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CASE REPORT

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Bilateral breast tuberculosis: A case report

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Key Clinical Message

Breast tuberculosis is a rare clinical condition that has the potential to imitate breast cancer or pyogenic abscess. It is crucial to consider this in patients who have resistant breast abscesses or persistent sinuses, particularly in high-risk groups or locations. The main treatment for breast tuberculosis is antitubercular treatment.

Abstract

Bilateral breast tuberculosis is a rare form of the disease that affects breasts. It is most commonly seen in young females, including nulliparous and lactating women. Diagnosis of bilateral breast tuberculosis can be challenging due to its similarity to other breast diseases, such as granulomatous mastitis and breast carcinoma. Patients from high-risk groups and/or endemic locations who present with clinically suspicious breast lumps or refractory breast abscesses should have breast TB taken into consideration in their differential diagnosis. A 24-year-old Ethiopian female presented to the surgical outpatient department with a complaint of bilateral breast pain of 1-year duration associated with a low-grade fever, not associated with chills or rigor. She also has ulceration on the lower part of both breasts. It was followed by pus discharge from the right breast 6 months later. Investigations, including fine needle aspiration cytology, were suggestive of tuberculous mastitis. Later, the patient was treated with antituberculous drugs for 6 months, and the above symptoms subsided. Individuals with breast lesions who do not respond well to antibiotics should be suspected of having breast tuberculosis, especially if they are young and reside in or were born in a nation where the disease is prevalent.

KEYWORDS

abscess, breast, case report, lump, mastitis, tuberculosis

1 | INTRODUCTION

Breast tuberculosis (TB) is a rare type of TB because the breast, like the spleen and muscle, is incredibly resistant to the infection. Sir Astley Cooper reported the first case of TB mastitis in 1829.[1] Even in endemic locations, breast TB is a very rare condition. The condition affects 0.025%–0.1% of all breast disorders that are surgically treated. In nations where TB is prevalent, like our own, the incidence is higher.[2] Breast TB often affects young, multiparous women who are nursing their child. It can manifest as a solitary, painless breast lump or as an abscess. Bilateral presentation is quite uncommon, nevertheless. Mammary TB can present with subtle, nonspecific clinical symptoms that resemble other granulomatous mastitis (GM) or breast cancer.[3] It is not unusual for breast TB to be misinterpreted as either cancer or a non-specific abscess, as it was in our case.[4] When used properly, fine needle aspiration cytology (FNAC) may be a very effective diagnostic tool. Granuloma on FNAC should be an indication for empirical therapy for TB in tuberculosis-endemic areas, even in the absence of positive acid-fast bacilli (AFB) and without positive culture findings for the previously indicated reasons.[5] Here, we report a patient with bilateral breast tuberculosis (BBT) that was treated with antituberculous drugs and it responded well.

2 | CASE HISTORY

A 24-year-old Ethiopian female presented to the surgical outpatient department with bilateral breast pain that had been ongoing for 1 year. She also reported experiencing a low-grade fever, but no chills or rigor. Additionally, she had ulcerations on the lower part of both breasts. 6 months later, she began experiencing pus discharge from her right breast. The patient denied any complaints of coughing or breathlessness, and she was not breastfeeding. There was no lymphadenopathy noted in her neck, axilla, or groin. She had no personal or family history of breast cancer and was nulliparous. She was not married and denied any history of abortion. She had regular menses, and she was not on any form of contraception. There was no history of trauma to the breast, smoking, or IV drug abuse. She also had no history of diabetes, hypertension, or known allergies. The patient was not currently taking any medications. Despite seeking treatment at a nearby health center, the patient's symptoms did not improve after multiple courses of oral antibiotics. The antibiotics she had been prescribed included cloxacillin 500 mg taken orally four times a day for 7 days, amoxicillin 500 mg taken orally twice a day for 7 days, and amoxicillin–clavulanic acid 625 mg taken orally twice a day.

Upon examination, a spherical lump measuring 4 × 4 cm was discovered at the 6 o'clock position of the left breast. The lump exhibited no tenderness and was accompanied by a discharge of pus from the nipple, as well as nipple retraction. Notably, the lump was firmly attached to the skin, possessed a smooth surface, and did not display any signs of the peau d'orange appearance. Additionally, an ulcerative skin lesion was observed on the inner side of the left breast (Figure 1). Shotty lymph nodes were also present in the left axilla. Furthermore, a separate ulcerative skin lesion measuring 3 × 1 cm was found on the lower area of the right breast, specifically at the junction of the areolar complex. However, no discharge or palpable lump was associated with this lesion (Figure 2). No supraclavicular lymphadenopathy was detected, and the patient's respiratory system appeared normal. Overall, the remaining examinations yielded normal results.

