

CASE REPORT

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Imaging of tubercular mastitis presenting as recurrent breast nodules and abscesses: a rare case report

Annu Singhal^{*} , Bhavya Kataria and Swati Sharma

Abstract

Background Tubercular mastitis could be a rare diagnostic find clinically. It is largely seen in Asian, African and alternative non-developed countries and might occur with coincident primary tuberculosis of the respiratory tract or spine. Primary breast tuberculosis (TB) is even rarer and presents with non-specific clinical signs of continual breast masses, inflammation and sinus tracts. It can be similar to bacterial inflammation/abscess and malignant pathologies on imaging. The key to identification could be a holistic combination of imaging, clinical, biochemical and histopathological analysis.

Case presentation We discuss a case of a 41-year-old lady who conferred at the start with tender breast nodules that progressed to continual, multiple abscesses and sinus tract formation. It had been an unusual and unanticipated presentation in breast followed by uncommon events throughout the course of the treatment forcing us to re-evaluate the primary diagnosis. A sequence of multiple diagnostic imaging and histopathological evaluations confirmed the identification of tubercular mastitis. Following prolonged treatment, there was vital reduction within the range and size of nodules and abscesses.

Conclusions Such cases imitate bacterial abscess and cancer in their clinical presentation and imaging findings and are imperative to be diagnosed via a myriad of diagnostic tests with histopathology. Such a clinical presentation should warrant a differential of granulomatous inflammation of the breast in cases of non-responders to incision and drainage, prolonged antibiotic medical therapy and prolonged anti-tubercular treatment up to twenty four months after assessment of the individual response.

Keywords Case report, Tuberculosis, Mastitis, Nodules, Abscess

Background

Tuberculosis is a communicable disease caused by *Mycobacterium tuberculosis* bacillus which might survive and duplicate within the macrophages of the host [1]. Though tuberculosis primarily attacks the lungs, different organs also are in danger of infection [2]. The primary case of

breast TB was reported in 1829 by an outstanding English medical professional (surgeon) Sir Astley Cooper, who delineated it as a “scrofulous swelling of the bosom.” [3].

Here, we intend to report a case of a 41-year-old woman with repeated breast masses having atypical Breast Imaging Reporting and Data System (BIRADS) three lesions each on mammography and ultrasound that underwent resolution in terms of range and size. On anti-tubercular treatment (ATT), recurrent fine-needle aspiration cytology (FNAC) and diagnostic biopsy characterized them as benign tubercular mastitis. A case presenting with nodular-type lesions, resulting in multiple

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abscess formation with rupture into fistulous tract and skin involvement, has not been reported hitherto within the literature to the best of our knowledge.

Case presentation

A 41-year-old woman, multipara with no history of recent lactation, presented to the OPD with complaints of multiple tender nodules and pain in bilateral breasts since one week in the month of October in 2019. On clinical examination, a medical diagnosis of breast abscess was considered and she was started on a course of

antibiotics and anti-inflammatory medication. No imaging was suggested then.

After 4 months, there was decrease in pain, but the nodules persisted. A mammogram with ultrasound was performed for the patient in January 2020 which revealed multiple hyperdense masses in bilateral breasts with partly circumscribed and partly obscured margins (Figs. 1, 2). Ultrasonography showed corresponding well defined wider than taller heteroechoic regions with circumscribed margins showing internal mobile debris. A few of these lesions showed conglomeration.

