Actinomycosis infection causing an acute appendicitis - case report

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This article was submitted to RAD CASA - Medical Sciences as the original article

Conflict of Interest Statement: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Received: 15 November 2024
Accepted: 2 December 2024
Published: 20 December 2024

Citation:
Brkić L, Bogdanić B, Marušić Z, Korša L, Mandarić A, Orešković Z, Morović S. Actinomycosis infection causing an acute appendicitis - case report 565=68-69 (2024): 92-95
DOI: 10.21857/moxpjhz56m

Abstract

Actinomyces species is a commensal organism in humans. If mucosal damage occurs, it becomes a pathogen. Most cases are limited to the face and neck. Abdominal actinomycosis (AA) is rarely encountered in clinical practice. Presentation is highly variable, ranging from an acute abdomen to an abdominal mass suspicious of malignancy. This case report describes a young, previously healthy female admitted for acute abdomen. Gangrenous appendicitis with perforation and diffuse peritonitis were found during the operative procedure. A laparoscopic appendectomy was performed. The pathology report described positive aggregates of filamentous organisms, consistent with *Actinomyces spp*. After the introduction of the empirical antibiotic treatment, the patient recovered completely. No intraabdominal relapse occurred in the 4-year follow-up.

Keywords: Actinomycosis; Appendectomy; Abdomen acute

Sažetak

Actinomyces species vrsta je komenzalnih organizama kod ljudi. Međutim, ukoliko dođe do oštećenja sluznice, oni postaju patogeni organizmi. Većina slučajeva ograničena je na lice i vrat, a abdominalna aktinomikoza (od engl. Abdominal Actinomycosis, AA) rijetko se susreće u kliničkoj praksi. Klinička slika je vrlo varijabilna, u rasponu od akutnog abdomena do abdominalne tvorbe koja je zloćudne prirode. Ovaj prikaz slučaja opisuje mladu, prethodno zdravu žensku osobu primljenu na Kliniku za kirurgiju zbog kliničke slike akutnog abdomena. Operativnim zahvatom utvrđen je gangrenozni apendicitis s perforacijom i difuzni peritonitis. Učinjena je laparoskopska apendektomija. Patolhistološka dijagnoza opisuje pozitivne agregate filamentoznih organizama, a što upućuje na *Actinomyces spp*. Nakon uvođenja empirijskog antibiotskog liječenja bolesnica se potpuno oporavila. U 4-godišnjem praćenju nije došlo do intraabdominalnog relapsa.

Ključne riječi: Aktinomikoza, apendektomija, akutni abdomen

Introduction

Actinomycosis is an indolent infection caused by the Gram-positive *Actinomyces* bacteria, typically *Actinomyces israelii*. The presumed pathophysiology is penetration through mucosal damage since it is a commensal organism in the human oral cavity, gastrointestinal, and female genital tract. In initial reports of abdominal actinomycosis (AA) from the 19th century it was a fatal disease, causing multiple suppurative inflammations (1). Known risk factors are previous surgery, perforation of a hollow viscus, and intrauterine device (IUD) placement (2,3). Justly considered "the great imitator", AA can mimic a lot of other pathologies, mainly acute appendicitis, Crohn's disease, and malignancy (4,5). It can present as a slowly growing palpable mass or cause intermittent abdominal pain many months before the initial examination (6,7). Sung and Kim described two cases where AA was incidentally found without reported symptoms (8). In this case report, a young female patient was admitted to the Abdominal surgery department because of an acute abdomen. A typical laparoscopic appendectomy was performed without complications. A pathology review confirmed actinomycosis.

Case report

A 27-year-old female was admitted to the Abdominal surgery department for acute abdomen. The initial examination was in the Emergency services, where the main complaint was pain in the right lower quadrant (RLQ) lasting 4 days. No vomiting occurred, but nausea was perceived. Previous medical history noted polycystic ovaries and no IUD placement. Medication and allergies were denied by the patient. A family history noted diverticulosis. She was previously admitted to the Gynecological department where no gynecological pathology was found. On physical evaluation abdominal tenderness and rebound were found in RLQ, and a fever of 39.5 Celsius was measured. The leukocyte count was elevated (11.7 x10^9/L), and C reactive protein (CRP) was suggestive of acute inflammation (157 mg/L). Abdominal computed tomography (CT) found no clear pathology. Due to clinically intense abdominal tenderness, it was decided to perform explorative laparoscopy.

