Cytological evaluation of benign breast lesions with histopathological correlation

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Abstract

Objective: To evaluate diagnostic performance of fine needle aspiration cytology[FNAC] in diagnosis of benign breast lesions.
Methods: Women who had FNAC diagnosis of benign breast lesion were followed up with histopathological evaluation to assess the diagnostic accuracy of FNAC.
Results: Out of sixty benign cases diagnosed on FNAC, fifty eight cases were benign and one case each of mastitis and fibrocystic disease had infiltrating ductal carcinoma on histopathological examination suggesting 96.7% diagnostic accuracy of FNAC in diagnosing benign breast lesions.
Conclusion: The correlation between cytology and histology showed that FNAC is an accurate test in diagnosing and managing benign breast lesions.

Keywords: Breast Lump, FNA, Benign Breast disease.

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Introduction

FNAC has become widely accepted tool for diagnosis of breast lesions as it is safe and simple method with high diagnostic accuracy.[1] At the same time very cost effective and used along with clinical and mammography examination re-operatively.[2] The main aim of FNAC is to separate malignant lesions that require more radical therapy from benign ones that may be conservatively managed[3]. There are various categories of breast lesions depending on risk of development of cancer.

Inflammatory breast disease and non proliferative breast disease do not increase the risk of cancer. Proliferative breast disease without atypia and with atypia confers mild and moderate risk respectively, whereas carcinoma in situ is associated with high risk.[4] There is increasing awareness and the associated anxiety and stress among women, who perceive every symptom in breast as carcinoma, compels the patients to seek medical advice. It is very difficult to determine whether a breast lump is benign or malignant only by clinical assessment.[5] FNAC could provide a diagnosis with only 10-30% of the cost of surgical biopsy [6]. This study intended to look at the distribution of benign lesions in breast using FNAC with histopathological correlation to assess the diagnostic accuracy.

Material and methods

The aim of the study was to know the distribution of various benign lesions in breast lump and to assess the diagnostic accuracy of FNAC in diagnosing the breast lesion by correlating with histopathology in females aged between 10-60 years attending out patient department of Sri Manakula Vinayagar Medical College, Puducherry after ethical committee approval. sixty patients with unknown primary diagnosis of breast lump undergoing FNAC followed by excision biopsy/lumpectomies or mastectomy were included in the study. Patients who did not undergo subsequent histopathological examination were excluded from the study. After taking an informed written consent, the patient was explained the procedure in complete detail. The procedure was performed without any anaesthesia by a trained cytolopathologist. The skin over the lump was cleaned with spirit, held by hand and stabilized. With the plunger retracted, many passes were made in the lump till sufficient material was seen in the needle hub. Air was aspirated in the syringe and after attaching the needle again the aspirated material was expelled onto slides. Six to eight slides were prepared for each patient. One of the smears was wet fixed in 95% methanol and stained with Hematoxylin and Eosin (H&E). The air dried smears were stained with Giemsa stain. All the cases were correlated histopathologically.

Results

All the Sixty patients underwent a diagnostic FNAC in our pathology department following which all underwent an exicisional surgical procedure after

admission to hospital. Excised specimens obtained were subjected to histopathology. The FNAC report was correlated with the final histopathology report and statistical tests were used to interpret the results. Out of sixty benign cases diagnosed on FNAC, fifty eight cases were benign suggesting 96.7 % diagnostic accuracy of FNAC in diagnosing benign breast lesions. The age groups were divided as 10-19, 20-29, 30-39, 40-49 and above 50 years. Of these groups, 20-29 group was largest. Thirty eight were between 20-29 years, twelve between 30-39, four between 10-19 years, six between 40-49 and above 50 years. Only two cases diagnosed as fibrocystic disease had family history of breast disease. Right sided lesion was seen in twenty eight and left sided lesion in thirty two cases. FNAC was done in sixty cases with breast disease, thirty nine of them had fibroadenoma, two had mastitis, benign breast disease in seven cases, ten had fibrocystic disease, one case of phyllodes and only one had fibroadenosis.

diagnostic accuracy of 96.7% for benign breast disease on FNAC. Out of Thirty nine cases of fibroadenoma diagnosed on FNAC, thirty seven was fibroadenoma and two cases had features of both fibroadenoma and fibrocystic disease with diagnostic accuracy of 100%. Out of 10 cases of fibrocystic disease diagnosed on FNAC, eight was fibrocystic disease, one had features of both fibrocystic disease and fibroadenoma and one case had infiltrating ductal carcinoma of breast on histology with diagnostic accuracy of 90%. Seven cases of benign proliferative breast disease had similar features on histology with diagnostic accuracy of 100%. One case each of fibroadenosis and phyllodes tumor on FNA had similar features on histology with diagnostic accuracy of 100%. Out of two cases of mastitis, one was mastitis and other one was infiltrating ductal carcinoma of breast on histology with diagnostic accuracy of only 50%. Of all the benign breast lesions diagnosed on FNAC, only two had malignancy.

