



Female genital tuberculosis mimicking advanced ovarian cancer – a diagnostic dilemma in resource limiting setup: case report and literature review

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Introduction and importance: Tuberculosis (TB), a major global health issue, predominantly affects the lungs but can manifest as extrapulmonary TB, including rare genitourinary TB. Isolated genital TB is uncommon, making diagnosis challenging and requiring careful evaluation to differentiate it from tumors, especially in low-resource settings.

Case presentation: A 20-year-old nulliparous Ethiopian woman presented with a history of long-standing abdominal swelling and constitutional symptoms, including fever and significant ascites. Investigations revealed bilateral adnexal masses and lymphocyte-predominant ascitic fluid, negative for malignant cells. Initially, advanced ovarian tumor was the primary differential diagnosis, leading to consideration for exploratory laparotomy. However, due to the patient's unfitness for surgery, tubo-ovarian tuberculosis was considered following further evaluation. The patient demonstrated improvement after initiating anti-tuberculosis therapy.

Case discussion: TB remains a major global health issue. Genitourinary TB is a common extrapulmonary manifestation, but isolated genital TB is challenging to diagnose due to non-specific symptoms mimicking ovarian tumors. Diagnosis requires confirming mycobacteria via tests like GeneXpert, and while cancer antigen 125 can be elevated, it is not specific. Treatment is a standard anti-TB regimen, with most patients improving without surgery.

Conclusion: Ovarian tuberculosis, often mistaken for ovarian tumors, requires thorough evaluation in young patients, especially those from low-resource settings, to avoid unnecessary surgery and prevent complications like infertility.

Keywords: case report, Ethiopia, extrapulmonary TB, GUTB, ovarian TB

Introduction

Tuberculosis (TB) is a chronic infectious disease caused by mycobacterium tuberculosis. Robert Koch first described the etiologic agent in 1882, marking a significant moment in understanding this disease with a long history. It disproportionately affects developing countries, such as Ethiopia^[1]. Before the COVID-19 pandemic, tuberculosis was the second leading infectious cause of death globally, following HIV/AIDS^[2]. TB is predominantly a pulmonary disease; however, it can also involve

HIGHLIGHTS

- Tuberculosis affecting the fallopian tubes and ovaries (tubo-ovarian TB) is an exceptionally rare form of extrapulmonary tuberculosis.
- Tubo-ovarian tuberculosis, presenting with bilateral adnexal masses and ascites, can closely resemble advanced ovarian cancer.
- Challenges in resource-constrained environments in terms of diagnosis.
- Initiating appropriate anti-TB treatment early in the course of the disease is crucial for improving patient outcomes.

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organs outside the lungs, a condition termed extrapulmonary tuberculosis^[3]. Recognizing the limitations of conventional TB diagnostics like sputum smear microscopy and culture, interest is increasing in aptamer-based technologies as a promising alternative^[4]. These technologies offer the potential for rapid and accurate detection of mycobacterium tuberculosis antigens with high sensitivity and specificity, particularly crucial in settings demanding timely diagnosis^[4]. While genitourinary tuberculosis is the second most common form of secondary TB after lymph node involvement, isolated genital TB is rare, occurring in only 9% of cases^[5]. This rarity necessitates a high index of suspicion and thorough evaluation to distinguish it from non-infectious causes like tumors, which poses a diagnostic challenge, particularly in low socioeconomic settings. The diagnosis of tubo-ovarian tuberculosis is difficult because its symptoms

are often non-specific and can mimic those of an ovarian tumor. This overlap in presentation frequently necessitates the use of sophisticated imaging and laboratory tests to distinguish between the two^[6]. In this case report we present a case of a 20-year-old nulliparous Ethiopian woman who presented with long-standing abdominal swelling and constitutional symptoms. Initially, advanced ovarian tumor was the primary differential diagnosis, leading to admission for exploratory laparotomy. However, due to her unfitness for surgery, tubo-ovarian tuberculosis was considered following a thorough evaluation, and she showed improvement after starting anti-tuberculosis therapy. This case report was prepared in accordance with the Surgical Case Report 2023 guidelines^[7].

Case presentation

A 20-year-old nulligravida from Bahirdar, Ethiopia, presented to the Gynecology outpatient department with a 6-week history of progressive abdominal distension and lower abdominal pain. Accompanying symptoms included low-grade fever, anorexia, easy fatigability, and unintentional weight loss of similar duration. She also reported menstrual irregularities. The patient denied any prior history of tuberculosis treatment or known exposure to TB. Physical examination revealed a fluctuating fever (37.8–39°C), tachycardia (130 bpm), significant abdominal distension with ascites, and a palpable, ballotable cystic pelvic mass on the right side, without tenderness.

