

BREAST TUBERCULOSIS: A FREQUENTLY OVERLOOKED ENTITY IN THE EPITOME OF TUBERCULOSIS, "INDIA"

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ABSTRACT

BACKGROUND

Tuberculosis is one of the most widespread infections in India, which can affect almost all the organs and mimic other illnesses, but breast tuberculosis is still a rare entity. It bears a burden on the microbiological investigations and thus early establishment of diagnosis is difficult.

METHODS

This study is a retrospective review of three cases of breast tuberculosis with each of the three patients presenting with features mimicking breast abscess and ulcer at Mahatma Gandhi Mission Hospital, New Mumbai.

RESULTS

The abscesses were drained and treated with courses of antibiotics, but to no avail. As tuberculosis is fairly common in our setting, samples were sent for microbiological and molecular and histopathological examination, which showed positivity for Mycobacterium Tuberculosis. Each patient was treated with course of anti-tuberculous drugs as per DOTS protocol with complete resolution of the disease.

CONCLUSION

Breast tuberculosis though a diagnostic dilemma is a completely treatable disease. Hence, a high index of suspicion is to be borne in mind as the 'Eyes see what the mind knows.'

KEYWORDS

Tuberculous Mastitis (TM), RNTCP, Breast, Abscess, Mycobacterium Tuberculosis (MTB).

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INTRODUCTION

Tuberculosis (TB) is a major global health problem. It causes ill-health among millions of people each year and ranks alongside the Human Immunodeficiency Virus (HIV) as a leading cause of death worldwide.¹ In 2014, there were an estimated 9.6 million new TB cases: 5.4 million among men, 3.2 million among women and 1.0 million among children.¹

The WHO Global Report 2015 states that 1.5 million TB deaths (1.1 million among HIV-negative people and 0.4 million among HIV-positive people), of which approximately 890,000 were men, 480,000 were women and 140,000 were children.¹ The number of TB deaths is unacceptably high: with a timely diagnosis and correct treatment, almost all people with TB can be cured.¹ The first case of tuberculous mastitis was reported by Sir Astley Cooper in 1829 and called it 'Scrofulous swelling of the bosom.'² Breast TB is a very rare disease.³⁻⁵ and constitutes only 0.025-1.04% of all breast diseases.⁶ Its prevalence has been estimated to be 0.1% of breast lesions examined histologically and it constitutes about 3-4.5% of surgically-treated breast diseases in developing countries.⁷

Despite the high prevalence of tuberculosis, mammary cells offer great resistance to the survival and multiplication of mycobacterium tuberculosis.⁸ The disease may be of primary etiology when infection affects only the breast or it may result

from other foci in the body, which is termed as secondary breast TB. Presentation of breast TB is variable and may be confused with other disorders.^{9,10} Fine Needle Aspiration Cytology (FNAC) is the most extensively used initial invasive method for diagnosis of breast TB.^{11,12} and the 'Gold standard' diagnostic tool for breast TB is bacteriological culture of breast tissue or the Ziehl-Neelsen stain.¹⁰ Breast TB is often misdiagnosed as a pyogenic abscess or carcinoma of breast, both clinically as well as radiologically, especially if well-defined clinical features are absent.¹³ Over the years the incidence, clinical presentation, diagnostic and treatment methodology of breast tuberculosis has gradually changed making it crucial for its prevention and management of this easily treatable disease.

METHODS

Over the 3-year period from 2012 to 2015, three patients were diagnosed with breast TB and the patients were referred to health centers for the 'Directly Observed Treatment Short-course' (DOTS). Demographic data such as age, gender, weight at diagnosis, ethnicity, location, occupation, marital status, educational status, the family and the patient's TB history, complaints and physical examination findings of the patient records were documented.

CASE PRESENTATIONS

Case-1

A 25-year-old lactating female patient presented with painful swelling in her right breast. According to the patient, the swelling had been present since one to one and a half months. On physical examination, the left breast was very tender and diffuse, irregular mass was felt, mainly involving the upper inner quadrant with no axillary lymph nodes.

