Original Article

Tuberculosis of breast — an experience of twenty four cases

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Tuberculosis of the breast is a rare form of extra pulmonary Tuberculosis. In our study conducted during the period 2003 to 2010 with 24 cases, we have observed the following things. Of 24 patients 8(33%) patients presented with painless breast lump, 12(50%) patients presented with lump associated with discharging sinus, making Breast lump as the most common presentation. Associated Axillary Lymphadenopathy was seen in 13(54%) patients. Fine Needle Aspiration Cytology (FNAC) showed Epithelioid granuloma with caseating necrosis in 20 (83.3%) patients. Ziehl Neelsen staining demonstrated presence of acid fast bacilli in 20 (83.3%) patients. The four cases where ZN staining of aspirated material was negative for AFB, Bactec culture showed positive growth of AFB. Evidence of Pulmonary Tuberculosis was seen in 20 (83%) patients, as was evident from Sputum microscopy for AFB and/or Chest X-ray. Mantoux test was positive in 24(100%) patients. 12(50%) patients were in age-group of less than 20,only 1(4%) patient was over 30 years of age. Associated fever and night sweats were present in 8(33%) patients. Upper Outer Quadrant was involved in 14(58%) patients. All patients responded to first line Anti Tubercular drug therapy for a period of 6 months. Tuberculosis of the Breast though rare should be considered in differential diagnosis of Breast lump, particularly in developing countries where the prevalence of tuberculosis is very high.

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Key words **: Breast tuberculosis, breast sinus, breast lump, cold abscess.**

Tuberculosis of breast is a rare form of extra pulmonary tuberculosis first described by Sir Astley Cooper in 1829[1]. Breast tissue is remarkably resistant to tuberculosis as it provides an infertile environment for the survival and multiplication of tubercle bacilli. Secondary TB can affect breast rarely as a consequence of lymphatic or haematogenous dissemination or direct extension from contiguous structures. Primary tuberculosis of breast is an even rarer condition, where the bacilli get inoculated in the nipple from faucial tonsils of the suckling infant, and infects the lactating breast through the lactiferous ducts[2]. Its prevalence is 0.1% in developed nations and between 3 and 4% in developing countries where prevalence of tuberculosis is high. With the global spread of HIV, mammary tuberculosis becomes relevant in developed nations also.

Presenting features can be varied in cases of tuberculosis of breast. These cases often pose diagnostic problems on clinical examination, during USG or mammography and can masquerade as a malignant condition. But definite diagnosis can be made on the basis of histology or cytology along with bacteriological confirmation.

In the present series twenty-four cases of tuberculosis of breast are being presented.

Materials and Methods

The study was carried out from 2003 to 2010 at Calcutta National Medical College, North Bengal Medical College and NRS Medical College, Kolkata. Clinical findings and investigation data were reviewed and recorded following diagnosis of breast tuberculosis. All patients were investigated with mammography and other imaging modalities like ultrasound and CT scan of the Breast, wherever feasible. After clinching the diagnosis of tuberculous granuloma on cytology, X-ray chest, Sputum microscopy for AFB and Mantoux test were done in these patients. The treatment details including compliance to antitubercular drug therapy and adverse drug reactions were carefully monitored. The response was evaluated at completion of treatment and patients were followed up at regular intervals.

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Results

Twenty four cases of tuberculosis of breast were included in the present study and all were females.

The age ranged from 13-54 years with a mean age of 22. Twelve patients were teen-aged. Eleven patients were aged between 25-30 years. One patient was 54 years old.

No patient in this series was pregnant, 12 (50%) patients were actively breast feeding their babies during diagnosis and were having lactational amenorrhea. The 54 year old lady was in menopause, 11 patients had normal menstrual history.

In 12 (50%) cases presented with multiple discharging sinuses (Table 1) over breast along with breast lumps. The sinuses produced dirty white fluid discharge on pressure. The lumps were painless. On palpation the lumps were diffuse, irregular in outline, firm to hard and non-tender. In 3 cases the skin overlying the lump was tethered and there was fixation to chest wall. In 8 of these patients presenting with discharging sinuses the axillary lymph nodes were palpable (Fig 1).

Fig 1 — Discharging Sinus

In 8 (33.3%) patients presented with painless breast lump (Table 1). The lumps were free from skin and underlying chest wall. There was no sinus formation. Among them 3 patients had palpable ipsilateral axillary nodes. This pattern of presentation mimicked malignant tumours of breast.

