Original Article

Study of Fine Needle Aspiration Cytology of Breast Tuberculosis

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ABSTRACT

Background: Characteristic feature of tuberculous mastitis like pus discharging sinus appear late in the disease. It commonly misinterpreted for malignancy and pyogenic abscess. Fine needle aspiration cytology (FNAC) is rapid and less invasive tool to diagnose tuberculous mastitis in initial phase of disease.

Methods: Tuberculous mastitis reported on FNAC of breast during the study period of two years were analyzed. Data were collected for physical examination and microscopic presence of granuloma, necrosis, inflammatory cells and giant cells.

Result: During the study period of two years, seven cases were reported as tuberculous mastitis. No case of axillary lymph node or opposite breast involvement detected. Pus discharging sinus was present in one case. On cytology, presence of granuloma, caseous type of necrosis and Langhans giant cells were reported in 100%, 71% and 43% respectively.

Conclusion: FNAC of breast is a useful tool to diagnose tuberculous mastitis and differentiate same from malignancy and pyogenic abscess. Cytological diagnosis help to identify tuberculous mastitis early in the course of disease and start of anti tuberculosis therapy eliminate need for radical surgical intervention.

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Introduction

India is a endemic zone for the tuberculosis with prevalence of 211 cases per 1,00,000 population.[1] Fine needle aspiration cytology (FNAC) which is important tool in diagnosis of breast lump, also helpful to diagnose tuberculosis by demonstrating granuloma with or without presence of necrosis.[2] Tuberculous mastitis often misdiagnose as malignancy or pyogenic abscess.[3] In such conditions patient often underwent numerous investigation before definitive diagnosis is made. FNAC in such circumstances help to make diagnosis in early course of disease and institution of specific therapy.

Clinically early diagnosis is challenging as characteristic sinus formation occur late in the disease. Mantoux test comes positive frequently in endemic areas as India and does not provide much help. Radiological investigations help only to determine extent of disease rather than in diagnosis. Modern radiological methods like mammography, computed tomography, magnetic resonance imaging of the breast have been extensively studied for diagnosis of breast tuberculosis but of no reward.[3] FNAC is the main diagnostic tool to investigate tuberculous mastitis with 73% cases diagnosed by it.[4]

Even though high prevalence of tuberculosis, extra pulmonary tuberculosis occurring in the breast is rare.[4] Main objective of this study was to examine cytomorphology of tuberculous mastitis.

Materials and Methods

All the patients came for FNAC of the breast during last 2 years from July 2013 to June 2015 in our cytology department were included in this study. Before aspiration, consent for FNAC was taken and data were collected regarding age, gender, patient's complain, site and size of lump, any lump in contralateral breast and both axilla. Universal safety precautions were taken during procedure. Aspirations were done with 22 or 24 Gauge needle and 10 ml syringe with or without applying negative pressure. Sample material put on glass slide. Second slide was taken and put on first slide to pull in opposite direction in horizontal position. Slides were immediately put in to alcohol for wet fixation and stained with Hematoxylin and Eosin. Cover slip mounted with DPX (Di-n-butyl phthalate in xylene) and reported. During microscopic examination presence of granuloma, necrosis, inflammatory and ductal cells as well as giant cells were noted.

Result

Total of 218 FNAs of the breast were done during the study period. Out of which seven were reported as tuberculous mastitis as shown in table-1. Age ranges from 16 to 53 years with mean of 33 years of age. Left side of breast more commonly involved than right. Symptoms of acute inflammation like pain and fever were present in 29% cases. Axillary lymphnode and opposite breast involvement not found in any patient however same were not documented in 3 patients. Pus was aspirated in one case, whitish material in two cases and remaining were blood mixed. None of the aspirate had cheesy material. All the cases on cytology showed granuloma (Fig.1,2). Cellularity on aspiration was adequate for reporting in all cases. Caseous type of necrosis which is characteristic of tuberculosis was present in 71% cases while remaining cases had nonspecific necrosis (Fig.3). 43% cases had Langhans type giant cells (Fig.4), 14% had foreign type giant cell and 43% had no giant cells. No case had nipple discharge. Patient C was on anti tuberculosis therapy during procedure. Patient D and F were diagnosed clinically as carcinoma. Patient E and F were having breast feeding at time of FNA.

