UTILITY OF FNAC IN UNCOMMON INFLAMMATORY AND REACTIVE LESIONS OF BREAST: AN UNSUSPECTED CLINICAL SCENARIO

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ABSTRACT

BACKGROUND

Fine Needle Aspiration Cytology (FNAC) has become an invaluable tool in the preoperative evaluation of the breast lumps and is a part of initial screening by triple assessment approach. Its main purpose is to differentiate benign lesions from malignant lesions. However inflammatory lesions of the breast are relatively uncommon benign breast lesions and can be of an abnormal finding on imaging. These lesions form palpable lumps and simulate a malignant process, both clinically and radiologically. Core biopsies may not help in the diagnosis of inflammatory lesions and are not necessary in most of these cases. Here, the present study aims to highlight the importance of FNAC in the diagnosis of inflammatory lesions of the breast.

MATERIALS AND METHODS

The present study was a prospective study conducted in Government General Hospital, Rangaraya Medical College, Kakinada, for a period of one year from July 2017 to June 2018. A total number of 591 female patients with palpable breast lumps were subjected to FNAC. Ten cases out of 591 were showed clinical and radiological discrepancies. Aspirated smears were studied microscopically, and final diagnosis was made after assessment by two pathologists. All ten cases were followed up for six months to assess the response to therapy.

RESULTS

Ten cases of uncommon inflammatory breast lesions out of 591 breast cases were included in the present study. All patients were females belonging to the age group between 28-55 years. Of these nine cases, 05 cases were of Tuberculosis, 2 cases of Filariasis, 2 cases of sinus histiocytosis with massive lymphadenopathy and 1 case of implant-related granulomatous inflammation.

CONCLUSION

Careful screening of fine needle aspiration cytology smears is helpful in diagnosing inflammatory breast lesions with specific etiology especially tuberculosis and microfilaria. Diagnosis of such cases allows swift and specific medical therapy where possible and prevents subsequent complications of the disease thereby avoiding unnecessary surgical intervention. The utility of FNAC initially started to diagnose malignant lesions got extended to the preoperative evaluation of both benign and malignant lesions.

KEYWORDS

FNAC, Inflammatory Breast lesions, Granulomatous.

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BACKGROUND

Fine Needle Aspiration Cytology (FNAC) has become an invaluable tool in the preoperative evaluation of the breast lumps and is a part of initial screening by triple assessment approach.[1] It has gained popularity due to its sensitivity, rapid results and excellent patient tolerance with little complications.[2] The primary purpose of FNAC is to differentiate benign from malignant lesions. Overlapping morphological features is an important cause of decreased sensitivity. A triple assessment approach comprising clinical examination, radiological imaging and cytological study can significantly improve the diagnostic accuracy.[3] Now-a-days,

core needle biopsy or trucut needle biopsy is being increasingly used and replaced the fine needle aspiration cytology in the evaluation of palpable breast lesions. However, it has certain limitations like needful technical expertise for the procedure, expensive, low patient tolerance and time-consuming results.[4]

Inflammatory lesions of the breast are relatively uncommon benign breast lesions and can be of an abnormal finding on imaging. These lesions form palpable lumps and simulate a malignant process, both clinically and radiologically.[5] The various inflammatory lesions of the breast are acute mastitis, breast abscess, fat necrosis and granulomatous inflammation. Clinical and radiological presentations can be extremely variable mimicking malignancy in some.[6] Core biopsies may not help in the diagnosis of inflammatory lesions and are not necessary in most of these cases.[4] FNAC thus plays a role in the diagnosis of various inflammatory breast lesions and direct the clinician for appropriate management.

Aims and Objectives

Here the present study aims to highlight the importance of FNAC in the diagnosis of inflammatory lesions of the breast.

