

# Breast tuberculosis in immunocompetent patients at tertiary care center: A case series

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The breast tuberculosis (TB) is an extremely rare manifestation for the reason that mammary cells offer great resistance to the survival and multiplication of *Mycobacterium* infection. The diagnosis is difficult because of nonspecific clinical and radiological findings. It is usually suspected in a multiparous, reproductive woman. We report three cases of tubercular infection of breast confirmed by either mycobacteriology, pathology or both. We described their diagnostic confirmation and six month follow-up after antitubercular treatment (ATT).

**Key words:** Breast tuberculosis, *Mycobacterium tuberculosis*, Treatment.

## INTRODUCTION

One fifth of the world tuberculosis (TB) disease burden across the globe contributes India alone. It has high morbidity and mortality rates mostly due to undiagnosed cases.<sup>1</sup> Extra pulmonary TB (EPTB) constituted about 15 to 20 percent of all cases of TB. In developing countries the diagnosis of EPTB with conventional diagnostic tools is a major challenge for early and accurate detection of *Mycobacterium tuberculosis* (MTB).<sup>2</sup> The breast tuberculosis is an extremely rare manifestation for the reason that mammary cells offer great resistance to the survival and multiplications of MTB.<sup>3</sup> The incidence of breast TB among all the breast lesions has been estimated by various authors as between 0.54% to 1.87%.<sup>4</sup> The common age concerned between 20 to 40 years *i.e.*, the period of reproductive age.<sup>4</sup> The diagnosis is difficult because of nonspecific clinical and radiological findings. It is usually suspected in a multiparous lactating woman.<sup>5</sup> We have reported three immunocompetent reproductive patients having prolonged pain within the breast and latter developed discharging sinuses.

## CASE 1

A 26-year-old female patient presented with recurrent left breast abscess with palpable lump and multiple

discharging sinuses attended our outdoor clinic in January 2010. According to the patient, the lump had been present for the past 24 months when she had 7 months pregnancy, the patient was treated with anti tubercular drugs<sup>6</sup> and after delivery she left antitubercular treatment (ATT) for 2 months then restarted again and completed full ATT regimens. Again, she developed sinuses in her left breast 6 months ago [Figure-1]. She had no past history of weight loss or fever and no history of breast malignancy or TB in her family. On physical examination, her weight was 45 kg. The left breast was very tender and diffused irregular mass was present, mainly involved the lower quadrants. Their overlying skin was discolored, with multiple sinuses discharging a dirty yellow colored fluid. On fine needle aspiration cytology (FNAC), smear disclosed aggregated of epithelioid histiocytes occasional multi nucleated histiocytic giant cells, on an inflammatory background consisting of polymorphs, lymphocytes and some plasma cell along with fair number of squamous epithelial cells. Zeihl Neelsen (ZN) stain was positive for acid fast bacilli (AFB). Culture by Lowenstein-Jensen medium (LJ Medium) was negative for *Mycobacteria* after eight weeks incubation. Interferon gamma releases assay gave negative result at standard cutoff by manufacture.<sup>7</sup> In view of again developed breast abscess with AFB, possibility of treatment

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**Received:** 21.10.2011; **Revised:** 25.11.2011; **Accepted:** 10.01.2012



**Figure 1.** Breast with multiple sinuses

failure was considered as relapse case restarted category II treatment under DOTS (Directly Observed Treatment Short Course). On three months follow-up, lymph node enlargement had regressed and abscess was resolved, though there was recurrence of small abscess after 1 month. Finally, she completed the treatment and was cured of TB infection.