Initial investigations revealed a normal complete blood count and chest X-ray. Viral markers for Hepatitis B surface antigen and Hepatitis C antibody were negative. Her investigations also revealed negative VDRL and HIV serology. A pregnancy test was negative, but the erythrocyte sedimentation rate was 80 mm/hr. Ascitic fluid analysis showed 440 cells/ μ L, with a lymphocyte predominance (92%), protein of 4 gram. Ascitic fluid was examined twice for acid-fast bacilli (AFB) and GeneXpert (Polymerase Chain Reaction [PCR]), both of which

were negative. Cytological analysis, performed with an adequate sample volume, revealed only lymphocytic fluid and no malignant cells. Bacterial culture was not performed due to limited resources and the absence of culture facilities in our setting. The cancer antigen 125 (CA-125) levels were elevated at 139 U/mL, while the carcinoembryonic antigen (CEA) level was normal at 2.6 ng/mL. Initial abdomino-pelvic ultrasound demonstrated a 6.2 \times 3.1 cm cystic right adnexal mass (Fig. 1) with significant ascites. An abdominal CT scan revealed a 6 \times 4 cm right and a 3 \times 2 cm left adnexal cyst, both with solid components, septations, contrast enhancement, and free peritoneal fluid collection (Fig. 2). Colonoscopy was attempted but only reached the transverse colon, where normal mucosa was observed. The procedure was terminated due to patient distress. Diagnostic laparoscopy was not performed due to the lack of available resources in our setting.

The patient was admitted to the ward and managed with antipyretics and empiric treatment for malaria, based on local epidemiology, and antibiotics for a presumed pelvic abscess. However, her condition failed to improve; she experienced progressive abdominal distension and orthopnea, requiring frequent therapeutic paracentesis. Given the clinical picture and initial imaging findings, an exploratory laparotomy was considered to evaluate for a possible advanced ovarian tumor. However, due to her overall instability, the planned surgical intervention was deferred after anesthetic evaluation deemed her unsuitable for surgery. Following a multidisciplinary team discussion involving medical, gynecologic, obstetric, and oncologic specialists, a trial of anti-tuberculosis treatment was considered. This decision was based on a review of relevant literature and case reports, consideration of local tuberculosis epidemiology, the presence of fever and high ascitic protein with lymphocyte predominance favoring tuberculosis, the patient's normal CEA level, the absence of risk factors for ovarian cancer in a young patient, and negative cytology for malignancy, arguing against an ovarian tumor.

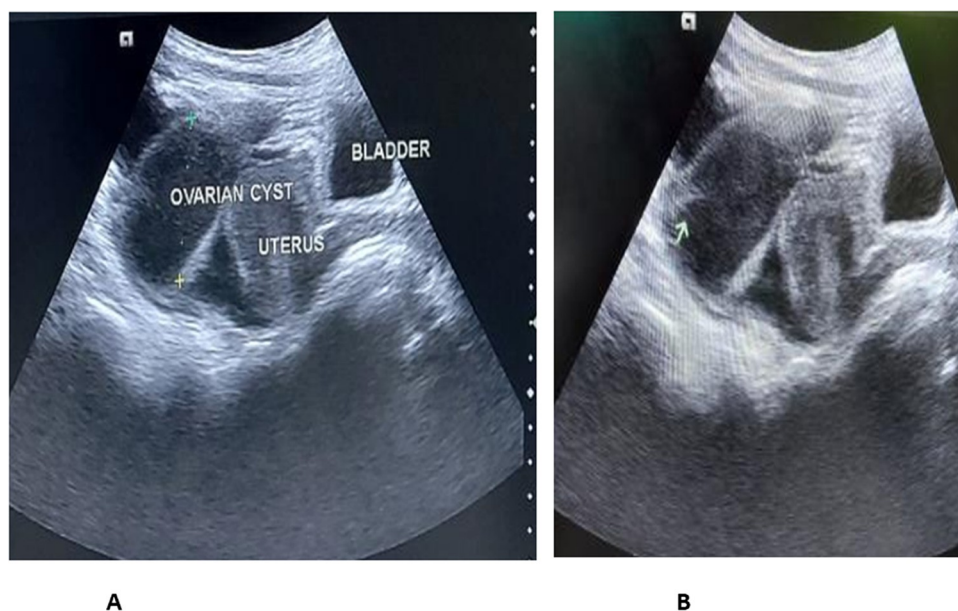


Figure 1. (A and B) Abdomino-pelvic ultrasound demonstrating right-side ovarian cyst with thick wall and solid component and free peritoneal fluid collection.