In 4 (16.7%) cases there were tense cystic swellings (Table 1) in the breast (aged 13,17,18,26 years) (Fig 2) and the overlying skin was stretched and shiny, but without florid signs of inflammation. In 2 of them ipsilateral axillary lymph nodes were palpable. Purulent material was aspirated from these swellings, making the presentation consistent with cold abscess.

Fig 2 — Cold Abscess in Right Breast (This patient also had palpable Axillary L Nodes on Right side

In all these cases the history of complaints varied between three to five months. Of these 24 patients, only 8 (33.3%) had systemic complaints of fever and night sweats.

Table 1 — *Showing Clinical Features*

Clinical Features	Number With %
Lump (painless) only	8 (33%)
Sinus (es) with Lump	12 (50%)
Tubercular cold abscess	4 (17%)
Associated axillary lymphadenopathy	13 (54%)

The disease was unilateral in all cases. In 10 cases the disease affected the left breast and in 14 cases the right breast was affected. Upper and outer quadrant was the commonest site of involvement (in 14 cases, 58.3%).

All four cases presenting with tense cystic swelling in breast had a past history of tuberculosis affecting cervical lymph nodes with irregular and incomplete treatment.

Out of these twenty-four cases eight were tea-garden workers, lived in slums and all of them had history of exposure to TB in the family.

Mammography revealed a irregularly marginated dense mass in 15 out of 24 cases. Ultrasound of the breast showed most commonly features of a complex abscess (Fig 3). In CT Scan of the Breast common feature was a large minimally enhancing irregular mass lesion or a non-enhancing cystic lesion. The four cases that presented with tense cystic swelling showed features of an abscess on ultrasound and on CT Scan showed fairly large hypo dense lesion with thick enhancing capsule suggestive of a cold abscess with mild extension deep to chest wall. MRI mammography done in a few of these cases also revealed the same.

FNAC from the lesions yielded pus-like material in the four cases with tense cystic swellings and particulate necrotic material in the other twenty cases. Smears prepared showed epithelioid cell granulomas with variable amount of caseation necrosis in the background in all cases. This cytomorphology was strongly suggestive of tuberculosis. Necrosis was the dominant feature in the cases yielding pus-like material without any feature of acute inflammation. The duct epithelial cells showed morphology within normal limits in all twenty-four cases, thereby excluding a neoplastic pathology. Ziehl Neelsen staining demonstrated presence of acid fast bacilli in 20 out of 24 (83.3%) cases, thereby confirming the diagnosis of tuberculosis. The four cases where ZN staining of aspirated material was negative for AFB, re-aspiration was done and the material was sent for Bactec culture. The pus-like yield obtained in four cases was also sent for

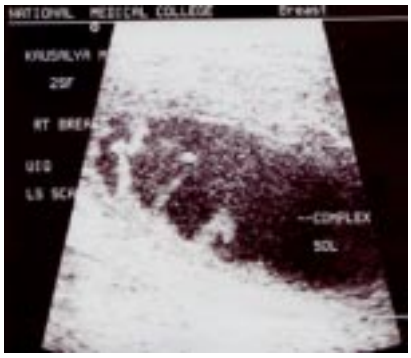

Fig 3 — Ultrasound Picture of a complex Abscess

Bactec culture and all four cases showed positive growth of AFB. So the cytological diagnosis of granulomatous inflammation along with caseation, most likely of tuberculous origin, was proved bacteriologically in all 24 cases. Smear prepared from discharge of the sinuses showed non-specific inflammation mostly and specific diagnosis of a granulomatous lesion was not possible. Since all the patients presenting with discharging sinuses had palpable breast lumps, examination of aspirated material was more important than collection of discharge from the sinuses and both were examined concurrently.

Aspiration of pus-like material in four cases gave a clue that it could be a case of cold abscess as there were no clinical features of acute inflammation, no history of active lactation and there was past history of incomplete treatment with ATD for TB of cervical lymph node in these four cases. But tuberculosis was diagnosed in the other twenty cases only after demonstration of caseating granulomas on cytology smear whereas clinical examination and imaging studies suggested a possible neoplastic lesion.

