

# Genital Tuberculosis in a Nigerian Woman with Primary Infertility

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## Abstract

We present a 30-year-old nullipara with a two-year history of inability to conceive and a 30-month history of recurrent lower abdominal pain. A transvaginal ultrasound scan showed a right complex adnexal mass measuring 70 cm × 65 cm; tumor makers were essentially normal aside marginally elevated CA-125. She subsequently had exploratory laparotomy with right salpingo-oophorectomy, and a histopathology examination of the specimen revealed caseous necrosis, granuloma formation with a rim of the Langhans giant cells within the wall of the fallopian tube. Serum tuberculosis (TB) QuantiFERON was also positive for *Mycobacterium tuberculosis*. She is currently on anti-Koch's and is responding to treatment. This case report aims to highlight the need for exploring other causes of chronic pelvic pain and primary infertility when evaluating women with similar history in our environment, especially in TB endemic areas.

**Keywords:** Female genital tuberculosis, infertility, tuberculosis QuantiFERON

## INTRODUCTION

*Mycobacterium* species are slender, nonmotile, nonspore forming, microaerophilic, catalase positive slender, nonmotile, nonspore forming, and rod-shaped Gram-positive bacilli. The outstanding species of this group of organisms is *Mycobacterium tuberculosis* the causative agent for tuberculosis (TB) in humans.<sup>[1]</sup> Globally, TB is the thirteenth-leading cause of death and the second-leading infectious killer after COVID-19.<sup>[1,2]</sup> The prevalence of TB in Nigeria is 4.4%.<sup>[1]</sup> It is a multiorgan disease whose symptoms and clinical manifestations depend on the organ or system affected.<sup>[1,2]</sup> It is usually classified according to the site of disease as pulmonary or extrapulmonary TB.<sup>[1,3]</sup> The typical symptoms are usually those associated with pulmonary TB which include cough productive of sputum with or without haemoptysis, anorexia, weight loss, drenching night sweats, fever, and chest pain.<sup>[1,2]</sup> Other symptoms such as inability to conceive, headache, flank pain, bone pain, or urinary symptoms depend on the organ affected.<sup>[1,3]</sup>

Extrapulmonary TB presents with a myriad of symptoms that sometimes poses a diagnostic challenge.<sup>[3,4]</sup> Genital tract TB has been reported as the cause of female infertility in

approximately 10% of infertile women although it is usually an incidental finding.<sup>[3,4]</sup>

Extrapulmonary TB can manifest as recurrent lower abdominal or chronic pelvic pain, unexplained infertility, dysmenorrhea, heavy menstrual bleeding, amenorrhea, hypomenorrhea, and other symptoms that may be suggestive of pelvic inflammatory disease. The organs affected include the fallopian tubes (most common), ovaries, endometrium and vulva/vagina causing perisalpingitis, tubo-ovarian abscess, and endometritis.<sup>[3-6]</sup> However, pelvic TB is not synonymous with female genital TB (FGTB), this is because FGTB affects the fallopian tubes, ovaries, endometrium, cervix, vulva, and vagina while pelvic TB usually manifests as TB adenitis, of the mesenteric or the pelvic lymph nodes or both, without affectation of the organs of the female reproductive tract.<sup>[5,7,8]</sup> This case report, therefore, aims to highlight the importance of increasing our

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index of suspicion when evaluating cases of infertility with similar symptoms.

**CASE REPORT**

Mrs. OD is a 30-year-old nullipara who presented with two-year history of inability to conceive and 30-month history of recurrent lower abdominal pain. There was no history of vaginal discharge or other history suggestive of sexually transmitted infection. There was also no history suggestive of thyroid dysfunction, hyperandrogenism, or galactorrhea. No history of impotence, erectile dysfunction, or pelvic surgeries in the partner. She worked as a nursing assistant in a TB treatment center for three years before relocating to Lagos. Her menses was regular with associated severe secondary dysmenorrhea, no history of heavy menstrual bleeding, intermenstrual bleeding, dyspareunia, and no postcoital bleeding. Her hormone profile and partner’s seminal fluid analysis were essentially normal.

Examination at the presentation showed a young woman in obvious painful distress, not pale, and anicteric. The abdomen was full and moved with respiration, with generalised tenderness more on the right lumbar region, with associated guarding and rebound tenderness, there was a 16 weeks’ size, and characteristics of the mass could not be assessed because of generalised tenderness. Speculum examination showed a grossly healthy-looking cervix, gentle digital examination showed a right adnexal mass of about 8 cm × 6 cm, no mass was palpated in the left adnexa cervical motion tenderness was not assessed due to the tenderness.