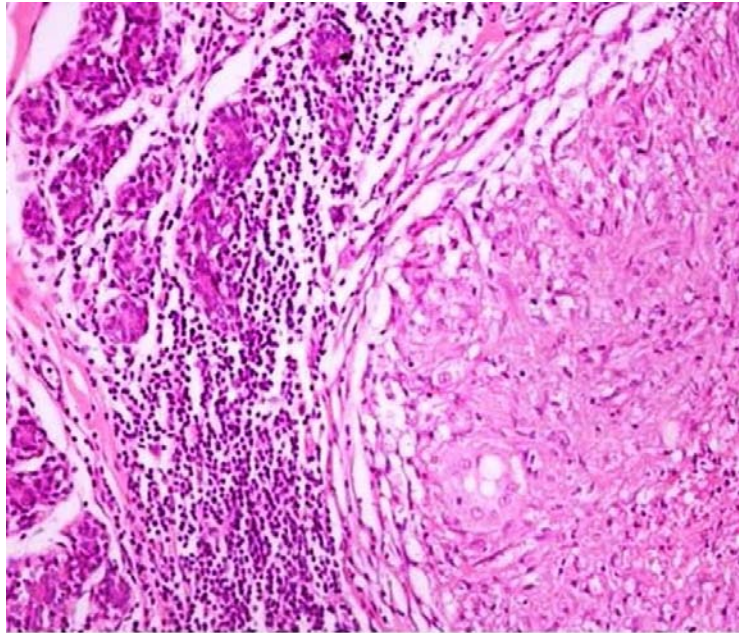
## CASE 2

A 40-year-old female was referred to our centre for management of left breast pain with purulent discharge in April 2010. There was no history of recent pregnancy or lactation or a history of breast trauma. She had noticed a painful mass in her left breast one year ago. Again from last 20 days she noticed a visible skin lesion on the breast with purulent discharge. She had no history of previous ATT intake, tubercular infection in her family, diabetic mellitus (DM) and weight loss or fever. She received at least 3 courses of antibiotic therapy by local physician but no therapeutic effect was noticed before she was referred to our centre. On physical examination, a painful nodular mass was detected near to the nipple of the left breast along with a discharging sinus. Based on the ultrasonography and mammography results, the patient underwent FNAC with a suspicion of malignancy/TB or any pyogenic infection. Diagnostic FNAC smear showed group of epithelioid cell and multinucleated histiolytic giant cell on a background of mixed inflammatory cell infiltrate composed of neutrophilic polymorphs lymphocyte and histocytes in conjunction with positive AFB in pathology. AFB was also positive by ZN stain in microbiology. *Mycobacterium* culture was positive after 3

weeks incubation. Interferon gamma releases assay in tube (IGRA-IT) was positive. Chest radiography was intact and there were no changes compatible with TB or sarcoidosis. On the basis of laboratory evidence, the patient was put on standard four ATT category I regimen (2HRZE)<sub>3</sub>(4HR)<sub>3</sub>.<sup>6</sup> The discharge was stopped and a healed sinus tract was seen after three months subsequent follow-up.

## CASE 3

A 29 year-old woman complained moderately painful pus discharge from incision site in right breast for last 3 months attended our outdoor clinic in February 2011. Incision and drainage for a lump was done at nearby hospital and treated with general antibiotics which were not responded and pus was persisted. She had last child birth 6 years earlier. No history of TB/chemotherapy of ATT was reported. She had no history of breast cancer in her family but had family history of TB to her grandfather. Mammography examination revealed a hypoechoic lesion about 0.7×0.72×0.69 cm, small rounded, with 0.18 ml volume which was noted in the inferior medial quadrant of right breast. After one month hypoechoic space occupying lesion size was increased to 1.02×0.9×0.84 cm and a volume of 0.40 ml. The patient underwent an open breast biopsy; the lump was completely excised under local anesthesia. Surgical finding was irregular cystic swelling in lower inner quadrant of right breast filled with thick and pultaceous materials communicating with lactiferous duct with surrounding fibrosis. She received intravenous augmentin 625 mg thrice daily with supplements. A sample of the pus/tissue was sent to



**Figure 2.** Histopathology section showed sheets of epithelioid cell granuloma, lymphoid cells and breast ductal epithelial cells

the microbiology and histopathology laboratory. ZN microscopy, LJ culture was negative and bacterial culture and sensitivity were sterile after 48 hour of aerobic incubation. But histopathology disclosed granulomatous mastitis in breast lesion with presence of defined granulomas composed of epithelioid and multinucleated langhans giant cells. The patient was immediately placed on ATT category I regimen (2HRZE)3(4HR)3.6 After six months of follow up, wound was healed without any pus discharge and 7 kg weight gain.