Surgery was performed laparoscopically with a supraumbilical 5mm camera port, 5mm trocar placed in the right medioclavicular line, and 12mm trocar placed in the left iliac fossa. The intraoperative finding was a diffusely thickened, gangrenous appendix with apical perforation and subsequent diffuse purulent peritonitis in all four quadrants. After dissecting the mesoappendix, resection was done with an endoscopic stapling device. The specimen was extracted with an endoscopic specimen bag. A drain was placed through a trocar incision. The appendix was sent to routine pathology (Figure 1.).

The initial antibiotic therapy was ciprofloxacin 2x400mg/day and metronidazole 3x500mg/day until the first postoperative day. On the second postoperative day, it was escalated to meropenem 3x1g/day and vancomycin 2x1g/day intravenously due to worsening of fever and protracted symptoms after surgery. The leukocyte count was 15x10^9/L, and CRP elevated to 402 mg/L, raising suspicion of peritoneal sepsis. An abdominal CT was indicated for suspicion of stapling line dehiscence and collection formation, which was negative.

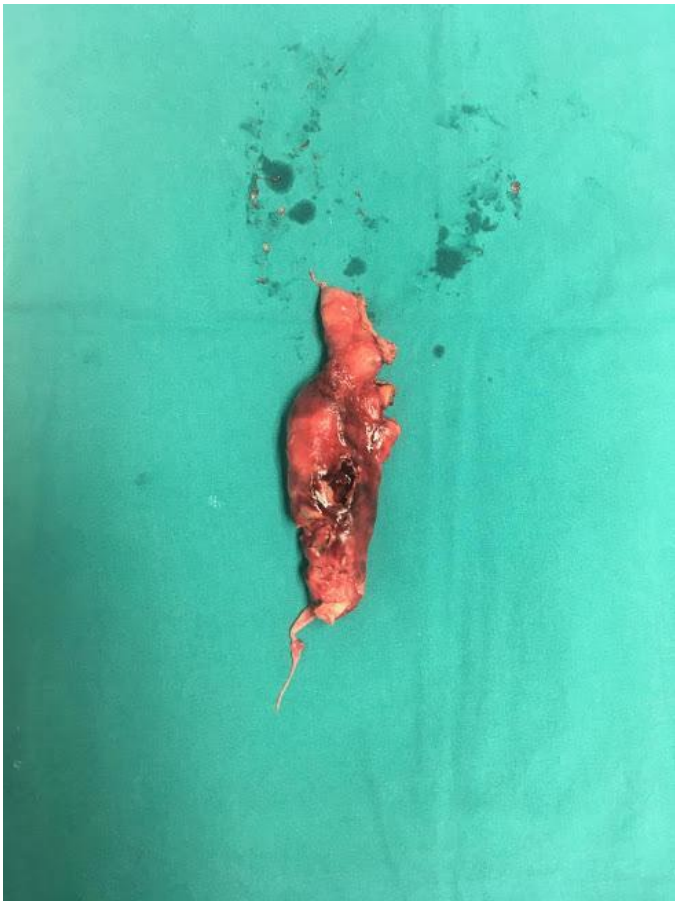

Figure 1. Inflamed, gangrenous appendix vermiformis

A pathology review was available on the sixth postoperative day. The colonies were stained positively in Gram, Grocott's methenamine silver (GMS), and Periodic-acid Schiff (PAS) staining, showing long filamentous bacteria (Figure 1). The Ziehl-Neelsen staining was negative. It reported diffuse fibrosis, crypts filled with Sulphur granules forming colonies, and neutrophilic and lymphocytic infiltration (Figure 2). The clinical microbiology department was consulted during the procedure, and the final pathology report stated Actinomycosis of the appendix with acute inflammatory response.