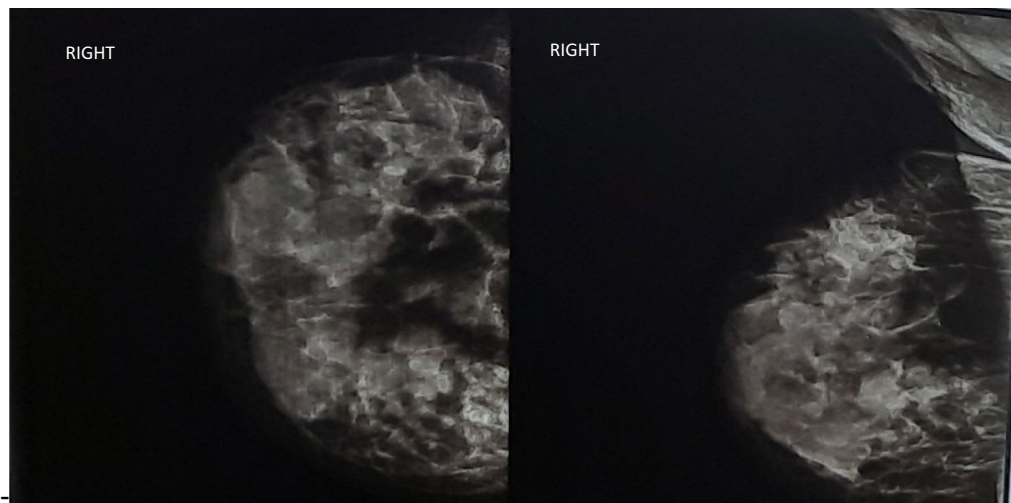


Fig. 1 Initial mammogram at the start of the treatment cranio-caudal and medio-lateral oblique views of the right breast shows ACR grade D dense parenchyma

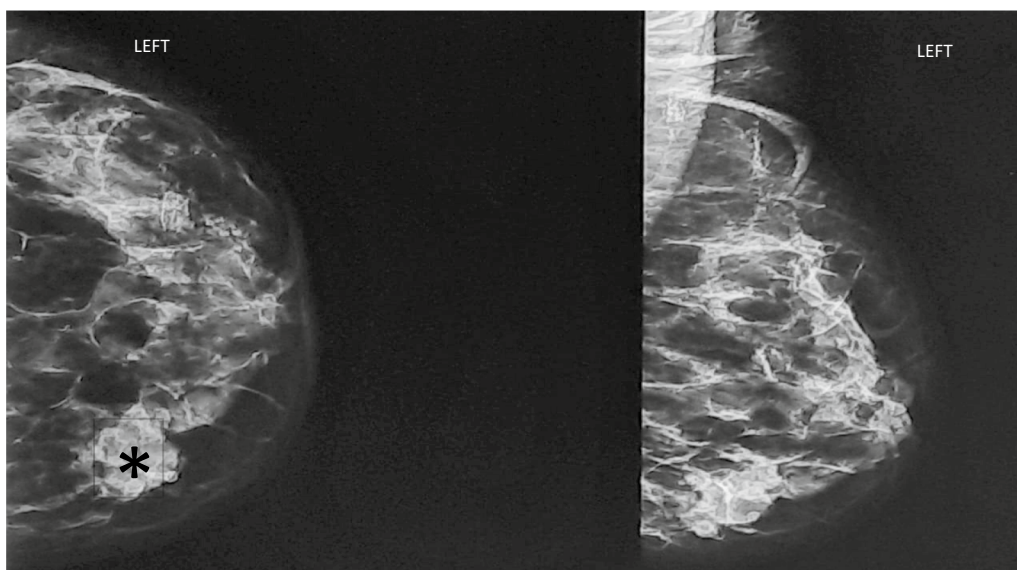


Fig. 2 Cranio-caudal and medio-lateral oblique views of the left breast show ACR grade C parenchyma. A lobulated hyperdense nodular lesion (*) is seen in the lower inner quadrant apart from few axillary nodes (BIRADS 3)

Multiple intra-mammary nodes were also noted scattered throughout bilateral breast parenchyma, few showing necrosis within (Figs. 3, 4). Axillary necrotic and conglomerated lymph nodes were also noted bilaterally. A BIRADS score of 3 was given in bilateral breasts.

