Actinomycosis of the Cervix Mimicking Stage II Cervical Cancer

Abstract
Actinomycosis is a chronic bacterial infection, characterized by suppurative and granulomatous inflammation. In humans, actinomycosis is most frequently caused by Actinomyces israelii. It is a normal commensal which becomes pathogenic upon any breach in the mucosa. We report the case of cervical actinomycosis in a 45-year-old female who had a mass per vagina for 2 years. There was no history of any intrauterine contraceptive device insertion. The radiological diagnosis was a neoplasm as the lesion is extending into the adjacent structures. Surgery was planned and a biopsy was taken which revealed Actinomyces. The patient was administered long-term penicillins and advised follow-up. Pelvic actinomycosis should be included in the differential diagnosis of pelvic masses. Even though actinomycosis can present as a large pelvic mass invading adjacent structures, it can be treated with medications and without any surgical intervention.

Keywords: Actinomycosis, cervix, histopathology

Introduction
Pelvic actinomycosis constitutes 3% of all human actinomycotic infections. There is a higher incidence of the infection in males than females, except in the abdominal and pelvic locations where the higher incidence is in females. Pelvic actinomycosis is notorious to mimic pelvic malignancy or inflammatory bowel disease and so the diagnosis is usually made after extensive and unnecessary surgery. If suspected at presentation, actinomycosis can be successfully treated with a prolonged course of penicillin without surgical intervention. We present a case of cervical actinomycosis where the early diagnosis has prevented surgery and the patient was treated with penicillin.

Case Report
A 45-year-old female presented with postmenopausal bleeding for 2 months and a mass per vagina for 2 years. A history of white discharge was present, which was watery and not associated with itching or foul smell. There was an increase in the frequency of micturition. She was a parous woman with three living children. The last childbirth was 22 years ago and she was tubectomised. The abdomen was soft. Per vaginal examination revealed fibrosed vaginal walls on both sides. Cervix was fibrosed and drawn up. Bilateral fornical fibrosis was present. Per speculum examination could not be done as the speculum could not be inserted. Magnetic resonance imaging (MRI) of the pelvis without contrast showed a large, fairly defined enhancing infiltrative cervical mass, appearing hypointense on T1-weighted image, hyperintense on T2-weighted, and short Tau inversion recovery (STIR). There was a subserosal extension into the mesorectum and parametrium, inferiorly extending up to the middle third of the vagina and superiorly extending into the uterus, consistent with a malignant lesion of the cervix. The high vaginal swab was sent for microbiology and revealed Gram-positive filamentous forms along with plenty of Gram-positive and negative bacilli suggestive of actinomyces. Pap smear showed scattered clumps of filamentous structures [Figure 1a and b]. A cervix biopsy was sent which showed acute inflammatory cells with multiple micro abscess formation and basophilic colonies of Actinomyces [Figure 2a and 2b]. Although we signed out as actinomycosis, gynecologists were not convinced as clinical and radiological findings were in favor of a neoplasm. So they sent a repeat biopsy which again showed similar findings of filamentous Actinomyces colonies and inflammatory infiltrate [Figure 3a and 3b].

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Upon confirming the diagnosis, the patient was put on long-term penicillin therapy and discharged.

Discussion

Garcia-Garcia et al. analyzed various articles on actinomycosis and concluded that Europe was the continent in which a large number of cases of pelvic actinomycosis were reported, followed by Asia and America.[4] The youngest cases (18 years) were found in the European and American continents, and the oldest case (86 years) was found in the Asian continent. In our case, the age of the patient was 45 years.

The cervicofacial region is the most common location for actinomycotic infections but in our case, the lesion was located in the cervix, i.e., the pelvic region.[5]

The common symptoms of pelvic actinomycosis include pelvic pain, abnormal uterine bleeding, a palpable mass, and symptoms related to bowel obstruction or obstructive uropathy.[6] No underlying disease was found in many cases by Dominguez and Antony[7] similar to our case. According to Mabeza and Macfarlane, imaging features are usually nonspecific and nondiagnostic in the early stages of infection and often similar to local inflammatory or neoplastic processes.[8] The impression on MRI pelvis without contrast in our case also was of a neoplastic process.

Actinomyces can be identified on routine vaginal examination in 10% of asymptomatic intrauterine contraceptive device (IUD) users, and 25% of IUD users have associated symptoms.[9] The incidental finding of Actinomyces-like organisms on a Pap smear does not require antimicrobial treatment or IUD removal.[6] The Pap smear received showed inflammatory cells but upon revision, we could identify the actinomycosis colonies in the slides.

Mild anemia, lymphocytosis, and elevated erythrocyte sedimentation rate were found in this patient which was also noted in a study by Perez-Lopez et al.[10] Urine examination also revealed plenty of pus cells and few red blood cells in the present case.

Direct identification or isolation of organisms is essential for diagnosis. Gram-stained smears aid in the diagnosis. Diagnosis by traditional culture techniques is difficult as Actinomyces is oxygen-sensitive and slow-growing. They are fastidious bacteria which require cultures enriched with brain–heart infusion media.[11] Actinomyces appear as “molar-tooth” colonies on agar or as “bread crumb” colonies suspended in broth media.[12] Gram-stained smears showed branched Gram-positive rods suggesting Actinomyces.