Table 1: Cytological Diagnoses of Breast diseases included in the study

Cytological Diagnosis	No. of Cases
Fibrocystic disease	10
Fibroadenoma	39
Benign Proliferative Disease	7
Fibroadenosis	1
Mastitis	2
Phyllodes tumor	1

Table 2: Histopathological correlation of cases diagnosed as benign on cytology

Breast Lesion	Cytology	HPE
Fibroadenoma	39	37
Fibrocystic disease	10	8
Fibroadenoma and fibrocystic disease	0	3
Benign Proliferative Breast Disease	7	7
Mastitis	2	1
Fibroadenosis	1	1
Phyllodes tumor	1	1
Infiltrating Ductal carcinoma	0	2

Out of sixty cases with benign breast disease observed in cytology, fifty eight cases showed benign breast disease on histopathological evaluation with
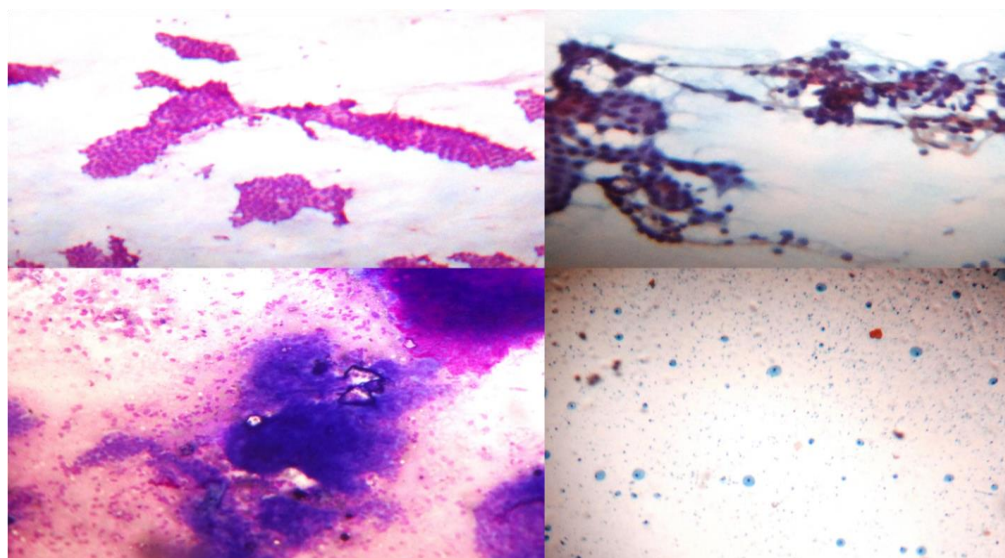

