



## A CLINICOPATHOLOGICAL STUDY OF PALPABLE BREAST LUMPS BY FNAC WITH HISTOPATHOLOGICAL CORRELATION

**Dr Hazrat Billal\*** 3<sup>rd</sup> year PGT, Department of Pathology, FAAMCH, Barpeta\*Corresponding Author

**Dr Sabari Devi** Professor, Department of Pathology, NMCH, Nalbari

**Dr Balmiki Datta** Professor and HOD, Department of Pathology, FAAMCH, Barpeta

**ABSTRACT** **BACKGROUND:** Breast Lump is the commonest presenting symptom in various types of Breast lesions. FNAC is performed as a pre-operative test to evaluate breast lump. **Aim and Objective:** To study the correlation between diagnostic accuracy of FNAC and histopathology in palpable breast lumps. **Materials & Methods:** The present study included 148 cases at FAAMCH, Barpeta. FNAC was done on 128 patients and 90 cases were undergone surgery. 70 cases had both FNAC and HPE reports. **Results:** Out of 128 cases on FNAC, 96 cases (75%) were diagnosed as benign and 32 cases (25%) were diagnosed as malignant. The sensitivity, specificity, positive predictive value, negative predictive value and accuracy was 92.86%, 91.07%, 72.72%, 98.1% and 92% respectively. **Conclusion:** FNAC serves as a rapid and reliable tool for the diagnosis of palpable breast lesion.

**KEYWORDS :** Breast lumps, FNAC, HPE, benign and malignant.

### INTRODUCTION

Breast lump is defined as the development of tissue within the breast. A breast lump is any discrete mass that is noticed by a patient, significant other, or physician. In both males and females, benign lesions are far more common than malignant lesions. 60 to 80% of all breast lumps are benign. The most common concern, however, is that a particular lump may be the first sign of breast cancer. [1,2]

Fibroadenomas are typically found in young women and have the consistency of a handball. They are mobile, solid, firm, well-defined masses that are usually painless. [1,2]

Breast cancer presents as a lump or mass in the breast in approximately 90% of patients. The lesions are typically solitary, unilateral, irregular, hard, nonmobile, and painless. [1,2]

Breast carcinoma is the most common malignant tumour in women and the leading cause of cancer death. Carcinoma of the breast is the most commonly diagnosed cancer in women (24.2%), that is about one in 4 of all new cancer cases diagnosed in women worldwide are breast cancer and is the leading cause of cancer death in women (15.0%), followed by lung cancer (13.8%) and colorectal cancer (9.5%). [3] It has been ranked number one cancer among Indian females with age adjusted rate as high as 25.8 per 100,000 women and mortality 12.7 per 100,000 women. [4] Fine needle aspiration cytology (FNAC) is a reliable method for evaluating and diagnosing palpable breast masses. [5] The prognostic and therapeutic implications of estrogen receptor (ER), progesterone receptor (PR) and Her2/neu expression in breast cancer have been studied extensively. Up to 75% of primary breast carcinomas express ER, about 50% co-express PR and about 20% have no ER or PR expression. [6]

### AIMS AND OBJECTIVES

- To determine the type of breast lesions on FNAC.
- To correlate the findings of FNAC with histopathology.
- To see the expression of IHC marker (ER, PR and HER 2/neu) on malignant breast lesions.

### MATERIALS AND METHOD

The present study included 148 cases presenting with palpable breast lump at FAAMCH, Barpeta from September 2021 to August 2022. FNAC was done on 128 patients and 90 cases had undergone lumpectomy or mastectomy. In 70 cases, fine needle aspiration cytology (FNAC) and histopathology were correlated. Immunohistochemistry was done on histopathologically confirmed malignant (21) cases.

### RESULTS AND OBSERVATIONS

The final observations and results were tabulated below:

**Table 1: Distribution of breast lesions on FNA.**

| FNAC Diagnosis | Number | Percentage |
|----------------|--------|------------|
|----------------|--------|------------|

|                                                |     |       |
|------------------------------------------------|-----|-------|
| Fibroadenoma                                   | 63  | 49.22 |
| IDC                                            | 30  | 23.44 |
| Acute Suppurative lesion                       | 10  | 7.81  |
| Fibrocystic disease                            | 9   | 7.03  |
| Gynaecomastia                                  | 3   | 2.34  |
| Atypical ductal hyperplasia                    | 2   | 1.56  |
| Benign proliferative lesion                    | 2   | 1.56  |
| Lactating change                               | 2   | 1.56  |
| Lipomatous lesion                              | 2   | 1.56  |
| Benign phyllodes tumour with cystic changes    | 1   | 0.78  |
| Galactocele                                    | 1   | 0.78  |
| Granulomatous lesion                           | 1   | 0.78  |
| Ca breast (? Lobular)                          | 1   | 0.78  |
| Cat V, Colloid or Mucinous Carcinoma of breast | 1   | 0.78  |
| Grand total                                    | 128 | 100   |