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The overlying skin was red and hyperemic. The patient was treated with antibiotics by local physician, but with no relief of symptoms. With these signs and symptoms, she was admitted to our General Surgery Department. The patient was treated with antibiotics and incision and drainage was performed. The patient's laboratory data was 12,000 leukocytes/mm³ and an ESR of 80mm/hr. Regular dressing were done, but resulted in chronic non-healing ulcer with discharging dirty yellow fluid (Fig-1).

Case-2

A 32-year-old female patient presented with a 2-month history of a painful erythematous ulcer over right breast with an associated yellowish discharge. She had received several courses of antibiotics, but her condition remained unchanged. On breast examination, a single ulcer 4×4cm² with moderate discharge and unhealthy granulation tissue and slough, pigmented, erythematous and indurated surrounding skin was present in the outer half of the right breast with no axillary lymphadenopathy. The patient's laboratory data was 10,000 leukocytes/mm³ and an ESR of 70mm/hr. debridement with regular dressing was done, but resulted in a chronic non-healing ulcer (Fig-2).

Case-3

A 28-year-old HIV positive woman was admitted with a forty-day history of swelling, breast lump and erythema of the skin over her left breast. On physical examination, a 6 to 7cm firm, mobile lump was felt with erythema and edema of the skin in the inner quadrant of the left breast. Ultrasonography examination revealed an hypoechoic mass with significant ductal dilatation without any collection and lymphadenopathy suggestive of mastitis. Patient was started on empirical antibiotics and incision and drainage was performed. Followup regular dressings were done, but it resulted in a chronic non-healing ulcer with discharging sinus (Fig-3).

All three patients denied smoking, family history of breast cancer. Case 1 and 2 denied having risk factors for HIV with both having previous exposure to tuberculosis. Case 3 was known HIV positive with no recent or past exposure to tuberculosis. Case 1 was tuberculosis positive 3 years back and had received complete treatment and was declared cured. Case 2 had a one-year history of tuberculosis and was declared defaulter and did not continue any treatment since. Tuberculin skin test results (Mantoux) were 16, 13 and 14mm for cases 1, 2 and 3, respectively. Their routine hematologic and biochemical parameters were in the normal range. Testing for HIV for case 1 and 2 were negative and positive for case 3.

Their erythrocyte sedimentation rates were also normal. Their sputum smears were found to be negative for Acid-Fast Bacilli (AFB). All of their chest X-rays were normal except case 2 showing healed or active tuberculous lesion. Discharge from breast was sent for culture and PCR. AFB culture was negative in all the cases. PCR was positive in case 1 and 3 and negative in case 2. A high degree of clinical suspicion of malignancy was suspected in case 2, hence edge biopsy of ulcer was sent. The pathological examination (Fig-4) showed chronic granulomatous inflammation with areas of necrosis, epithelioid granulomas with Langhans giant cells and lymphohistiocytic aggregates suggestive of tuberculosis.

RESULTS

The patients were all diagnosed as breast tuberculosis according to clinico-pathological, histological and molecular examinations. After primary diagnosis, they were referred to a DOTS Center and treatment started as category 1 for case 1, 3 and category 2 for case 2. For case 1 and 3 intensive therapy with anti-tuberculosis drugs (Isoniazid 300mg, rifampicin 450mg, pyrazinamide 1500mg and ethambutol 1200mg per day) was initiated for 2 months and continued with the

addition of rifampicin and isoniazid therapy for an additional four months.

For case 2 intensive therapy with anti-tuberculosis drugs (Isoniazid 300mg, rifampicin 450mg, pyrazinamide 1500mg ethambutol 1200mg and streptomycin 750mg per day) was initiated for 3 months and continued with intensive therapy of rifampicin, isoniazid, streptomycin and ethambutol for one month and continued with the addition of rifampicin, isoniazid and ethambutol therapy for five months a total of 8 months regime. All patients responded well and their breast lesions steadily improved. Cures were obtained for all patients at the end of the sixth and eighth month period for case 1, 3 and 2 respectively.