Discussion

Considering minimal invasion, cost effectiveness and rapid interpretation, FNAC is the important tool to diagnose breast lump. [5] It remain important modality for diagnosis of tuberculosis of breast.[2] Our study reported tuberculous mastitis in 7 cases out of 218 FNAC of breast lump. In literature reported incident vary from 0.64% to 3.59%.[6] Incident rate in our study was 3.2%, which is consistent with reported in other studies. Tuberculosis of breast in western countries are rare, being less than 0.1% of breast lesions examined histologically.[7,8] In present study duration of symptoms were from 1 week to 1.5 years. Dubey et al and Shukla et al noted history of symptoms varies from few weeks to several years.[9,10] Bilateral breast involvement is uncommon(3%).[11] In present study none of patient had bilateral involvement. Considering objective of present study, which was to study cytomorphology of breast tuberculosis, follow up of the patients after making diagnosis of tuberculous mastitis was omitted as patients were put under consultation of district tuberculosis center for further treatment.

Major characteristic of diagnosis of tuberculosis on FNAC are presence of granuloma and caseous type of necrosis. All patients under study had granuloma formation detected by FNAC study. 6 out of 7 patients' cytology study indicate presence of caseous type of necrosis and/or Langhans type giant cells considered as feature of tuberculosis. One patient had granuloma without caseous type of necrosis and Langhans type giant cells, but presence of predominant lymphocytes in smear rule out acute suppuration. As only small quantity of tissue is available for examination during FNAC, absence of necrosis on cytology of breast does

Table 1: Findings of patients reported as tuberculous mastitis.

Case	Patient A	Patient B	Patient C	Patient D	Patient E	Patient F	Patient G
Age in years	53	31	22	50	26	35	16
Complain duration	7 days	1 week	10 days	2.5 months	25 days	1 month	1.5 years
C/o Pus discharge	Yes	No	No	No	No	No	No
C/o Fever	No	Yes	No	No	No	No	No
C/o Pain	No	No	Yes	No	No	No	No
USG/ Mammography	Well define lesion	Abscess	Abscess	Complex mass	Well define lesion	Not done	Well define lesion
On examination							
Area of involvement	Right breast; Periareolar	Right breast; Lateral half	Left breast; UI quadrant	Right breast; Lower half	Left breast; LO quadrant	Left breast; UO quadrant	Left breast; Upper half
Axillary LN involvement	No	No	No	Not documented	Not documented	No	Not documented
Opposite breast involvement	No	No	No	Not documented	Not documented	No	Not documented
Lump	Soft	Firm	Ill define thickening	Hard	Firm	Firm	Firm
Size in cm	2*1	2*2	4*2	4*4	0.5*0.5	5*5	4*2
FNA aspiration	Pus	Blood mixed	Yellow whitish	Blood mixed	Whitish	Blood mixed	Blood mixed
Microscopy							
Inflammatory cells	Neutrophils	Lymphocytes	Neutrophils	Neutrophils	Lymphocytes	Neutrophils	Lymphocytes
Granuloma	Present	Present	Present	Present	Present	Present	Present
Necrosis	Caseous	Present	Caseous	Caseous	Present	Caseous	Caseous
Giant cells	No	Langhans	No	Langhans	No	Langhans	Present
Ductal cells	No	Benign	No	No	Benign	Benign	Benign

(C/o: complain of; USG: ultrasonography; UI: upper inner; LO: lower outer; UO: upper outer; LN: lymph node)

