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RESEARCH ARTICLE

CYTOLOGICAL DIAGNOSIS OF MASTITIS WITH EMPHASIS ON GRANULOMATOUS MASTITIS

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ABSTRACT

Objective: The objective of the study is to evaluate the efficacy of fine needle aspiration cytology in the diagnosis of mastitis and estimate the frequency of lesions diagnosed as tuberculous mastitis solely on FNAC. **Methods:** A total of 506 randomly selected cases of breast lumps over a retrospective period of 5 years were evaluated clinically and subjected to FNAC. The clinical, cytological, and histopathological data of these patients were studied. The smears were stained with H&E, Papanicolaou, and Giemsa. Data was collected from the cytology section of the Pathology Department and smears retrieved were reviewed and differentiated as acute, granulomatous or tuberculous mastitis. Histopathological confirmation was done wherever possible. **Results:** Out of 506 cases, inflammatory lesion of breast was detected in 30 cases. The most commonly encountered lesions were acute mastitis or abscess (46%), followed by granulomatous mastitis (36%), followed by tuberculous mastitis (10%), and 6% of acute on chronic mastitis. Histopathological follow up was available for 2 patients. **Conclusion:** It is a well-established fact that FNAC helps confirm tuberculosis in the presence of necrosis. From the study it can be concluded that FNAC is an efficient, minimally invasive and cost-effective method in the diagnosis of acute and granulomatous mastitis. FNAC prevents delay in initiation of therapy and complications of the disease. Our study has shown us that careful screening of FNAC smears for the presence of necrosis will aid in the confirmatory diagnosis of tuberculosis.

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INTRODUCTION

Mastitis is inflammation of the breast tissue usually caused by infection. Fine needle aspiration cytology has become the procedure of choice in the initial diagnostic evaluation of benign breast lesions. 4 types of mastitis are recognized– acute, chronic, granulomatous, and non-specific (Orell, 2005). Granulomatous mastitis is an uncommon breast lesion that was first described by Kessler and Wolloch in 1972 (Vidyavathi, 2012). It is usually seen in women of child bearing age (Vidyavathi, 2012). Due to the high incidence of tuberculosis in India, we must suspect tuberculosis as one of the causes of granulomatous mastitis. In 1829, Sir Astley Cooper recorded the first case of mammary tuberculosis and called it 'Scrofulous swelling of the bosom'. As mentioned in an article by Shirish Chandanwale et al, Hamit and Ragsdale documented 500 cases of tuberculous mastitis (Chandanwale, 2013). Kasture Jyoti et al has also observed in their study that the incidence of tuberculosis was 2% (Kasture Jyothi, 2013). Fine needle aspiration cytology (FNAC) is useful in the assessment of breast lesions. Fine needle aspiration is a safe method for the diagnosis of lesions of breast and the risk of complications is extremely low Kasture Jyothi, 2013).

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FNAC has become a cost-effective and accurate procedure for diagnosing non-neoplastic lesions of breast preoperatively and has helped in avoiding unnecessary surgical procedures such as diagnostic excision or incisional biopsy (Kasture Jyothi, 2013). It is used to diagnose acute mastitis and specifically, granulomatous mastitis. The etiology of granulomatous inflammation in the breast is vast. Granulomas may be due to an infectious process or may be part of a systemic disease, such as Wegener's granulomatosis, sarcoidosis, diabetes mellitus and giant cell arteritis (Dalal Nemenqani, 2009). Bacterial infections, such as brucellosis, blastomycosis, actinomycosis and Corynebacterium, and fungal infections and parasitic infections have also been reported as causes of granulomatous mastitis. A cytological diagnosis of granulomatous mastitis is made when smears show the presence of epithelioid histiocytes and/or multinucleated giant cells. The presence of caseous necrosis favours a diagnosis of tuberculous mastitis. Acute mastitis is diagnosed when cytological smears show numerous acute inflammatory cells like polymorphonuclear neutrophils.

Aims and Objectives

The objective of the study is to evaluate the efficacy of fine needle aspiration cytology in the diagnosis of mastitis and

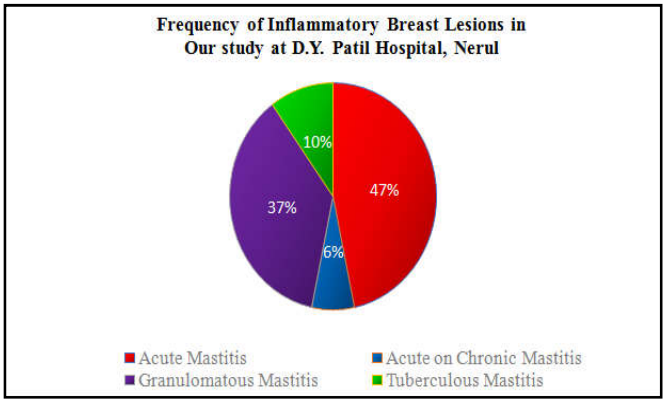
estimate the frequency of lesions diagnosed as tuberculous mastitis solely on FNAC.