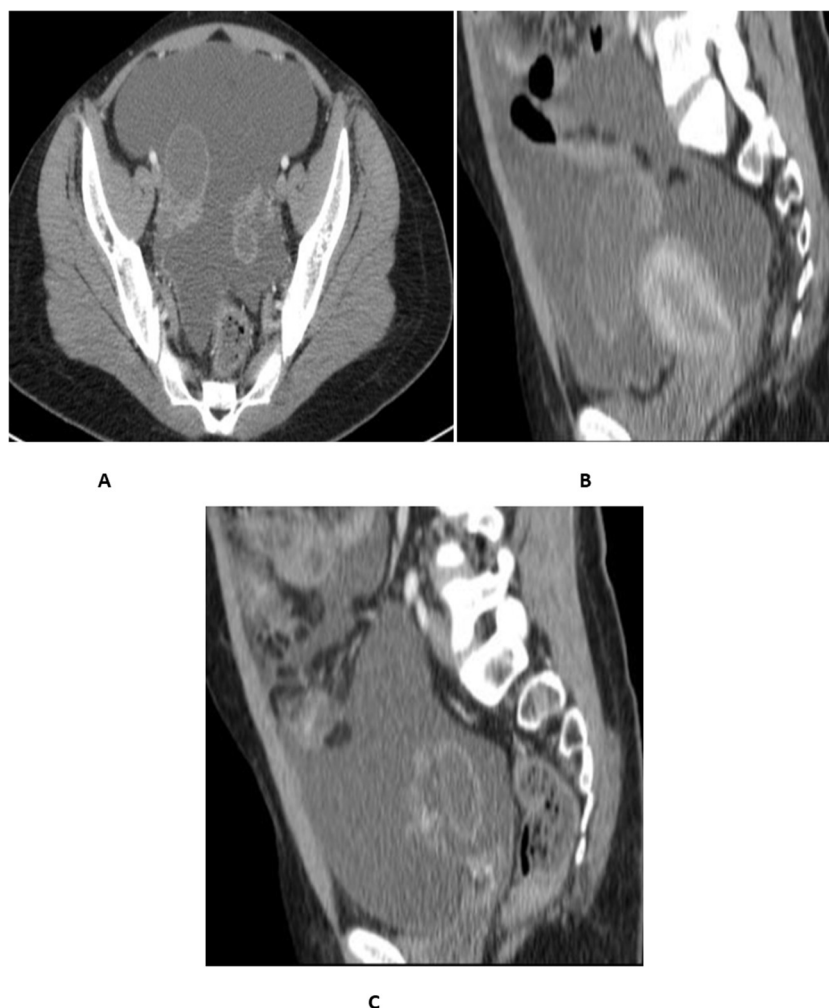


Figure 2. Abdomino-pelvic CT scan of the patient showing free peritoneal fluid collection and large (6 × 4 cm) right adnexal cystic mass with thick contrast enhancing wall and solid component (A – coronal view; and B – sagittal view). (C) 4 × 2 cm left adnexal cystic mass with thin wall and less solid component.

The patient was initiated on anti-tuberculosis treatment as per national and WHO guidelines (2RHZE/4RH), along with pyridoxine. She was monitored closely with serial therapeutic paracentesis. Within two weeks, her ascites began to decrease, and her fever resolved. With continued anti-tuberculosis treatment, her appetite improved, and she was discharged home with a full course of anti-TB medication, with a follow-up appointment scheduled for one month. At the one-month follow-up, her adnexal masses had decreased in size, her ascites had significantly improved, and her overall condition was markedly better, with a good appetite. At the end of the second month, her ascites had resolved completely, and the adnexal masses had also disappeared. Her overall health was excellent. By the end of her anti-tuberculosis treatment, she was physically active, had completed the entire course without any drug side effects, and her abdominopelvic ultrasound was normal. She was discharged from follow-up with family planning counseling.

Discussion

Tuberculosis remains a major global health concern, with an estimated 10.6 million people affected worldwide in 2021^[8].

Genitourinary tuberculosis (GUTB) is a prevalent extrapulmonary manifestation of tuberculosis, occurring in 30-40% of cases, primarily affecting the kidneys and fallopian tubes. However, our patient presented with a rare form of GUTB: bilateral tubo-ovarian (adnexal) masses with significant ascites, mimicking an advanced ovarian tumor^[9]. This atypical presentation poses a significant diagnostic challenge, particularly in resource-limited settings like Ethiopia. Tubo-ovarian tuberculosis typically occurs alongside primary pulmonary tuberculosis; however, isolated tubo-ovarian tuberculosis, as seen in our patient who had no primary focus, is an extremely rare condition^[10]. This rarity can lead to diagnostic delays, as demonstrated in our case, where the patient's late presentation and the diagnostic dilemma with an apparent advanced ovarian tumor resulted in initial preparation for surgery^[11].

