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Original Research Paper
Cytological Evaluation of Palpable Breast Lumps: A Prospective Analysis of 84 Cases

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Abstract
Introduction: *Breast lesions are very common in India. FNAC is a reliable method for the initial evaluation and diagnosis of palpable masses of the breast.*
Objectives: *1. To study the cytological features of palpable breast lumps.*
2. To correlate the cytological and histological features.
Material and Methods: *Present study was carried out on 84 patients who presented with palpable breast lumps. Cytological evaluation was done along with histological correlation. Sensitivity, specificity and diagnostic accuracy of FNAC were calculated.*
Results: *Out of the 84 cases, 62 were benign (73.8%) while 22 were malignant (26.1%). On histological correlation, out of the 62 benign cases cytologically, 60 were benign histologically also while 2 turned out to be malignant on histology. On the other hand, out of the 22 malignant cases on cytology, 21 cases were malignant on histology as well while 1 case turned out to be benign.*
Conclusion: *FNAC has a very high sensitivity, specificity and diagnostic accuracy along with low cost and few side effects. Thus, it is quite useful for the diagnosis of breast lumps and can be an important tool in screening of breast cancer patients.*
Keywords: *Cytological evaluation, breast lumps.*

Introduction

Fine needle aspiration of breast is one of the most common procedures performed on patients with a palpable mass.[1] Since last decade, cytodiagnosis has gained importance due to rapid results at low cost and may help in early diagnosis in country like India. FNAC is a reliable method for the initial evaluation and diagnosis of palpable masses of the breast.[2]

The technique of FNAC was first described in 1847 and was introduced into clinical practice by Ellis and Martin in the 1930s. Tham et al., Zagorianaku et al. and Koss et al. have found that diagnosis of palpable breast lesions in developing countries by FNAC as a component of Triple test is the initial method of pathological assessment.[3] The triple diagnostic (Clinical examination, FNAC and Mammogram) approach to breast

neoplasms have significantly changed the evaluation of breast lesions.[4]

Objectives

1) To study the cytological features of palpable breast lumps.
2) To correlate the cytological and histological features.

Material and Methods

It was a prospective study conducted on 237 cases who presented with palpable breast lumps in one year duration but only 84 cases were available for histopathological examination. Thus, cyto-histological correlation could be done in 84 cases only.

After the preliminary documentation, the FNAC procedure was explained in detail to the patient and informed consent obtained. The breast lump was palpated and immobilized between the thumb and forefinger. After disinfecting the skin with alcohol, a 22 gauge needle was applied to a 5-10 ml syringe and introduced into the skin upto the anterior edge of the mass and a negative pressure was created. Several passes were made without removing the needle from the mass. The aspirated material was expressed onto a clean glass slide and spread with a similar slide applied by separating them with a horizontal motion. The preparation was fixed immediately in 95% ethanol .The slides were stained with H&E, Papanicolaou and/or Giemsa stain and examined under the microscope. Histopathological examination was done on biopsy, lumpectomy and mastectomy specimens. Paraffin embedded sections were stained with H&E (Haematoxylin and Eosin) and were examined for tumor typing.

Inclusion Criteria: Patients aged 15-70 years having palpable breast lump of variable size.

Exclusion Criteria

1) Age of patient <15 and> 70 years.
2) Patients not giving written informed consent.

Statistical analysis: Sensitivity, specificity and diagnostic accuracy of FNAC were calculated.

Results

Patients were mostly females (83 i.e.98.8%) & only 1 was male (1.1%). Left side of the breast was more commonly involved (53%) than right (47%). Upper outer quadrant was involved in maximum cases (42%) followed by central (39%). Lower outer quadrant was least commonly involved.

Cytologically, out of the 84 cases, 62 were benign lesions while 22 were malignant (20 malignant, 2 suspicious), no diagnosis was given as unsatisfactory. (Table 1)

Table 1: Cytological diagnosis of palpable breast lumps

S.N.	Cytological Diagnosis	No. of cases
1	Benign	62
2	Malignant	20
3	Suspicious/probably malignant	02
4	Unsatisfactory	00
	Total	84

Histological correlation was done and out of 62 benign cases on cytology, 60 cases were found to be benign on histology as well while 2 cases turned out to be malignant on histology(false negative on FNAC). Likewise out of the 22 malignant cases on cytology, 21 cases were found to be malignant on histology as well while 1 case turned out to be benign on histology(false positive on FNAC).