DISCUSSION

The incidence of tuberculosis, in general is still quite high in India and so is expected of breast tuberculosis. But the disease is often overlooked and misdiagnosed as carcinoma or pyogenic abscess.¹⁴ Tuberculosis is rare in developed countries and breast tuberculosis is even rare having an incidence of <0.1%.⁷ But with the global spread of AIDS, mammary tuberculosis may no longer be uncommon in the developed world.¹⁵ Breast lesion caused by an atypical mycobacterium has recently been reported by Verfaillie G, et al.¹⁶ Breast tissue is remarkably resistant to tuberculosis. This is due to the fact that like skeletal muscles and spleen, it provides infertile environment for the survival and multiplication of tubercle bacilli.¹⁷ The theory of secondary involvement of the breast from a tuberculous lesion at some other site was supported by Raw.¹⁸ and Morgan.¹⁹

But McKeown and Wilkinson.²⁰ classified breast tuberculosis as primary when the breast lesion was the only manifestation of tuberculosis and secondary when there was a demonstrable focus of tuberculosis elsewhere in the body. The breast may become infected by either.²⁰ haematogenous, lymphatic, spread from contiguous structures, direct inoculation or ductal infection. Of these, the most accepted view for spread of infection is centripetal lymphatic spread.¹⁷ The path of spread of the disease from lungs to breast tissue was traced via tracheobronchial, paratracheal, mediastinal lymph trunk and internal mammary nodes.²⁰ According to the Cooper's theory, communication between the axillary glands and the breast results in secondary involvement of the breast by retrograde lymphatic extension.²¹ Supporting this hypothesis was the fact that axillary node involvement was shown to occur in 50 to 75 percent of cases of tubercular mastitis.⁶ Coincidental tuberculosis of the faucial tonsils of suckling infants has been suggested as one of the common routes of spread of breast tuberculosis from the suckling infant to the nipple and in turn to the lactating breast via lactiferous ducts.^{22,23}

In all cases, bacilli infected the ducts and spared the lobules. This may be the sole example of primary breast tuberculosis relevant even today. Breast TB usually affects young, lactating, multiparous women as breast undergoes frequent changes and is more liable to trauma and infection, though it also may occur in prepubescent males and in elderly women.²⁴ According to one study.²⁵ the rate of involvement of the right and left sides was very similar with a slight dominance of the left breast. In contrast, Da Silva and Pal.²⁶ reported that TB mostly in the right breast, but Khanna.²⁷ reported that the occurrence was the same on both sides.

The mean duration of the symptoms was reported to be a few weeks or months and it is generally less than a year and late presentation is a problem in patients with breast TB.⁴ Khanna and colleagues.²⁷ reported the presentation at 8.5 months, whereas Tiwari and colleagues reported 9.4 months.⁴

In one study,²⁵ only 1 of 27 cases with breast TB had a history of contact with a TB patient, while the others had no history of contact with TB. In another study,²⁸ 5 of 7 cases had a history of contact with a TB patient.

In our study, two of the three women with breast TB had a history of TB; the third had no such history of contact. In our opinion, having a history of TB or contact with a TB patient should be considered in screening or examining patients for breast TB. Breast tuberculosis most commonly presents as a lump in the central or upper outer quadrant of the breast.²⁹ It is probably due to frequent extension of tuberculosis from axillary nodes to the breast. The lump is often indistinguishable from carcinoma breast being irregular, hard and at times fixed to either skin or muscle or even chest wall.³⁰ But the lump is usually painful. Breast remains mobile unless involvement is secondary to tuberculosis of the underlying chest wall. Tubercular ulcer over the breast skin and tubercular breast abscess with or without discharging sinuses are other common forms of clinical presentation of breast tuberculosis.²⁹ In our study breast mass was the most frequent finding upon examination, the initial complaint was pain in the breast.

Breast tuberculosis is classified as Nodular, Disseminated and Abscess varieties. Tests are useful in the diagnosis and further evaluation of patients with breast TB. The 'Gold standard' for the diagnosis of breast TB is the detection of *M. tuberculosis* by Ziehl-Neelsen staining or by culture.³¹ Radiological imaging modalities, such as mammography or ultrasonography are unreliable in distinguishing breast TB from carcinoma because of the variable pattern of presentation of such an inflammatory lesion.²⁷ Though mycobacterial culture remains the gold standard for diagnosis of tuberculosis, the time required and frequent negative results in paucibacillary specimens are important limitations. Moreover, culture is not always helpful in the diagnosis of breast tuberculosis.¹⁹ Polymerase Chain Reaction (PCR) Gene amplification methods are highly sensitive, especially in culture-negative specimens from paucibacillary forms of disease. A variety of PCR techniques have been developed for detection of specific sequences of *Mycobacterium tuberculosis* and other mycobacteria. PCR has positivity rates ranging from 40 to 90 percent in diagnosing tubercular lymphadenitis.³²

