

CASE REPORT

Fine-needle aspiration cytology-based accurate and rapid diagnosis of breast tuberculosis mimicking an abscess

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Abstract

A case of breast tuberculosis was initially misdiagnosed as a breast abscess and diagnosed definitively by minimally invasive fine-needle aspiration cytology. This definitive diagnosis enabled us to prevent widespread infection by early initiation of the standard anti-tuberculosis regimen. The patient recovered, and no disease recurrence was noted during follow-ups.

KEYWORDS

biopsy, breast, breast diseases, diagnosis, fine needle, tuberculosis

1 | INTRODUCTION

Breast tuberculosis (BT) is a rare and uncommon presentation of tuberculosis.¹ In developing countries, the overall incidence of BT is 0.1% and 4% among clinically diagnosed and surgically excised breast lesions, respectively.^{2,3} BT is more common in women of reproductive age, particularly lactating and multiparous women, but is occasionally diagnosed in men in 4.5% of cases.^{3,4} It is often misdiagnosed as a malignancy or abscess⁵ and usually coexists with immunodeficient states like human immunodeficiency virus (HIV) infection.⁶ Primary BT is extremely rare, whereas secondary BT develops from hematogenous, retrograde

(axillary lymph nodes) or direct (lung, pleura, mediastinum, and articular lesions) spread.⁷ This study documented primary BT in a patient with no other tubercular foci or HIV. The objective of this report was to emphasize the utility of fine-needle aspiration cytology (FNAC) in diagnosing BT to avoid more invasive diagnostic methods.

2 | CASE HISTORY

A 34-year-old woman presented to the hospital, with a 2-month history of a unilateral painless lump in the right breast. The lump recently became painful and was

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associated with induration of the overlying skin, ulcer formation, and purulent discharge from the sinus on the right breast 20 days before hospitalization. She denied any history of loss of appetite, weight loss, night sweats, or respiratory symptoms. There was no family history of breast cancer, tuberculosis, or other pulmonary diseases. Systemic examination findings were normal.

2.1 | Differential diagnosis, investigations, and treatment

Physical examination demonstrated a palpable mass and purulent material originating from a 1-cm sinus in the upper outer quadrant of the right breast, whereas the left breast showed no clinical abnormalities in the breast tissue and nipple-areolar area or nipple discharge. The patient tested negative for HIV infection, and no foci of tuberculosis were found elsewhere in the body.

Her laboratory results were within the normal limits, except for an elevated erythrocyte sedimentation rate (102 mm/h). The patient underwent computed tomography of the neck, abdomen, and breast, which revealed a 2 × 2-cm mass in the right breast. Right-sided axillary lymphadenopathy was also noted, and the node measured 10–20 mm in size. Ultrasonographic examination of the right breast demonstrated an 87 × 17-mm hypoechoic lesion with heterogeneous features and irregular borders (Figure 1). Doppler ultrasonography revealed elevated circumferential vessels around a central avascular lesion, which was characteristic of an existing infection. The lesion was diagnosed as a breast abscess; however, there was no improvement in symptoms even after seven days of amoxicillin/clavulanic acid (875/125 mg every 12 h).

To establish a definitive diagnosis, the patient underwent FNAC of the lesion. FNAC was performed with a 22-gauge needle and a 10-ml syringe; 2 ml of purulent fluid was aspirated. Under the microscope, the collected specimen showed Langhans giant cells, epithelioid cell granulomas, caseous necrosis, lymphocytes, and necrotic foci (Figure 2). Ziehl-Neelsen (ZN) staining demonstrated acid-fast bacilli (AFB) (Figure 3), whereas cytology revealed Langhans giant cells, epithelioid cell granulomas, and lymphocytic aggregates. A cartridge-based nucleic acid amplification test revealed *Mycobacterium tuberculosis* complex that was sensitive to rifampicin.

2.2 | Outcome and follow-up

The standard anti-tuberculosis regimen was initiated, which consisted of two months of isoniazid, rifampicin, pyrazinamide, and ethambutol therapy, followed by four months of isoniazid and rifampicin treatment. She attended regular follow-ups for one year, and no disease recurrence was noted during this period.

