Original Research Article

# Cytopathological correlation of malignant breast lesion in determining grade of the tumor- An experience from tertiary care center from South India

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## Abstract

**Introduction:** Fine needle aspiration cytology (FNAC) is a rapid and an accurate technique in diagnosing the nature of the breast lesion. There are only few studies where correlation between FNAC and histology of malignant breast lesion have been done.

**Aim:** To study the correlation between FNAC and histopathology in determining grade of the breast malignancy and also to find the correlation between above two techniques in diagnosing malignant breast lesions.

**Materials and Methods:** In prospective single center study, we included 35 patients with malignant breast lesion whose FNAC and histopathology were available. The histopathogical grading was done by using Scarf bloom Richardson grading system and cytological grading was done by Robinson's grading.

**Results:** Out of the 35 patients included in the study, the concordance rate of cytopathological correlation in determining the grading of lesion was 85.7% (30 out of 35 cases) and the concordance rate in determining nature of the lesion was 94.3% (33 out of 35 cases) respectively.

**Conclusion:** Even though FNAC has replaced histopathology in diagnosing the nature of breast lesion, histopathology still remains the gold standard in determining grade of the malignant breast lesion.

## Introduction

Breast cancer is the most common cancer among women worldwide and second most common cancer among Indian women.[1] Women presenting with breast lump can either have benign or malignant breast lesion. FNAC is a rapid and accurate method in diagnosing the nature of breast lesion. It is the most widely used tool both for diagnosing early breast cancer and in confirming the recurrence of breast cancer.[2]

National Cancer Institute has recommended that tumor grading should be mentioned in reporting of FNAC of breast cancer.[3] This study was conducted to find the correlation between FNAC and histopathology in determining the grade of the breast cancer, as the data from India is limited.

## Materials and Methods

Our study was a prospective single institute study conducted in a tertiary medical centre in South India between 2009 to 2012. Patients having palpable breast lesions were included in the study and those who were non cooperative or with non palpable lesions were excluded. Patients were subjected to clinical examination, briefed about the FNAC procedure and informed consent was taken. FNAC was performed with strict aseptic precautions using 23 gauge needle. Slides were immediately wet fixed in 95% alcohol for H&E stain and Papanicolaou's stain. Air dried smears were prepared and stained with Giemsa. Cytological interpretation was done taking into consideration relevant clinical and radiological data. Whenever the biopsy of the same patient was received at the laboratory, it was routinely processed to obtain paraffin section which were stained by H&E. Histopathological study was done independently. Thirty five patients who underwent cytology and true cut biopsy/surgery were included in the study. Cytological grading was done by Robinson's grading.

Histopathological grading was done by using the Scarf-Bloom - Richardson grading system.

The findings were recorded in a proforma and results of cytological and histopathological studies were later correlated. The results of the study were calculated by using methology of Galen and Gambino for substantiating the correlation.

The ethical approval was not taken for the study as the data was properly anonymised and informed consent was obtained at the time of original data collection.

## Results

Out of 35 patients, 15 (42%) of our study population were in the age group between 50 to 60 years (Table 1). The youngest patient was 32 years old and the oldest patient was

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80 years old. The majority of patients were diagnosed as infiltrating ductal carcinoma (IDC) by histopathology. Two patients were diagnosed as infiltrating lobular carcinoma (ILC) and one patient had mucinous carcinoma (Table 2)

**Table 1:** Age distribution

| Age group (in years) | n | % |
|---|---|---|
| 30-40 | 3 | 8.5 |
| 40-50 | 7 | 20 |
| 50-60 | 15 | 42.8 |
| 60-70 | 8 | 22.9 |
| 70-80 | 2 | 5.8 |
| Total | 35 | 100 |

**Table 2:** Malignant breast lesions

| Type of malignancy | n |
|---|---|
| Infiltrating ductal carcinoma | 32 |
| Infiltrating lobular carcinoma | 2 |
| Mucinous carcinoma | 1 |

There was a discordance between cytological and histopathologic diagnosis in two patients. Both of them were diagnosed as atypical ductal hyperplasia by FNAC but histopathology showed IDC and ILC respectively. (Table 3).

**Table 3:** Analysis of cyto-diagnostic error

| S. No | FNAC diagnosis | Histopathological diagnosis | Reason for error |
|---|---|---|---|
| 1 | Atypical ductal hyperplasia (ADH) | Infiltrating ductal carcinoma(IDC) | Adjacent tissue showed features of ADH. Features of IDC were not seen in cytological smear |
| 2 | Atypical ductal hyperplasia | Infiltrating lobular carcinoma(ILC) | Adjacent tissue showed features of ADH. Features of ILC were not seen in cytological smear |

Out of 35 patients with malignant breast lesions who underwent FNAC, 25 (71.4%) had grade 1, 7 (20%) had grade 2 and 3 (8.5%) had grade 3 lesion. When compared with histopathology, 5 out of 35 FNAC reports had discordance in grading. Discordance in grade 1, grade 2 and grade 3 were 4 out of 25(16%) among grade 1 lesion, 1 out of 7 (14.3%) among grade 2 lesion. All the 3 cases of FNAC diagnosed grade 3 lesions had concordance with histopathologic grading (Table 4).

