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Original Research Article

A 2 year retrospective study of cyto-histopathological correlation of breast lesions at a tertiary hospital: A study of 200 cases

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Abstract

Background:

Breast lesions constitutes a major public health problem worldwide, both in developed as well as in developing countries. A palpable breast lump, whether benign or malignant, is a cause of great anxiety to the patient. Thus, the need arises to distinguish benign from malignant lesions, prior to definitive treatment.

The National Health Services Breast Screening Program recommends Fine Needle Aspiration Cytology (FNAC) as a non-operative diagnostic tool. One of the major goals of FNAC is to differentiate benign from malignant lesions.

Aim & Objectives:

1. To diagnose any palpable lump of the breast in females by FNAC
2. To correlate Cytological findings with histopathological results.

Methods and Materials: Retrospective study done at department of pathology at a tertiary centre, Karnataka for 2 years (2018-2019). FNAC of the breast lesions done and the excision biopsy of the same specimen sent for histopathological examination were taken in this study.

Results: In this study, a total of 200 cases on cytology were correlated with their histological diagnosis. Fibroadenoma (116 cases) being the most common benign lesion and intraductal carcinoma (29 cases) being the most common malignant breast lesion.

Conclusion: FNAC is a reliable tool to rule out benign from malignant lesions and shows high concordance with the histopathological reports. Therefore cytology can play a vital role in the evaluation and management of the patients with palpable breast mass.

Keywords: breast lesions, cyto-histopathological correlation and Fibroadenoma

Introduction

Breast carcinoma is the most common leading cause of cancer death in women worldwide. Triple assessment of breast lesion is practiced worldwide for definitive diagnosis. It comprises of clinical examination, imaging and cyto-histological diagnosis. FNAC is a cheap, readily available, relatively painless, repeatable and patient-friendly investigation with good sensitivity and specificity. FNAC does not yield a tissue diagnosis as opposed to core biopsy,

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however, a well-performed FNAC and reporting by an expert pathologist help to avoid unnecessary surgeries in benign lesions where only conservative management or elective surgery is needed [1]. Hence, we have conducted this study with an objective to co-relate FNAC and histology findings in a breast.

Aim & Objectives

1. To analyze any palpable lump of the breast in females by FNAC.
2. To correlate cytological findings with histopathological results.

Materials and Methods

In this 2-year retrospective study, 200 cases were examined from January 1, 2018, to December 31, 2019 at our institute.

Inclusion criteria

- All OPD and IPD cases of palpable breast lesions were included. Histopathological correlation was done wherever possible.

Exclusion criteria

- Inadequate smears
- Non co-operative patients with clinically palpable breast lumps.

A detailed complete clinical history were taken of 200 cases and complete evaluations were done by doing all routine investigations. After doing local examination, procedure was explained to patients in their local understandable language and consents were obtained. Lesions were localized and under aseptic precautions, aspiration was done with a 22 G needle and 5 ml syringe. Smears were prepared by evenly spreading the material. Patients were then observed for 15– 20 minutes, after the procedure for any complications. Both air dried and alcohol fixed smears (smears were immediately fixed in 95% ethyl alcohol) were prepared. Alcohol fixed smears were stained with Papanicolaou stain, Hematoxylin and Eosin stain. Air dried smears were stained with Giemsa stain. Ziehl-Neelson stain was done when required.
Surgical excision was done in 200 patients after pre-operative FNAC. Surgically resected specimens were subjected to gross examination and fixed in 10% formalin for 24 to 48 hours. After fixation, representative areas were selected for paraffin embedding. Paraffin blocks were prepared and sections of 5-7 μ thick were cut and stained with Hematoxylin and Eosin stain.
The cytological and histopathological study were done separately and the results of both were correlated to evaluate the accuracy of the procedure. Data was analysed using suitable descriptive studies.