However, PCR is by no means absolute in diagnosing tubercular infection and false negative reports are still a possibility.³² Most of these new techniques are too expensive and sophisticated to be of any practical benefit to the vast majority of TB patients living in underdeveloped countries like India for whom an early and inexpensive diagnosis remains as elusive as ever. Histopathology of the specimen includes epithelioid cell granulomas with caseous necrosis in the specimen. Biopsy (Incision or excision) of breast lump, ulcer and sinus or from the wall of a suspected tubercular breast abscess cavity almost always confirms breast tuberculosis.³⁰ In the present study, the most frequently-used diagnostic tool was excisional biopsy and positive TB PCR. Therapeutic guidelines by RNTCP indicate that a six-month regimen of anti-TB therapy for new pulmonary or extrapulmonary tuberculosis two and four months of intensive and maintenance phase respectively (Category 1) and eight months, three and five months of intensive and maintenance phase respectively (Category 2) for defaulter, failure or relapse or extrapulmonary recurrence is sufficient.³³ Our treatment success rate was 100%. Surgical intervention is indicated in cases that show poor response to anti-TB therapy and it is used mainly to drain abscesses or the excision of residual lumps. Simple mastectomy is used for cases with extensive disease that causes a large, painful, ulcerated mass that involves the entire breast.³⁴

CONCLUSION

Due to the high incidence and prevalence of tuberculosis in India, breast TB should always be included in the differential diagnosis in cases of inflammatory breast lesions and breast tumors. The use of anti-tuberculosis drugs in combination with surgical drainage usually produces an excellent outcome. Breast tuberculosis, though a diagnostic dilemma, is a completely treatable disease. Hence, a high index of suspicion is to be borne in mind as the 'Eyes see what the mind knows.'

REFERENCES

1. Laura Anderson, Anna Dean, Dennis Falzon. WHO Global Tuberculosis report 2015. 20th ed. Geneva; World Health Organization 2015. Available from http://apps.who.int/iris/bitstream/10665/191102/1/9789241565059_eng.pdf?ua=1.
2. Cooper A: Illustration of the diseases of the breast. London: Longman, Rees, Orme, Brown, & Green; 1829. p.73.
3. Kaneria MVSP, Burkule D, Shukla A, et al.: Bilateral breast tuberculosis a rare entity. JIACM 2006;7:61-63.
4. Tewari M, Shukla HS: Breast tuberculosis: diagnosis, clinical features & management. Indian J Med Res 2005;122(2):103-110.
5. Puneet SK, Tiwary RR, Sanjay Singh S: Breast tuberculosis: still common in India. Internet J Trop Med 2005;2(2):1540-2681.
6. Sharma PK, Babel AL, Yadav SS: Tuberculosis of breast (study of 7 cases). J Postgrad Med 1991;37(1):24-26. 6A.
7. Fadaei-Araghi M, Geranpayeh L, Irani S, et al.: Breast tuberculosis: report of eight cases. Arch Iran Med 2008;11(4):463-465.
8. Banerjee SN, Ananthakrishnan N, Mehta RB, et al.: Tuberculous mastitis: a continuing problem. World J Surg 1987;11(1):105-109.
9. Mehta G, Mittal A, Verma S: Breast tuberculosis-clinical spectrum and management. Indian J Surg 2010;72(6):433-437.
10. Baharoon S: Tuberculosis of the breast. Ann Thorac Med 2008;3(3):110-114.
11. Martinez-Parra D, Nevado-Santos M, Melendez-Guerrero B, Garcia-Solano J, Hierro-Guilmain CC, Perez-Guillermo M: Utility of fine-needle aspiration in the diagnosis of granulomatous lesions of the breast. Diagn Cytopathol 1997;17(2):108-114.
12. Madhusudhan KS, Gamanagatti S: Primary breast tuberculosis masquerading as carcinoma. Singap Med J 2008;49(1):e3-e5.
13. Wani I, Lone AM, Malik R, Wani KA, Wani RA, Hussain I, et al.: Secondary tuberculosis of breast: case report. ISRN Surgery 2011;2011:529-368.
14. Green RM, Ormerod LP: Mammary tuberculosis: rare but still present in the United Kingdom. Int J Tuberc Lung Dis 2000;4:788-90.
15. Kakkar S, Kapila K, Singh MK, et al. Tuberculosis of the breast. A cytomorphologic study. Acta Cytol 2000;44:292-6.
16. Verfaillie G, Goossens A, Lamote J. Atypical mycobacterium breast infection. Breast J 2004;10:60.
17. Mukerjee P, George M, Maheshwari HB, et al. Tuberculosis of the breast. J Indian Med Assoc 1974;62:410-2.
18. Raw N. Tuberculosis of the breast. Br Med J 1924;1: 657-8.
19. Morgan M. Tuberculosis of the breast. Surg Gynecol Obstet 1931;53:593-605.