On subsequent FNAC of the mass lesion, cytological evidence of epithelioid cell granulomas, lympho-histiocytic aggregates and Langerhans's giant cells without caseous necrosis was found leading to the diagnosis of tubercular mastitis. The diagnosis of primary tubercular

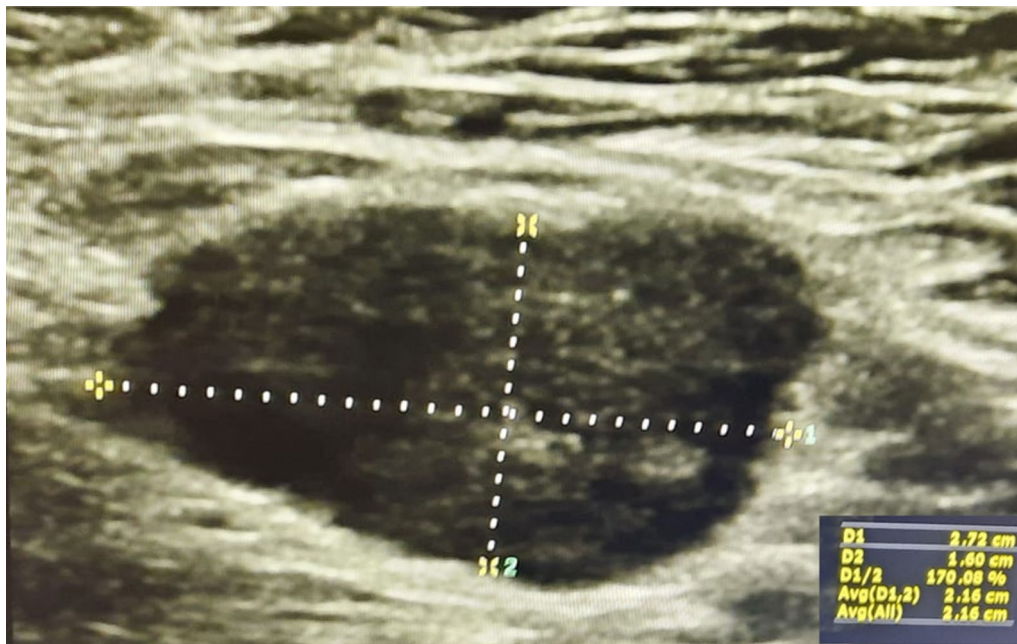


Fig. 3 Ultrasound from the left breast lower inner quadrant shows a well-defined, lobulated 2.72 × 1.60 cm hypo-anechoic lesion with internal debris. No vascularity was appreciated within or surrounding the lesion. No e/o calcification/septations or solid component seen within (BIRADS 3)

