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Case Report

The great pretender: ovarian actinomycosis presenting as pelvic inflammatory disease mimicking ovarian malignancy – a rare case report

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ABSTRACT

Ovarian actinomycosis is a rare chronic granulomatous infection that often mimics ovarian malignancy, leading to diagnostic challenges. We report a case of a 38-year-old female presenting with abdominal pain, fever, and a complex adnexal mass favouring the suspicion of Pelvic inflammatory disease and malignancy. Surgical exploration and histopathology confirmed ovarian actinomycosis. This case highlights the importance of considering actinomycosis in differential diagnosis to avoid unnecessary radical surgery.

Keywords: Ovarian actinomycosis, Pelvic mass, Ovarian malignancy mimic, IUD, Case report

INTRODUCTION

Ovarian actinomycosis is a rare infectious chronic granulomatous disease caused by Actinomyces israelii, a gram-positive anaerobic bacterium. Actinomycetes are commensal inhabitants of the oral cavity and intestinal tract.[1] Most cases tend to be polymicrobial.[2] Commonly, identified co-infecting pathogens include Aggregatibacter, Prevotella, Enterobacteriaceae and Staphylococcus.

Actinomycosis is a rare condition with an annual incidence of approximately 0.00003%.[3] Pelvic actinomycosis represents approximately 3% of human actinomycosis infections.[4] This organism has low virulence and can become pathogenic when mucosal integrity is breached or in the presence of a foreign body like an Intrauterine device.[5] After invasion, actinomycosis is characterized by chronic granulomatous response with tissue necrosis followed by abscess and fistulae formation through which sulfur granules are released. Infection spreads contiguously and does not spare the tissue planes. Hematogenous spread is rare.[6] Lymphadenopathy is not a clinical feature of the infection. The disease may present as tubo-ovarian mass, abscess, ovarian tumor or a retroperitoneal mass that mimics a pelvic or intra-abdominal malignancy that requires extensive surgical management.[7] Symptoms that overlap with a variety of common gynecological complaints like chronic pelvic pain, vaginal discharge and abdominal discomfort complicate and delay the diagnosis in general and so the appropriate treatment as well.[8] It almost always presents as a dry type and ascites and lymphadenopathy is rare.[9]

CASE REPORT

A 38-year-old P1L1 female presented in emergency with pain in the abdomen for 3-4 days, fever for 2 days, nausea and vomiting for 2 days, and abdominal distension. She had a history of Cu-T insertion approximately 12 years ago. Past history of suggestive hypothyroidism for which she was under treatment.

Clinical examination

On examination patient was febrile. Pulse: 120/min; Respiratory rate: 24/min. Abdomen appeared moderately

distended with guarding which could not be accurately made out. On per speculum examination, Cu-T thread was visible. Cervical motion tenderness was absent. Fullness and tenderness were noted in the both the fornices and POD. A vague pelvic mass was appreciated and could not be clearly appreciated separately from the uterus.

Investigations

Baseline blood workup including CBC, Tumor markers, RFT, LFT were sent and revealed: Tumor markers: AFP 12.2 ng/ml, CA-125 94.5 U/ml (mildly elevated) Hemoglobin ranged between 8–9 g/dl on two different occasions. Leukocytosis: TLC approximately 24,000/mm³. LFT, RFT, PT and INR were within normal limits.

Imaging

Further diagnostic modalities were explored for confirmation of diagnosis. Ultra-sound showed a complex solid-cystic lesion in the right adnexa measuring approximately 69 × 42 mm. Right ovary was not visualized separately. Free fluid was present in the pelvic cavity. Uterus normal in size and shape. Mild bilateral pleural effusion was also reported.

CECT abdomen/pelvis reported a large heterogeneous solid-cystic lesion (~7 × 6.4 × 8.3 cm) in the pouch of Douglas with diffuse peripheral collection. Two peripherally enhancing lesions in the POD and right adnexa with adjacent pelvic fluid collection. Findings suggestive of tubo-ovarian abscess.

HRCT chest: Bilateral pleural effusion (R>L) with compressive atelectatic changes. A 2.3 × 2.9 × 2.7 cm hyperdense lesion in the right pleural space, suggestive of hematoma. Pleural fluid evaluation was negative for tuberculosis.

