



## Breast Tuberculosis: A Rare Case Report of Extra Pulmonary Tuberculosis

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### ABSTRACT

*Tuberculosis (TB) of the breast is an uncommon disease even in countries where the incidence of pulmonary and extra-pulmonary tuberculosis is high. A rare case report of a medical student, with a 2-month history of a painful erythematous lump in the upper outer quadrant of the left breast, was presented. Breast TB is a diagnosis of exclusion and should be suspected in patients from endemic countries, with high-risk professions, and with poor response to antibiotic therapy of breast inflammation. In presence of high clinical suspicion of TB, a trial of anti-tuberculous therapy with regular clinical assessment is warranted.*

**Keywords:** Extra-pulmonary, Mastitis, Tuberculosis

### INTRODUCTION

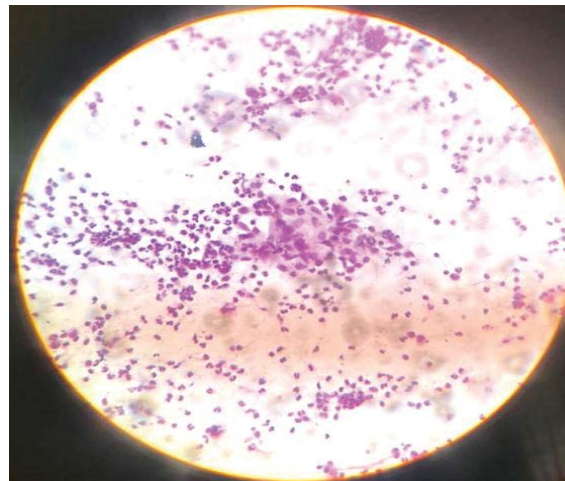
Tuberculosis (TB) is the most widespread and persistent human infection in the world. The infection can involve any organ and mimic other illnesses; hence it is called the great mimicker. It may be difficult to differentiate from carcinoma breast, a condition with which it may co-exist [1,2]. Tuberculosis of the breast is an uncommon disease even in countries where the incidence of pulmonary and extra-pulmonary tuberculosis is high [3]. Tuberculous Mastitis (TM) is a rare extra-pulmonary presentation of tuberculosis accounting for less than 1% of all diseases of the breast in the industrialized world [3]. Incidence of this disease is higher in countries endemic for tuberculosis, like the Indian subcontinent, where it may be as high as 4% [2]. TM may be part of a systemic disease or maybe the only manifestation of tuberculosis. Clinical presentation is usually of a solitary, ill-defined, unilateral hard lump situated in the upper outer quadrant of the breast. It occurs far more frequently in women, especially in their reproductive age, and is uncommon in prepubescent and elderly women [4-6]. This could be because the female breast undergoes frequent changes during the period of childbearing activity and is more susceptible to trauma and infection [7]. This disease can present a diagnostic problem on radiological and microbiological investigations, and thus a high index of suspicion is needed. Therefore, demonstration of caseating granulomas from the breast tissue and involved lymph nodes may be sufficient for the diagnosis [8-11]. Fine Needle Aspiration Cytology (FNAC) is the most widely used initial invasive method for the diagnosis of breast tuberculosis. The disease is curable with anti-tubercular drugs, and surgery is rarely required. Here we present a case of a young medical student with tubercular mastitis presenting with minimal symptoms.

### CASE REPORT

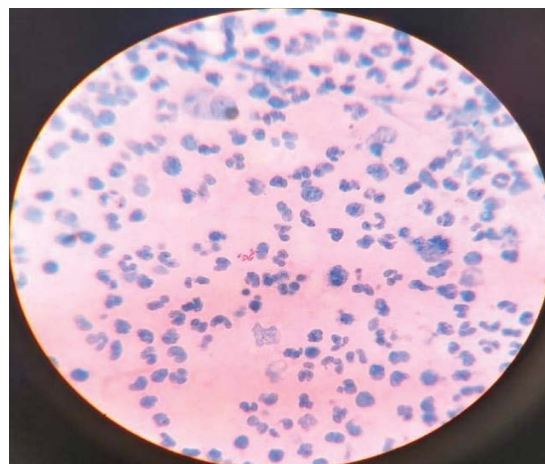
A 24-year-old 2<sup>nd</sup> Year Medical student presented with a 2-month history of a painful erythematous lump in the upper outer quadrant of the left breast in Surgery OPD. On physical examination, a (6-7) cm, firm, mobile and painful mass was palpated, which caused erythema and edema of the skin in the superolateral quadrant of the left breast in the specified area near the nipple. There was no fistulization. There were no significant peripheral lymphadenopathies. According to the patient, it was a longstanding lesion, but she refused any previous physical examination due to her shyness. She denied a history of fever, smoking, use of contraceptive pills, injury, or exposure to radiation of the breast. There was no family history of tuberculosis or breast disease. She was HIV negative unmarried student of the medical fraternity

with no history of breast trauma but with exposed risk for TB-positive patients during her clinical duties. A pus-like sample was collected through needle aspiration amounting to approximately 2 ml for microbiological and cytological examinations. The histopathological report highlighted granulomatous inflammation and the cytological test on the material showed clusters of epithelioid cells admixed with degenerated polymorphs, macrophages, histiocytes, giant cells, and a few clusters of benign ductal epithelial and myoepithelial cells in a necrotic background.

