

A Rare Case of Breast Tuberculosis Presenting in Non-Lactating Woman: A Case Report

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Abstract: ***Introduction:** Mastitis tuberculosis is an uncommon manifestation of extrapulmonary tuberculosis for less than 2% of total tuberculosis patients. Diagnosis is often challenging due to the diverse presentation mimicking several diseases such as breast abscesses. **Case:** 47-year-old woman complained of a lump on left breast which gradually grew 3 months before admission with purulent discharge from the sinus adjacent to the lump. 4 kg of weight loss in 2 months and fever were reported. Examination of the left breast showed a firm, palpable, painful mass with the size of 3x3 cm, with the formation of single sinus track atop the lump generating purulent discharge. Breast abscess was suspected and broad-spectrum antibiotics were given. As the patient showed no significant changes, biopsy was performed and showed granulomatous, necrosis, and multinucleated giant cells Langhans in breast parenchyma. The patient was treated with 9 months of anti-tuberculosis treatment and showed significant improvement. **Discussion:** Mastitis Tuberculosis occurs mostly in women of reproductive age with an incidence less than 2% of extrapulmonary tuberculosis. It may present as single or multiple firm or flexible masses. Granulomatous reaction, necrosis, and Langhans giant cell were shown in biopsy and as standard for diagnosis. It is recommended for extrapulmonary tuberculosis to be treated with 9 months of anti-tuberculosis and she showed significant improvement after it. **Conclusion:** Although it is a rare form of extrapulmonary tuberculosis often mimicking breast abscess and is challenging prior to diagnosis, mastitis tuberculosis should be given prompt treatment to increase the patient's outcome and quality of life.*

Keywords: Mastitis; Tuberculosis; Breast

1. Introduction

As of now, Tuberculosis (TB) still presents itself as a major global health burden, particularly in endemic developing countries, such as Indonesia. Indonesia ranks second in terms of highest burden of TB in the world.¹ The decrease in timely detection during the era of the pandemic might denote that the reported cases might not represent the true health burden of tuberculosis cases in reality, particularly in low socioeconomic countries.² This is evidenced by some reports displaying a decrease of new cases yet followed by unfavorable treatment outcomes and the increase of lost to follow-up cases owing to the diversion of healthcare resources and priority.³

Mastitis is a common manifestation in women of productive age, predominantly caused by *Staphylococcus Aureus* & *Staphylococcus epidermidis*.⁴ The involvement of *Mycobacterium Tuberculosis* in breast tissue as an extrapulmonary manifestation of tuberculosis, however, is considered very rare and accounts for less than 2% of total tuberculosis patients, which is even less for primary breast tuberculosis. The prevalence might tweak up to 3-5% in developing countries endemic to *Mycobacterium Tuberculosis*.⁵

The majority of mastitis tuberculosis cases stem secondary to lung involvement, which dominantly spread through the lymphatic vessels, and hematogenous spread to a lesser extent. Direct inoculation through skin abrasion can also result in the breast being the primary foci, albeit much rarer. Lactating women are regarded to be the more susceptible population owing to the increase of tissue vascularization which eases organism transport and skin abrasion.⁶

Timely diagnosis is often challenging due to the diverse presentation mimicking several diseases such as breast abscess, breast cancer, and non-tuberculous infections, especially during lactating period. Palpable mass, ulceration, discharges, and skin retraction, are among the manifestations reported.^{7, 8} Enlargement of axillary lymph node, Constitutional signs, and symptoms of tuberculosis such as night sweats, weight loss, and decrease of body weight might appear subtle in patients without lung involvement, or those who have already improved after months of tuberculous treatment.⁸ Histopathology findings of granulomatous reaction accompanied by necrosis of Langhans cells are considered a reliable method to establish the diagnosis.⁷ This case is about mastitis tuberculosis found in a non-lactating woman with lymphadenopathy in the axillary region who was treated with anti-tuberculosis treatment and went well.