X-ray chest showed hilar lymphadenopathy in 20 out of 24 (83.3%) cases and there was no lung parenchymal lesion. CXR was entirely normal in the other four cases. Sputum microscopy for AFB was negative in all 24 patients. Presence of hilar lymphadenopathy and past history of tuberculosis of cervical lymph node ruled out primary tuberculosis of breast in twenty cases. In four cases no primary focus could be found in lungs, mediastinum or neck nodes. Mantoux test was positive in all cases; in seven cases indurations ranged between 12X12 mm to 18X18 mm 72 hrs after 5 TU of PPD. HIV serology was negative in all cases. Leukocyte count was within normal range or showed mild leucocytosis. ESR was raised in all cases and ranged from 35-50 mm/ hour (1st hour Westergren reading).

In 20 patients received quadruple therapy consisting of an initial phase of two months of Isoniazid (Daily dose:5mg/kg, max.300mg), Rifampicin (Daily dose:10mg/kg, max.600mg), Ethambutol (Daily dose:15mg/kg) and Pyrazinamide (Daily dose:25mg/kg,max.2g) followed by four months of continuation phase of Isoniazid and Rifampicin in previous dosage. All the patients completed this regimen and there were no major adverse reactions like drug induced hepatitis, gouty arthritis (due to Pyrazinamide), autoimmune thrombocytopenia (due to Rifampicin) or optic neuritis (due to Ethambutol). In the four cases presenting with tense cystic swelling and having history of irregular antitubercular drug therapy, Inj Streptomycin was added to quadruple therapy for first 2 months of initial phase. Initial and continuation phases of treatment lasted for 3 and 5 months respectively, and Ethambutol was continued in continuation phase as well. Local wound management was done for the patients presenting with draining sinuses. There was resolution of the lumps and healing of the skin wound in all 24 cases.The patients are being followed up and no recurrence has been noted after a follow-up of 8-81 months. (Median Follow up: 42 months).

Discussion

Tuberculosis of breast is a rare entity even in areas endemic for tuberculosis. There has been reports of some single cases[4], but only a few series of cases on tuberculosis of breast has been reported in the literature[5,6]. This may be due to the fact that clinically it may present just as a breast lump.& lack of awareness may cause the diagnosis to be missed. Breast tissue is not conducive for the growth of mycobacterium like spleen or skeletal muscle[7].

A study from Turkey recorded 27 cases of tuberculous mastitis from a retrospective study covering over years[6]. One study from Iran recorded eight cases over a four year period[8] and another 13 cases were reported from Quatar, from a retrospective study of ten years[9]. Fourteen cases of granulomatous mastitis were reported over a seven year period from Lahore[10]. Another study by Puneet *et al* recorded 42 cases of Tuberculous mastitis over a period of three years[11].We in our series have recorded 24 cases of bacteriologically proven tuberculosis breast over a span of seven years. Therefore considering the above mentioned studies on tuberculosis breast from a world literature review, though pulmonary tuberculosis as a disease is very common in India, tuberculosis breast per se is still quite rare, even when all other extra pulmonary forms of the disease other than tuberculosis breast are considered. The rarity of the disease becomes even more pronounced when compared with the reported cases of tuberculosis breast in the west.

Tuberculosis of breast may occur secondary to any other foci or after dissemination from blood stream. Diagnosis of primary tuberculosis of breast requires demonstration that there is no pre-existing focus of tuberculosis in the body. In the present study, twenty out of twenty-four cases showed hilar lymphadenopathy on chest X-ray thereby excluding primary mammary tuberculosis and four of these twenty cases had previous diagnosis of tuberculosis of cervical lymph node being treated irregularly and incompletely. Primary mammary tuberculosis is a condition where no other focus of tuberculosis could be demonstrated and the same will be called as secondary in case of demonstratable focus. This primary focus could be in lungs, or lymph nodes including axillary, paratracheal or mediastinal lymph nodes[17].Tuberculosis may affect breast primarily in case of abrasion of breast tissue or through infection of lactiferous ducts in the nipple. In four cases there was no other focus of tuberculosis and the disease was primary in breast. Routes of spread may be through hematogenous route, lymphatic route, or directly from contiguous structures. Most popular hypothesis is retrograde lymphatic spread from axillary lymph nodes[18,19]. Several studies report 50-70% cases of mammary tuberculosis is associated with axillary lymphadenopathy[20], similarly in

our study, 13 out of 24 patients had enlarged lymph nodes. A 13 year period study of 20 cases from Brazil showed only 1 case of primary tuberculosis[12] whereas Tanrikulu, et al, reported 26 cases of primary tuberculosis of breast in their 27-case series[6] from Turkey. Tuberculosis of breast represents up to 3% of surgically treatable breast conditions in India[21,22].