**Table 2: Distribution of breast lesions on HPE.**

| HPE Diagnosis                                       | Number | Percentage |
|-----------------------------------------------------|--------|------------|
| Fibroadenoma                                        | 59     | 65.56      |
| IDC                                                 | 17     | 18.89      |
| Fibrocystic disease                                 | 3      | 3.33       |
| Benign phyllodes tumour                             | 3      | 3.33       |
| Gynaecomastia                                       | 2      | 2.22       |
| Galactocele                                         | 1      | 1.11       |
| Carcinoma with Medullary feature                    | 1      | 1.11       |
| Invasive Lobular Carcinoma with perineural invasion | 1      | 1.11       |
| Paget disease of breast with IDC                    | 1      | 1.11       |
| Mucinous Carcinoma                                  | 1      | 1.11       |
| Periductal Mastitis                                 | 1      | 1.11       |
| Grand total                                         | 90     | 100        |

**Table 3: Cyto-histological correlation of lesion.**

| Breast lesion               | Number of cases | FNAC | HPE                              |
|-----------------------------|-----------------|------|----------------------------------|
| Atypical ductal hyperplasia | 1               | 1    | Diagnosed as Fibrocystic disease |

|                             |    |    |                                                                                                        |
|-----------------------------|----|----|--------------------------------------------------------------------------------------------------------|
| Benign proliferative lesion | 1  | 1  | Diagnosed as Benign Phyllodes tumour                                                                   |
| Fibroadenoma                | 50 | 50 | 49 cases diagnosed as Fibroadenoma, 1 case diagnosed as Benign Phyllodes tumour                        |
| Fibrocystic disease         | 2  | 2  | 1 case diagnosed as Fibrocystic disease, 1 case diagnosed as IDC                                       |
| Gynaecomastia               | 2  | 2  | 2                                                                                                      |
| IDC                         | 13 | 13 | 11 cases diagnosed as IDC-NST, 1 case diagnosed as Mucinous Carcinoma, 1 case as atypical fibroadenoma |
| Benign Phyllodes Tumour     | 1  | 1  | 1                                                                                                      |
| Total                       | 70 | 70 | 70                                                                                                     |

**Table 4: ER, PR and HER 2 expression on malignant lesions of breast.**

| Hormonal Status | N  | %      |
|-----------------|----|--------|
| ER/PR (++)      | 14 | 66.67% |
| ER/PR (+-)      | 2  | 9.52%  |
| ER/PR (-+)      | 0  | 0%     |
| ER/PR (--)      | 5  | 23.81% |
| Her2 (+)        | 5  | 23.81% |
| ER/PR/Her2(---) | 3  | 14.29% |

Out of 128 cases on FNAC, 96 cases (75%) were diagnosed as benign and 32 cases (25%) were diagnosed as malignant. Out of 70 cases correlated on HPE, 1 case was false negative and 1 case was false positive for malignancy. The sensitivity, specificity, positive predictive value, negative predictive value and accuracy was 92.86%, 91.07%, 72.72%, 98.1% and 92% respectively. Significant level of P was <0.0001.

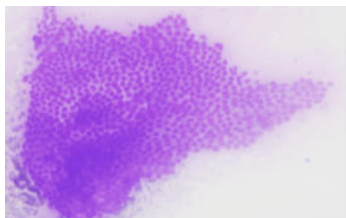
In present study, out of all 21 malignant cases diagnosed on HPE, 14 cases (66.67%) expressed ER/PR (++), 2 cases (9.52%) expressed ER/PR (+-), 5 cases (23.81%) expressed ER/PR (--). HER 2/neu (+) expression was found in 5 cases (23.81%). Triple negative (ER/PR/HER 2/neu negative) expression was found in 3 cases (14.29%).

In present study, out of the 21 malignant cases in which IHC were done; ER and PR were positive in 76.19% and 66.67% respectively. Both ER and PR were negative in 23.81% cases.

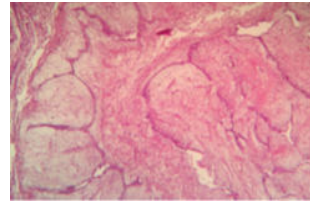
The HER2-positive was found in 5 cases (23.81%) of malignant breast tumours. Out of these 5 cases (3.81%), 4 cases (80%) were grade 3 IDC-NST and 1 case (20%) was Paget disease of nipple.