2. Case Illustration

A 47-year-old non-lactating woman came to the outpatient clinic with the complaint of a lump on her left breast which had grown 3 months before admission. The lump gradually grew in the upper inner quadrant of the left breast and in size with intermittent purulent discharge from the sinus adjacent to the lump. History of cough and night sweats were denied. The patient also reported 4 kg of weight loss in 2 months, as well as waxing and waning fever. She was suspected of having abscess mammae before and treated with a broad-spectrum antibiotic. Showed no significant changes, and she then came to agree on a biopsy.

General examination revealed blood pressure of 130/80 mmHg, Respiratory rate of 20x/m, Heart rate of 90x/m, and

temperature of 36.7 C. Local examination of the left breast showed a firm and palpable, ill-demarcated, painful mass with the size of 3 x 3 cm, with the formation of a single sinus track atop the lump, which reportedly generated purulent discharge (figure 1). The left axillary region revealed multiple smaller lumps which we suspected to be enlarged lymph nodes. Other examinations including the respiratory system were within normal limits. The patient was suspected of a breast abscess.

A routine hematological examination revealed leukocytosis. Liver and renal functions were normal. Chest X-Ray also showed normal findings (figure 2) and USG findings showed a mass on the left breast (figure 2). The Mantoux test was positive, but the pus culture with media for aerobic and anaerobic bacteria did not show any pathogens revealed. A culture test for Lowenstein Janson Agar was not performed due to no facility in the hospital. Incision and drainage of abscess and biopsy were done under general anesthesia. Biopsy showed granulomatous in breast parenchyma with multinucleated giant cells Langhans suggested granulomatous mastitis. Necrosis is also shown in the biopsy (figure 3). There was no evidence of malignancy.

The patient was treated with a fixed-dose combination of anti-tuberculosis treatment. The sinus healed well and she showed no symptoms after nine months of treatment.

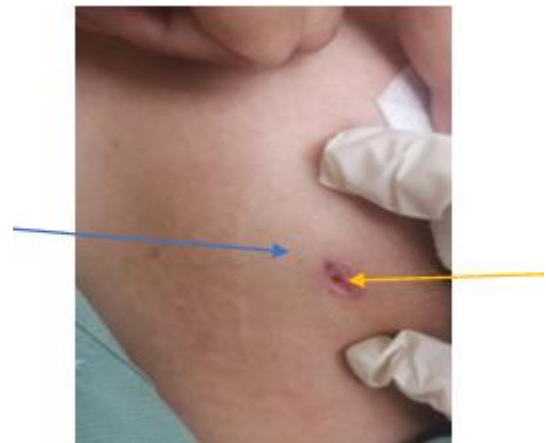


Figure 1: Showed a lump (blue arrow) on the patient's upper inner quadrant of the left breast with a sinus (Yellow arrow) atop of it.

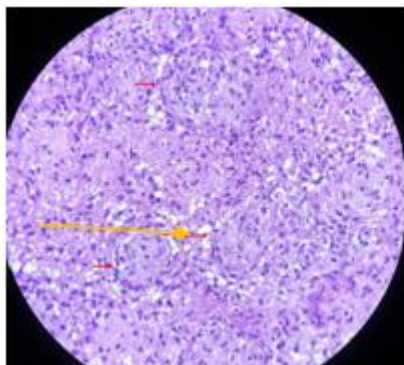


(a)

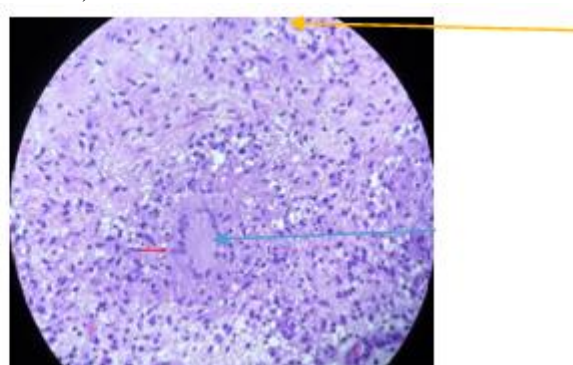


(b)

Figure 2: Radiology findings. (a) Normal CXR showed no infiltrates. (b) USG revealed a Mass on the left breast (Yellow Arrow).