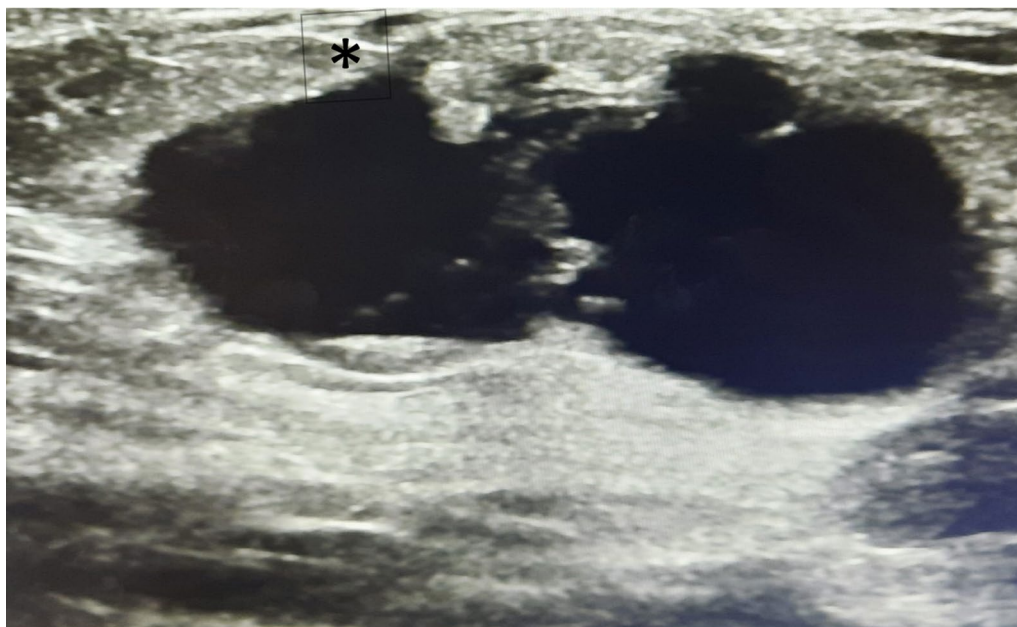


Fig. 4 A conglomerate abscess in the right upper outer quadrant showing liquified contents and thin septae. A part of the abscess is seen kinking superiorly with exudation in the adjacent breast parenchyma and sub-cutaneous region (*)

mastitis was confirmed on the basis of positive QuantiFERON TB assay.

A screening evaluation of the lung, cervical lymph nodes and the spine was done to look for primary site of involvement, which were all negative. Anti-tubercular treatment was started for the patient (Category 2) with intensive therapy for 2 months followed by continuation therapy.

The patient showed worsening of symptoms on starting the treatment. There was increase in pain, formation of breast abscess which ruptured and presented as multiple discharging sinuses. Dressings were done, and patient was motivated to continue the oral medications alongside. Within a month, the patient showed improvement of symptoms with reduction in the size of the masses and absence of active discharge. She was continued on medication for 2 more months.

Her axillary nodes resolved followed by subsidence of pain in 4 months. By 8th month, there was reduction in the size and number of the breast nodules as well.

Serial ultrasound post one year of dedicated treatment in January 2021 showed marked reduction in the masses in bilateral breasts with resolution of axillary lymph nodes. However, skin thickening and few small residual masses remained in bilateral breasts.

Patient was continued on treatment with follow-up mammogram and ultrasound in January 2022. They showed marked reduction in the size of masses in the right breast with intra-mammary nodes remaining in the left breast (Fig. 5).

Patient is doing fine currently in March 2022. She has been advised to stop ATT and is advised to follow-up every 6 months.

Discussion

Breast TB accounts for fewer than 0.1% of all breast pathologies [4] and has been reported as 3–4.5% of breast pathologies requiring surgery in developing countries [5]. Multipara and women practicing lactation between the ages of twenty and forty are often affected. Breast TB can be either primary or secondary; however, primary breast TB is extraordinarily rare because the breast parenchyma is impervious against the tubercular bacillus [6]. The primary type of tubercular inflammation is caused by the extension of infection through abrasions within the skin of the breast or through cracks within the breast nipples. The secondary type is caused by the retrograde unfurling of the infection from infected axillary nodes, or by direct spread from tissue within the ball-and-socket joint of the shoulder, costo-chondral cartilage, ribs, sternum or pleural membranes adjacent to the ductal glandular breast tissue [6].

The clinical presentation is variable and ranges from a spectrum of multiple painless lesions that may be adhering to the skin or the chest wall, multiple discharging sinuses, skin inflammation and associated nipple retraction or skin thickening and axillary inflammation or nodal formation. This might cause diagnostic predicament because of similitude with cancer or bacterial breast infection.

In 1952, McKeown and Sir Geoffrey Wilkinson classified tuberculosis of the breast into 5 totally different types: nodular, mastitis obliterans, sclerosing, disseminated and acute military type of inflammation [7]. Caseous nodular type of inflammation is the commonest kind. It presents as a pain-free, oval, well-defined, slow growing, non-vascular hypoechoic mass, mimicking the looks of a fibroadenoma within the early stages of the disease. Later, it evolves to become a fistula within the nipple-areolar complex or on the skin and could closely remind of cancer [7].

Radiologically, tuberculosis of the breast has 3 crucial appearances: nodular, diffuse and sclerosing [8].