Triple negative marker (ER-, PR- & Her2 -) was found only in 3 cases (14.29%) of malignant breast tumours. Out of these 3 cases (14.29%), 2 cases (66.67%) were grade 3 IDC-NST and 1 case (33.33%) was carcinoma with medullary feature.

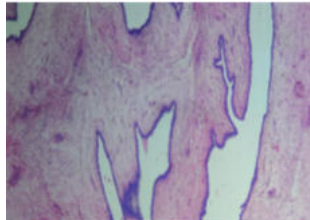
We had found 1 case (1.11%) of mucinous carcinoma and 1 case (1.11%) of lobular carcinoma, both showed ER+, PR+, Her2-.



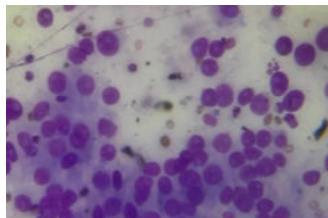
**Figure 1: PHOTOMICROGRAPH OF FIBROADENOMA: MGG staining of FNAC smear shows aggregation of cohesive ductal epithelial cells (40X).**



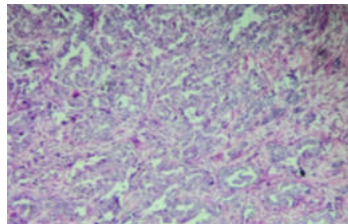
**Figure 2: PHOTOMICROGRAPH OF FIBROADENOMA: Histology shows Proliferation of intralobular stroma surrounds, pushes and distorts the associated epithelium (H&E-10 X).**



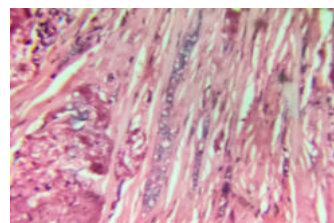
**Figure 3: PHOTOMICROGRAPH OF BENIGN PHYLLODES TUMOUR: Histology shows increased stromal cellularity and overgrowth, giving cleft-like architecture (10 X).**



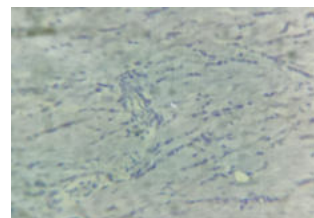
**Figure 4: PHOTOMICROGRAPH OF DUCTAL CARCINOMA: Poorly cohesive malignant ductal epithelial cells, single and in clusters; obvious nuclear enlargement and pleomorphism and containing prominent nucleoli (MGG-40 X).**



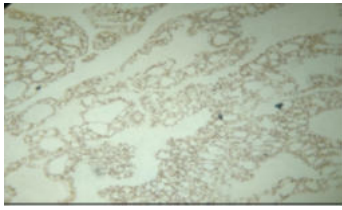
**Figure 5: PHOTOMICROGRAPH OF INVASIVE DUCTAL CARCINOMA: The closely packed neoplastic cells arranged in sheets. Tubular arrangement was seen in 10 - 75% of the tumour. [H&E, 10X]**



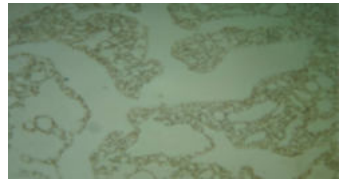
**Figure 6: PHOTOMICROGRAPH OF INVASIVE LOBULAR CARCINOMA: Indian file pattern of growth of tumour cells [H&E- 40X].**



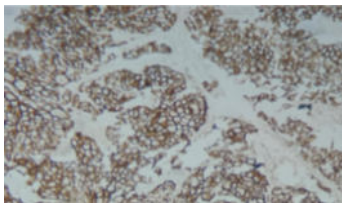
**Figure 7: Expression of E-cadherin negativity in Invasive Lobular Carcinoma [40X].**



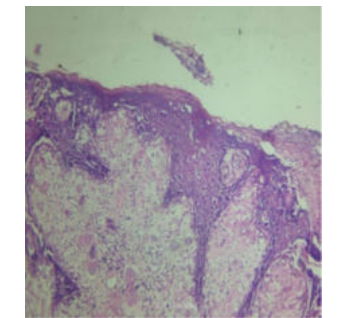
**Figure 8: Expression of ER positivity in IDC [10X].**