## DISCUSSION

The breast TB is uncommon although the incidence of pulmonary and extra pulmonary TB is high in our country, India. Breast TB usually occurs in women who are at breast-feeding and reproductive (20 to 40 years) ages.<sup>8</sup> In present study all patients were in reproductive age and one was on lactation period. Our findings were in line with recent report by Mehta et al.<sup>9</sup> and Sen et al.<sup>10</sup> that found the average age of  $32.2 \pm 11.8$  years. The duration of symptoms ( $13 \pm 10.5$ ) months observed in present cases series was similar to case series of Khanna et al.<sup>11</sup> and Mehta et al.<sup>9</sup> with a range of 6 to 24 months and a mean of 8.5 months. The clinical manifestation of breast TB are varied, hence the constitutional symptoms such as fever, weight loss, night sweats or a failing of general health are infrequently encountered.<sup>12</sup> But not all of them were present in same patients in our case series, case 3 presented only weight loss approx 10 Kg and she gained 7 kg weight after 6 month ATT. Remaining patients had neither fever nor weight loss or increased weight during 6 months follow-up. The lump development is a common presentation of breast TB with or

without ulceration associated with the sinus. Other presentations are diffuse nodularity and multiple sinuses. Multiple lumps are less common, pain in the lump is present more frequently in breast TB cases than breast carcinomas. Both breasts can be affected equally but bilateral involvement is very uncommon. Although the upper outer quadrant seems to be the most frequently involved site due to its proximity to the axillary nodes, any area of the breast can be affected.<sup>13</sup> TB involvement of breast occurs more commonly via lymphatic, hematogenous or contiguous seeding either by direct inoculation of the bacilli though abrasions in the nipple, which is rare. The lymphatic route is the most likely route of the breast involvement which occurs by retrograde extension from the axillary lymph node.<sup>14</sup> Mammography and ultrasonography are unreliable in distinguishing breast TB from breast carcinoma. Similarly, computed tomography (CT) scan and magnetic resonance imaging (MRI) do not give a conclusive diagnosis without histopathological confirmation. A correct diagnosis may be established by a combination of clinical suspicion and guided FNAC findings. An accurate diagnosis is conventionally performed by demonstrating a classical cassation, AFB within such a lesion, and/or by demonstrating epithelioid granulomas formation, Langerhans giant cells and lymphocyte aggregates. ZN microscopy method is a popular technique routinely used in the clinical laboratories worldwide, due to its simplicity, cost effectiveness and rapidity but it suffers with low sensitivity and requires  $10^4$  to  $10^5$  bacilli per ml in the clinical samples to be positive. Although presently, the culture of *M. tuberculosis* is a yardstick method for diagnosis of *M. tuberculosis* but it also has some limitations such as time consuming, low positivity rate. However, it represents an important clinical evaluation but having low sensitivity.<sup>8</sup>



According to Tewari et al.<sup>15</sup> cultures and AFB staining were negative in most cases. In our case series, ZN smear were positive in two case and culture positive in one case; their identification of *Mycobacterium tuberculosis* complex was done NAP test along with sensitivity, all drugs were sensitive for first line therapy. Pathological test has more sensitivity and specificity than conventional bacteriological examination. Accurate diagnosis of breast tuberculosis according to Khanna et al.<sup>11</sup> was 100% reliable in diagnosis of breast TB. We found that in histopathology results of present case series, sheets of epithelioid cell granuloma, lymphoid cells and breast ductal epithelial cells in all cases (Figure 2). A new diagnostic tests for TB using interferon gamma (IFN- $\gamma$ ) responses produced by T lymphocytes after stimulation by specific antigens [early secretory antigen target 6 (ESAT-6), culture filtrate protein 10 (CFP-10) and TB7.7] promised better sensitivity and specificity in diagnosis of tubercular infection than the TST because they are not cross reactive like with BCG.<sup>7</sup> In the present study, two cases were positive by IGRA (In Tube) using as a screening test of tubercular infection.

In conclusion, incidence of breast tuberculosis is high in pulmonary TB and EPTB. The diagnosis of breast TB in clinical presentations remains a true challenge. It also presents a diagnostic dilemma on radiological and microbiological investigations and thus high index of suspicion acquires an important position. Precise diagnosis, however, must be based on histopathological examination. It is curable with antitubercular chemotherapy drugs with surgery playing major in prevention.

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**How to cite this article:** Kumar M, Chand G, Lakshmi Nag V, Kumar Maurya A, Nawal Rao R, Agarwal Sh et al. Breast tuberculosis in immunocompetent patients at tertiary care center: A case series. J Res Med Sci 2012; 17(2): 199-202.

**Source of Support:** Nil, **Conflict of Interest:** None declared