CASE REPORT

Acute Appendicitis Secondary to Actinomycosis Gastrointestinal Infection – A Case Report

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ABSTRACT

Actinomycosis is a rare inflammatory disease caused by saprophytic commensal micro-organism and mostly involves the appendix in the abdomen. Mucosal barrier injuries, abdominal surgery, and immunosuppression are some of the risk factors of appendiceal actinomycosis. We report a case of appendiceal actinomycosis in a 30-year young woman firstly presented with acute appendicitis, who complained of hypogastric abdominal pain, postprandial nausea, and vomiting with having no bowel movement and gas passing that were begun following the appendectomy. Although abdominal actinomycosis is rare, it should be considered in the differential diagnosis, especially if patients do not achieve recovery after surgery. Immediate and accurate diagnosis, usually by histopathological examinations, and bacterial culture can prevent unnecessary invasive interventions and additional costs.

Key words: Abdominal actinomycosis, Actinomycosis, Appendicitis, Corticosteroids

INTRODUCTION

Acute appendicitis is one of the main causes of abdominal pain within the world that mostly requires emergency surgery, with a lifetime occurrence of around 8%.[1] Appendiceal obstruction following lymphoid hyperplasia, fecal stasis, increased mucus production, and bacterial overgrowth is the most common etiologies of acute appendicitis. Furthermore, it can rarely occur secondary to actinomycosis.[1,2] An uncommon suppurative granulomatous infection caused by *Actinomyces* species, which is a filamentous, Gram-positive, and anaerobic micro-organism that naturally exist in the oral cavity, gastrointestinal (GI), and urogenital tracts as a saprophytic commensal germ. The ileocecal region, especially the appendix, is the most common places which are being involved in abdominopelvic actinomycosis. This bacterium has the ability to be pathogenic following the mucosal barrier injuries, abdominal surgery, and immunosuppression.[3,4] Here, we present a case of acute appendicitis secondary to actinomycosis in a 30-year-old female who referred with abdominal cramping 5 days after the appendectomy.

CASE REPORT

A 30-year-old female from Yazd province, referred to the emergency department, with right lower quadrant (RLQ) pain. According to initial assessments and consulting with the general surgeon, the patient was hospitalized with the diagnosis of acute appendicitis and taken to the operating room for an open appendectomy. The appendix was inflamed and edematous with a minimal amount of pus discharge. It was excised without complications. Furthermore, the ovaries and terminal ileum were explored up to 60 cm. Post-operatively, the patient had a good general condition and normal abdominal examination. She

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had gas passing and tolerated the diet without any abdominal pain or other complications, only had a mild nausea. The patient was discharged home on the second post-operative day with cefixime, metronidazole, domperidone, pantoprazole, and acetaminophen. Five days later, she presented with abdominal cramping, nausea, and vomiting. There was no radiating pain, alleviating, or aggravating factors. The patient denied having bowel movement and gas passing since 3 days ago. Pertinent medical history included taking nutritional supplements for gaining weight since 6 months ago, which contained steroids. Past social history (history of tobacco, alcohol, or drug use) were negative and all reviews of systems such as weight loss, weakness, and fever were also negative. She was generally ill; however, vital signs were normal. The abdomen was soft and mildly distended. There was generalized mild tenderness by negative rebound tenderness. Bowel sounds were absent. Besides, no palpable mass, enlarged lymph nodes, or ascites were detected. Abdominal ultrasound showed an evidence of bowel loop dilatation in the RLQ. Upright abdominal radiography revealed multiple air-fluid levels representing intestinal obstruction. Furthermore, a localized micro abscess with a diameter <2 cm in site of appendectomy was detected on computed tomography (CT) [Figures 1 and 2].

In laboratory examinations at this time, complete blood count test results were all normal. However, inflammatory markers were increased (C-reactive protein [CRP] 3+ and erythrocyte sedimentation rate (ESR) 37 mm/h) and serum potassium level was decreased (3.3 mEq/L, normal: 3.5–5.5). The pathology reported acute suppurative appendicitis and the serosa was covered by the purulent and fibrinous exudate, which was suggestive of *Actinomyces* in lumen [Figure 3]. When the diagnosis was confirmed by a pathologist, antibiotic regimen was changed to high-dose amoxicillin. Bowel movements were restored and distention was improved following medical therapy. The treatment continued 1 month and the patient was currently asymptomatic, with no evidence of recurrence after 1.5 months follow-up.