Out of the 62 benign cases, maximum cases (27 cases) were of fibroadenoma (43.5%). On FNAC, fibroadenoma shows large branching sheets of bland epithelial cells and fragments of fibromyxoid stroma with many bare bipolar nuclei in the background.

Fibrocystic disease was the 2nd most common benign lesion noted (15 cases) which on FNAC shows sheets of ductal epithelial cells & scattered single bipolar nuclei in the background of variable amount of cyst fluid, macrophages & apocrine metaplastic cells. Other benign lesions reported were benign proliferative breast disease (6 cases), fibroadenosis (5 cases), mastitis (4 cases), simple cyst(2 cases), galactocele (2 cases), and gynecomastia (reported in 1 male who was included in the study).

Out of the 22 malignant cases on cytology, 21 cases were malignant on histology as well but 1 case which was IDC on cytology turned out to be fibroadenoma on histology. 2 cases which were suspicious/probably malignant on cytology came out to be malignant on histology.

Cytologically, maximum malignant cases (16 cases) were reported as infiltrating ductal carcinoma (IDC) which showed moderately to highly cellular smears with malignant cells arranged in sheets and dispersed singly. No myoepithelial cells or bare bipolar nuclei was seen. Moderate to severe nuclear atypia, enlargement, pleomorphism, irregular nuclear membrane & chromatin was seen. (figure 1)
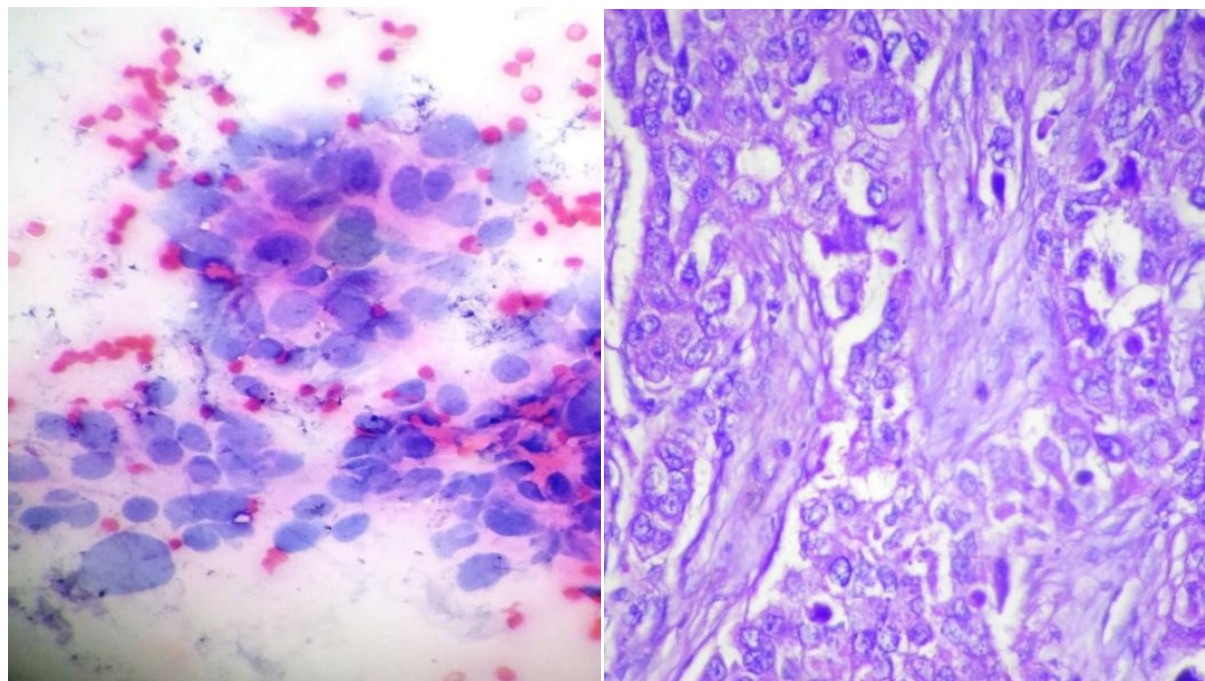

Figure 1: Cytological & histological picture of IDC

Other malignant cases were of lobular carcinoma (2 cases), medullary carcinoma (1 case), papillary carcinoma (1 case). [See table 2]

