

## **A Retrospective Study to Correlate Cytological Findings with Histopathological Findings and to Determine the Accuracy of FNAC in the Diagnosis of Breast Lesions**

**Vivek Kumar Pandey<sup>1</sup>, Rituraj, Vimal kumar Gupta<sup>2</sup>, Awadhesh Singh<sup>3</sup>**

<sup>1</sup>Tutor, Department of Pathology, Sri Krishna Medical College and Hospital, Muzaffarpur, Bihar, India

<sup>2</sup>Tutor, Department of Pathology, Government Medical College, Bettiah, Bihar, India.

<sup>3</sup>Assistant Professor, Department of Pathology, Sri Krishna Medical College and Hospital, Muzaffarpur, Bihar, India

<sup>4</sup>Assistant Professor, Department of Pathology, Sri Krishna Medical College and Hospital, Muzaffarpur, Bihar, India

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Corresponding author: Dr. Vivek Kumar Pandey

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### **Abstract**

**Aim:** The aim of the present study was to correlate cytological findings with histopathological findings and to determine the accuracy of FNAC in the diagnosis of breast lesions.

**Methods:** This retrospective study was carried out in the Department of Pathology, Sri Krishna Medical College and Hospital, Muzaffarpur, Bihar, India, for 12 months. Total 50 all cases of breast lump FNAC in which cytological impression could be given were included in the study. Slides of the entire breast FNAC conducted during the above period were surveyed and those fitting in to C3 and C4 categories were selected for study. The cytological diagnosis was compared with histopathological diagnosis in the cases where biopsy was done subsequent to FNAC diagnosis.

**Results:** A total of 400 breast FNACs were done in the above- mentioned period. C3 and C4 categories constituted 30 (7.5%) and 40 (10%) cases respectively. Histopathological diagnosis was available in 20 cases of C3 (40%) and 30 cases of C4 (60%). All the malignant cases in both these categories were infiltrating ductal carcinomas (33 cases). Benign histological diagnosis between both categories included fibroadenoma (10 cases), fibrocystic disease (4 cases) and proliferative breast disease (3 cases). Among C3 category, 14/20 cases in which histopathological examination was available showed benign lesions (70%) and 6/20 cases were malignant (30%). Among C4 category, 3/30 cases available for histopathological examination showed benign lesion (10%) and 27/30 cases turned out to be malignant (90%). There was a significant statistical difference between benign and malignant diagnosis of C3 & C4 categories ( $p < 0.001$ ). The accuracy of present study in diagnosing breast neoplasms is 96%. The specificity of 97% and the sensitivity of 96%.

**Conclusion:** FNAC of breast is a simple, safe, rapid and inexpensive diagnostic modality and plays a very important role in diagnosis of breast lesions especially malignancies. However it is important that clinicians understand the limitations of FNAC. C3 and C4 categories should still be

continued with, as there was a statistically significant difference in benign & malignant diagnosis for these categories in our study.

**Keywords:** Fine Needle Aspiration, Breast Lesions.

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## Introduction:

Fine needle aspiration cytology (FNAC) is an established tool in the diagnosis of various palpable lesions, and it correlates well with histopathological diagnosis in most of the cases. The major utility of FNAC is in differentiating benign and malignant lesions of various tissues. Breast is one of the organs, which is routinely subjected to FNAC to diagnose malignant lesions. Breast carcinoma is the second commonest cancer among Indian females after carcinoma cervix and FNAC is a very cost-effective, sensitive and rapid diagnostic method in differentiating benign breast lesions from malignant ones [1,2]. But there exist some gray areas in breast lesions in which this differentiation becomes difficult. Although needle core biopsy (CNB) is now being preferred over FNAC, FNAC still has a lot to offer as a first line diagnostic procedure, particularly in developing countries with economic restrictions. Moreover, FNAC remains almost as accurate as CNB in determination of malignancies [3]. FNAC has its definite value in the diagnosis of various breast lesions as it is minimally invasive, safe and cost effective [4,6]. FNAC is used to evaluate not only palpable mass and cyst of breast but also non palpable mammographic abnormalities. FNAC is highly accurate for palpable mass [7,8].

FNAC is a part of 'triple test' for diagnosis of carcinoma breast. The 'triple test' is a multidisciplinary approach which analyses the pathologic features in conjunction with

clinical and radiologic findings to diagnose the lesion and determine the best treatment plan [7].

The use of FNAC significantly lowers the costs of health care by decreasing the number of open surgical biopsies, without sacrificing early detection [8]. In benign lesions, further procedures are avoided or delayed and also it helps in diagnosing the recurrence, obtaining material for IHC and other ancillary studies. It is useful for evaluation of local chest wall recurrences and permits a number of ancillary studies such as flow cytometry, hormone receptor analysis and molecular studies [9]. Most cases of breast lumps are benign.<sup>10</sup> but sometimes, it is difficult to determine whether a suspicious lump is benign or malignant, simply by doing a clinical examination. In these circumstances, as a widely accepted and established outdoor patient procedure, FNAC plays an important role in determining the nature of the lump. FNAC can reduce the number of open breast biopsies [10].

## Material and methods

This retrospective study was carried out in the Department of Pathology, Sri Krishna Medical College and Hospital, Muzaffarpur, Bihar, India, for 12 months

After taking informed consent detailed history was taken from the patient or the relatives if the patient was not in good condition. The technique, risks, benefits,

results and associated complications of the procedure were discussed with all patients.