Results

A total of 200 cases of female breast FNAC's during the period of 2 years from January 1st 2018 to December 31 2019 were taken which showed histopathological correlation. Aspirates obtained were satisfactory in all of the cases. The age at presentation ranged from 13 years to 80 years with a mean age of 46.5 years. Benign lesions were more common in 21–30 years and malignant lesions in 41–50 years. (Table. 1)

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Table 1: Age Distribution

Age group	Frequency	Percent
</=20	33	16.5
21-30	56	28.0
31-40	68	34.0
41-50	21	10.5
51-60	14	7.0
61-70	07	3.5
>80	01	0.5
Total	200	100.0

Fibroadenoma being the most common benign breast lesion noted which accounted for a total of 116 cases. Of these 116 cases, 104 cases were concordant on FNAC and HPE, 12 cases of fibroadenoma on FNAC, was reported as fibrocystic disease in 5 cases, 4 as phyllodes,1 each as tubular adenoma, lactating adenoma and IDC on HPE.

This is followed by Intraductal carcinoma which accounted for 29 cases. 28 cases were concordant on both the FNAC and HPE, 1 case turned out to be Phyllodes tumor on HPE.

12 cases of Fibrocystic disease was noted on FNAC, of which 6 cases were concordant and 3 cases turned out to be fibroadenoma,1 case each as duct ectasia, duct papilloma and IDC on HPE.

6 cases were diagnosed as phyllodes on FNAC and 4 cases were concordant and 2 cases turned out to be fibroadenoma. 6 cases were diagnosed as granulomatous mastitis and was concordant with 5 cases, and 1 was discordant showing as chronic nonspecific mastitis.

4 cases of ductal papilloma which was diagnosed on FNAC, all showed discordant results. 3 were diagnosed as fibroadenoma and 1 case as duct ectasia on HPE.

1 case each of duct ectasia, benign epithelial hyperplasia and benign cyst on FNAC was reported as FCD, fibroadenoma, IDC on HPE respectively.

3 cases of ADH on FNAC, showed discordant results on HPE as 2 cases of fibroadenoma and 1 cases as IDC.

2 cases of galactocele on FNAC showed, 1 case as phyllodes tumor and another case as galactocele on HPE.

4 cases of suspicious for malignancy on FNAC, of which 2 cases were diagnosed as IDC, and 1 each as phyllodes and UDH on HPE.

3 cases of UDH on FNAC showed discordant results on HPE as FCD, Fibroadenoma, IDC of 1 case each.

2 cases which was reported as unsatisfactory were diagnosed as FCD and tubular adenoma on HPE.

1 case of mucinous carcinoma on FNAC was reported as IDC on HPE.

3 cases of suppurative mastitis and 1 case each of invasive micropapillary carcinoma, infiltrating lobular carcinoma, IDC with lymphnode metastasis, breast abscess and fibroadenosis on FNAC showed concordance with HPE results.

Discussion

FNAC of breast lumps is an important diagnostic tool for the pre-operative diagnosis of breast neoplasm. It provides rapid and accurate diagnosis and has become a cost effective tool for the treatment of breast lesions.

Factors contributing - Good aspiration experience, skill full cytological interpretation and analysis based upon correlation of cytological as well as histopathological and clinical information in the context of the patient

In our study, 200 cases were studied and analyzed. We came across different breast

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lesions of benign and malignant. In this study, age ranged from 13 to 80 years. A maximum number of cases were seen in 21–30 years age group which is also seen in other studies [1, 2, 3, 4]. The most common age group was second decades for benign breast lesions and fourth decades for malignant breast lesions.

Upper outer quadrant of the breast most commonly involved which is also similar findings in other studies [15, 6, 7, 8].

In the present study, the most common benign lesion was fibroadenoma and the most common malignant lesion was infiltrating duct carcinoma (IDC).

Fibroadenoma can sometimes shows epithelial cells with apocrine differentiation, with large number of foamy macrophages, could be confused as cystic component and misdiagnosed as FCD and atypia in the epithelial component can mimic carcinoma. On the benign and borderline end of the spectrum, fibroadenoma and phyllodes cytological features overlap. Classic cytological features in phyllodes tumor are similar to fibroadenoma, however assail to fibroadenoma, stromal fragments are larger, increase in number (Stromal overgrowth) and are hypercellular. To avoid overdiagnosis of malignancy, as a general rule, a definitive malignant diagnosis should not be given if smears include more than few clearly benign elements in addition to the atypical cells [12].