3 | DISCUSSION

BT regularly presents as a mass^{8,9} in the central or upper outer quadrant of the breast.¹⁰ While the features may be inconsistent, BT most frequently presents as round, nodular lesions with tissue induration and fistula formation and is rarely associated with pain. Our patient presented with a painful mass with diffuse ulceration in the upper outer quadrant of the right breast.

Granulomatous mastitis is an important differential diagnosis because it can present with fistulae, abscesses,

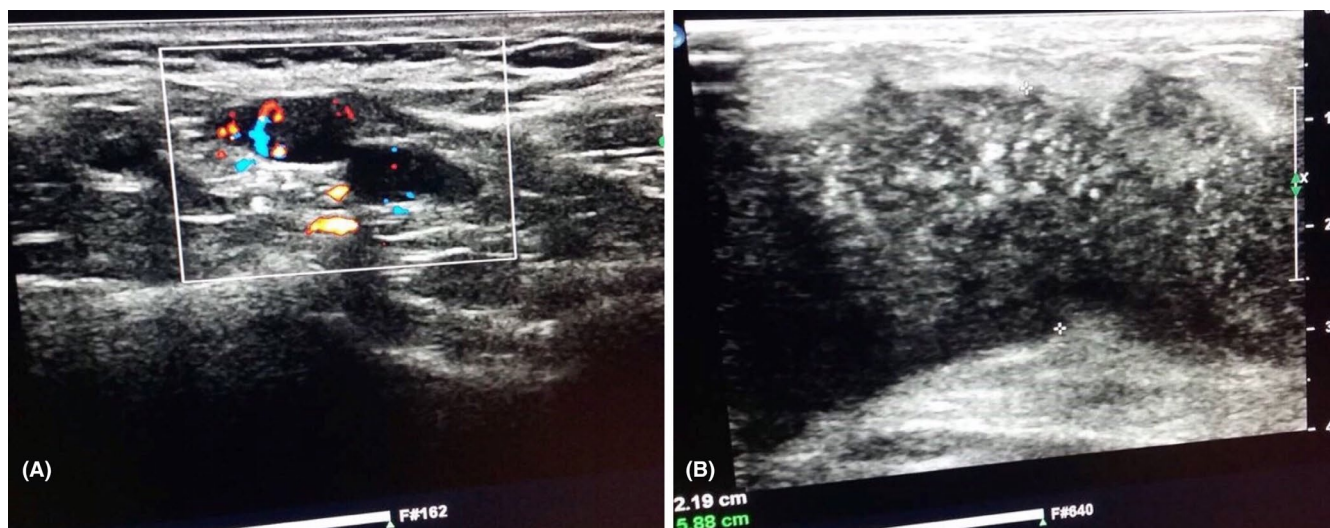


FIGURE 1 (A, B) Ultrasonography revealed a hypoechoic lesion with heterogeneous formation (87 × 17 mm) having irregular borders

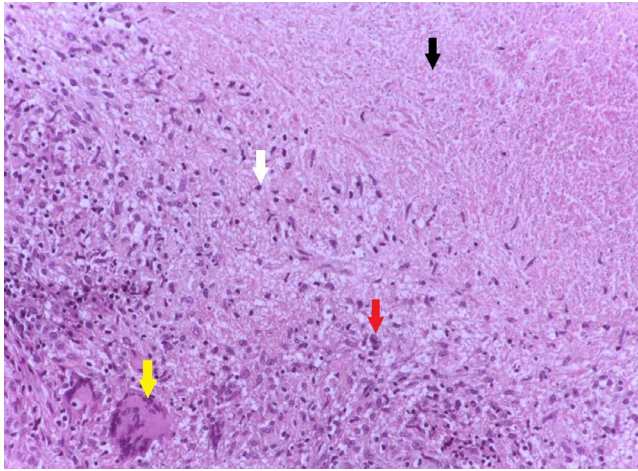


FIGURE 2 Hematoxylin and eosin staining demonstrating Langhans giant cells (yellow arrow), epithelioid cell granulomas (red arrow), caseous necrosis (black arrow), lymphocytes (white arrow), and necrotic foci (x40)