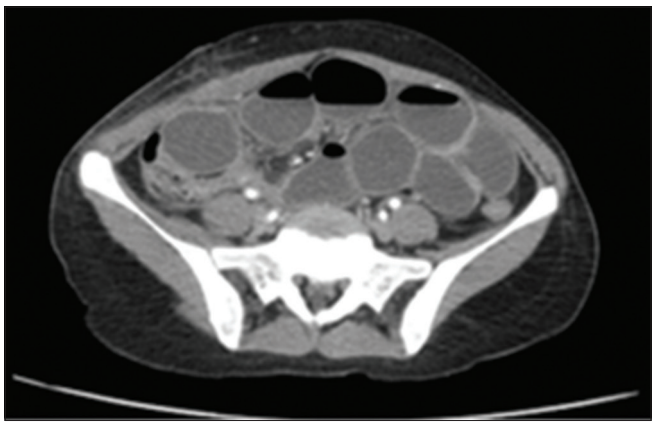

Figure 1: Abdominopelvic computed tomography-scan showing the bowel obstruction pattern with the left lower quadrant mass (transverse view)

DISCUSSION

Actinomycosis is a rare suppurative granulomatous infection caused by *Actinomyces* species. It is a filamentous Gram-positive and anaerobic microorganism, with a worldwide distribution.[5] Actinomycetes are saprophytic commensal inhabitants in the oral cavity, GI, and urogenital tracts.[3,4] The incidence ratio in males is three-fold more common than females, and also, it affects middle-aged populations.[4,5] Cervicofacial infections include around half of cases and abdominopelvic is in the second place by 20% involvement.[4] Abdominal actinomycosis (AA) frequently involves ileocecal region, especially appendix (66%).[1,4] Some of predisposing factors can be listed as: Diabetes, immunosuppression caused by steroid intake, HIV-infection, lung and renal transplant, local tissue damage caused by trauma, recent abdominal surgery (appendectomy and cholecystectomy), appendicitis and perforation, intrauterine device maintained over 10

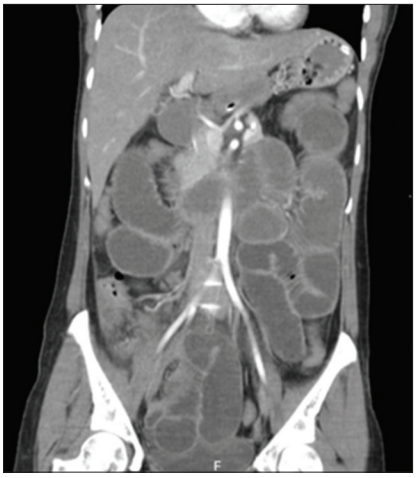

Figure 2: Abdominopelvic computed tomography-scan showing the bowel obstruction pattern with the left lower quadrant mass (coronal veiw)

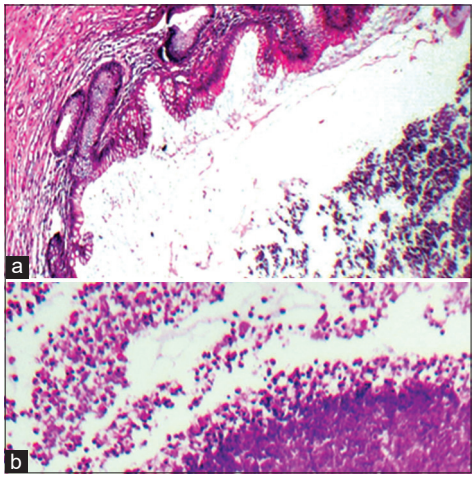

Figure 3: (a and b) *Actinomyces* in appendix lumen (A=×2.5–B=×4)

years, etc.[5-7] The absence of specific clinical presentation could make actinomycosis difficult to diagnose.[1,4,8] Patients usually have non-specific presentations such as fatigue, low-grade fever, abdominal pain, bowel habits changing, nausea, vomiting, weight loss, and palpable mass.[5] Laboratory findings are non-diagnostic as well and typically include anemia, mild leukocytosis, and elevated inflammatory markers (ESR and CRP).[7] Sung *et al*. evaluated clinical features of AA for 15 years in a single institute. Their study showed a small elevation in white blood cell (mean: 10.8 109/L) and neutrophil count (70.6%) in most patients. Furthermore, ESR and CRP were elevated and liver function test results were normal, similar to our patient.[9] CT imaging is also non-specific and cannot distinguish malignancies from local inflammation.[7] Observation of bowel thickening, solid, or cystic masses with contrast enhancement, also infiltration and fistula formation in later stages may indicate actinomycosis.[5,7,10] It is just useful for detecting the extent and location of infection.[10] More than 90% of cases, similarly our patient, are diagnosed following the surgery by bacterial cultures and histopathological examinations.[3,5,11] Observation of necrosis tissue with yellow sulfur granules is highly suggestive for actinomycosis.[3,4] Although it is only seen in half of the specimen and it is not pathognomonic for actinomycosis.[9,10] The slow growth of actinomycetes and the special conditions required may cause delay in diagnosis and reduce the efficiency of its culture.[3,7] A Gram staining is more sensitive. Particularly, when the patient had given antibiotics.[3] AA features can strongly resemble other abdominal pathologies such as malignancy, tuberculosis, inflammatory bowel disease (Crohn's disease), appendicitis, diverticulitis, and even ovarian pathologies in reproductive females.[11,12] Hence, physicians should be considered at the end of their differential diagnosis list and follow the pathology results to prevent misdiagnosis.[10,13,14] Antibiotic therapy is the conventional treatment of actinomycosis. High-dose i.v penicillin G (18–24 million units/day) for 2–6 weeks, followed by penicillin V or amoxicillin orally for 6–12 months, is suggested for treatment and relapse prevention.[5,10] Surgical intervention has been performed in cases who present with necrotic tissues, abscesses, fistulas, or obstructions as a therapeutic adjunct. Combination of both surgical and medical treatment not only can reduce the duration of antibiotic therapy even to 3 months but also it is adequate for complete healing in 90% of all patients.[3,5,10,13,15] It seems that receiving antibiotics may be continued until response to treatment has been observed in radiological and clinical examination during the follow-up. Furthermore, it relies on the initial extent of the infection and removal of infectious tissue.[4,10]