Differential diagnosis

Based on the clinical examination, laboratory investigations, and imaging findings, the differential diagnoses considered were acute pelvic inflammatory disease with tubo-ovarian abscess, ovarian malignancy, and genital tuberculosis.

Initial management

The patient was started on broad-spectrum antibiotics (cephalosporin and metronidazole) for presumed PID of unknown etiology. Over the next 3 days, fever subsided and TLC decreased from approximately 27,000/mm³ to 16,000/mm³.

Clinical deterioration and surgery

Subsequently, the patient developed increasing tachypnea and worsening abdominal pain and distension in abdomen. In view of the presenting danger signs and symptoms she was decided for emergency laprotomy keeping the possibility of suspected ruptured abscess.

Intraoperative findings

Approximately 100 ml of pus was drained and sent for culture and CBNAAT. An 8 × 8 cm mass involving the left ovary and left fallopian tube, omentum and a portion of sigmoid colon was noted with a ruptured wall and purulent discharge. A similar mass (3×3 cm) involving the right fallopian tube and the right ovary was also noticed.

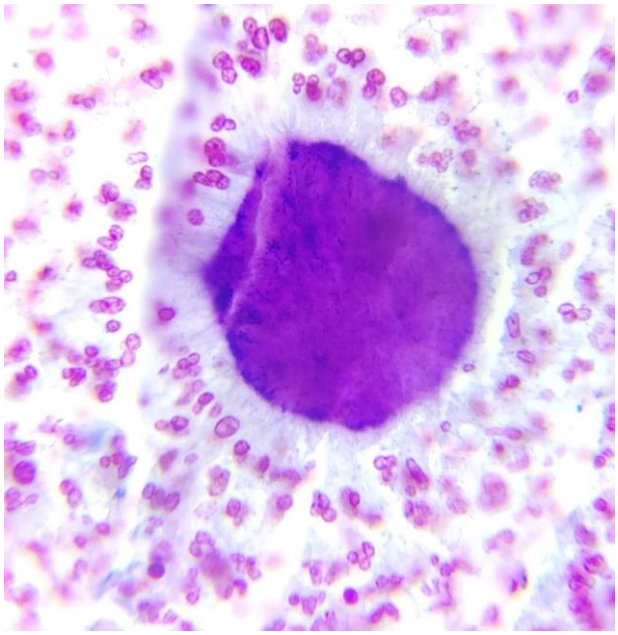

Figure 1: Actinomycotic granule-gram staining.

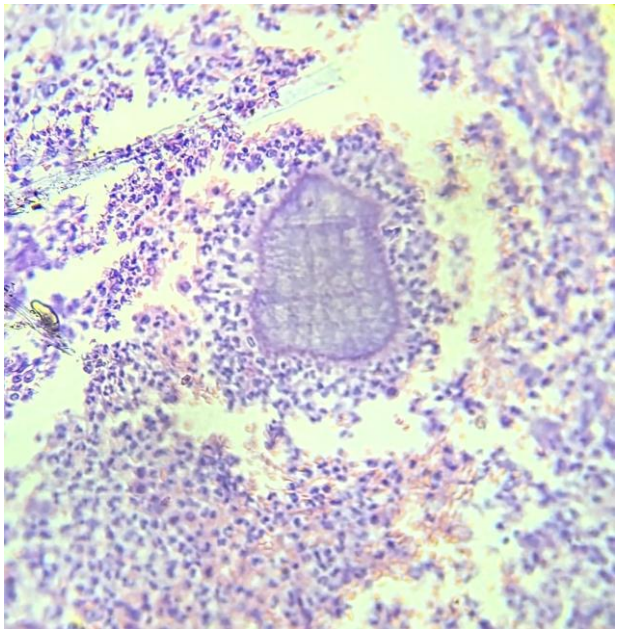

Figure 2: Actinomycotic granule surrounded by acute inflammation- Hematoxylin and Eosin staining.

Procedure performed

After adhenolysis left salpingo-oophorectomy with right salpingectomy was performed. Specimen was sent for histopathological examination.