### Methodology

Total 50 all cases of breast lump FNAC in which cytological impression could be given were included in the study. Slides of the entire breast FNAC conducted during the above period were surveyed and those fitting in to C3 and C4 categories were selected for study. The cytological diagnosis was compared with histopathological diagnosis in the cases where biopsy was done subsequent to FNAC diagnosis. The statistical significance of benign and malignant lesions in both these categories was calculated.

### Results

A total of 400 breast FNACs were done in the above- mentioned period. The age of the patients ranged from 15 to 81 years. The commonest age group was 20-30 years. C3 and C4 categories constituted 30 (7.5%) and

40 (10%) cases respectively. All patients belonging to these two categories were females. Among these categories, the age ranged from 30-60 years. Histopathological diagnosis was available in 20 cases of C3 (40%) and 30 cases of C4 (60%). All the malignant cases in both these categories were infiltrating ductal carcinomas (33 cases). Benign histological diagnosis between both categories included fibroadenoma (10 cases), fibrocystic disease (4 cases) and proliferative breast disease (3 cases). Among C3 category, 14/20 cases in which histopathological examination was available showed benign lesions (70%) and 6/20 cases were malignant (30%). Among C4 category, 3/30 cases available for histopathological examination showed benign lesion (10%) and 27/30 cases turned out to be malignant (90%) (TABLE.2). There was a significant statistical difference between benign and malignant diagnosis of C3 & C4 categories ( $p < 0.001$ ).

**Table 1: Age of the patients**

Age in years	No. of patient	%
30-40	12	24
40-50	20	40
50-60	18	36

**Table 2: CYTO-Histological Correlation**

HISTOPATHOLOGICAL DIAGNOSIS	FNAC C3	FNAC C4	TOTAL
BENIGN	14	3	17
MALIGNANT	6	27	33
<b>TOTAL</b>	<b>20</b>	<b>30</b>	<b>50</b>

**Table 3: Specificity and sensitivity of present study**

Parameter	Sensitivity (%)	Specificity (%)	Accuracy (%)
Total	96	97	96

The accuracy of present study in diagnosing breast neoplasms is 96%. The specificity of 97% and the sensitivity of 96%.

### Discussion

Breast FNAC is a widely accepted safe, rapid and an effective diagnostic modality for diagnosis of breast lesions especially

malignancy. Out of the various diagnostic categories, C3 and C4 pose challenges to the pathologists and are also known as gray zone/indeterminate where a definite

diagnosis of benign or malignant is difficult [1,5]. An interpretation of C3 is given when the aspirates show benign characteristics but have some features not present usually in benign aspirates. These include any or a combination of nuclear pleomorphism, loss of cell cohesion, nucleocytoplasmic changes resulting from treatment/hormonal influences and increased cellularity. C4 category diagnosis is given when the aspirates have cells with features of malignancy however the material is not very cellular to be diagnostic, poorly preserved or spread. These also include samples showing malignant features of a greater degree than seen in C3 without the presence of overtly malignant cells [11]. In this study, the age ranged from 30-60 years for both the above-mentioned categories and is comparable to many other studies conducted [1,2]. C3 and C4 categories combined constituted 70/400 (17.5%) cases subjected to breast FNAC during the study period. This percentage of C3 and C4 categories correlated well with various other studies, which give a range of 4-17.7% for both, these categories combined [12,13]. This is essential because there should not be erroneous overuse of these categories in reporting of breast FNAC.

In C3 category, where 20/30 cases were available for histopathological examination, 6 cases turned out to be (IDC) infiltrating duct carcinomas ( $6/20 = 30\%$ ) and thus were considered false negative (FN). This result also corroborated well with the range established by other studies (8.6-52%) [12,14]. The reasons for these false negative cases can be sampling error, small tumor size. Low-grade tumor, less cellularity or low grade well differentiated carcinomas arising in cystic lesions. These 6 FN cases were again reviewed after histopathological diagnosis. All of these cases showed mainly cohesive sheets of ductal epithelial cells, bare nuclei with few clusters showing cellular crowding and lack of cohesiveness. Thus

patients with C3 diagnosis need not undergo a surgical procedure if the proper clinical and mammographic correlation is done and they too suggest a benign lesion.

In C4 category, 27/30 cases (90%) available for histopathological examination showed malignant pathology (IDC). 3/30 cases (10%) showed benign pathology on histopathological examination and were considered false positive (FP). Of these 2 were highly cellular fibroadenomas and 1 were proliferative breast disease. These cases showed dyscohesive clusters, cellular overlapping and moderate cellular and nuclear pleomorphism. These results also correlate with the other studies, which show a range of 81-97% for malignancies in this category [12,18]. Some degree of atypia, dyscohesion and nuclear pleomorphism can be seen in fibroadenomas and along with increased cellularity can cause diagnostic difficulty. Most of these cases are conventional fibroadenoma although a few may be associated with proliferative lesions especially when atypical changes are present. Proliferative breast lesion is another gray zone lesion and can be called as the nightmare of the pathologists' especially radial scar and complex sclerosing lesions. These lesions can be hypercellular with dyscohesive cell clusters, atypia and absence of myoepithelial cells in few clusters. Thus, all the patients with cytological diagnosis of C4 lesion on breast FNAC should undergo surgery, as the percentage of malignancies in these lesions is very high.

### Conclusion

FNAC of breast is a simple, safe, rapid and inexpensive diagnostic modality and plays a very important role in diagnosis of breast lesions especially malignancies. However, it is important that clinicians understand the limitations of FNAC. C3 and C4 categories should still be continued with, as there was a statistically significant difference in benign

& malignant diagnosis for these categories in our study.

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