MATERIALS AND METHODS

A 5 year retrospective and prospective study of patients with breast lump diagnosed on FNAC as mastitis was done. Patients who were diagnosed with inflammatory breast lesions including acute mastitis, acute on chronic, granulomatous mastitis, and tuberculous mastitis on fine needle aspiration cytology were included in the study. All patients with palpable breast lumps who came to the FNAC OPD clinic between 1st January 2012 and 31st December 2016 were included in the study. The clinical, cytological, and histopathological data of these patients were studied. Smears which were evaluated were stained with H & E, Papanicolaou stain and Giemsa. Slides obtained were evaluated on the basis of adequacy, cellularity, and diagnosis. Data was collected from the cytology section of the Pathology Department and smears retrieved were reviewed and differentiated as acute, acute on chronic, granulomatous or tuberculous mastitis. Histopathological confirmation was done wherever possible.

Results and Follow-Up: Inflammatory lesion of the breast was detected in 30 cases out of 506 breast lesions. All patients were females. The age incidence of these patients ranged from 20 to 65 years. Eighteen patients were in the age group of 20 to 30 years. Six patients were in the age group of 31 to 40 years. Five patients were in the age group of 41 to 50 years. Only 1 patient was above the age of 60 years. The clinical, cytological, and histopathological data of these patients were studied. Out of a total of 30 inflammatory breast lesions, the frequency of distribution of lesions was as follows:

Type of Lesion	Number of Cases	Percentage
Acute Mastitis	14	46.6%
Acute on Chronic Mastitis	2	6.6%
Granulomatous Mastitis	11	36.6%
Tuberculous Mastitis	3	10%
TOTAL	30	



Majority of cases of acute mastitis responded to treatment protocol. The cases of acute mastitis responded to antibiotics and therefore were treated conservatively. No history of lactation was found in any cases of acute mastitis. However, a single case diagnosed as granulomatous gave history of lactation. For AFB, no follow up was available. For histopathological evaluation, follow-up was reported in only 2 patients. One patient of pyogenic breast abscess was confirmed on histopathology. One patient of acute mastitis was confirmed as granulomatous mastitis on histopathology.

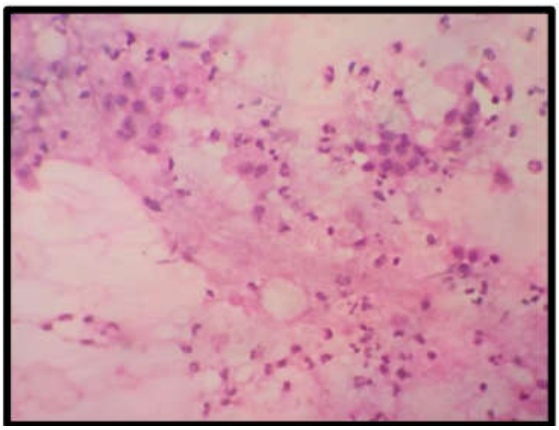


Figure 1. FNAC Acute Mastitis FNAC Smear showing ductal epithelial cells in discohesive clusters along with polymorphonuclear neutrophils (H & E x400)

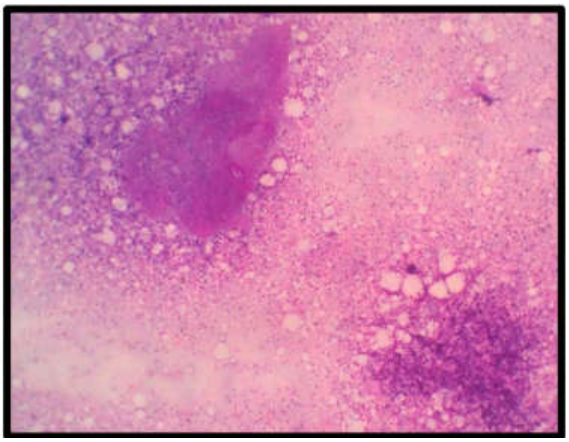


Figure 2. FNAC Tuberculous Mastitis FNAC smear showing caseous necrosis and an epithelioid cell granuloma along with lymphocytes (H & E x100)

One patient of pyogenic breast abscess was confirmed on histopathology. One patient of acute mastitis was confirmed as granulomatous mastitis on histopathology.