Cases which are diagnosed as fibroadenoma showed large branching sheets of uniform ductal epithelial cells. The characteristics feature is the detachment of the oval naked nuclei from cell clusters and sheets and fragments of fibromyxoid stroma are seen. Malignant smears are cellular, with atypical ductal epithelial cells arranged in dyscohesive clusters and also in singles, hyperchromasia and membrane irregularity is seen. Similar findings were seen by many authors [7, 8, 9, 10].

The false-negative report may be due to technical failure as normal breast part only may have got aspirated or due to small size of the tumor, hypocellularity, inadequate aspiration, insufficient experience of a pathologist, poor technique in performance of FNAC or due to the type of lesion itself [2, 11, 12].

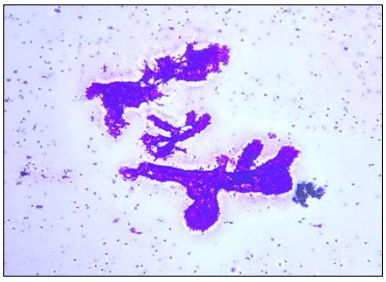

Fig 1: FIbroadenoma, Low magnification. Ductal cells are arranged in branching antler horn clusters (H&E)

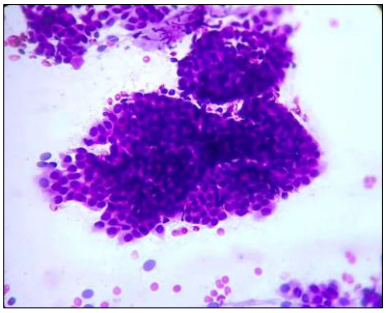

Fig 2: Fibroadenoma 40x. Tight cohesive cell clusters with minimal nuclear atypia is the hall mark of fibroadenomas. Stripped naked nuclei and bipolar cells in the background are noted

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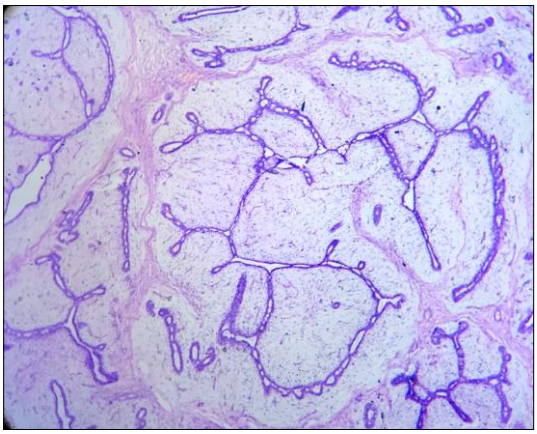

Fig 3: Fibroadenoma, Low magnification. H&E section Shows intracanalicular pattern in which epithelial elements are compressed into slit like luminal spaces by proliferative stroma

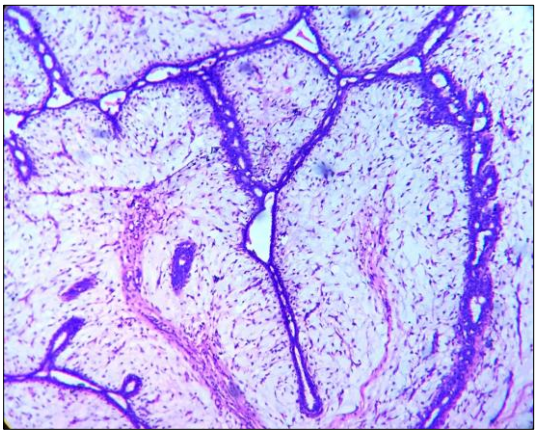

Fig 4: Fibroadenoma, 10x. H & E section shows intracanalicular growth pattern. No stromal atypia or mitotic activity seen

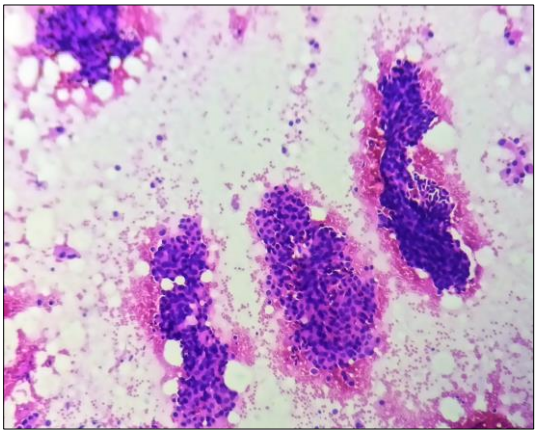

Fig 5: Intraductal carcinoma, 10x. H&E smears are hypercellular showing loosely cohesive clusters and in singles

