



## UTILITY OF FINE NEEDLE ASPIRATION CYTOLOGY AS A SCREENING TOOL IN DIAGNOSIS OF TUBERCULOUS MASTITIS

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### ABSTRACT

Characteristic feature of tuberculous mastitis is pus discharging sinus or non-healing painful ulcer which appears late in the disease. It is commonly misinterpreted as malignancy or pyogenic abscess. So to diagnose tuberculous mastitis in initial phase of disease, fine needle aspiration cytology (FNAC) can be used as it is rapid and minimally invasive technique. The purpose of this study was to see the utility of FNAC as a screening tool for tuberculous mastitis. The present cross sectional study was conducted over three years from 2015 to 2017. FNAC was done on 539 consecutive cases of palpable breast lumps referred to the pathology department. After doing FNAC, three alcohol fixed smears were prepared. First smear was stained with Z- N stain by Kenyon's modified method using 20 % H<sub>2</sub>SO<sub>4</sub>, second with routine Hematoxylin Eosin stain while third one was air dried and studied with Leishman's stain. Out of these 539 patients, 82 were diagnosed having inflammatory breast lesion i.e. mastitis. All data regarding inflammatory breast lesion was collected and analyzed statistically. In the present study, 41.4% cases were diagnosed as tuberculous mastitis on FNAC, 41.4% patients had granulomatous inflammation and 58.54% patients had acute inflammation. ZN staining was positive in 10% patients. We got sensitivity of FNAC as 93% and specificity as 70% for screening tuberculous mastitis. Also we found positive predictive value as 41.17% and negative predictive value as 97%. From the study results we conclude that FNAC of breast is a useful tool to screen tuberculous mastitis.

**KEYWORDS :** tuberculous mastitis, granulomatous inflammation

### INTRODUCTION:

Tuberculous mastitis is extra pulmonary presentation of tuberculosis accounting for less than 1% of all diseases of the breast in the industrialized world.<sup>1,2</sup> The incidence of tuberculous mastitis in developing countries like India varies from 3-4.5%.<sup>3</sup> Tuberculous mastitis is often misdiagnosed as pyogenic abscess or breast malignancy.<sup>4</sup> Often patient needs many investigations for the definitive diagnosis like ultra-sonography, mammography. So to diagnose tuberculous mastitis in initial phase of disease, fine needle aspiration cytology (FNAC) can be used as it is rapid and minimally invasive technique. So in such circumstances FNAC can be useful to make diagnosis in early course of disease which can be helpful for early institution of specific therapy.

Due to late appearance of characteristic findings like discharging sinus, non-healing and painful ulcers in mastitis, clinically early diagnosis of tuberculous mastitis becomes very challenging. Montoux test is not much helpful as it frequently comes positive in countries like India where tuberculosis is endemic. Radiological investigations like mammography, CT scan, MRI are not useful for the diagnosis of the tuberculous mastitis, but can help only to determine extent of disease.<sup>5</sup>

Regarding breast pathology, palpable breast lump is most common presentation of patients. FNAC of the breast lump is very important tool and can be used to diagnose the suspicious breast lesions. Definitive therapy can be started depending on cytological diagnosis.<sup>6</sup> The present study was done to find out the diagnostic accuracy of FNAC procedure as well as its role in screening the patients with breast lump for tuberculous mastitis.

### MATERIAL AND METHODS:

The present study was hospital based cross sectional study, done in pathology department of YCM Hospital Pune over a period of three years and from January 2015 to December 2017. FNAC was done on 539 consecutive cases of palpable breast lumps referred to pathology department. In each case along with detailed history and clinical examination, variables like patient's age, gender, clinical symptoms and location of swelling, gross examination of aspirate and cytomorphological patterns were studied. After explaining the procedure in detail, written informed consent was taken from each patient. Aspiration was done using 22-23 gauge needle and 10ml plastic syringe with a detachable syringe holder. In each case, two alcohol fixed smears were prepared, first smear was stained with Z-

N stain by Kenyon's modified method using 20 % H<sub>2</sub>SO<sub>4</sub>, second with routine Hematoxylin Eosin stain while third one was air dried and studied with Leishman's stain. All malignant cases and some suspicious benign cases were sent for biopsy to confirm the diagnosis and further IHC work up for additional information of hormone receptor and oncogene studies if required. Out of these 539 patients, 82 were diagnosed having inflammatory breast lesion i.e. mastitis. All data regarding inflammatory breast lesion was collected and analyzed statistically.

### Statistical diagnosis:

Percentage of patients having acute, granulomatous inflammation, Z.N. stain positive, response to AKT was calculated. Sensitivity, specificity, positive predictive value, negative predictive value had been calculated to know diagnostic accuracy.