IUCD was removed and sent for culture studies.

Histopathology

It was suggestive of left ovarian actinomycosis with bilateral acute-on-chronic salpingitis.

Based on the clinical examination, laboratory investigations, and imaging findings, the differential diagnoses considered were acute pelvic inflammatory disease with tubo-ovarian abscess, ovarian malignancy, and genital tuberculosis.

DISCUSSION

Actinomycosis is an uncommon chronic granulomatous infection caused by actinomyces species, most commonly actinomyces israelii, a filamentous gram-positive anaerobic bacterium that normally colonizes the oral cavity, gastrointestinal tract and female genital tract. The disease develops following disruption of mucosal barriers, allowing contiguous spread across tissue planes and resulting in extensive fibrosis, abscess formation and sinus tract development. Clinically, actinomycosis is classified into cervicofacial, thoracic and abdominopelvic forms, with the latter accounting for a relatively small proportion of cases.

Pelvic actinomycosis has been strongly associated with prolonged intrauterine device use and frequently presents with nonspecific symptoms, including chronic pelvic pain, abdominal mass, weight loss, fever and abnormal vaginal discharge.[11] Ovarian involvement is particularly rare and often mimics advanced ovarian malignancy, tubo-ovarian abscess or severe pelvic inflammatory disease. In the present case, the patient presented with a tubo-ovarian mass and elevated CA-125 levels, findings that initially favored a neoplastic etiology. Similar diagnostic challenges have been described in the literature, where ovarian actinomycosis is frequently identified only after surgical exploration and histopathological examination.

The preoperative diagnosis of ovarian actinomycosis remains difficult because radiological findings are nonspecific and tumor markers may be elevated secondary to chronic inflammation. Imaging typically demonstrates a complex adnexal mass with infiltrative features, often indistinguishable from ovarian cancer. Furthermore, associated lymphadenopathy, reported in a substantial proportion of cases, may further increase the suspicion of malignancy. Although endometrial biopsy with microbiological culture may aid in diagnosis, the low sensitivity of cultures and the fastidious nature of the organism often limit their utility.[12]

Historically, actinomyces species were initially misclassified as fungi because of their branching filamentous morphology. They were subsequently recognized as bacteria owing to their prokaryotic cellular structure, absence of chitin in the cell wall and reproduction by binary fission.[13] Histopathological identification of sulfur granules surrounded by suppurative inflammation remains highly suggestive of actinomycosis and continues to represent the diagnostic gold standard in many settings.

In the present case, clinical deterioration with features suggestive of a ruptured pelvic abscess necessitated exploratory laparotomy. Intraoperative findings revealed extensive pelvic adhesions involving the omentum, bowel and adnexa, with purulent collections within the pelvis. Microbiological investigations, including culture and CBNAAT, were inconclusive; however, histopathological examination of the resected specimen confirmed ovarian actinomycosis. This observation highlights the importance of histopathology in establishing a definitive diagnosis when preoperative investigations fail to identify the underlying etiology.

Management of ovarian actinomycosis requires a combination of appropriate surgical intervention and prolonged antimicrobial therapy. High-dose intravenous penicillin G remains the treatment of choice, typically administered for 4–6 weeks, followed by prolonged oral therapy with amoxicillin for 6–12 months.[14] Alternative regimens may be considered in patients with penicillin allergy. Early recognition of this condition may permit conservative management in selected cases and potentially reduce the extent of surgery required.

CONCLUSION

Ovarian actinomycosis is a rare but important differential diagnosis of complex adnexal masses, particularly in women with a history of prolonged IUD use. Because its clinical, biochemical and radiological features frequently mimic ovarian malignancy and other chronic pelvic inflammatory conditions, preoperative diagnosis remains challenging.

Histopathological examination continues to be the cornerstone of definitive diagnosis, although emerging molecular techniques such as MALDI-TOF mass spectrometry and 16S rRNA gene sequencing may improve diagnostic accuracy in the future. Increased clinical awareness and a high index of suspicion may facilitate earlier diagnosis, allow timely initiation of antibiotic therapy and help avoid unnecessary radical surgical procedures.

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