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Title: ISOLATED GENITAL TUBERCULOSIS: A RARE CAUSE OF PREMATURE OVARIAN FAILURE



INTRODUCTION

- Latent genital tuberculosis (LGTB) refers to *Mycobacterium tuberculosis* (MTB) in the genital tract without laparoscopic, microbiological, or histopathological evidence. It is a significant yet underdiagnosed cause of infertility in India⁽¹⁾.
- Chronic inflammation from LGTB can lead to irreversible damage to the reproductive organs, including the fallopian tubes, endometrium, and ovaries, and, in rare cases, premature ovarian failure (POF)⁽²⁾.
- It is suggested that patients with infertility undergo an endometrial biopsy for evaluation using histology, polymerase chain reaction (PCR), and culture for *Mycobacterium tuberculosis* before initiating infertility treatments⁽³⁾.
- Traditional diagnostic modalities, such as imaging and endometrial biopsy, often fail to provide definitive results in LGTB cases, necessitating reliance on laparoscopy or advanced molecular techniques like PCR⁽⁴⁾.

OBJECTIVES

- To underscore the diagnostic challenges of latent genital tuberculosis (LGTB) and highlight the essential role of molecular diagnostics, particularly PCR, in confirming LGTB in resource-limited settings where surgical methods like laparoscopy are not viable.
- To illustrate how chronic inflammation caused by LGTB affects ovarian function and leads to premature ovarian failure (POF), as well as to emphasize the importance of early identification and treatment of LGTB for improved fertility outcomes.

CASE PRESENTATION

- Background:**
A 35-year-old nulliparous female with a history of infertility and secondary amenorrhea for 18 months presented with persistent fatigue and diffuse tinea corporis unresponsive to antifungal treatment (Fig. 1).

- The patient grew up in a tuberculosis (TB)-endemic region and had a household member who was treated for TB. She also recalled a history of recurrent pelvic pain during her twenties, which was attributed to dysmenorrhea.

Laboratory findings:

- FSH: 58.3 mIU/mL (elevated).
- AMH: 0.12 ng/mL (markedly reduced).
- Estradiol: 9.7 pg/mL (low).
- Thyroid panel: Normal.
- Prolactin: 12.3 ng/mL (normal).
- Autoimmune panel: Negative for anti-ovarian, anti-adrenal, and anti-thyroid antibodies.
- IGRA (Interferon-Gamma Release Assay): Positive. HIV Serology: Negative.

Imaging:

- TV USG findings revealed reduced ovarian volume, a low antral follicle count, and a thin endometrium measuring 3.2 mm. There were no pelvic masses or free fluid (Fig. 2).
- Chest X-ray results were unremarkable, showing no pulmonary calcifications or fibrosis.



FIGURE 1



FIGURE 2

As the patient declined laparoscopy, the decision was made to conduct an endometrial biopsy. The histopathological examination did not show granulomas or caseation. However, PCR testing on the endometrial tissue returned positive for *M. tuberculosis*. The positive IGRA and PCR results confirm latent TB as the cause of ovarian failure.

Differential Diagnosis:

- Radiation-induced ovarian failure: No history of previous radiation exposure or malignancy.
- Autoimmune premature ovarian failure: Autoimmune panel is negative.
- Chronic pelvic inflammatory disease (PID): There is no imaging or clinical evidence of an active infection.
- Genetic causes: Unlikely, based on family history and absence of other suggestive symptoms.

Management and Outcome:

The patient was started on HRZE for the first two months, followed by a continuation phase of HRE for the next four months. Hormone replacement therapy (HRT) and fertility counseling were also provided. A marked resolution of tinea corporis was observed within 4 weeks of ATT, likely indicating immune restoration. Amenorrhea persisted, and repeat ovarian function tests after 6 months showed no improvement (AMH: 0.1 ng/mL; FSH: 59.2 mIU/mL).

DISCUSSION

- This case illustrates the challenges of diagnosing LGTB. The patient's demographic risk factors and a positive IGRA test support a suspicion of LGTB despite nonspecific symptoms such as ovarian atrophy, reduced ovarian reserve, and a thin endometrium. This case is noteworthy because it underscores the role of molecular diagnostics in confirming LGTB under challenging circumstances.
- The literature increasingly recognizes chronic inflammation as a significant underlying factor in ovarian failure associated with LGTB. The patient's TV USG findings of vascular damage and follicular depletion due to ongoing inflammatory activity in the genital tract support this pathophysiological mechanism ⁽²⁾.
- Further research is essential to explore the accuracy of advanced molecular diagnostics, such as PCR, in identifying LGTB early and integrating them into the routine workup for infertility ⁽⁴⁾.

CONCLUSION

This case highlights the importance of recognizing LGTB as a cause of infertility and ovarian failure, as well as the role of advanced molecular diagnostics, such as PCR, in diagnosing this condition.

References:

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