(a)



(b)

Figure 3: Biopsy findings in pathological anatomy. (a) granulomatous area (yellow arrow) as a pathognomonic sign for tuberculous mastitis (b) Multinucleated Giant cell Langhans (blue arrow) as large cells found in the granulomatous condition.

3. Discussion

Mastitis Tuberculosis is the breast tissue involvement of

tuberculosis infection, which occurs mostly in women of reproductive age. It can either occur as a primary infection or secondary to other sites of infection, namely the lungs,

vertebrae, lymph nodes, etc. Primary breast TB is considered to be extremely rare and accounts for less than 2% of total tuberculosis cases, and less than 1% of all breast lesion that requires surgical intervention. The prevalence can go as high as 3% in endemic, developing countries such as Indonesia.^{5,9}

Lactating and reproductive women are among the notable risk factors, as vascularization enriches during such period which allows a higher chance of spread via hematogenous, lymphatic, or even direct inoculation through skin abrasion, so it is rather uncommon to happen in a non-lactating woman. Other risk factors include immunosuppression, adjacent skin trauma, and multiparity.¹ This case is a 47-year-old non-lactating woman, no history of trauma nor immunosuppression was noted. Though even rarer, mastitis tuberculosis can also be found in people beyond the reproductive age, as documented by Sagara et al, who presented a mastitis TB in a 69-year-old woman.⁹

Clinical presentation varies depending on the types which may present as single or multiple firm or flexible masses that is mostly ill demarcated that can cause adjacent tissue or nipple retraction. The disease most commonly present in Upper Outer Quadrant (UOQ) of the breast. In advanced cases, sinus tracks and fistula may form which can generate painful discharges like in this case's patient.^{7,13}

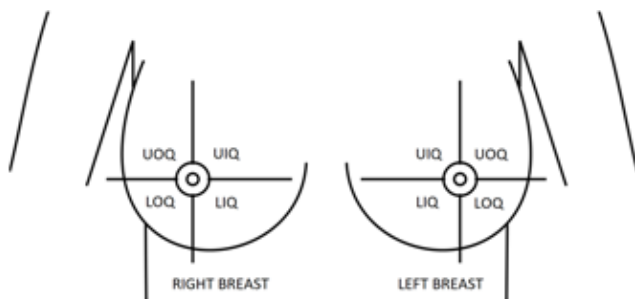


Figure 4: Breast Quadrants. Upper Outer Quadrant being the most common presentation of breast tuberculosis¹⁰

The most recent classification of mastitis TB by Tewari et al divides the clinical presentation into 3 different categories; 1) Nodular type, 2) Disseminated type, and 3) Abscess type. The nodular type is a slowly growing mass that progressively involves nearby skin and can present with or without sinus tracks. The disseminated type begins with multiple lesions diffusely scattered in breast tissue, which usually form a sinus track. The abscess type involves liquified lesions which may or may not form a sinus track.¹⁴

The presentation of mastitis TB can greatly mimic that of a malignant process, thus warrants a careful workup and follow-up to not hinder and delay the timely diagnosis. It should be noted that both conditions can co-exist in the same breast with lesions adjacent to each other, and such circumstances can make the diagnosis very challenging.¹⁴ In this case, the patient came with a solitary unilateral firm mass on her left breast, which formed a sinus tract with occasional discharge at the top of the lesion. No nipple retraction was noted. This finding is concordant with the case series of mastitis TB reported by Ghaleb et al, where solitary mass is the most common presentation¹⁶. This

patient's mastitis TB is the type in line with the nodular type of Tewari classification.¹⁴