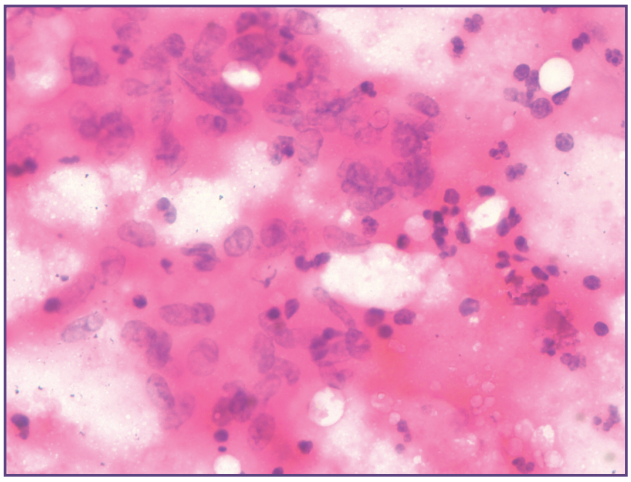

Fig. 1: Microphotograph of granuloma (H&E, X400)

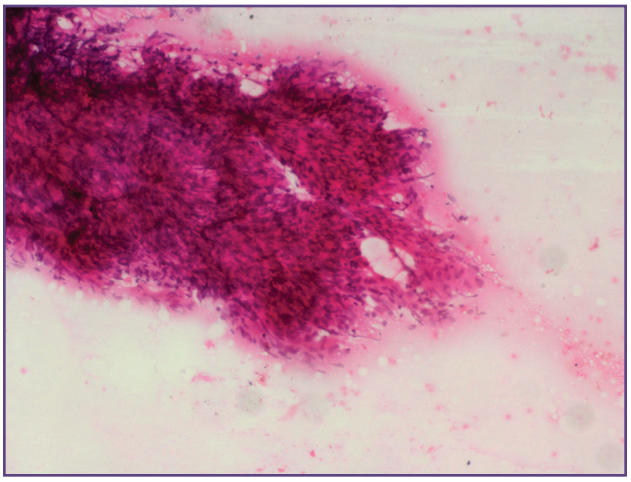

Fig.2: Microphotograph of granuloma (H&E, X100)

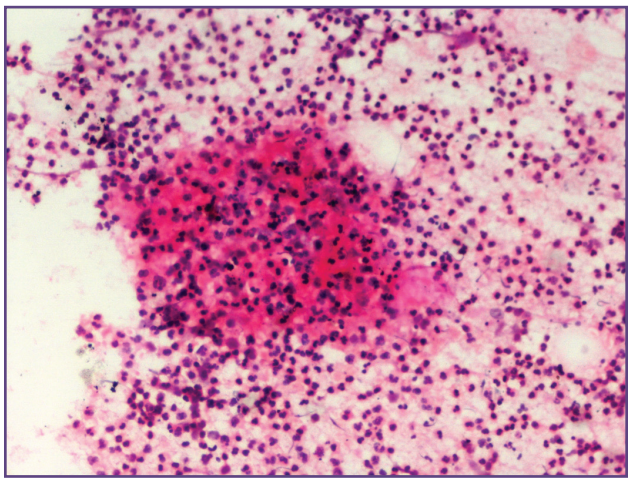

Fig. 3: Microphotograph of necrosis with neutrophilic inflammatory cells (H&E, X100)

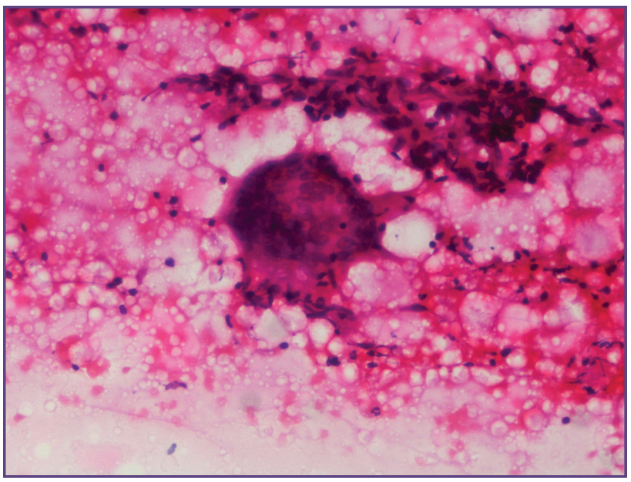

Fig. 4: Microphotograph of Langhans type of giant cell (H&E, X100)