Sulfur granules are yellowish particles seen by the naked eye. They are also seen in infections by Nocardia and Streptomyces. Actinomycotic sulfur granules are formed by clumps of filamentous Actinomyces surrounded by neutrophils. They appear as round or oval basophilic masses with eosinophilic terminal “clubs” on staining with hematoxylin-eosin.[13] Actinomyces granules are positive with periodic acid-Schiff and silver methenamine stains.[14]

The differential diagnoses for actinomycotic granules in the gynecological tract are pseudoactinomycotic radiate granules (PAMRAGS) which are noninfectious granules and commonly seen in patients with IUD. Actinomycotic granules (AMGs) comprise irregular-to-spherical, nonrefractile granules with basophilic peripheral thin filaments and an eosinophilic granular dense center. In contrast, PAMRAGs comprise irregular spherical granules and strips of crystalline, refractile material without a central dense core.[15]

It has been estimated that fewer than 10% of patients with actinomycosis are diagnosed preoperatively.[12] We have diagnosed the case preoperatively and the patient was put on penicillins obviating the need for surgery. Urbina et al. reported two cases of pelvic actinomycosis, one presenting as a sealed uterus and another as bilateral tubo-ovarian masses. Both the cases have a history of IUD and the diagnoses were made postoperatively.[16] Kumar et al. also reported a case
of pelvic actinomycosis in a patient with IUD which was diagnosed postoperatively.[14] Baird et al. also reported three cases of pelvic actinomycosis, all were associated with IUD and diagnosed after surgery/laparotomy.[3]

**Conclusion**

Pelvic actinomycosis can mimic an infiltrating malignancy. A high index of suspicion of actinomycosis should be present while encountering pelvic masses, especially in females of the reproductive age group. The preoperative biopsy is a must before planning surgery and a timely diagnosis saves the patients from undergoing unnecessary radical surgery.

**Declaration of patient consent**

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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**Conflicts of interest**

There are no conflicts of interest.

**References**

1. Simsek A, Perek A, Cakcak IE, Durgun AV. Pelvic actinomycosis presenting as a malignant pelvic mass: A casereport. J Med Case Rep 2011;5:40.
2. Fiorino AS. Intrauterine contraceptive device-associated actinomycotic abscess and Actinomyces detection on cervical smear. Obstet Gynecol 1996;87:142-9.
3. Baird AS. Pelvic actinomycosis: Still a cause for concern. J Fam Plann Reprod Health Care 2005;31:73-4.
4. Garcia-Garcia A, Ramirez-Duran N, Sandoval-Trujillo H, Romero-Figueroa MD. Pelvic actinomycosis. Can J Infect Dis Med Microbiol 2017;2017:9428650.
5. Weese WC, Smith IM. A study of 57 cases of actinomycosis over a 36-year period. A diagnostic ‘failure’ with good prognosis after treatment. Arch Intern Med 1975;135:1562-8.
6. Saramago SM, Comincho JC, Proença SS, Conde PJ, Nunes FM. Pelvic actinomycosis mimicking pelvic malignancy. Rev Bras Ginecol Obstet 2019;41:463-6.
7. Dominguez DC, Antony SJ. Actinomyces and nocardia infections in immunocompromised and nonimmunocompromised patients. J Natl Med Assoc 1999;91:35-9.
8. Mabeza GF, Macfarlane J. Pulmonary actinomycosis. Eur Respir J 2003;21:545-51.
9. Yilmaz M, Akbulut S, Samdanci ET, Yilmaz S. Abdominopelvic actinomycosis associated with an intrauterine device and presenting with a rectal mass and hydroureter: A troublesome condition for the clinician. Int Surg 2012;97:254-9.
10. Perez-Lopez FR, Tobajas JJ, Chedraui P. Female pelvic actinomycosis and intrauterine contraceptive devices. Open Access J Contracept 2010;1:35-8.
11. de Montpréville VT, Nashashibi N, Dulmet EM. Actinomycosis and other bronchopulmonary infections with bacterial granules. Ann Diagn Pathol 1999;3:67-74.
12. Smego RA Jr., Foglia G. Actinomycosis. Clin Infect Dis 1998;26:1255-63.
13. Wong VK, Turmezei TD, Weston VC. Actinomycosis. BMJ 2011;343:d6099.
14. Kumar N, Das P, Kumar D, Kriplani A, Ray R. Pelvic actinomycosis mimicking: An advanced ovarian cancer. Indian J Pathol Microbiol 2010;53:164-5.
15. Pritt B, Mount SL, Cooper K, Blaszky H. Pseudoactinomycotic radiate granules of the gynaecological tract: Review of a diagnostic pitfall. J Clin Pathol 2006;59:17-20.
16. Urbina S, Ruiz H, Parejas S. Pelvic actinomycosis infection: Report of two cases occurred in the Hospital of San José. Infect Dis Obstet Gynecol 2006;2006:69020.