A number of diagnostic workups are helpful to establish the diagnosis. Chest radiographs might reveal normal results but is still valuable to exclude pulmonary lesions.¹⁷ Mammography might result in bias depending on the patient's age which correlates with tissue composition. Ultrasonography is usually the most useful first line of diagnostic tool, and may also evaluate nearby lymph nodes. It also provides a valuable role in guiding needle biopsies and abscess drainages.⁷

The gold standard remains the presence of *M. Tuberculosis* in either Ziehl Nielsen stain or culture within Lowenstein medium. Breast tissue is not considered the preferred affinity for *M. Tuberculosis* growth, thus both culture and staining tests might prove a false negative result.⁷ Should Lowenstein culture revealed negative result, aerobic and anaerobic culture warrant consideration to exclude nontuberculous etiology. A negative result should be followed by a histopathological examination which is often considered a sufficient diagnosis, that shows a granulomatous process with internal necrotic and Langhans giant cells.¹¹

Langhans cells refer to giant cells formed as result of fusion of epithelioid (macrophages) cells which secrete interleukins that aids with inflammation during granulomatous process. It is considered a dendritic cell which is noted by horseshoe shaped nucleus arrangement. The fusion of this cell is governed by the presence of IFN- γ , which is the product of interaction of T cells and monocytes in chronic inflammatory processes.¹²

In this case, both the radiograph and sputum examination revealed negative results. As the lesion remained refractory following standard treatment of mastitis, a tissue sample was taken during the excision & drainage procedure, which yielded a chronic granulomatous process with central necrosis in histopathology examination. A case report of mastitis tuberculosis by Kayali et al conducted a histopathological examination following an excisional biopsy which revealed a granulomatous caseating process.¹¹

The patient was treated with the standard 9 months of antituberculosis 1st regimen. As the patient complained of recurrent painful discharge, incisional surgery was conducted in the beginning for both diagnostic and treatment measures. Symptomatic treatments consisting of analgesics, antipyretics, and broad-spectrum antibiotics at the initial phase of treatment were also given. No response for a broad-spectrum antibiotic, the patient was given anti-tuberculosis treatment and the general condition improved following 4 weeks of treatment, and the course is currently being resumed until the 9th month while closely monitoring the patient's condition and compliance every 2 weeks.

The treatment duration for extrapulmonary tuberculosis is still debatable.^{18, 19} Aside from bone and meningeal tuberculosis, 6 months of therapy is considered adequate. Most experts however still opt an extended therapy of a minimum of 9 months due to difficulty in assessing

treatment response and defining a cure.¹⁷ Sagara et al reported a case of mastitis TB that conducted 2 months of intensive phase and 7 months of continuation phase treatment.⁹ Follow-up is usually done 1 year following the treatment completion. Ultrasonography, Chest x-ray, as well as clinical evaluation, can be done to assess residual lesions or possible pulmonary manifestations.

4. Conclusion

Mastitis tuberculosis is a rare extrapulmonary tuberculosis with an incidence of less than 2% and is often hard to diagnose.⁵ An accurate examination is still difficult to perform, and the results are often unspecified even though a proper diagnosis is needed to perform the accurate treatment. Often mimicking other breast masses like abscess or malignancy, it should be differentiated in order to decide whether anti-tuberculosis treatment will be given or not in a timely manner.¹⁵ Extended duration of treatment should be considered given to extrapulmonary tuberculosis due to difficulties in assessing treatment response.¹⁸ This patient's diagnosis was based on histopathology which showed granulomatous and Langhans cells and also based on her clinical condition. This patient responded well to the treatment.