On ultrasonographic examination, the nodular type of tubercular inflammation presents as lesion/lesions which take the shape of an indistinctly bordered, hypoechoic, heterogeneous mass which might mimic the looks of a slowly growing fibroadenoma and hence is classified as BIRADS three lesions [9]. Diffuse type of the mastitis shows multiple hypoechoic masses which are not well defined, while the sclerosing type shows exaggerated echogenicity of the breast parenchyma without a typical mass formation; the tissue echogenicity here is reflective of edematous breast tissue and inflammation. Various other common appearances include necrosis of the axillary nodes with caseous pathology with conglomeration, focal or diffuse skin thickening or fistula formation. If there is abscess formation which fistulizes to the skin, the fistula tract may additionally be visible with ultrasound [10].

Computerized tomography (CT) and magnetic resonance imaging (MRI) are considered higher diagnostic modalities and helpful with the analysis of deep retro-mammary localization of the breast lesions and associated chest wall involvement. Communication of the fistula tract with pleural membranes, bone and underlying deep soft tissues of the chest can be determined accurately with these imaging modalities.

Biopsy constitutes the gold standard for categorization of the lesions as they show necrotizing inflammation with granulomatous and Langerhans's cells. These also show predominance of acid fast tubercular bacilli (AFB) diagnosed with the Ziehl-Neelsen stain, thus confirming the diagnosis [11].