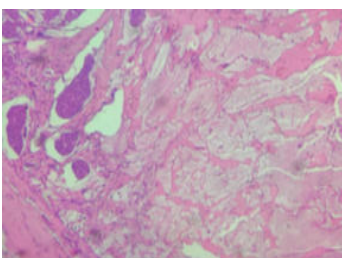
**Figure 9: Expression of PR positivity (nuclear positivity) in IDC [10X].**



**Figure 10: Expression of HER 2/neu positivity (membrane positivity) in IDC [10X]**



**Figure 11: PHOTOMICROGRAPH OF PAGET DISEASE OF NIPPLE: Histologically, epidermis contains clusters of ductal-type epithelial cells that are larger than usual ductal epithelial cells and have abundant pale cytoplasm [H&E-10X].**



**Figure 45: PHOTOMICROGRAPH OF MUCINOUS CARCINOMA OF BREAST: Clusters of well-differentiated tumour cells are seen floating in a pool of mucin, [H&E-10X].**

### Discussion

The present study was undertaken to evaluate the lesion of breast lump by FNAC and the cytological findings were studied and correlated with histopathology wherever available. The FNAC of breast lump was performed in 128 patients in the Department of Pathology FAAMCH, Barpeta for a period of one year from September 2021 to August 2022 of which 70 patients underwent surgery (lumpectomy or mastectomy). Immunohistochemistry was performed in malignant cases found in histopathology.

A comparison of various parameters in our present study were done with that of studies by other authors.

In the present study, the various benign breast lesions on FNA were Fibroadenoma, Fibrocystic disease, Lactating changes, Benign Phyllodes tumour, Gynaecomastia and Galactocele constituted 49%, 7.09%, 1.56%, 0.78%, 2.34% and 0.78% respectively, which is similar with other studies done by Sahil I. Panjvani et al (2013) <sup>[7]</sup> and S Chandanwale et al (2013) <sup>[8]</sup>

In the present study, the various benign breast lesions on HPE were Fibroadenoma, Fibrocystic disease and Benign Phyllodes, Galactocele and Gynaecomastia constituting 45.97%, 3.33%, 3.33%, 1.11% and 2.22% respectively, which is similar with other studies done by V Pandey et al (2017) <sup>[9]</sup> and R Agarwal et al (2017). <sup>[10]</sup>

In the present study, the various malignant breast lesions on FNAC were IDC, Lobular carcinoma and Mucinous carcinoma constituting 23.44%, 0.78% and 0.78% respectively, which is similar with other studies done by Sahil I. Panjvani et al (2013) <sup>[7]</sup> and SN Shobha et al (2017) <sup>[11]</sup>

In the present study, the various malignant breast lesions on HPE were IDC, ILC, Carcinoma with Medullary feature, Mucinous carcinoma and Paget disease constituting 18.89%, 1.11%, 1.11%, 1.11% and 1.11% respectively, which similar with other studies done by V Pandey et al (2017) <sup>[9]</sup> and R Agarwal et al (2017) <sup>[10]</sup>

In present study, the Sensitivity, Specificity, PPV, NPV and Accuracy of FNAC were 92.86%, 91.07%, 72.72%, 98.1% and 92% respectively, which is similar with other studies done by Mulazim Hussain Bukhari et al (2011) <sup>[12]</sup> and Chokshi Mital et al (2014) <sup>[13]</sup>

In the present study, IHC were done in all histologically confirmed malignant cases, that is 21 cases. It was observed that ER and PR were positive in 16 cases (76.19%) and 14 cases (66.67%) respectively. Our findings are similar to the study by Vohra P. et al (2016) <sup>[14]</sup>, where out of 134 cell blocks, ER and PR were positive in majority of cases, 74.6% and 53.7% respectively. In another study, Xinxin Zhu et al (2014) <sup>[15]</sup> studied 3198 cases, of which 78.4% and 79.7% cases showed ER and PR positivity.

In the present study, both ER and PR were negative in 5 cases (23.81%). Similarly, in studies conducted by Ghosh M et al. (2011) <sup>[16]</sup> and Alnegheimish NA et al. (2016) <sup>[17]</sup>, only 9.3% and 14.8 % of cases were identified as double negative phenotype respectively.

From the above, it can be inferred that the pattern of expression of hormone receptors in our study is similar to that seen in many other studies.

The present study demonstrates that FNA is a reliable method. There is no need for local anaesthesia. It helps in the confirmation of the clinical diagnosis without the need for an open biopsy. It helps in deciding on the mode of surgery. This study concludes that FNAC-based breast lesion diagnosis should be practised as a routine procedure due to the high degree of correlation with histopathologic findings. Because of its low cost, FNAC should be used as a routine diagnostic procedure.

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