MATERIALS AND METHODS

The present study was a prospective study conducted in Government general hospital, Rangaraya medical college, Kakinada for a period of one year from July 2017 to June 2018. A total number of 591 female patients with palpable breast lumps were subjected to FNAC. All the patients were examined and assessed clinically and compared with radiological findings where available. Ten cases out of 591 showed clinical and radiological discrepancies. An informed consent was taken for all the patients in their own language and explained the procedure in detail. Material aspirated from breast lumps were smeared on the slides and kept for both air-dried and wet fixation. Air dried smears were stained with May Grunwald and Giemsa stain and wet fixation smears were stained with Haematoxylin and Eosin. Air dried smears were stained with Acid fast bacilli stain in a few selective cases. A final diagnosis was made after assessment by two pathologists. All the ten cases were followed up for six months to assess the response to therapy.

RESULTS

Ten cases of uncommon inflammatory breast lesions out of 591 breast cases were included in the present study. All patients were females belonging to the age group between 28-55 years. Of these ten cases, 05 cases were of Tuberculosis, 2 cases of Filariasis, 2 cases of sinus histiocytosis with massive lymphadenopathy and 1 case of implant-related granulomatous inflammation.

Cytomorphological features of breast tuberculosis include the presence of epithelioid granulomas with or without caseous necrosis (Figure 1). One of the cases showed numerous polymorphs with scattered epithelioid granulomas without necrotic material. Three cases out of these five were positive for AFB stain including the later one. (Table 1)

A young female patient presented with ill-defined lumps both breasts of five months duration. Mammosonogram showed multiple small cystic lesions both breasts, and the radiological impression was fibrocystic disease. Clinical examination showed an ill-defined lump upper outer quadrant of the right breast. Remaining lumps were small and impalpable. Cytology smears showed plenty of lymphoid cells, few histiocytes and histiocytic giant cells. The background showed fragmented eosinophilic material. We initially thought the lesion as a parasitic cyst. (Figure 2 & 3). On further inquiry, the patient gave a history of breast augmentation surgery. In correlation with clinical history, a diagnosis of granulomatous mastitis due to breast augmentation implant was made (Table 1).

Two cases of Filariasis of breast presented as palpable lumps. A clear fluid was aspirated, sediment cytosmears showed numerous microfilaria with few lymphocytes in a proteinaceous material background. (Table 2) (Figure 4).

A 45 years old female patient presented with lumps both breasts for six months. Mammosonogram opinion was multiple fibroadenomas of both breasts. Cytology smears were cellular and showed plenty of histiocytes exhibiting emperipolesis of plasma cells and lymphocytes (Figure 5 & 6). A diagnosis of Rosai-Dorfman disease was made. Follow up of the patient revealed resolution of bilateral lumps.

Another patient of Rosai-Dorfman disease was a 55 years old female patient with a complaint of lump left breast with a swelling in the left axilla of one month duration. With a clinical impression of carcinoma breast with metastatic lymph nodes, the patient was sent for FNAC. The cytology smears from both the breast and axillary lymph node were highly cellular and were composed of plenty of large histiocytes with voluminous cytoplasm. Many histiocytes showed emperipolesis predominantly of plasma cells and few lymphocytes. Histopathology followed by immunochemistry with S100 and CD 68 confirmed the diagnosis. (Table 3)

DISCUSSION

Granulomatous mastitis is a rare chronic inflammatory lesion of the breast that may mimic malignancy both clinically and radiologically. Common causes of granulomatous mastitis are tuberculosis, idiopathic, subareolar abscess, foreign body reaction (suture and implant-related) and duct ectasia.[5] In the present study, we diagnosed six cases of granulomatous mastitis. Out of these, five cases were tuberculosis mastitis and one case was implant-related granulomatous mastitis.

Breast is a rare site for extra-pulmonary tuberculosis constituting 0.1% of all tuberculosis cases. Tuberculosis of breast is very uncommon even in areas endemic to Tuberculosis.[7] It can be part of a systemic disease or the only manifestation of the disease. Clinically they may form firm to hard fixed lumps with or without ulceration and mimic malignancy. The five cases of tuberculosis in the present study were opined as BI-RAD 4 or 5 on mammography and

suspicious of malignancy on mammosonogram. The cytological picture of tuberculosis mastitis is similar to tuberculosis elsewhere. (Table 1)

Das et al[8] categorized cytological features of Tuberculosis into three groups. Type I indicates the presence of epithelioid granulomas without necrosis, type II is epithelioid granulomas with necrosis, type III is necrosis without epithelioid granulomas. Some pathologists adopted a fourth group comprising poorly developed epithelioid granulomas with predominant neutrophilic infiltrate resembling acute suppuration.