References

- [1] Global tuberculosis report 2022. Geneva: World Health Organization; 2022. Licence: CC BY-NC-SA 3.0 IGO.
- [2] Hashem MK, Hussein AA, Amin MT, Mahmoud A, Shaddad AM. The burden of covid-19 pandemic on tuberculosis detection: A single-center study. *The Egyptian Journal of Bronchology*.2022; 16 (1).
- [3] Lestari T, Kamaludin, Lowbridge C, Kenangalem E, Poespoprodjo JR, Graham SM, et al. Impacts of tuberculosis services strengthening and the COVID-19 pandemic on case detection and treatment outcomes in Mimika District, Papua, Indonesia: 2014–2021. *PLOS Global Public Health*.2022; 2 (9).
- [4] Morales-Ferré C, Franch A, Castell M, Olivares M, Rodríguez-Lagunas MJ, Pérez-Cano FJ. *Staphylococcus epidermidis*' overload during suckling impacts the immune development in rats. *Frontiers in Nutrition*.2022; 9.
- [5] Thimmappa D, Mallikarjuna MN, Vijayakumar A. Breast tuberculosis. *Indian Journal of Surgery*.2015; 77 (S3): 1378–84.
- [6] Bouziyane A, Benaguida H, Lamsisi M, Khoaja A, Benayad S, Ennachit M, et al. Tuberculosis of the breast: Analysis of 17 cases. *Pan African Medical Journal*.2020; 37.
- [7] Baykan AH, Sayiner HS, Inan I, Aydin E, Erturk SM. Primary breast tuberculosis: Imaging findings of a rare disease. *Insights into Imaging*.2021; 12 (1).
- [8] Khanna R. Mammary tuberculosis: Report on 52 cases. *Postgraduate Medical Journal*.2002; 78 (921): 422–4.
- [9] Sagara Y, Hatakeyama S, Kumabe A, Sakuragi M, Matsumura M. Breast tuberculosis presenting with intractable mastitis: A case report. *Journal of Medical Case Reports*.2021; 15 (1).
- [10] Zolfagharnasab H, Bessa S, Oliveira S, Faria P, Teixeira J, Cardoso J, et al. A regression model for predicting shape deformation after breast conserving surgery. *Sensors*.2018; 18 (2): 167.
- [11] Kayali S, Alhamid A, Kayali A, Danial AK, Brimo Alsaman MZ, Alhamid A, et al. Primary tuberculous mastitis: The first report from Syria. *International Journal of Surgery Case Reports*.2020; 68: 48–51.
- [12] Sakai H, Okafuji I, Nishikomori R, Abe J, Izawa K, Kambe N, et al. The CD40-CD40L axis and IFN- γ play critical roles in Langhans Giant Cell Formation. *International Immunology*.2011; 24 (1): 5–15.
- [13] Wani I, Lone AM, Malik R, Wani KA, Wani RA, Hussain I, et al. Secondary tuberculosis of breast: Case report. *ISRN Surgery*.2011; 2011: 1–3.
- [14] Tewari M, Shukla HS. Breast tuberculosis: diagnosis, clinical features, and management. *Indian J Med Res*.2005; 122: 103–110.
- [15] Farrokh D, Marashi M, Fallah Rastegar Y, Boloursaz Mashhadi S. The coexistence of carcinoma and tuberculosis in one breast: A case report and literature review. *International Journal of Cancer Management*.2017; 10 (8).
- [16] Ghaleb M, Seghaier S, Adouni O, Bouaziz H, Boudia A, Hassouna JB, et al. Breast tuberculosis: A case series. *Journal of Medical Case Reports*.2021; 15 (1).
- [17] Rizzo G, Colli F, De Marco P, La Brocca A, Militello G, Gulotta G. An unusual presentation of breast tuberculosis: A case report. *Clinical Case Reports*.2020; 9 (1): 210–2.
- [18] Hoang H, El-Helou E, Pop C-F, Shall A, Zaiter M, Naccour J, et al. Primary breast tuberculosis mastitis manifested as nonhealing abscess. *The Surgery Journal*.2022; 08 (02).
- [19] Quaglio GL, Pizzol D, Bortolani A, Manenti F, Isaakidis P, Putoto G, et al. Breast tuberculosis in men: A systematic review. *PLOS ONE*.2018; 13 (4).