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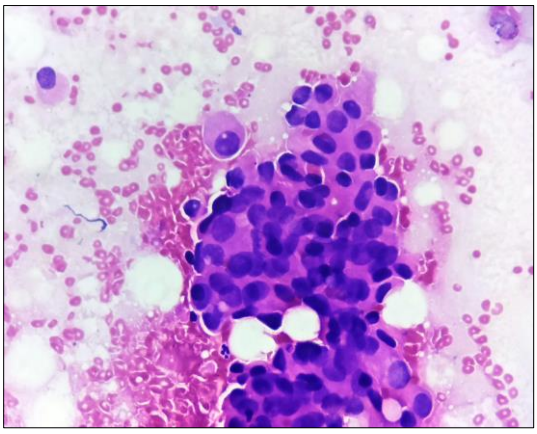

Fig 6: Intraductal carcinoma, 40x. Note the pronounced nuclear atypia and pleomorphism

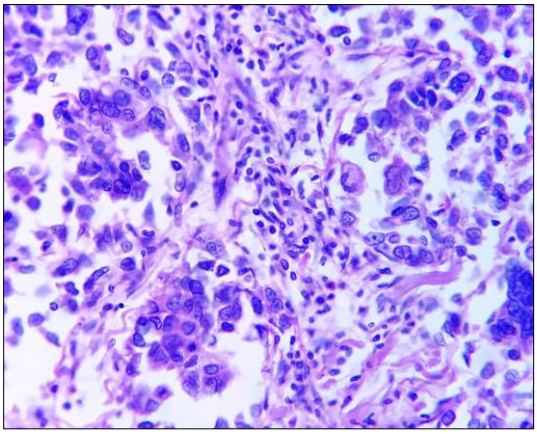

Fig 7: Intraductal carcinoma, 40x. H&E sections shows pleomorphic cells arranged in nests or cords with moderate eosinophilic cytoplasm, Hyperchromatic nuclei and prominent nucleoli

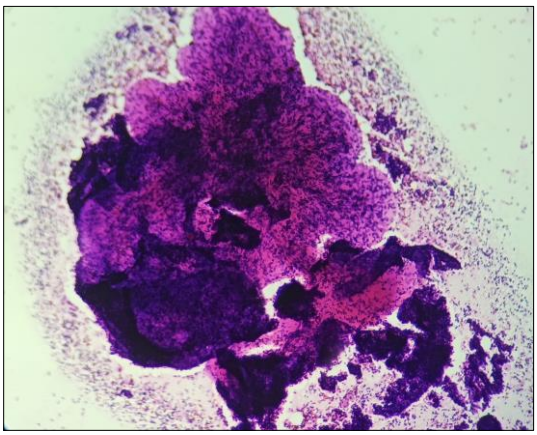

Fig 8: Phyllodes tumor, 4x. H&E smears shows epithelial clusters resembling those of fibroadenoma, but are more crowded. Stromal clusters are very cellular.

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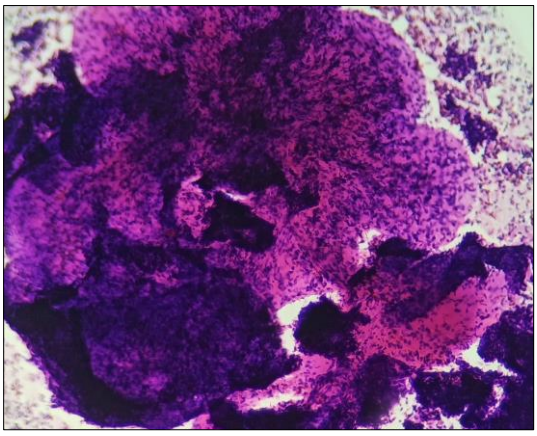