CONCLUSIONS

Although AA is rare, luckily, it is curable and has an excellent prognosis if diagnosed early and treated correctly. It should be considered in the differential diagnosis of appendicitis, especially in patients who referred after surgery by post-operative complications (such as manifestations of mechanical bowel obstruction, raised inflammatory markers besides observation of the pus collection, or unusual mass on abdominal CT). Similarly, having AA predisposing factors is considerable. As a result, immediate and accurate diagnosis, usually by following histopathological reports and bacterial culture, can prevent unnecessary invasive interventions and additional costs.

CONFLICTS OF INTEREST

None.

FUNDING

None.

ETHICAL APPROVAL

The written consent was obtained from the patient and none of the patient's personal information will be published.

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REFERENCES

1. Gómez-Torres G, Ortega-Gárcia OS, Gutierrez-López EG, Carballido-Murguía CA, Flores-Rios JA, López-Lizarraga CR, *et al*. A rare case of subacute appendicitis, actinomycosis as the final pathology reports: A case report and literature review. Int J Surg Case Rep 2017;36:46-9.
2. Snyder MJ, Guthrie M, Cagle S. Acute appendicitis: Efficient diagnosis and management. Am Fam Physician 2018;98:25-33.
3. Valour F, Sénéchal A, Dupieux C, Karsenty J, Lustig S, Breton P, *et al*. Actinomycosis: Etiology, clinical features, diagnosis, treatment, and management. Infect Drug Resist 2014;7:183.
4. Sharma S, Hashmi MF, Valentino DJ. Actinomycosis. In: StatPearls. Treasure Island, FL: StatPearls Publishing; 2020.
5. Târcoveanu E, Vasilescu A, Andronic D, Lupaşcu C, Ciobanu D, Vlad N, *et al*. Abdominal actinomycosis mimicking colon cancer. Chirurgia (Bucur) 2019;114:251-8.
6. 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;47:98-102.
7. Wong VK, Turmezei T, Weston V. Actinomycosis. BMJ 2011;343:d6099.
8. Łanowy P, Ślusarz K, Pyka W, Dzindzio J, Bichalski M, Blaszkowska M, *et al*. Actinomycosis-forgotten disease as a diagnostic challenge. J Educ Health Sport 2019;9:256-64.
9. Sung HY, Lee IS, Kim SI, Jung SE, Kim SW, Kim SY, *et al*. Clinical features of abdominal actinomycosis: A

15-year experience of a single institute. J Korean Med Sci 2011;26:932-7.
10. 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:rjw068.
11. Asiri BI, Alshehri AA, Alqahtani AS, Albishi AM, Assiri YI, Asmiri EA. Caecum actinomycosis with acute abdomen: A case report. J Taibah Univ Med Sci 2020;15:148.
12. Filippou D, Psimitis I, Zizi D, Rizos S. A rare case of ascending colon actinomycosis mimicking cancer. BMC Gastroenterol 2005;5:1.
13. Alhumoud Z, Salem A. Actinomycosis presenting as an anterior abdominal mass after laparoscopic cholecystectomy. Case Rep 2017;2017:220357.
14. Elzein F, Kharraz R, Arab N, Alotaibi F, Almohaya A, Almutairy A. A case series of actinomycosis from a single tertiary care center in Saudi Arabia. IDCases 2019;15:e00521.
15. Sung YN, Kim J. Appendiceal actinomycosis mimicking appendiceal tumor, appendicitis or inflammatory bowel disease. Korean J Pathol 2020; Doi: 10.4132/jptm.2020.05.17.

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