The differential diagnoses to be considered in case of granulomatous mastitis of the breast are fungal mastitis, sarcoidosis, idiopathic granulomatous mastitis. Acid fast staining for tuberculosis bacilli is the gold standard investigation for confirmation.

Breast augmentation surgery is increasing nowadays for cosmetic reasons. Silicone breast implants have been used commonly for breast augmentation in India. Implant rupture is not an infrequent complication resulting in the immune reaction producing granulomas. They can form mass lesions within the breast and mimic neoplastic lesions. Silicone granuloma has characteristic cytological features enabling a specific diagnosis possible in the given clinical setting. The cytology consists of vacuolated histiocytes, multinucleated giant cells and lymphocytes. Presence of extracellular implant in the form of amorphous glassy material is an important clue to the diagnosis.[9,10]

Filariasis is an endemic parasitic disease in coastal parts of India. Wuchereria Bancroft is the causative agent in the majority of cases. Varied species of mosquito acts as a vector and man is the definitive host. After mosquito bite, the microfilaria enters the human blood, where the larvae develop into mature adults in lymphatic channels thus disrupts the lymphatics leading to their blockage.[11] It usually affects lymph nodes and lymphatic channels of lower limbs and genital area. However, filariasis presenting as a breast lump is extremely rare.[12] The clinical and radiological assessment would not be predictable. A clear fluid aspirate with microfilaria larvae on cytosmears is diagnostic. Medical treatment by diethylcarbamazine would resolve the lesion within two weeks and thus avoids unnecessary surgery.

Rosai Dorfman disease, also known as Sinus histiocytosis with massive lymphadenopathy is an uncommon non-neoplastic proliferative histiocytic lesion typically involves bilateral cervical lymph nodes. Extranodal presentation with or without lymph nodal involvement is a well-described entity. It can affect any organ including breast, with only 20 cases of Rosai Dorfman disease involving breast reported in the English literature according to one study.[13]

Clinically and radiologically this lesion can be mistaken for various neoplastic lesions including malignancy. Cytological features are very characteristic and include histiocytes exhibiting emperipolesis of neutrophils, lymphocytes and plasma cells. There will be numerous lymphocytes, histiocytes, plasma cells, and neutrophils. Cytology is virtually diagnostic of this self-limited disease.[14]

The exact etiology of RDD is not known. Various viruses like Human Herpes virus 6, Epstein - Barr virus and recently, polyoma virus were implicated in the causation, but none were proven.[14]

The diagnosis of most inflammatory breast lesions is clinical and usually resolve within a short period. However, rare chronic inflammatory lesions and reactive lesions like RDD with their atypical presentations cause diagnostic dilemmas. FNAC plays a significant role in providing an accurate diagnosis and guiding the management. It is a multidisciplinary approach in conjunction with clinical and radiological findings with high diagnostic accuracy in the assessment of inflammatory breast lesions. Using special stains and submitting the purulent aspirates for culture should be an integral part of the evaluation of granulomatous inflammatory breast lesions.[8]

CONCLUSION

Careful screening of fine needle aspiration cytology smears is helpful in diagnosing inflammatory breast lesions with specific aetiology especially tuberculosis and microfilaria. Similarly, this study showed FNAC is quite useful in diagnosing rare lesions like Rosai Dorfman disease and Implant related granulomatous mastitis. Diagnosis of such cases allows swift and specific medical therapy where possible and prevents subsequent complications of the disease thereby avoiding unnecessary surgical intervention. The utility of FNAC initially started to diagnose malignant lesions got extended to the preoperative evaluation of both benign and malignant lesions.