2.1 | Methods

In the investigations, the patient's complete blood count showed normal results, except for a low hemoglobin level of 11.9 g/dL. Additionally, her erythrocyte sedimentation rate (ESR) was elevated at 79 mm/h (The normal values are 0–15 mm/h in men and 0–20 mm/h in women), indicating inflammation in the body. The chest X-ray, however, appeared normal (Figure 3). Further examination using bilateral breast ultrasound (US) revealed several

FIGURE 1 Gross appearance of left breast ulceration around the areola with nipple inversion.

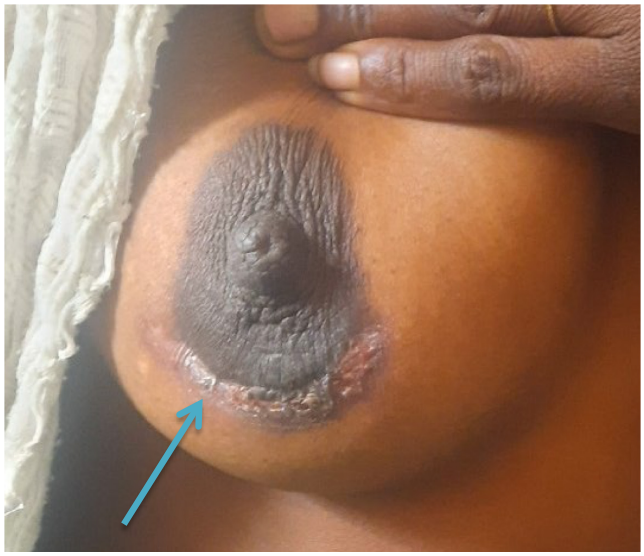

FIGURE 2 Gross appearance of the lesion on the right breast.

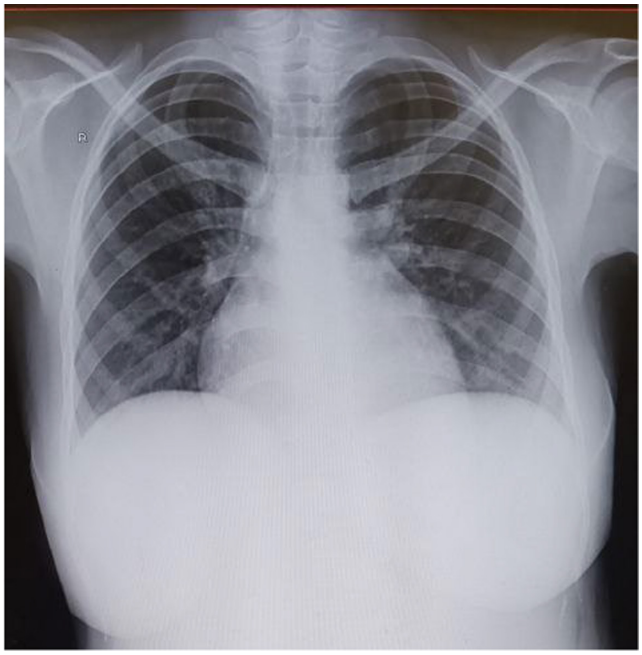

FIGURE 3 Posteroanterior chest X-ray of the patient, which appeared grossly normal.

abnormalities. At the right breast peri-areolar region at 6 o'clock, there was an ill-defined hypoechoic lesion measuring 7.56 mm. This lesion showed strong acoustic enhancement but no internal flow was detected. Another hypoechoic lesion measuring 1.6 × 1.3 cm was found at the right breast peri-areolar region at 12 o'clock, with postacoustic enhancement. Additionally, a 2.2 × 1.4 cm ill-defined hypoechoic lesion with internal debris was observed mainly at 6 o'clock on the left breast. Her organ function tests (liver function tests and renal function tests) and serum electrolytes were within the normal limits.

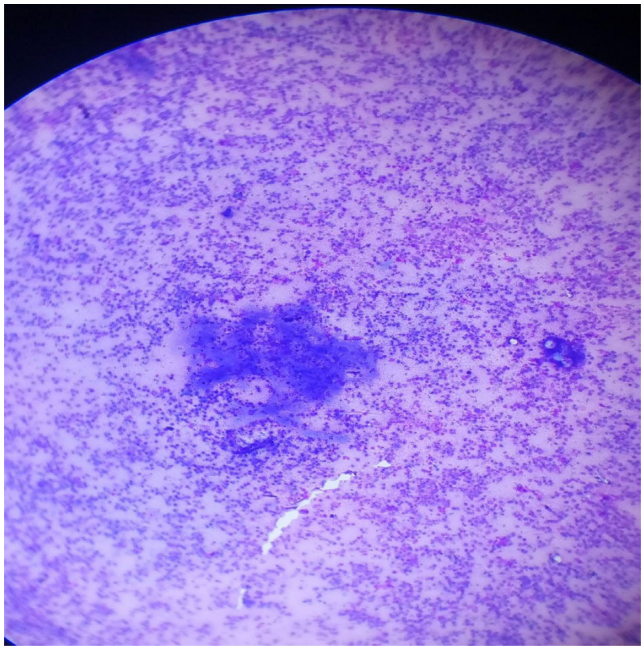

FIGURE 4 Histopathology sample of breast tissue showing sheets of degenerating neutrophils and lymphocytes admixed with aggregates of epitheliod histiocytes with necrotic background.