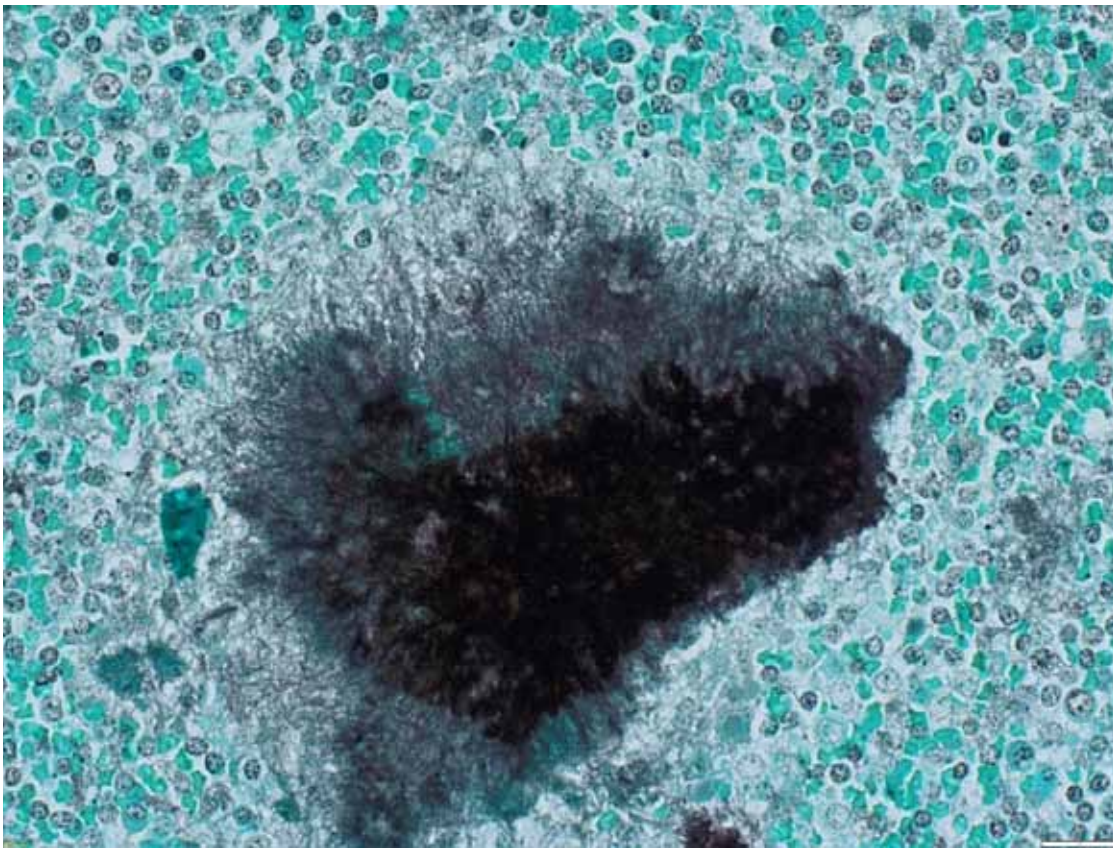

Figure 2 Grocott's methenamine silver (GMS)x40 stain showed positive aggregates of filamentous organisms, consistent with Actinomyces.