Sl. No.	Age /sex	Clinical Presentation	Clinical Diagnosis	Radiology	Cytology	Treatment and Follow Up
1.	41/F	4x3 cm firm nodular mass with skin ulcer in Right breast since 2 months.	Breast abscess, ?malignancy	BIRADS 5	Tuberculosis of breast	Responded to ATT
2.	35/F	3x2 cm lump right breast since 1 month, firm and fixed.	? Malignancy	BIRADS 4	Tuberculosis of breast	Responded to ATT
3.	42/F	1x1cm irregular lump in the lower inner quadrant of right breast.	? Fibroadenoma	BIRADS 4	Tuberculosis of breast	Responded to ATT
4.	38/F	3x3 cm firm irregular nodular mass in the central quadrant of left breast	? Malignancy	BIRADS 4	Tuberculosis of breast	Responded to ATT
5.	46/F	3x2 cm lump left breast since one month, firm and fixed.	?Malignancy	----	Tuberculosis of breast	Responded to ATT

6.	28/F	2x1 cm lump in bilateral breasts since 6months.	Benign breast disease	BIRADS 3	Silicon granuloma	Excision done

Table 1. List of the Granulomatous Mastitis Cases with Clinical, Radiological and Cytopathological Finding

Sl. No.	Age /Sex	Clinical Presentation	Clinical Diagnosis	Radiology	Cytology	Treatment and Follow up
1.	33/F	3x2 cm lump left breast, cystic to firm, restricted mobility.	Fibrocystic disease	BIRADS 3	Microfilaria infestation	Medical therapy, swelling subsided.
2.	28/F	2x2 cm lump right breast, cystic, freely mobile.	Fibroadenoma	BIRADS 3	Microfilaria infestation	

Table 2. List of the Microfilaria Breast Cases with Clinical, Radiological and Cytopathological Finding

Sl. No.	Age /Sex	Clinical Presentation	Clinical Diagnosis	Radiology	Cytology	Treatment and Follow up
1.	45/F	Multiple lumps in both breasts since 6 months, firm and fixed.	? Multiple fibroadenoma	BIRADS 2	Rosai dorfman disease	Conservative therapy, doing well.
2.	55/F	4x3 cm lump in the lump left breast and left axilla since 1month	? Malignancy	BIRADS 4	Rosai dorfman disease	Conservative therapy, doing well.

Table 3. A Total of Two Cases of Rosai Dorfman Disease of the Breast with Clinical, Radiological and Cytological Finding

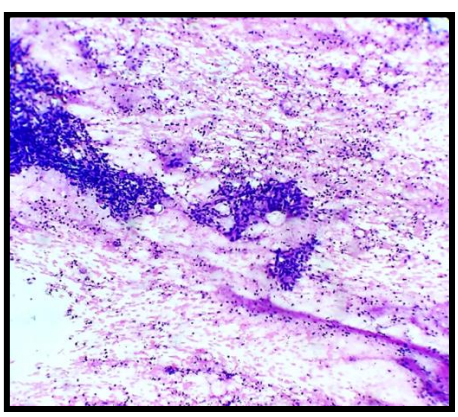

Figure 1. Cytosmears shows Syncytial Clusters of Epithelioid Histiocytes, Lymphocytes with Specks of Caseous Necrosis, in the inset, ZN Stain Shows Faggots of Bacilli within the Macrophage – Suggestive of Tuberculosis of Breast

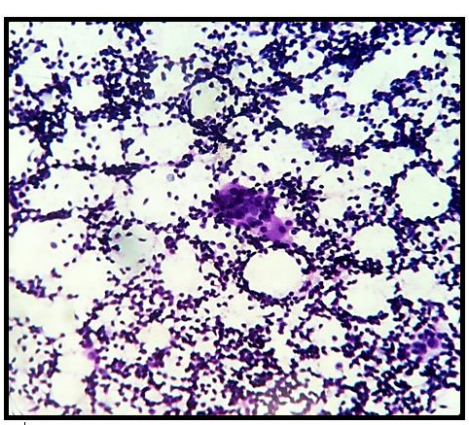

Figure 2. MGG Stain: Cytosmears shows Plenty of Lymphocytes, Syncytial Clusters of Histiocytes, Forming Giant Cells