Lumps in the breast are the most common presenting feature as reported in by other authors[5,6], and in our series also lumps were the presenting feature in eight cases, & a lump accompanied by discharging sinuses in twelve of them. Accompanying axillary lymph node enlargement is a finding recorded in most reports.

Lactation increases susceptibility of breast to tuberculosis. Shinde, *et al*[13] found 7% of the patients to be lactating whereas Khanna, *et al*[17] recorded 30% patients to be lactating. In present study 12 out of 24 cases were lactating. Several studies report that mammary tuberculosis is the disease of young women between 20-40 years of age[23-25], similarly in our study 23 out of 24 were aged between 13 and 30 & the mean age was 22 years.It is relatively uncommon in older women & pre pubertal girls[13].

Clinical examination of the lump often raises the suspicion of malignancy[13] and in present series firm lumps with fixity to overlying skin and underlying tissue suggested a malignant condition. Goksoy, *et al*[14] described three clinical manifestations of breast tuberculosis: Nodular, disseminated, and sclerosing. The nodular variant is often mistaken for a fibroadenoma or carcinoma. The disseminated variety commonly leads to caseation and sinus formation. Sclerosing tuberculosis afflicts older women and is slow growing with the absence of suppuration.

Presence of a discharging sinus over a breast lump and presence of granuloma on cytology may occur in fungal lesions like Actinomycosis. A tuberculous etiology was suggested by caseation necrosis in the background of epithelioid granuloma on cytology, ruling out granulomatous mastitis, plasma cell mastitis or fungal lesion[26], and was confirmed by presence of AFB in smear or culture. Besides clinical examination other diagnostics tools are, FNAC, Mantoux test, biopsy, mammography, ultrasonography & CT scan of breast. Chest X-ray should be done in all cases to exclude pulmonary tuberculosis. In all cases of breast lump FNAC is a must, because it usually clinches the diagnosis. Kakkar *et al* diagnosed 73% of patients and Khanna *et al* diagnosed 100% of their patients on the basis of FNAC[26,17].In our study we could diagnose 20 out of 24 cases through aspiration cytology. Mycobacterial culture is the gold standard in diagnosing tuberculosis but, it takes a lot of time and frequently gives negative results. BACTEC is a better option. Polymerase chain reaction is rapid and specific but has low sensitivity[27].

Mammography or ultrasonographies are not of use in diagnosing tuberculous mastitis[15]. A dense sinus tract connecting an ill defined breast mass to a localised skin thickening on mammography is strongly suggestive of tuberculous breast abscess[16] but was not found in any case in this series.

Demonstration of AFB was possible in 20/24 cases in this series which is in contrast with the findings of other authors[10,17]. BACTEC Culture showed growth of AFB in the remaining 4 cases. Thus the diagnosis of tuberculosis was bacteriologically confirmed in all twenty four cases in this study.

Conclusion

Tuberculosis of the breast is rare but should be considered in the differential diagnoses of a lump in the breast, particularly in developing countries where prevalence of tuberculosis is high. Though rare, but it is wise to exclude past history of tuberculosis or contact, in a lady presenting with breast lump. Aim is to diagnose and treat the condition well before it comes as an ugly looking multiple discharging sinus or cold abscess. FNAC can strongly suggest the diagnosis but demonstration of AFB should be tried in smear or on culture. Standard anti-tuberculous treatment is curative.