not rule out diagnosis of tuberculosis.[2,3,4,12] Kakkar et al demonstrated 74% cases of cytology had granulomas along with caseous type of necrosis.[4] In present study 71% of cases had similar findings on FNAC. Granulomatous mastitis occurs in diverse pathology including infections like Mycobacterium tuberculosis, Blastomycosis, Corynebacterium; autoimmune process like Wegener granulomatosis and foreign body reaction; diabetes mellitus and sarcoidosis. In India as the prevalence of tuberculosis is high, granulomatous mastitis even in absence of acid fast bacilli(AFB) on Ziehl-Neelsen (ZN) stain, first choice is antituberculosis therapy, and in case no response to it, then consider alternate diagnosis.[13] Detection of AFB on ZN stain not mandatory as extrapulmonary tuberculosis likely to be paucibacillary and to able to detect bacilli on microscopy, number of bacilli must be more than 10,000/ml of material.[14] Polymerase chain reaction (PCR) is not mandatory for diagnosis in AFB negative patients and false negative reports are a possibility. Considering paucibacillary nature of condition, microscopy, culture and PCR do not have the same diagnostic utility as in pulmonary tuberculosis.[15]

Tewari et al demonstrate 22/30(73%) lump, 11/30(37%) ulcer, 4/30(13%) sinus, while present study had 7/7(100%) lump, 0/7(0%) ulcer and 1/7(14%) sinus during presentation of patients.[16] Multiple lumps are less frequent, comparable to present study having no such presentation.[17] It is unlikely for breast tuberculosis patients to have pulmonary or systemic symptoms.[16,18] Mammography and other radiology techniques play limited role as findings are often indistinguishable from carcinoma of breast.[19,20] In present study complex mass, abscess and well defined mass reported by radiologist in 1,2 and 3 cases respectively.

FNA play important role when provisional clinical diagnosis of breast lump is malignancy. Kakkar et al describe a case where pre operative FNA examination not carried out and had been operated for malignancy and on histology turn out to be tuberculosis.[4] In present study there had been two cases, which were clinically diagnosed as malignancy but turn out tuberculous mastitis on cytology examination. Out of these two patients, one was reported having complex mass on ultrasound. Lump in both cases were large (4 and 5 cm diameter on physical examination). Pre operative FNA examination helps to avoid unnecessary surgical interventions.

Mckeown and Wilkinson classified tuberculous mastitis as primary and secondary.[21] Vassilakos stated primary condition is quite rare and was diagnose because the clinician was unable to detect true nidus of the disease.[22] However for primary condition, likely possibility is ascending infection from dilated lactiferous duct in lactating women. Two cases were lactating at the time of diagnosis in present study.

Tuberculosis of breast is a disease of young female.[12] In this study also mean age was 33 years. In older patients tuberculosis may mimic carcinoma while in younger patients it resemble pyogenic abscess.[23] While treatment for tuberculous mastitis significantly differ from carcinoma and pyogenic abscess, it is important to diagnose condition appropriately and in timely manner. Combination of drug therapy and limited excision of diseased breast is a treatment of choice.[24,25]

Conclusion

Effectiveness of FNAC in diagnosis of breast lump is well established. Same usefulness of FNAC also applied for

diagnosis of tuberculous mastitis and to differentiate from malignancy and pyogenic abscess. Characteristic feature of tuberculosis like sinus formation appear late in the disease. Emphasis should be made for early diagnosis by cytology to initiate antituberculosis therapy and eliminate need for more radical surgical interventions.

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Competing Interests
None declared

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