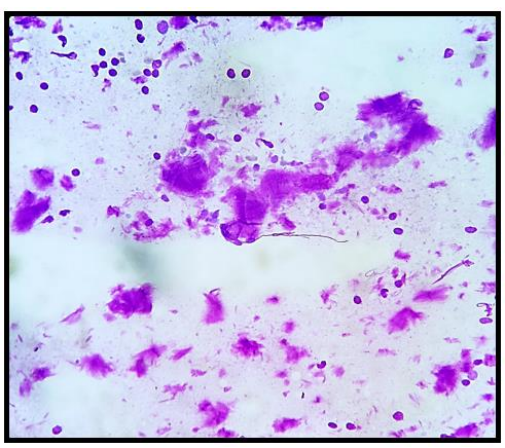

Figure 3. Shows Specks of Thick Eosinophilic Material with Surrounding Lymphocytes. Suggestive of Implant Related Granulomatous Mastitis

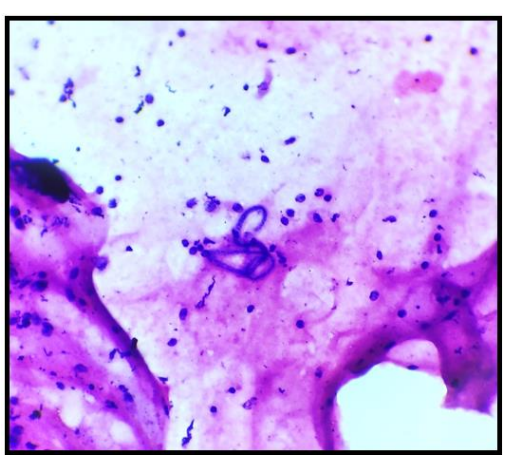

Figure 4. Cytosmears from Breast Lump shows Microfilaria with Surrounding Inflammatory Cells in a Proteinaceous Background. Suggestive of Microfilarial Infestation

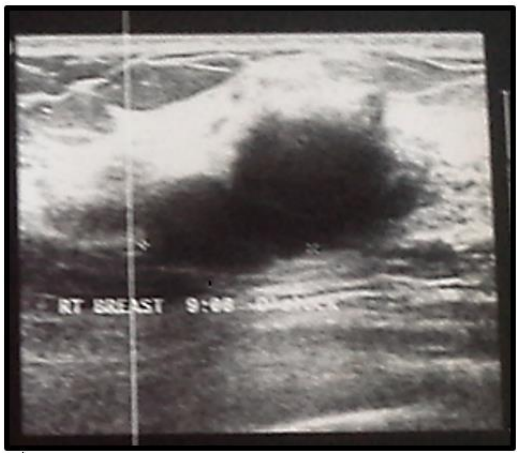

Figure 5. Ultrasound of Right Breast shows Irregular Mass of Size 2x1 cm with Altered Echotexture

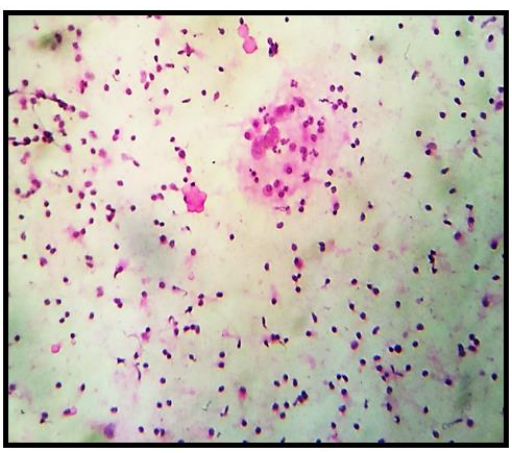

Figure 6. Cytosmear from the Similar Lump Shows Histiocytes with Emperipolesis of Lymphocytes and Plasma Cells Suggestive Rosai Dorfman Disease

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