References

1 Cooper A — Part I. London, Longman, Rees, Orme: Brown and Green; 1829. Illustration of the Diseases of the Breast. 7.
2 Gupta R, Gupta AS, Duggal N — Tubercular Mastitis. *Int Surg* 1982; **67 :** 422-4.
3 Wilson TS, MacGregor JW — The diagnosis and treatment of tuberculosis of the breast. *Can Med Assoc J* 1963; **89 :** 1118-24.
4 Islam A, Gafur MA, Khan SA, Karim MR, Mohiuddin M, Jahan S — A young Lady with Secondary Tuberculosis of Breast. *Mymensingh Med J* 2010; **19:** 618-21.
5 Lin TL, Chi SY, Liu JW, Chou FF — Tuberculosis of the breast: 10 years' experience in one institution. *Int J Tuberc Lung Dis* 2010; **14:** 758-63.
6 Tanrikulu AC, Abakay A, Abakay O, Kapan M — Breast Tuberculosis in Southeast Turkey: Report of 27 Cases. *Breast Care (Basel)* 2010; **5:** 154-7. Epub 2010 May 11.
7 Mukerjee P, George M, Maheshwari HB, Rao CP — Tuberculosis of the breast. *J Indian Med Assoc* 1974; **62:** 410-2.
8 MohsenFadaei-Araghi,Loabat Geranpayeh,Shirin Irani,Reza Matloob,Soheil Kuraki — Breast Tuberculosis :Report of eight cases. *Arch Iranian Med* 2008; **11:** 463-5.
9 Al-MarriMR,AlmoslehA, AlmoslmaniY — Primary tuberculosis of the breast in Quatar: ten year experience & review of literature: *Eur J Surg* 2000; **166:** 687-90.
10 Rubab Ahmed,Faisal Sultan — Granulomatous Mastitis:A review of fourteen cases. *J Ayub Med Coll,Abbotabad* 2006; **18:**
11 Puneet SK, Tiwary R, Ragini S, Singh S, S Gupta, V Shukla — Breast Tuberculosis :Still common in India : *The Internet Journal of Tropical Medicine* 2005; **2:** Number 2.
12 Da Silva BB, Lopes-Costa PV, Pires CG, Pereira-Filho JD, dos Santos AR — Tuberculosis of the breast: analysis of 20 cases and a literature review. *Trans R Soc Trop Med Hyg* 2009; **103:** 559-63. Epub 2009 Mar 6. .
13 Shinde SR, Chandawarkar RY, Deshmukh SP — Tuberculosis of the breast masquerading as carcinoma: a study of 100 patients. *Word J Surg* 1995; **19:** 379-81.
14 Goksoy E, Duren M, Durgun V — Tuberculosis of the breast. *Eur J Surg* 1995; **161:** 471-3.

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15 Zandrino F, Monetti F, Candolfo N. Primary tuberculosis of the breast. A case report. *Acta Radiol* 2000; **41:** 61-3.

16 Makanjuola D, Murshid K, Al Sulaimani S, Al Saleh M — Mammographic features of breast tuberculosis: the skin bulge and sinus tract sign. *Clin Radiol* 1996; **51:** 354-8.

17 Khanna R, Prasanna GV, Gupta P, Kumar M,Khanna S,Khanna AK — Mammary tuberculosis: a report on 52 cases. *Post grad medical J* 2002; **78:** 422-4.

18 Domingo C,Ruiz J,Roig J,Texido A, Aguilar X, Morera J — Tuberculosis of the breast, rare modern disease. *Tubercle* 1990, **71:** 221-3.

19 Baharoon S — Tuberculosis of breast. *Ann Thoracic Med* 2008; **3:** 110-4.

20 Sharma PK, Babel AL, Yadav SS — Tuberculosis of breast(study of 7cases). *J Postgrad Med* 1991; **37:** 24-6.

21 Hamit HF, RagsdaleTH — Mammary tuberculosis'. *R Soc Med* 1982; **75:** 764.

22 Akcay MN, Saglam L, Polat P, Erdogan F, Albayrak Y, Povoski S — Mammary tuberculosis-importance of recognition and differentiation from that of breast malignancy. *World J Surg Oncol* 2007; **5:** 67.

23 Afridi SP,Memon A,Rehman SU — Spectrum of breast tuberculosis. *J Coll Physicians Surg Pak* 2009;**19:** 158-61.

24 Kedar GP, Bophate SK, Kherdekar M — Tuberculosis of breast. *Ind J Tub* 1985; **32:** 146.

25 Elsiddig KE,Khalil EA,Elhag IA,Elsafi ME,Suleiman GM,Elkhidir IM, *et al* —Granulomatous mammary disease:ten years experience with fine needle aspiration cytology. *Int J Tuberc Lung Dis* 2003; **7:** 365-9.

26 Kakkar S,Kapila K,Singh MK,Verma K — Tuberculosis of the breast: a cytomorphological study. Acta Cytol 2000; 44: 292-6.

27 Sriram KB, Moffat D, Stapleon R— Tuberculosis infection of the breast mistaken for granulomatous mastitis. *Cases J* 2008; **1:** 273.

28 Tewari M, Shukla HS — Breast tuberculosis; diagnosis, clinical feature and management. *Indian J Med Res* 2005; **122:** 103-10.