Microbiologic analyses, including gram stain, AFB stain, and culture, were performed on the discharge from the patient, but all results came back negative. The patient was also tested and found to be seronegative for HIV. A FNAC was conducted, which revealed sheets of degenerating neutrophils and lymphocytes mixed with aggregates of epithelioid histiocytes against a necrotic background. This pattern indicated pyogranulomatous inflammation, suggesting a superinfected case of tuberculous mastitis (Figure 4 and Figures S1–S6).

2.2 | Outcome and follow-up

Afterwards, the patient's condition was treated by administering antituberculous drugs for a duration of 6 months, in adherence to the national TB treatment guideline of Ethiopia. This guideline entails a 2-month course of rifampicin, isoniazid, pyrazinamide, and ethambutol, followed by an additional 4 months of rifampin and isoniazid. To prevent isoniazid-induced peripheral neuropathy, the patient was also prescribed pyridoxine, which was to be taken until the completion of the antituberculosis treatment. The specific dosages were as follows: isoniazid 300 mg orally per day, rifampicin 600 mg orally per day, pyrazinamide 1200 mg orally per day, ethambutol 800 mg orally per day, and pyridoxine 25 mg orally per day. Ultimately, the aforementioned symptoms subsided, and no significant adverse effects were observed by the conclusion of the patient's treatment.

3 | DISCUSSION

A 24-year-old woman presented with bilateral breast pain, ulceration, and nipple discharge and was later confirmed to have breast TB. The clinical presentation of BBT is frequently nonspecific, resembling various benign and malignant breast conditions. Patients may exhibit breast lumps, pain, or nipple discharge, which can pose diagnostic challenges. The presence of bilateral involvement adds complexity to the clinical presentation, underscoring the importance of maintaining a heightened level of suspicion for TB in regions where the disease is endemic. Bilateral breast tuberculosis is a rare manifestation of extrapulmonary TB that affects breasts and has been dubbed a "great masquerader" due to its complex appearance, which can often be misinterpreted as cancer or a pyogenic abscess. Breast TB often affects women in the reproductive age range like this patient; it is uncommon in prepubescent and elderly women. The cause might be that this age group experiences numerous changes during their active years and is more susceptible to injury and infection.[5]

Breast TB typically presents unilaterally and can be classified as either primary or secondary based on the presence or absence of other disease foci. In this particular case, the patient is likely experiencing primary breast TB as no other focus has been identified. The potential pathways of dissemination to the breast include hematogenous spread, lymphatic spread, direct extension from the thoracic wall or axillary lymph nodes, or direct inoculation through damaged skin or ducts.[6] Retrograde lymphatic spread from the pulmonary center via the paratracheal and internal mammary lymph nodes, however, is the most frequent mechanism of infection. Cooper's theory states that involvement of the breast is caused by retrograde lymphatic extension resulting from connection between the axillary glands and the breast. This was corroborated by data showing that 50%–75% of instances of tubercular mastitis had involvement of the axillary nodes.[5,7]

One of the primary differential diagnoses taken into consideration for this patient, alongside TB, was pyogenic breast abscess, potentially caused by drug-resistant microbes and fungal infection. Other potential differentials considered include sarcoidosis, granulomatous reaction to tumor, foreign body reaction, and Wegener's granulomatosis of the breast. Mammary duct ectasia was also considered, although epithelioid granulomas are not typically associated with this condition.[4] Another important differential diagnosis of breast TB with similar presentation is GM, a condition characterized by the primary presentation of breast masses, tumorous indurations, skin ulcerations, inflammation, local discomfort, tenderness, galactorrhea, abscesses, and fistulae. Many individuals with GM also experience nipple retraction and a mass that is adhered to the skin or underlying tissues.[8,9] In this case, the patient exhibited symptoms such as breast pain, nipple discharge, nipple retraction, and skin ulceration, further supporting the possibility of GM as a differential diagnosis.[10]

In order to confirm the diagnosis, the patient underwent FNAC of the breast lesion, a crucial diagnostic modality for breast TB. The FNAC results revealed a composition of lymphocytes interspersed with clusters of epithelioid histiocytes set against a necrotic background. When both epitheloid cell granulomas and necrosis are present, as this patient had, FNAC may detect 73% of instances of breast TB. Failure to support the aforementioned conclusions does not, however, rule out TB because only a little amount of tissue is taken and studied. Furthermore, breast TB does not require the presence of AFB in order to be diagnosed. Suspicion of underlying TB should be raised in cases of AFB-negative breast abscesses that do not heal after receiving appropriate drainage and antibiotic therapy, as well as those with persistently draining sinuses, particularly in TB-endemic areas.[7] In our case, the patient was given an adequate trial of antibiotics several times without any response in the nearby health center.