Table 2: Cytological and histological correlation of palpable breast lumps

Diagnosis on FNAC	Number of cases	Concordance on histopathology	Disconcordance on histopathology
Fibroadenoma	27(43.5%)	26	1(IDC)
Fibrocystic disease	15(24.1%)	14	1(IDC)
Benign proliferative disease	6(9.6%)	6	0
Fibroadenosis	5(8.06%)	5	0
Mastitis	4(6.4%)	4	0
Simple cyst	2(3.2%)	2	0
Galactocele	2(3.2%)	2	0
Gynecomastia	1(1.6%)	1	0
IDC(ductal carcinoma)	16(72.7%)	15	1(fibroadenoma)
ILC(lobular carcinoma)	2(9.09%)	2	0
Medullary carcinoma	1(4.5%)	1	0
Papillary carcinoma	1(4.5%)	1	0
Suspicious/probably malignant	2(9.09%)	2	0

Total histological concordance with cytological diagnosis was found out to be 96.4% (81 cases out of total 84 cases were correlated cyto-histologically). Only 3 cases show disconcordance on histopathology (3.5%).

Statistical analysis

1. Sensitivity- The sensitivity is the ability of a test to identify correctly all those who have the disease. In our study FNAC was 91.3% sensitive. It was calculated as given below:

$$\frac{\text{True positive}}{\text{True positive+ false negative}} \times 100 = \frac{21}{21+2} \times 100 = 91.3\%$$

2. Specificity- The specificity is the ability of the test to identify correctly those who do not have the disease. In our study FNAC was 98.3% specific. It was calculated as given below:

$$\frac{\text{True negative}}{\text{True negative+ false positive}} \times 100 = \frac{60}{60+1} \times 100 = 98.3\%$$

3. Diagnostic accuracy- It is the proportion of correct results in relation to all the studied cases. In our study diagnostic accuracy of FNAC was 96.4%.. It was calculated as given below:

$$\frac{\text{True positive +True negative}}{\text{True positive+ false negative +True negative+ false positive}} \times 100 = \frac{60 +21}{21+2+60+1} \times 100 = 96.4\%$$

Discussion

In our study, age of patients ranged from 15-70 years. Similar age-group (17-72 years) was observed in studies done in Asian countries.[5] Also age group 22-75 years was taken in study by Eleuterio et al in 2015.[6]

A palpable breast lump is a common clinical problem that is presented to surgeons, gynaecologists, and general practitioners and a multidisciplinary approach based on the "triple test," analyzing clinical and radiologic findings in conjunction with the pathologic features is used to diagnose the lesion and determine the best treatment plan for the patient.[7]

FNAC is safe, reliable and time saving outdoor procedure with little discomfort to the patient. It is helpful not only in diagnosis and planning of treatment, but also helpful in prognostication of the tumor factors like nuclear grading, mitotic index, hormone receptor status and DNA contents.[8]

Fibroadenoma is the most common benign lesion (43.5%) reported in the present study. This corresponds to the study done by Ferguson who also reported fibroadenoma as the most common benign lesion.[9] Chandanwale et al[10] in 2014 reported the same. Study done by Kujur P[11] in 2015 also reported fibroadenoma as the most common benign lesion(43.3%).

Fibrocystic disease was the second most common benign lesion (24.1%) reported in our study. Also similar study was done by Sankaye et al[12] in 2014 who reported 24.4% cases of it.

1 case of fibroadenoma and 1 case of fibrocystic disease turned out to be IDC on histology. The reason may be that FNAC was done from non representative area.

Mastitis was seen in 4(6.4%) cases out of the total benign lesions which corresponds to the study done by Chandanwale et al (7.76%).[10]

Gynecomastia was reported in one male patient (1.6%). In study done by Chandanwale et al[10], it accounted for 3.32%. Gynaecomastia in young age is related to hormonal pubertal changes whereas in later years, it may be caused by hormonally active tumors, cirrhosis or medications.[13]

Galactocele in our study was observed in 3.2% cases which corresponds to the study done by Chandanwale et al (2.43%) in 2014.[10] All these patients were lactating.

In the present study, out of the 22 malignant cases reported on cytology, most common was IDC (72.7%). Similar observations were made by Likhar et al (78.5%) in 2013[14]. Sankaye et al[12] in 2014 observed IDC in 88.6% cases.

After IDC, other malignant lesions reported were lobular carcinoma (2 cases), medullary carcinoma (1 case), papillary carcinoma(1 case). Similar study was done by Chandanwale et al[10] who reported 1 case of lobular carcinoma, 2 cases of medullary carcinoma & one of papillary carcinoma.

In our study, cytological and histological concordance was observed in 96.4% cases which is quite high. Similar observations were made by

Kujur P[11] in 2015(84.9%). Handa et al[15] in 2015, reported 78% cyto-histological correlation of the palpable breast lumps.