DISCUSSION

The accurate etiological diagnosis of granulomatous mastitis on fine needle aspiration is debatable. In order to detect the presence of tuberculosis in granulomatous mastitis, careful evaluation must be done. Breast and skin are rare sites of extrapulmonary mycobacterial infection (Dalal Nemenqani, 2009). In our study, 36.6 % of lesions were diagnosed as granulomatous mastitis, 46.6 % of lesions were diagnosed as acute mastitis and only 10% were diagnosed as tuberculous mastitis. In Nemenqani et al's study, out of 49 cases of inflammatory breast lesions, he found 30.6% cases of granulomatous mastitis (Dalal Nemenqani, 2009). Tuberculous mastitis can be diagnosed with confidence in 72% of cases in the absence of acid-fast bacilli if epithelioid granulomas and necrosis can be demonstrated (Dalal Nemenqani, 2009). In Nemenqani et al's study, epithelioid granulomas and multinucleated giant cells were the commonest findings. Thus, in their study, FNAC was found to be a useful tool in the early diagnosis of granulomatous mastitis and its classification (Dalal Nemenqani, 2009). Furthermore, he mentions that granulomatous mastitis represents 0.025–3% of surgically treated breast diseases (Dalal Nemenqani, 2009). Kishore B. et

al's study had shown that in a country like India, where tuberculosis is endemic, the presence of necrosis even in absence of acid-fast bacilli should alert one to the diagnosis of tuberculosis (Kishore, 2007). According to a study conducted by Kasture Jyoti et al, the incidence of acute mastitis was 52% of total lesions of breast and incidence of tuberculous mastitis was rare, accounting for only 2% of mammary lesions in India (Kasture Jyoti, 2013). In our study, acute mastitis was the most frequent type of mastitis, followed by granulomatous mastitis and frank tuberculous mastitis. Out of the 11 cases diagnosed as granulomatous mastitis, 2 cases were reviewed and the smears for these cases showed foci of caseous necrosis. Thus, these 2 cases were diagnosed as tuberculous mastitis. Granulomatous mastitis is an uncommon breast lesion. The disease usually occurs in women of reproductive age and may be associated with lactation or may occur in the postpartum period (Tse, 2003). The cytological diagnosis of granulomatous mastitis is difficult because the features overlap with other etiologies, including tuberculosis. The diagnostic cytological criteria for granulomatous mastitis remains poorly defined, and the common features that have been evaluated include necrosis, giant cells, epithelioid histiocytes, granulomas, and neutrophils present in the background (Tse, 2003).

The clinical and radiologic findings of granulomatous mastitis are similar to those of breast cancer, so it is often initially misdiagnosed and proper treatment is delayed (Kishore, 2007). Before treatment, other causes of granulomatous lesions in the breast, tuberculosis must be ruled out, followed by other causes such fungal and parasitic infections, and idiopathic granulomatous mastitis. The diagnosis of idiopathic granulomatous mastitis is a diagnosis of exclusion and should be given only when all other known causes of granulomatous inflammation have been excluded (Dalal Nemenqani, 2009). The cause of idiopathic granulomatous mastitis is still uncertain(Vidyavathi, 2012). In one of the references quoted by authors, autoimmune disease, infection, and trauma have been suggested. Tse et al has stated that single epithelioid histiocytes present within the smears should alert the cytopathologist to the possibility of a granulomatous inflammation even in the absence of granulomas (Tse, 2003). The absence of necrosis and a predominantly neutrophilic infiltrate in the background favour a diagnosis of granulomatous mastitis (Tse, 2003). In a study conducted by Shirish Chandanwale *et al*, FNAC was reported to have an accuracy of 97.40% in the diagnosis of breast lesions (Chandanwale, 2013). FNAC is a rapid, efficient, minimally invasive and cost-effective method in the diagnosis of acute and granulomatous mastitis. It helps in avoiding unnecessary surgical interventions such as biopsies and lumpectomies. FNAC prevents delay in initiation of therapy and complications of the disease.Hossain et al mentioned that no definite protocol has been established yet for idiopathic granulomatous mastitis (Hossain, 2016). Authors have formulated an algorithm of management of idiopathic granulomatous mastitis. They have also proposed that follow-up with regular clinical checkup including sonography scan should be done considering the high rate of recurrence in idiopathic granulomatous mastitis (Hossain, 2016).

Conclusion

The cytological features of granulomatous mastitis are not specific and can overlap with other etiologies. A confirmatory diagnosis can be made only after exclusion of other conditions like tuberculosis, sarcoidosis and fungal infection. It is a well-established fact FNAC can confirm tuberculosis in the presence of necrosis which we also wanted to evaluate in our setup. Our study revealed that careful screening of FNAC smears for the presence of necrosis will aid in the confirmatory diagnosis of tuberculosis. The significance of breast tuberculosis is due to its mistaken identity with breast cancer and pyogenic breast abscess. As a result, the patients are often subjected to many investigations before a definitive diagnosis is made. A high index of awareness of granulomatous mastitis by the cytopathologist is needed in order to make a diagnosis, initiate proper treatment, and to prevent unnecessary lumpectomies and mastectomies.

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