A transvaginal ultrasound scan showed an anteverted uterus with normal homogeneous echoes measuring 5.3 × 4.1 × 3.4, a right complex adnexa mass measuring 70 cm × 65 cm [Figure 1], whereas the left adnexa was normal. There was a mild fluid collection in the pouch of Douglas. Alfa-fetoprotein, lactate dehydrogenase, and quantitative beta-human chorionic gonadotropin were all within normal values with a marginally

elevated cancer antigen-125 level (42 units/mL). Her erythrocyte sedimentation rate was also elevated. A recent hysterosalpingography (HSG) revealed loculated opacities of both fallopian tubes, dilatation of both tubes, and hydrosalpinx of the right tube, with no free spillage of contrast suggesting bilateral tubal blockage. The differential diagnoses were endometrioma, tubo-ovarian abscess, FGTB, and ovarian torsion.

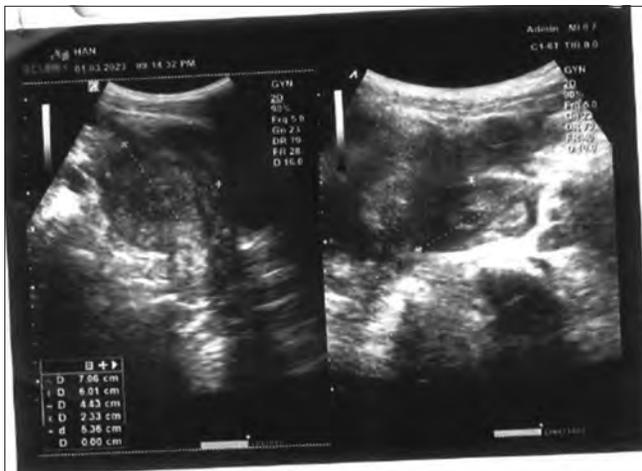
She was counseled on the above findings and the benefit of exploratory laparotomy to which she consented. She subsequently had exploratory laparotomy with right salpingo-oophorectomy, and intraoperative findings included normal sized uterus, edematous and hyperemic left ovary and fallopian tube, right tubo-ovarian mass that was thickened, edematous and dilated measuring 10 cm × 8 cm, with associated pelvic, peri hepatic and perimfrial adhesions, with moderate cheesy/turbid fluid in the pouch of Douglas. Right salpingo-oophorectomy was done, the sample of which was sent for histopathology examination. The cheesy aspirate from the pouch of Douglas was sent for TB culture. The uterus was normal in size and appearance.

She improved clinically postsurgery and was discharged on the third postoperative day. Histology showed caseous necrosis, granuloma formation with a rim of the Langhans giant cells within the wall of the fallopian tube [Figures 2 and 3]. TB culture of the aspirate was positive for *M. tuberculosis*. Serum QuantiFERON TB testing done following the clinic visit was also positive for *M. tuberculosis*; however, the chest radiograph was normal, and lentiviral screening was negative.

She was subsequently referred to the respiratory clinic of the hospital for subsequent anti-Koch chemotherapy. She has completed two months of rifampicin, isoniazid, ethambutol, and pyrazinamide and is currently on four months’ continuation phase with rifampicin and isoniazid.

**DISCUSSION**

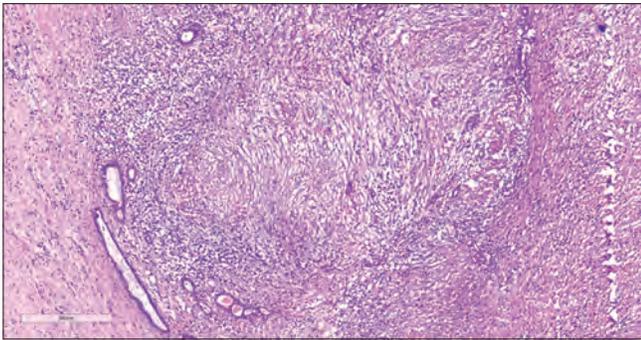
FGTB is an uncommon manifestation of extrapulmonary TB. The prevalence varies in different studies as most women are



**Figure 1:** Transvaginal ultrasound scan showing right complex adnexa mass



**Figure 2:** Transvaginal ultrasound scan showing right complex adnexa Mass in higher magnification



**Figure 3:** Photomicrograph showing granulomatous salpingitis

asymptomatic and are diagnosed as incidental finding during the evaluation of infertility.<sup>[7]</sup> A high index of suspicion is required in any woman presenting with infertility and recurrent pelvic pain that other causes have been ruled out. This is also important considering the fact that there is no established gold standard or protocol for diagnosis of FG TB.<sup>[7,8]</sup> Mrs. OD presented with an inability to conceive and recurrent lower abdominal pain.