Few pink rod-shaped bacilli were seen on Ziehl-Neelsen (ZN) staining as Acid-Fast Bacilli (AFB) (Figure 1 and Figure 2). On fluorescent microscopy TB bacilli fluoresced as golden yellow rods on a dark background after staining with rhodamine dye. Bacterial pus culture turned out to be negative and TB culture was performed by Mycobacterial Growth Indicator Tube (MGIT) and found positive on the 23<sup>rd</sup> day. Also, Gene-Xpert was performed but it was negative due to paucibacillary load. The total leukocyte count, ESR, and other blood tests were normal. The hematological profile of the patient was normal. No pathological findings were seen on the chest X-ray (Figure 3). Breast Ultrasound showed a centimetric hypo-echoic sub-areolar lesion, as for a breast abscess. The patient was also prescribed empirical antibiotic therapy with Amoxicillin and Clavulanic Acid 1 g every 12 hours for 6 days, but because of the clinical nonresponse to an antibiotic and positive report of cytology and staining methods; an interpretation of primary breast tuberculosis was made. So the patient was referred to Chest and Tuberculosis Department for anti-tuberculous therapy. The patient was treated with anti-tubercular drugs (rifampicin, isoniazid, pyrazinamide, and ethambutol) for two months and she is continuing with continuation phase treatment with a favorable response.



**Figure 1** Leishman-Giemsa stain in 40× magnification field showing epithelioid granulomas with necrosis



**Figure 2** Ziehl Neelsen stain in 100× magnification field showing acid-fast bacilli in clusters



**Figure 3 Chest X-ray of the patient**

### DISCUSSION

Breast tuberculosis can mimic carcinoma, and it can be mistaken for a pyogenic breast abscess. A painful lump is the most common clinical presentation, often located in the central or upper outer quadrant of the breast, followed by inflammation, abscess formation, skin ulceration, or diffuse mastitis [6]. It is usually frequent in multiparous and breastfeeding women, although our patient was nulliparous, with no fever. Regarding the radiological aspect, no specific mammographic signs of mammary tuberculosis are individualized [12]. The gold standard for the diagnosis of breast tuberculosis is the detection of *M. tuberculosis* by ZN staining and by microbiological culture. FNAC, instead it is unable to identify the presence of the etiologic agent, but it contributes by detecting the presence of epithelioid cell granulomas and necrosis. The polymerase chain reaction is highly sensitive to breast TB diagnosis although rarely used since it is recommended in cases with negative culture or for differential diagnosis among other forms of granulomatous mastitis [7,13-15]. A high incidence of breast tuberculosis is presumed in India despite only a few hundred cases of breast tuberculosis reported, probably due to lack of cytology aid in the diagnosis of breast lumps with or without lymphadenopathy. It must also be noted that TB of the breast usually co-exists as a secondary component in a disseminated disease to a primary focus usually in the lung parenchyma or bony chest wall. In this patient, however, the presentation was primary breast TB as no other organ was found to be involved in the disease process after her evaluation. This patient was initially thought to have a pyogenic breast abscess, but it failed to heal with antibiotics. Cytological examination and culture revealed the correct diagnosis. It is generally thought that the breast gets involved in tuberculosis by retrograde lymphatic extension from the mediastinal, axilla, and cervical region, but in the cases reported here, there was no associated lymphadenopathy as confirmed by physical exam and ultrasonography and no other foci of tuberculosis infection, and all chest X-rays were normal [11]. There are three clinical varieties of mammary TB-namely, nodular, sclerosing, and disseminated [5]. The nodular variant is often mistaken for a fibroadenoma or carcinoma and is the commonest accounting for 60% of cases. The disseminated variety commonly leads to caseation and sinus formation. Sclerosing TB affects older women and is slow-growing with the absence of suppuration. Also in this case it was of nodular type as it is the most common variant. Our patient had a significant risk for TB infection as she lived in India with a high prevalence of TB. Also being a medical student falls under healthcare risk for tuberculosis. Khanna found that in 52 patients with breast TB, FNAC was 100% reliable in diagnosing breast tuberculosis [15]. In our case, the clinical diagnosis was supported by the positivity of cytology, ZN, Fluorescent staining, and automated liquid culture [16]. Direct infection of the breast may occur through skin abrasions or the milk duct openings as in this case trauma may be assumed to be the cause though the patient didn't give a history of it. Breast TB may be considered primary when no other demonstrable focus exists and may be considered secondary when a pre-existing lesion is located elsewhere. In our patient as none of the organs or lymph nodes was involved suggesting primary infection of breast tuberculosis.

## CONCLUSION

Breast TB is an unusual presentation of extrapulmonary tuberculosis. Breast TB is a diagnosis of exclusion and should be suspected in patients from endemic countries, with high-risk professions, and with poor response to antibiotic therapy of breast inflammation. In presence of high clinical suspicion of TB, a trial of anti-tuberculous therapy with regular clinical assessment is warranted. Clinical awareness of TB is always necessary for evaluating breast lesions. A high degree of clinical suspicion and familiarity with physical examination findings are necessary to enable an early diagnosis. This requirement for familiarity motivated us to present our experience with breast TB to increase the awareness of other doctors of this condition, and to enable the prevention of delays in the diagnosis of breast TB and unnecessary interventions and surgical procedures.

## DECLARATIONS

### Conflict of Interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

### Ethical Approval

Informed consent was obtained from the patient.

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