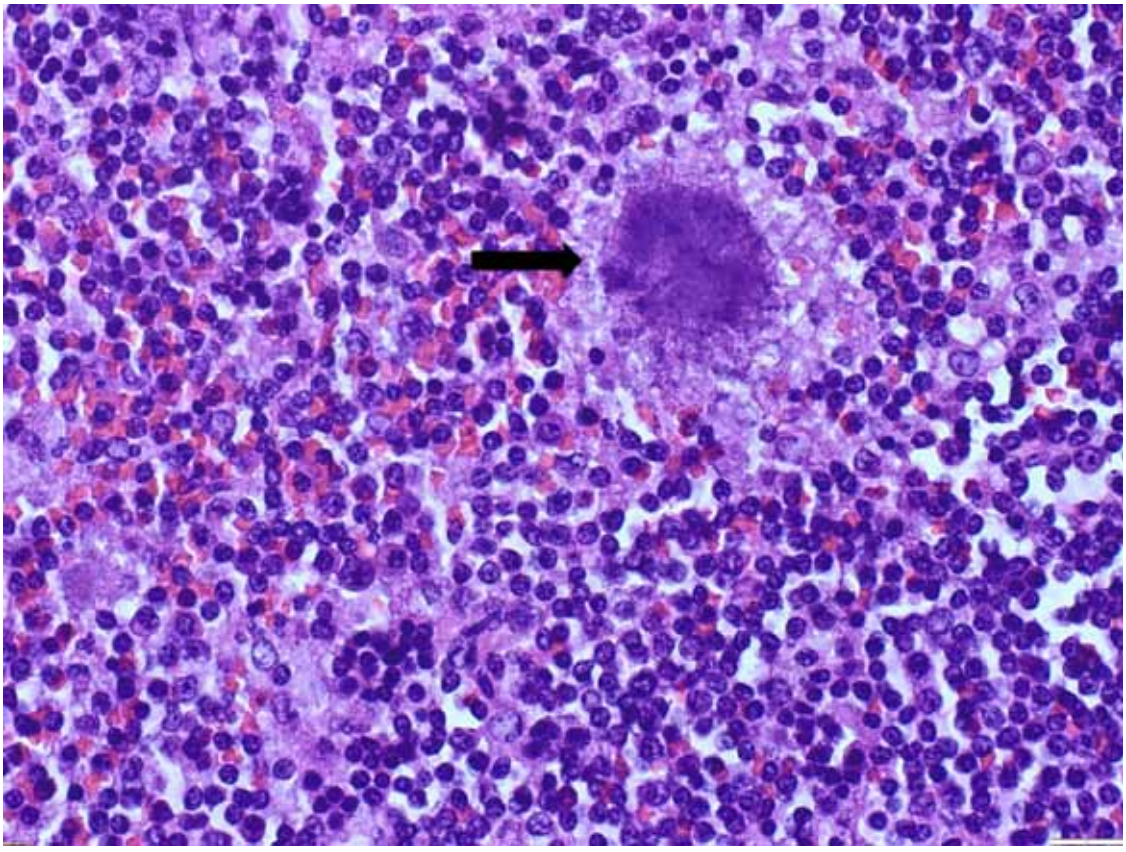

Figure 3. Hematoxylin and eosin stain (HE) x40 The lumen of the appendix was filled with inflammatory cells (neutrophils and lymphocytes) and Actinomycotic sulfur granules (arrow)

Prolonged antibiotic therapy with penicillin is recommended in uncomplicated cases. After consulting with the infectious disease specialist, a broad-spectrum antibiotic therapy covering both *Actinomyces species* and intestinal pathogens originating from the perforated appendix was started intravenously (ceftriaxone 2x1g/day and metronidazole 3x500mg/day). This therapy continued for three weeks, with significant improvement. She was discharged with 2x1g/day of oral Amoxicillin for another six months. No relapse or late postoperative complications occurred in the four years of follow-up.

Discussion

Symptoms of AA are nonspecific. The most common complaints are abdominal tenderness, palpable mass, and mild fever. Differential diagnoses include appendicitis, tumors of the appendix, colon malignancies, and tuberculosis. When actinomycetes are detected, the differential diagnosis includes *Nocardia species*, so microbiological specimen sampling is encouraged. (9) Our patient presented with pain in the RLQ, high fever, and leukocytosis, indicating appendicitis, similar to previously described cases. (10–12) The surgical approach is determined by probable diagnosis. Actinomycosis was diagnosed in a case performed through a single-port laparoscopic approach because the initial diagnosis was a tumor of the caecum. (13) Intraoperatively, our patient's appendix appearance raised no suspicion of AA, similar to a case Mitrović et al. reported (14). Some macroscopical changes may have been lost to gangrenous deterioration. Although mostly confined to the appendix and caecum, synchronous liver abscesses have been described, so subsequent imaging studies, such as CT or magnetic resonance (MR), are recommended (15). This case report highlights the importance of a detailed clinical examination and thorough medical history since the initial abdominal CT reported no pathology. The systematic review by Manterola et al. found 406 cases in extensive database research. Their work highlights the scarcity of available data on epidemiology, suggested duration of antibiotic therapy, and comprehensive treatment guidelines (16).