In the present study, sensitivity, specificity and diagnostic accuracy of FNAC were noted as 91.3%, 98.3% and 96.4% respectively. Similar observations were made by Hammond et al who reported sensitivity, specificity and diagnostic accuracy of FNAC as 94%, 98% & 96% respectively.[16] Bhagat R et al in a study done in 2013 reported sensitivity, specificity and diagnostic accuracy of FNAC as 93%, 98% & 96% respectively.[17]

Conclusion

Breast cancer is the second most prevalent cancer among Indian women, the first being cervical cancer.[18] FNAC can be used for screening of breast carcinoma as it is very cost effective and has minimum adverse effects. Also FNAC has a very high sensitivity, specificity and diagnostic accuracy. Thus, it is very reliable in the diagnosis of breast lesions (both benign and malignant).

References

1. David J Dabbs. Prognostic information from the fine needle aspiration biopsy of breast carcinoma. Am J of Clinical Pathol 2000;113(1):76-83.
2. M.Rosa, A Mohammadi, and S. Masood, "The value of fine needle aspiration biopsy in the diagnosis and prognostic assessment of palpable breast lesions, "Diagnostic Cytopathology,2012, vol.40, no.1, pp.26-34
3. Rekha TS, Nandini NM. Validity of different Cytological Grading Systems of Breast Carcinoma – a hospital based study in South India. Asia Pacific Journal of Cancer Prevention. 2011;12:3013-5
4. Lindholm K. Breast. In: Manual and atlas of fine needle aspiration cytology, Orell SR, Sterrett GF, Walters MNI, Whitaker D, 4th ed. India: Churchill Livingstone; 2005. pp.165- 226
5. Kumar R. A clinicopathologic study of breat lumps in Bhairahwa, Nepal. Asian Pac J Cancer Prev. 2010;11:855–8
6. Eleuterio J Jr, Aragao A, Cavalcante DI. FNA of breast lesions: Surepath liquid based technique versus conventional smears. Acta Cytol 2015;59:253-7.
7. Das AK, Kapila K, Dinda AK, Verma K. Comparative evaluation of grading of breast carcinomas in fine needle aspirates by two methods. Indian J Med Res 2003;118:247-50.
8. Meena SP, Hemrajani DK, Joshi N. A comparative and evaluative study of cytological and histological grading system profile in malignant neoplasm of breast – an important prognostic factor. Indian J Pathol Microbiol 2006;49:199-202
9. Ferguson CM, Powell RW. Breast masses in women. Arch Surg. 1989;124:1338.
10. Chandanwale SS, Gupta K, Dharwadkar AA, Pal S, Buch AC, Mishra N. Pattern of palpable breast lesions on fi ne needle aspiration: A retrospective analysis of 902 cases. J Midlife Health 2014;5:186-91.
11. Kujur P. Fine-Needle Aspiration Cytology of the Palpable Breast lump of 106 Cases and Correlation with Histologic Diagnosis:A Prospective Analysis. Int J Sci Stud 2015;3(9):111-115.
12. Sankaye SB, Dongre SD. Cytological study of palpable breast lumps presenting in an Indian rural setup. Indian J Med Paediatr Oncol 2014;35:159-64.
13. Coen P, Kulin H, Ballantine T, Zaino R, Frauenhoffer E, Boal D, et al. An aromatase-producing sex-cord tumour resulting in prepubertal gynaecomastia. N Engl J Med.1991;324:317–22.
14. Likhar KS, Fatima A, Hazari RA, Gupta SG, Shukla U. Diagnostic role of FNAC in breast lesions. IJRRMS 2013;3:12-4.
15. Handa U, Kumar A, Kundu R, Dalal U, Mohan H. Evaluation of grading and

hormone receptor immunostaining on fi ne needle aspirates in carcinoma breast. J Cytol 2015;32:1-5.

16. Hammond S, Keyhan I, Rofagha S. Statistical analysis of fine needle aspiration cytology of Breast: A review of 678 cases plus 4265 cases from literature. Acta Cytologica 1987;31:276-280.

17. Bhagat R, Bal MS, Bodal VK, Suri AK, Jindal K. Cytological study of palpable breast lumps with their histological correlation. Int J Med and Dent Sci 2013;2(2): 128-136.

18. Rao DN, Ganesh B. Estimate of cancer incidence in India in 1991. Indian J Cancer. 1998;35:10-18.