In order to further assess individuals with breast TB, a number of additional tests are helpful. Our patient underwent blood tests such as ESR, which was elevated and suggests chronic inflammation such as TB, and breast US, which showed multiple ill-defined lesions. Among the US's added value are the following: finding nodules can aid in improved lymph node evaluation, direct attempts at fine needle aspiration and percutaneous abscess drainage, and perhaps help in the exclusion of cancer.[11]

Other ancillary tests for TB include skin testing for tuberculin, which validates prior exposure but does not provide a conclusive diagnosis. This may not be important in a country like Ethiopia, where the majority of the population has already been exposed to TB. Mammography is rarely beneficial, especially for younger women due to their high breast density. In older women, the results of mammography are typically similar to those of breast cancer. Consequently, mammography may not be necessary for certain people, like this patient.[6]

The most accurate techniques for the diagnosis of breast TB are histological analysis of tissues taken from biopsies and bacteriological cultures of aspirates from the lesion.[12] The gold standard method for detecting TB involved microbial culture and AFB staining.[13] However, since breast TB is paucibacillary, routine diagnostic tests like microscopy, culture, and nucleic acid amplification tests such as polymerase chain reaction techniques do not have the same diagnostic utility as they do in pulmonary TB. Furthermore, the histology could be similar to that of other granulomatous disorders.[14] In this patient,

all microbiological studies were negative, supporting the paucibacillary nature of the disease.

According to radiologic and clinical presentation, there are three kinds of breast TB: the nodular variant, which is distinguished by a breast lesion that is slowly expanding and surrounded by caseous tissue. The second kind, known as the diffuse form of disseminated TB mastitis, is characterized by many confluent foci of TB in the breast, which may caseate and result in skin ulcerations and multiple discharging sinuses. There is also involvement of the axillary lymph nodes. The third type of TB is called a sclerosing form, and it usually affects older women. It is distinguished by extensive fibrosis rather than a caseous process.[2] Based on the above classification, our patient had a nodular variant involving both breasts.

The patient underwent treatment for a pyogenic breast abscess on multiple occasions, as distinguishing breast TB from a simple pyogenic abscess in a young woman is a particularly challenging yet essential aspect of diagnosing breast TB. Clinical features may not always provide reliable indicators, making it difficult to accurately identify TB mastitis in a patient presenting with a lump, infection, or both in the breast. In such cases, empirical treatment for TB may be considered if the clinical history and progression of the disease suggest TB, as was the case with this patient.[15]

With regard to breast TB treatment, surgery with certain indications and antitubercular treatment (ATT) are the two main treatments. The mainstay therapy for breast TB is ATT, which typically yields positive outcomes for patients. However, in rare cases, surgical intervention may be necessary for procedures such as breast abscess drainage, biopsy of the abscess wall, breast sinus excision, and incisional or excisional biopsy.[7] In this particular case, the patient responded well to ATT alone, obviating the need for surgery. Ultimately, the patient expressed satisfaction with the care she received.

4 | CONCLUSION

In summary, individuals with breast abscesses who do not respond well to antibiotics should be suspected of having breast TB, especially if they are young and reside in or were born in a nation where the disease is prevalent, such as ours. A trial of ATT combined with routine clinical evaluation is strongly advised if there is a high clinical suspicion of TB.

AUTHOR CONTRIBUTIONS

Yohannis Derbew Molla: Conceptualization; writing – original draft; writing – review and editing. **Mohammed Alemu Iberahim:** Writing – original draft; writing – review and editing. **Hirut Tesfahun Alemu:** Writing – original draft; writing – review and editing. **Samuel Addisu Abera:** Conceptualization; writing – review and editing.

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Not applicable.

CONFLICT OF INTEREST STATEMENT

No potential conflict of interest relevant to this article was reported.

DATA AVAILABILITY STATEMENT

The authors of this manuscript are willing to provide any additional information regarding the case report.

ETHICS STATEMENT

The case report has been submitted for Ethical Board Review and approved as ethically sound report.

CONSENT

Written informed consent was obtained from the patient to publish this report in accordance with the journal's patient consent policy.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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