Conclusion

Actinomycosis of the appendix, though rare, should be considered in differential diagnoses when evaluating patients with atypical or recurrent abdominal pain, unexplained masses, or abscesses following appendicitis. Due to its indolent nature and ability to mimic malignancies or other chronic infections, timely recognition is essential to prevent diagnostic delays. Histopathological examination revealing sulfur granules or culture of *Actinomyces species* provides a definitive diagnosis. Effective management includes prolonged antibiotic therapy, typically with penicillin, and may involve surgical intervention when abscesses or extensive fibrotic tissue are present. Awareness of this rare presentation and early intervention can significantly improve patient outcomes, reduce morbidity, and prevent recurrence.

References

1. Ransom WH. A Case of Actinomycosis of the Vermiform Appendix causing Perityphlitis. Med Chir Trans. 1892;75:63-84.1.
2. Lisa-Gracia M, Martín-Rivas B, Pajarón-Guerrero M, Arnáiz-García A. Abdominal actinomycosis in the last 10 years and risk factors for appendiceal actinomycosis: Review of the literature. Turk J Med Sci. 2017;47(1):98-102.
3. Touati MD, Saidani A, Kallel MA, Brahem E, Belhadj A, Chebbi F. Actinomycosis as a rare cause of acute appendicitis: Case report and comprehensive literature review. Int J Surg Case Rep. 2024 Aug 1;121.
4. Lee SY, Kwon HJ, Cho JH, Oh JY, Nam KJ, Lee JH, et al. Actinomycosis of the appendix mimicking appendiceal tumor: A case report. World J Gastroenterol. 2010 Jan 21;16(3):395–7.
5. Horvath BA, Maryamchik E, Miller GC, Brown IS, Setia N, Mattia AR, et al. Actinomyces in Crohn's-like appendicitis. Histopathology. 2019 Oct 1;75(4):486–95.
6. Atalaia-Martins C, Cotrim I, Alves P. Appendiceal Tumor or Something More? Gastroenterology. 2018 Jun;154(8):e14-e15
7. Liu K, Joseph D, Lai K, Kench J, Ngu MC. Abdominal actinomycosis presenting as appendicitis: two case reports and review. J Surg Case Rep. 2016;2016(5).
8. Sung YN, Kim J. Appendiceal actinomycosis mimicking appendiceal tumor, appendicitis or inflammatory bowel disease. J Pathol Transl Med. 2021 Sep 1;55(5):349–54.
9. Lamps LW. Appendicitis and infections of the appendix. Semin Diagn Pathol. 2004;21(2):86–97.
10. Jarry J, Shekher M, Imperato M, Michel P. Appendicitis: When there is more than meets the eye. Clin Res Hepatol Gastroenterol. 2011 Nov;35(11):765–7.
11. Yardimci VH, Yardimci AH. Is appendectomy always the adequate treatment? Clinical manifestations of isolated actinomycosis in appendix. Turk J Surg. 2021;37(4):403–7.
12. Maternini M, Saucy F, Sandmeier D, Vuilleumier H. Simple appendicitis? Can J Surg. 2008 Jun;51(3):E54-5.
13. Cho IS, Bae SU, Jung HR, Park KS, Jeong WK, Baek SK. Actinomycosis of the appendix mimicking cecal tumor treated by single-port laparoscopic approach. Ann Coloproctol. 2021;37(2):125–8.
14. Mitrović M, Janković R, Đuknić M, Simić L, Poljašević N, Jevtić J. Pediatric appendicular actinomycosis: a case report and literature review. Turk J Pediatr. 2023;65(4):687-692.
15. Hernigou J, Dugué L, Maftouh A, Balian C, Charlier A. Appendiceal actinomycosis complicated by multiple hepatic abscesses. J Visc Surg. 2013 Dec 1;150(6):415–7.
16. Manterola C, Grande L, Riffo-Campos ÁL, Salgado C, Otzen T. Clinical aspects of abdominal actinomycosis: a systematic review. ANZ J Surg. 2020 Jul 1;90(7-8):1465-8.