Fig 9: Phyllodes tumor. 40x. Note the pronounced stromal hypercellular and tight clusters of epithelial cells. (H&E

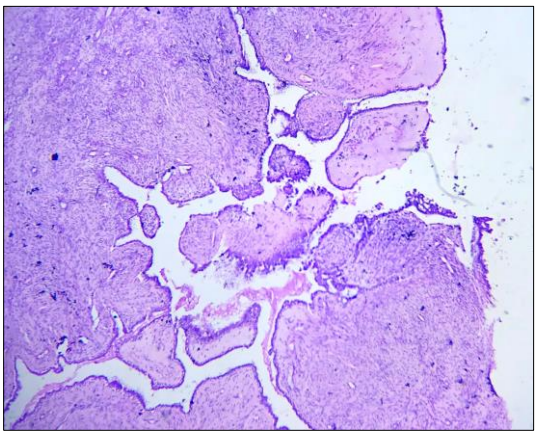

Fig 10: Phyllodes tumor, 10x. H&E section shows well developed leaf like architecture with marked stromal hypercellularity.

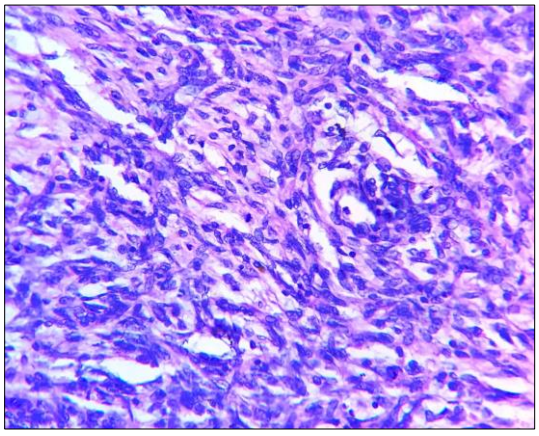

Fig 11: Borderline Phyllodes tumor, 40x. H&E section shows Stromal overgrowth and mitotic activity

Conclusion

Palpable breast masses are one of the most common presentation at an OPD. So proper evaluation of a breast lump is very much essential as a part of patient management.

FNAC is an important preliminary diagnostic test in palpable breast lumps, the results show a high degree of concordance with a final histopathological report. This proves that cytological diagnosis by FNAC are extremely helpful in the evaluation of breast lump and management.

A benign diagnosis allows a time period in which a surgery can be planned, and a positive diagnosis of carcinoma on cytology allows for preoperative diagnosis and counselling of the patient for further planning of the surgery or neoadjuvant therapy, thereby reducing the morbidity.

Table 2: Cyto-histo correlation

Cyto diagnsosis	HPE diagnosis																		Total
	Breast abscess	Chronic nonspecific mastitis	Duct ectasia	Ductal papilloma	FCD	Fibroadenoma	Fibroadenosis	Galactocele	Granulomatous mastitis	IDC	IDC with LN mets	ILC	Invasive micropapillary ca	Lactating adenoma	Phyllodes tumor	Suppurative mastitis	Tubular adenoma	UDH	
ADH	0	0	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	3
Benign cyst	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Benign epithelial hyperplasia	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
breast abscess	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Duct ectasia	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Duct papilloma	0	0	1	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	4
FCD	0	0	1	1	6	3	0	0	0	1	0	0	0	0	0	0	0	0	12
Fibroadenoma	0	0	0	0	5	104	0	0	0	1	0	0	0	1	4	0	1	0	116
Fibroadenosis	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Galactocele	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	2
Granulomatous mastitis	0	1	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	6
IDC	0	0	0	0	0	0	0	0	0	29	0	0	0	0	1	0	0	0	30
IDC with LN mets	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
ILC	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Invasive micropapillary ca	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
mucinous carcinoma	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Negative for malignancy	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Phyllodes tumor	0	0	0	0	0	2	0	0	0	0	0	0	0	0	4	0	0	0	6
Suppurat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3

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ive mastitis																			
Suspicious for malignancy	0	0	0	0	0	0	0	0	0	2	0	0	0	0	1	0	0	1	4
UDH	0	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	3
Unsatisfactory	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	2
Total	1	1	2	1	14	116	1	1	5	36	2	1	1	1	11	3	2	1	200

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