abscess(es) or resection of infected tissue often shortens antimicrobial therapy duration and decreases the recurrence rates. Excision of infected or necrotic tissue reduces the bacterial burden and enhances antimicrobial action [10]. Depending on the location and extent of the involvement, percutaneous/surgical drainage of the abscess(es) or surgical resection of the involved tissue can be considered. A few cases of abdominal wall lesions and pelvic abscesses were reported to be successfully treated by antimicrobials alone. The need for surgery must be determined on a case-by-case basis. Surgery is essential in cases with huge abscesses, declining general health, or perforative/compressive complications [1]. The prognosis is excellent; a combination of surgery and antimicrobial treatment can provide a cure for most cases [11]. In line with the above recommendations, we focused our treatment on the long-term use of antimicrobials and surgery for sigmoid stricture, which could be a complication of the infectious process. Follow-up period centered on multiple CT-guided percutaneous drainage of abscesses, most likely due to relapse of the infection.

Conclusion

This case report aims to highlight malignancy mimicking clinical and imaging features of abdominal actinomycosis. Physicians may mislead themselves into diagnosing pelvic organ malignancy with clinical symptoms of weight loss, fatigue, chronic lower abdominal pain, and intra-abdominal mass(es) imaging findings, especially in females. A biopsy can help ascertain diagnosis (as in our case) and further guide management, primarily long-term antimicrobials, and debridement of infected tissue. Prognosis is excellent in healthy patients, prompting physicians to keep actinomycosis in differential diagnoses of suspected intra-abdominal malignancy.

Consent

Consent has been taken

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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