**Table 1: Distribution of mastitis according to findings**

Distribution of mastitis according to findings		
Findings	No of patients n= 82	Percentage
Granulomatous inflammation on FNAC	34	41.4%
Acute Inflammation on FNAC	48	58.54%
Response to AKT in acute inflammatory group, after no response to initial antibiotics treatment.	15	18.29%
ZN stain positive	10	12.19%
Amplification Technique (Cartridge Based Nucleic Acid Amplification Test- CBNAAT) Positive	1	1.21%
History of Lactation	20	24.39%
Palpable axillary lymph nodes	7	8.53%
Discharging sinus	9	10.97%

**Table 2: Cyto-histopathological correlation of 82 cases of breast lesion**

Tuberculosis	14 (True positive)	20 (False positive)	34
Cytological Diagnosis	Tuberculosis	No Tuberculosis	Total
No Tuberculosis	1 (False negative)	47 (True negative)	48
Total	15	67	82

**Table 3: Validity markers of the FNAC Test**

Sensitivity	93%
Specificity	70%
Positive predictive value	41.17%
Negative predictive value	97%

**DISCUSSION:**

Tuberculosis of the mammary gland is a rare disease and often mistaken for malignancy of the breast or pyogenic abscess. The first case of mammary tuberculosis was diagnosed in 1829 by Sir Astley Cooper. He named it Scrofulous swelling of the bosom.<sup>7</sup> Only 500 cases of tuberculous mastitis were documented in 1982 in world medical literature.<sup>8</sup> Since then, case reports highlighting the diagnostic dilemma of the tuberculous mastitis are being published. Comparatively tuberculous mastitis is less common than breast carcinoma. Breast tissue is highly resistant to tubercular infection because the mammary tissue provides an infertile environment for the survival and multiplication of tubercle bacilli.<sup>9,10</sup>

Tuberculosis mastitis is of three types i.e. nodular, sclerosing and disseminated. The nodular type is commonest variant, presents as slowly growing painless breast lump and at later stages it becomes ulcerated with multiple discharging sinuses. Sclerosing variant affects older women and presents as painless, hard, slowly growing mass with nipple retraction. Disseminated variant presents as painless indurated lump with numerous discharging sinuses and extension to axillary lymph nodes.<sup>8</sup>

Tuberculosis mastitis is more common in females especially in the reproductive age.<sup>11,12</sup> In the present study 24.39% women were lactating at the time of diagnosis of tuberculous mastitis. In pregnancy and lactating female, the breast tissue becomes more vascular with dilated ducts. This increased vascularity may facilitate tuberculous infection and dissemination of bacilli. Shinde et al<sup>3</sup> found 7% and Banerjee SN et al<sup>10</sup> found 33% of their patients lactating at the time of presentation. The lactating breast is susceptible to trauma, making it more vulnerable to tubercular infection.<sup>3</sup>

In the present study 41.4% patients were diagnosed as granulomatous inflammation having tuberculosis on FNAC and 58.54% patients were diagnosed having acute inflammation on FNAC and treated with antibiotics. Out of acute inflammatory group patients, 18.29% patients showed no response to given antibiotics but showed response to AKT. Only 7 patients (8.53%) had axillary lymphadenopathy and 9 (10.97%) patients had discharging sinus at the time of diagnosis.

We got sensitivity of FNAC as 93% and specificity 70% as screening tool for tuberculous mastitis. We got positive predictive value of 41.17% and negative predictive value 97%. Our study results showed that FNAC can be used to diagnose caseating granulomatous inflammation in breast aspirates as well as to demonstrate acid fast bacilli successfully. Nipple discharge if present should be screened for tuberculosis.

In future, Z.N. staining may get replaced by CBNAAT. It may further increase the diagnostic accuracy & detect more MDR or XDR cases from tuberculous mastitis. FNAC has become the first choice as a diagnostic procedure in a variety of breast diseases as it is minimally invasive. FNAC is rapid, simple, safe, cost effective and good screening procedure with high sensitivity and hence overall diagnostic accuracy.

**CONCLUSION:**

FNAC is very simple, cost effective, relatively painless, safe, minimally invasive test. It is repeatable from multiple sites and can be done on OPD basis. In addition special investigation can be performed like Z.N. stain, culture, CBNAAT on aspirated material. High sensitivity and negative predictive value makes FNAC a good screening procedure. On the basis of FNAC alone we can find large number of patients suffering from tuberculosis of breast.

Histopathology can be used to confirm the diagnosis of suspicious cases. Early diagnosis will significantly reduce morbidity by starting AKT at the earliest.

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