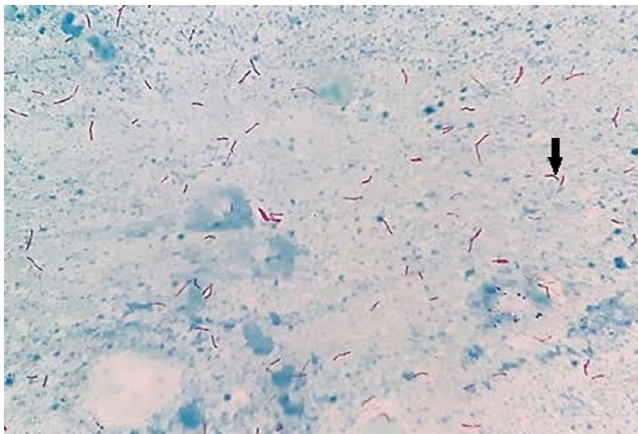


FIGURE 3 Ziehl-Neelsen staining demonstrating classic pink-colored, beaded, rod-shaped acid-fast bacilli (black arrow) (x40)

nipple retraction, and skin inflammation and ulceration, mimicking BT. However, granulomatous mastitis can present in any quadrant and generally involves the lobules, whereas BT more usually involves the ducts.¹¹ Moreover, a histologic examination of granulomas shows no signs of necrosis.¹²

BT can be classified into the following five pathological variants: nodular, disseminated, sclerosing, tuberculous mastitis obliterans, or acute miliary tubercular mastitis (abscess type).⁸ The sclerosing, tuberculous mastitis obliterans, and acute miliary tubercular mastitis types are of historical significance; BT cases are currently classified as either nodular, disseminated, or abscess types. Our patient had the abscess type of BT.

On mammography and ultrasonography, BT lesions may mimic malignant tumors (30%) or present as well-defined masses with smooth borders (40%), axillary

adenopathy (40%), ductal ectasia (30%), or nipple retraction (20%).¹³ Mammography and ultrasonography cannot differentiate BT from carcinoma and breast abscesses because inflammatory lesions have varied presentations. FNAC provides reliable results and may be considered the gold-standard diagnostic procedure for BT,¹⁴ because the aspirated material can be analyzed histologically for AFB detection.¹⁵ Studies have shown that FNAC accurately diagnosed three-quarters of all BT cases with epithelioid granulomas and necrosis.³ While Doppler ultrasonography imaging demonstrated features characteristic of a breast abscess in this patient, ZN staining of FNAC samples demonstrated AFB-positive epithelioid granulomas. These findings, in addition to the therapeutic failure with antibiotics, supported the diagnosis of BT.

Core needle biopsy of breast tumors may also provide reliable results; however, incisional or excisional biopsy of the breast mass, ulcer, sinus, or cavity wall of a suspected tuberculous breast abscess is more helpful in diagnosing BT.¹⁶ An excision biopsy was suggested in this patient; however, the patient and her caregivers refused the procedure. Although the QuantiFERON-TB Gold test is a good alternative because of its high sensitivity and specificity for tuberculosis, it provides false-negative results in extrapulmonary tuberculosis in 28.8% of cases.¹⁷ In this patient, FNAC alone provided an accurate diagnosis.

Several studies have documented the role of FNAC in accurately diagnosing BT,^{18,19} however, FNAC was also inconclusive in some cases in which AFB was not detected in the subsequent cultures.²⁰ BT may be difficult to diagnose based on radiologic and microbiologic findings alone; a high index of suspicion is required.

In conclusion, in patients suspected of BT, FNAC should be performed as the gold-standard diagnostic method of choice. Proper diagnosis facilitates treatment earlier during the course of the disease, thus preventing widespread infection.

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None.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

AUTHOR CONTRIBUTIONS

Yethindra Vityala, Tugolbai Tagaev, and Asel Namazbekova involved in conception, design of the work, manuscript preparation, and data acquisition. Altnai Zhumabekova and Cholpon Dzhumakova involved in: clinical management. Bolotbek Djanaliev involved in manuscript preparation and data acquisition.

ETHICAL APPROVAL

The patient gave her informed consent prior to her inclusion in the study.

CONSENT

Published with written consent of the patient.

DATA AVAILABILITY STATEMENT

Data are available from the corresponding author upon reasonable request.

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