Genital TB has been reported to be the third-most common manifestation of extrapulmonary TB occurring in 2%–20% of individuals with pulmonary TB.<sup>[9]</sup> However, a lower prevalence of 0.45% and as high as 52% have been reported in studies in Nigeria and India, respectively.<sup>[10,11]</sup>

Tubercle bacilli infect the female urogenital tract via different routes;—hematogenous direct spread from adjacent viscus, lymphatic spread, primary infection of the genital organs through sexual transmission, or rarely via intravesical implantation of the live attenuated *Bacillus Calmette–Guérin* in the treatment of bladder cancer.<sup>[8]</sup>

Most women with FG TB are asymptomatic.<sup>[2]</sup> Clinical manifestation depends on the affected organ.<sup>[2]</sup> The most common presentations include menstrual irregularity, chronic pelvic pain, infertility, adnexa masses, intrauterine and peritubal adhesions, endometritis, abnormal vaginal discharge, postmenopausal bleeding, persistent leucorrhea, pyometra, and tubal blockage. The organs most commonly affected are the fallopian tubes, endometrium, ovaries, cervix, uterine smooth muscles, vagina, and vulva<sup>[8–11]</sup> when compared to our patient, she presented with a history of infertility and chronic pelvic pain, intraoperative findings also showed affection of the tubes and ovaries peritubal and perihepatic adhesions.

The risk factors that increase the likelihood of FG TB include a history of contact with a smear-positive pulmonary TB patient, previous history of pulmonary TB infection, people living in endemic areas, low socioeconomic status, immunosuppression such as HIV infection, intravenous drug abusers, history of extrapulmonary TB, and people that work in TB treatment centers.<sup>[1,5,8,12]</sup> Although Mrs. OD is lentiviral negative, she had significant exposure from her previous occupation as a nursing assistant in a TB treatment centre, she also resides in Nigeria which an endemic area for TB.

It is pertinent to consider the likelihood of FG TB in reproductive women from areas endemic for TB infection or any woman with a family history of or other exposure to TB, or a woman with some proven extragenital manifestations of Koch's disease. The diagnosis of TB revolves around the identification of *M. tuberculosis* complex on sputum smear microscopy or in culture from clinical specimens.<sup>[8]</sup> However, because of the difficulty in collecting samples for diagnosis of FG TB, recently, TB QuantiFERON—(a highly specific and sensitive test) and polymerase chain reaction (GeneXpert) were also introduced into clinical practice for supportive diagnosis of TB using the serum.<sup>[8,10–12]</sup> Positive TB QuantiFERON supports diagnosis of TB in a patient who has not been previously diagnosed of TB. Mrs. OD also had a positive TB QuantiFERON test.

HSG may be helpful in diagnoses as some tubal abnormalities may suggest the possibility of FG TB. These findings on HSG include tubal dilatation, tubal blockage, diverticular outpouching of tubes, hydrosalpinx, cotton wool plug, pipestem appearance of fallopian tubes, golf club appearance of both tubes, cobblestone tube, beaded or corkscrew appearance in both fallopian tubes, and peritubal halo.<sup>[8]</sup> HSG done for the index patient revealed loculated opacities of both fallopian tubes, dilatation of both tubes, and hydrosalpinx of the right tube, with no free spillage of contrast suggesting bilateral tubal blockage. This also increased our suspicion of TB.

Histology of specimens from suspected FG TB has been used for the diagnosis for the decades.<sup>[8]</sup> These specimens when examined may show obvious features typical of TB infection, such as granulomatous caseous necrosis with giant epithelioid cells. Other diagnostic approaches that have been utilised include TB culture, TB QuantiFERON and GeneXpert.<sup>[8]</sup> Histopathological examination of the specimen from Mrs. OD showed caseous necrosis, granuloma formation with a rim of the Langhans giant cells within the wall of the fallopian tube, TB culture of the aspirate was also positive for *M. tuberculosis*, and serum QuantiFERON testing done following clinic visit was also positive for *M. tuberculosis*.

The treatment of FG TB may be medical and or surgical. Surgery is reserved for those patients with pelvic/adnexa masses, intractable pelvic pain, or for some patients that will require assisted conception, to increase the success rate.<sup>[5,8]</sup> Mainstay of treatment is using anti-Koch's. This entails using a combination of drugs in sufficient doses for a long duration of up to six–nine months.<sup>[8,13–15]</sup> Our patient had exploratory laparotomy because of the adnexa mass with recurrent pain and is currently on medical treatment.

## CONCLUSION

FG TB, although uncommon, is still a cause of infertility and chronic pelvic pain in our environment. It is important to increase our index of suspicion while evaluating clients seeking fertility care with unusual genital manifestations, especially in the endemic regions such as Nigeria.

### Ethical approval

The approval for this report was sort and obtained from the human research and ethics committee of the 68 Nigerian Army Reference Hospital Yaba. Reference: 68 NARHY 126AX.

### Guarantor

The corresponding author is the guarantor for this manuscript.

### Declaration of patient consent

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

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Nil.

### Conflicts of interest

There are no conflicts of interest.

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