Fig. 1: Upper right (H&E, 4x magnification) showing branching monolayered sheets of ductal epithelial cells in the background of bare nuclei in fibroadenoma. Upper left (pap, 4x magnification) showing ductal epithelial cells with apocrine cell change along with cyst macrophages in fibrocystic disease. Lower right(leishman, 4x magnification) showing sheets of degenerated neutrophils in Mastitis. Lower left(pap, 4x magnification) showing cyst macrophage and squamous epithelial cells in Duct ectasia.
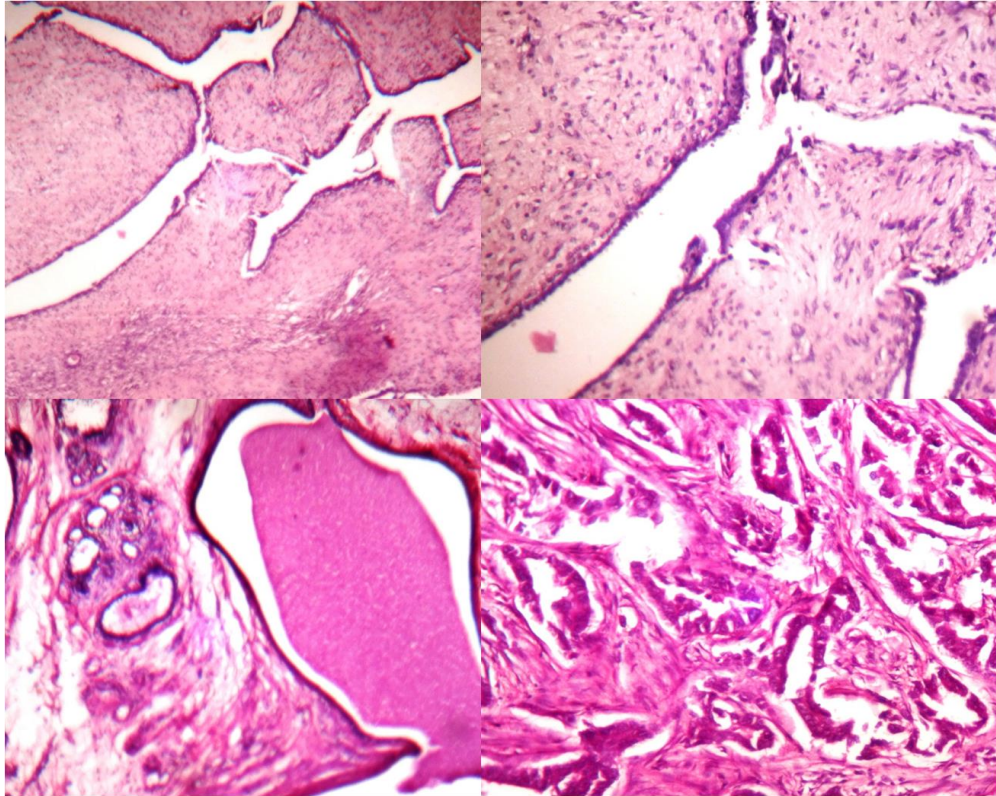
Fig. 2: Upper right & left (H&E, 4Xx & 10x magnification) showing leaf like pattern with extensive stromal proliferation lined by ductal epithelial cells in phyllodes tumor. Lower right (H&E, 10X magnification) showing cystic change and duts lined by apocrine cells in fibrocystic disease. . Lower left (H&E, 10X magnification) showing pleomorhic ductal epithelial cells in cords and ductular pattern surrounded by desmoplastic reaction.

Discussion

The results of our study showed FNA of breast lump to be a reliable method to diagnose breast lump with high accuracy. Triple assessment by clinical, radiological and FNAC can produce 99% accuracy for both benign and malignant lesions as false negative results can mislead a clinician and cause a delay in appropriate investigation, diagnoses, and treatment.[7] Different studies have shown that the most common lesions are benign. Early screening and diagnosis of breast lesions and categorization into different groups of breast pathology can be helpful in accurate management of the breast lesions. [8]

Akçil et al. in his meta-analysis noted 72%–95% diagnostic accuracy on review of literature. Our study showed slightly higher accuracy than the range reported.[9] The overall false negative rate in our study was 3.3% within the range reported in other studies, 2.5-17.9% reviewed by Chaiwun et al.[10] All false negative cases had histopathologic diagnoses of infiltrative ductal carcinoma as noted by Sudarat et al.[11] Factors contributing to false negative results may be due to small tumor size; hypocellularity and inadequate sampling during aspiration; interpretative problems; particular histologic tumor types, such as, low nuclear grade carcinoma or scirrhous tumors.[12] The accuracy of FNAC for obtaining a definite diagnosis also depends on the palpability of the lesion. Accuracy rate reported for FNAC is 34–58% for non-palpable breast lesions, whereas accuracy rate for core needle biopsy is 94%.[13,14] FNAC has some pitfalls in the diagnosis of fibrocystic disease, adenosis, epithelial hyperplasia with or without atypia, apocrine metaplasia, radial scar, and papilloma, which may have to be correlated with imaging studies to rule out malignancy.[15]

However, FNAC in the context of a rapid assessment of Breast lesions allows the same day diagnosis and early treatment of breast cancer, with the immediate reassurance and discharge of those with benign disease. When a large majority of patients have benign disease, FNAC provides an equivalent, if not better, method of evaluation of patients in a triple assessment.[16] FNAC is not only useful in diagnosis and further planning of treatment without need for biopsy, but also helpful in prognostication of the tumor factors such as nuclear grading, mitotic index, hormone receptor status and DNA contents.[17] Breast lesions represents a major public health problem. FNAC is ideal for use in resource-limited health settings as well.[18] Recently, cytopuncture or Non aspiration cytology has gained popularity because of its ease of use, interpretation of results , its safety & claims that it

yields specimens of superior diagnostic accuracy. [19] However FNAC is widely used technique.[1]

Conclusion

There are various techniques in diagnosing varied pathology in breast. FNAC is a highly reliable tool in the assessment of breast lump for the differential diagnoses of benign from malignant tumor without any surgical intervention. It has advantage of being highly accurate in expert hands, cost-effective and can be done as Out-patient procedure. It can be an excellent diagnostic modality in the context of a multidisciplinary approach. The current study showed that FNAC is a reliable method.

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