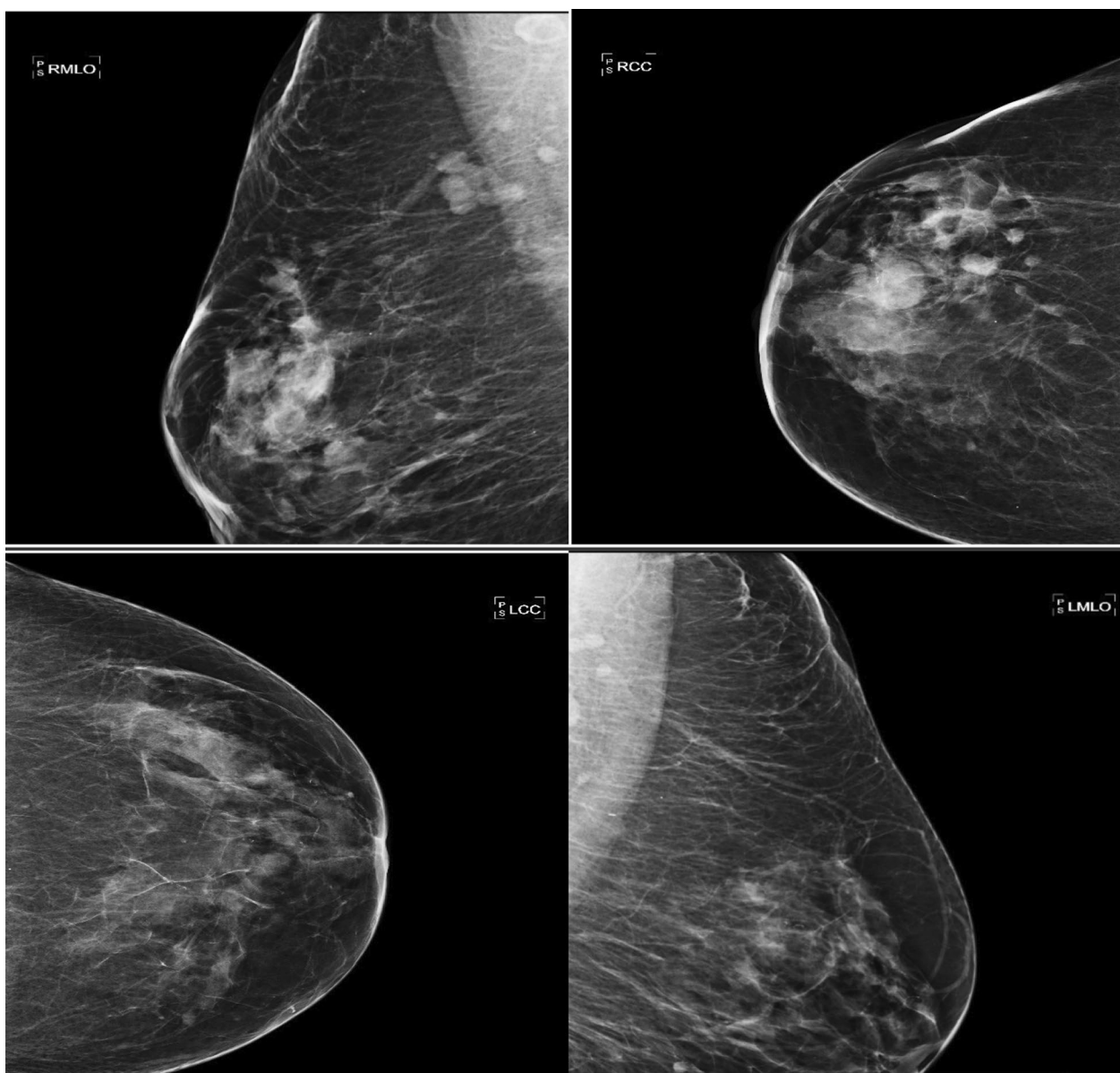


Fig. 5 Follow-up mammography after 2 years of treatment: bilateral breasts show significant reduction in the density of the parenchyma (from ACR D pre-treatment to ACR B). The nodules are well defined and well circumscribed, smaller in number and size. There are few small conglomerate lymph nodes in bilateral axilla with skin thickening overlying the previous sinus tract area

There is no medical treatment specific to tubercular mastitis with anti-tubercular treatment forming the backbone of treatment strategy lasting for about six to eighteen months. With emerging resistant strains, the treatment is extended until twenty four months. Surgery (lumpectomy or mastectomy) is additionally a possibility once there is no response to medical treatment betting on the surgeon's preference [12]. Abscesses can be effectively treated with ultrasound-guided external evacuation.

Conclusions

We report a rare case of primary tubercular mastitis in a multiparous female with recurring inflammatory breast masses progressing to breast abscess, overlying skin thickening and multiple sinus formation. Such cases mimic pyogenic abscess and carcinoma in their clinical presentation and imaging findings and need to be diagnosed via a myriad of diagnostic tests including interferon assay for tuberculosis, serial ultrasounds and mammograms with histopathology proving the last nail

in the diagnosis. Presence of caseating granulomas with granulomatous tissue inflammation with the tissue samples testing positive for acid fast bacilli on Ziehl-Neelsen staining forms a gold standard. The treatment comprises of anti-tubercular treatment up to 24 months depending on individual response or surgery if required.

Such a clinical presentation must warrant a differential of granulomatous mastitis in cases of non-responders to incision and drainage and antibiotic therapy.

Abbreviations

BIRADS	Breast Imaging Reporting And Data System
ATT	Anti-Tubercular Treatment
FNAC	Fine-Needle Aspiration Cytology
OPD	Outpatient Department
TB	Tuberculosis

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Not applicable.

Author contributions

AS and BK have contributed to conceptualize the design, analyze, interpret and drafted the work. All have approved the submitted version and agree both to be personally accountable for the contributions and ensure that questions related to the accuracy or integrity of any part of the work, are appropriately investigated, resolved and the resolution documented in the literature. Both the authors have read and approved the manuscript.

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Availability of data and materials

The identity and pictures of the patient are not being shared to safeguard her privacy. However, we agree to share the same when specifically asked for.

Declarations

Ethics approval and consent to participate

Our case report is a descriptive observational retrospective study with no interventions being done; the approval from ethical committee is waived off. Patient's written consent was taken for participation, publishing and sharing the clinical data and/or images.

Consent for publication

Patients written consent was taken for images, photographs and clinical details to be published.

Competing interests

The authors declare that they have no competing interests.

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