The pathways for GUTB are variable, potentially involving hematogenous or lymphatic spread from a primary source, direct ascending or descending pathways, or extension from adjacent gastrointestinal sites such as the intestine, peritoneum, or mesenteric lymph nodes^[12,13]. Despite our patient's lack of a known primary focus, the presence of ascites raises the possibility of dissemination from contiguous structures, such as the

peritoneum. Despite our patient being a young female with no known risk factors, a variety of conditions can increase susceptibility to GUTB. These include chronic medical conditions like diabetes mellitus and chronic kidney disease, as well as treatments such as dialysis and chronic immunosuppressive therapies, like steroid treatment^[14].

Female genital tuberculosis can manifest in various ways. Our patient presented with an adnexal mass, ascites, fever, weight loss, and anorexia. Other potential presentations include pelvic pain with or without ascites, constitutional symptoms such as anorexia, weight loss, and night sweats, primary or secondary infertility, and menstrual irregularities, although our patient was nulliparous^[15,16]. The majority of female genital TB patients, approximately 80%, present between the ages of 20 and 40 years, a category that includes our patient, who presented at 20 years old^[17]. While ovarian involvement occurs in about 20% of female genital TB cases, the fallopian tubes are the most frequently affected organ (95%), followed by the endometrium (50%)^[18].

Diagnosing genital TB is particularly challenging, especially in patients without a pulmonary focus, as illustrated by our patient with isolated pelvic tuberculosis. Given the lack of specific clinical manifestations and imaging findings, the identification of mycobacteria from various fluid or tissue samples using methods like GeneXpert, culture, or AFB staining is essential for confirming the diagnosis^[19]. In our patient's case, surgery was deferred due to her condition, and a laparoscopic examination was not possible due to inadequate resources. Histopathological examination can, however, support the diagnosis^[14,19]. While a transvaginal ultrasound was not performed, abdominal pelvic ultrasound and CT scan findings in our patient revealed thickened peritoneum and omentum, septated ascites, and multilocular solid adnexal masses^[20]. These findings, while suggestive of our patient's separated bilateral adnexal masses with ascites, highlight the difficulty of relying solely on imaging for a definitive diagnosis. Although CA-125 is a primary marker for ovarian tumors, it can also be elevated in other conditions, including ovarian tuberculosis, further complicating the differentiation from an ovarian tumor^[21,22]. It is sometimes used to monitor treatment response in ovarian TB^[21]. Our patient presented with an elevated CA-125 level, which normalized following treatment.

According to WHO and Ethiopian national guidelines, genital tuberculosis is managed with a standard anti-tuberculosis regimen of 2RHZE/4RH, and patients typically improve without the need for surgical intervention^[23]. Follow-up care includes monitoring for drug side effects. Our patient improved clinically without experiencing any adverse drug effects.

Conclusion

Ovarian tuberculosis, a rare form of extrapulmonary tuberculosis, is often misdiagnosed as an ovarian tumor. In young patients without identified risk factors for ovarian tumors, particularly those from low socioeconomic backgrounds where tuberculosis is prevalent, thorough evaluation is crucial. This approach can help avoid unnecessary surgical interventions, reduce delays in appropriate patient management, and prevent late complications such as infertility.

Ethical approval

Ethical approval for this study was provided by our institution.

Consent

Written informed consent was obtained from the patient for publication and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

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Author's contribution

A.A.A.: conceptualization, design of the study, acquisition of data, drafting the article, revising it critically for important intellectual content, approval of the version to be submitted; T.D.C.: analysis, interpretation of data, drafting the article, revising it critically for important intellectual content, approval of the version to be submitted; H.A.E.: conceptualization, analysis, drafting the article, revising it critically for important intellectual content, approval of the version to be submitted; E.M.A.: acquisition of data, analysis, revising it critically for important intellectual content, approval of the version to be submitted; T.A.Y.: acquisition of data, analysis, revising it critically for important intellectual content, approval of the version to be submitted; G.A.B.: acquisition of data, analysis, revising it critically for important intellectual content, approval of the version to be submitted; S.M.F.: acquisition of data, analysis, revising it critically for important intellectual content, approval of the version to be submitted.

Conflicts of interest disclosure

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Data availability statement

None.

Declaration of generative AI and AI-assisted technologies in the writing process

AI language modelling tools were utilized for the improvement of English-language only in this case report.

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