20. Mckeown KC, Wilkinson KW. Tuberculous diseases of the breast. *Br J Surg* 1952;39:420.
21. Domingo C, Ruiz J, Roig J, Texido A, Aguilar X, Morera J. Tuberculosis of the breast: a rare modern disease. *Tubercle* 1990;71:221-3.
22. Gupta R, Gupta AS, Duggal N. Tubercular Mastitis. *Int Surg* 1982;67:422-4.
23. Wilson TS, MacGregor JW. The diagnosis and treatment of tuberculosis of the breast. *Can Med Assoc J* 1963;89:1118-24.
24. Luh SP, Chang KJ, Cheng JH, et al.: Surgical treatment for primary mammary tuberculosis-report of three octogenarian cases and review of literature. *Breast J* 2008;14(3):311-312.
25. Tanrikulu AC, Abakay A, Abakay O, et al.: Breast tuberculosis in Southeast Turkey: report of 27 cases. *Breast Care (Basel)* 2010;5(3):154-157.
26. da Silva BB, Lopes-Costa PV, Pires CG, et al.: Tuberculosis of the breast: analysis of 20 cases and a literature review. *Trans R Soc Trop Med Hyg* 2009;103(6):559-563.
27. Khanna R, Prasanna GV, Gupta P, Kumar M, Khanna S, Khanna AK: Mammary tuberculosis: report on 52 cases. *Postgrad Med J* 2002;78(921):422-424.
28. Atamanalp SS, Gundogdu C, Polat P, et al.: Clinical presentation of breast tuberculosis in eastern Anatolia. *Turk J Med Sci* 2010;40(2):293-297.
29. Shukla HS, Kumar S. Benign breast disorders in non-western populations: Part II- Benign breast disorders in India. *World J Surg* 1989;13:746-9.
30. Shinde SR, Chandawarkar RY, Deshmukh SP. Tuberculosis of the breast masquerading as carcinoma: a study of 100 patients. *World J Surg* 1995;19:379-81.
31. Marinopoulos S, Lourantou D, Gatzionis T, Dimitrakakis C, Papaspyrou I, Antsaklis A: Breast tuberculosis: diagnosis, management and treatment. *Int J Surg Investig Case Reports* 2012;3(11):548-550.
32. Katoch VM. Newer diagnostic techniques for tuberculosis. *Indian J Med Res* 2004;120:418-28.
33. National strategic plan for tuberculosis control, 2012-2017 (PDF). Central TB Division, Ministry of Health and Family Welfare. Aug 2012. Retrieved 22 November 2015.
34. Harris SH, Khan MA, Khan R, Haque F, Syed A, Ansarimm: Mammary tuberculosis: analysis of thirty-eight patients. *ANZ J Surg* 2006;76(4):234-237.



Figure 1



Figure 2



Figure 3

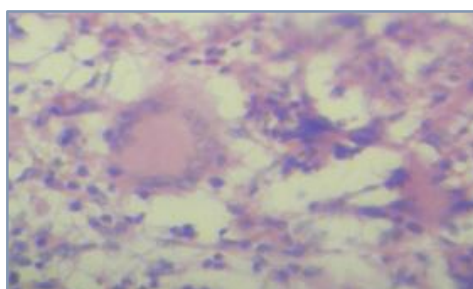


Figure 4