**Table 4:** Analysis of cytohistological correlation of grading

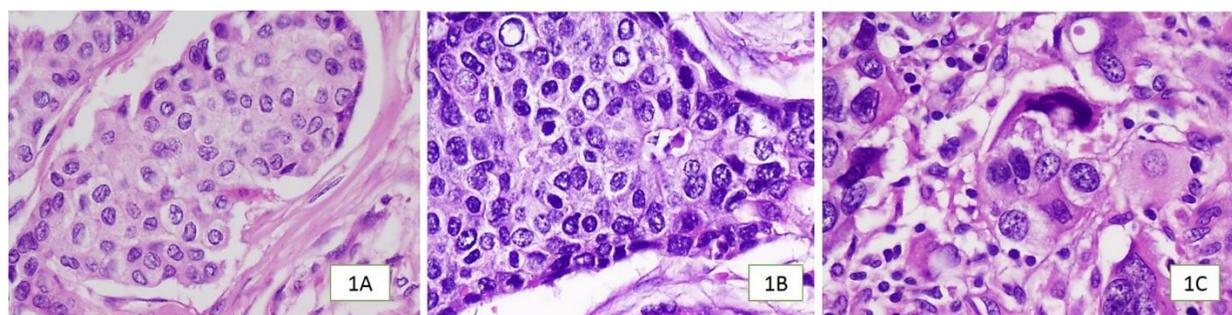| Robinson's cytological grading | No. of cases in cytology | Scarf Bloom Richardson histological grading | | | | | |
|---|---|---|---|---|---|---|---|
| | | 1 | | 2 | | 3 | |
| | | n | Concordance | n | Concordance | n | Concordance |
| 1 | 25 | 21 | 84% | 4 | 16% | 0 | |
| 2 | 7 | 1 | 14.3% | 6 | 85.7% | 0 | |
| 3 | 3 | 0 | | 0 | | 3 | 100% |
| Total | 35 | 22 | | 10 | | 3 | |



**Fig. 1A,1B and 1C:** Infiltrating ductal carcinoma(IDC) histological grade 1, grade 2 and grade 3 respectively according to Scarff-Bloom-Richardson(SBR) grading
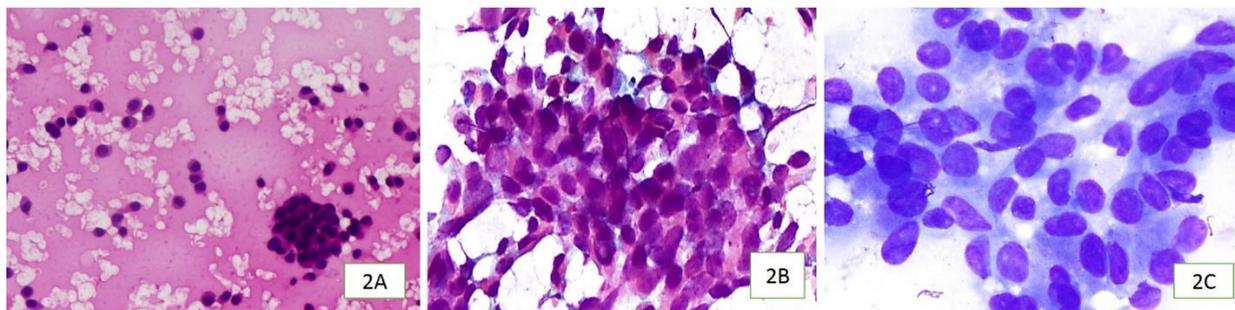
**Fig. 2A,2B and 2C:** Cytological grade 1, grade 2 and grade 3 of IDC according to Robinson grading

## Discussion

FNAC is a reliable and accurate technique in diagnosing a malignant breast lesion when performed and interpreted by an experienced pathologist. The high degree of correlation between histopathology and cytology makes FNAC a reliable tool in determining the nature of breast lesion and in establishing the recurrences.

In our study the sensitivity and specificity of FNAC and histopathology in diagnosing malignant breast lesion was 94.3% and 100% (33 out of 35 cases) which is comparable to study by Sarangan et al where sensitivity and specificity was 93.5% and 100% respectively.[4] In a study by Shanmugasamy K et al, the sensitivity and specificity in diagnosing malignant breast lesion was 93.5% and 100% respectively. Dr. Manju et al also showed similar results.[5,6]

In our study 25 (71.4%) patients had grade 1 lesion, 7 (20%) had grade 2 lesion and 3 (8.5%) had grade 3 lesion. Thirty of the 35 (85.7%) samples obtained on FNAC had concordance with histopathological diagnosis. In a study by J P Phukan et al 28% cases were graded as grade 1, 48% grade 2, and 24% grade 3 by FNAC with a concordance rate of 72%.[7] Concordance rates between CG and HG in studies by Das et al., Sinha and Sinha and Lingegowda et al. were 71.2%, 73.0% and 64.0% respectively.[8] However, Robinson et al reported a concordance rate of 57%. The high concordance rate in our study might have been confounded by a small sample size.[9]

In our study discordance rates while grading was seen in 4 out of 25 (16%) among grade 1 lesions, 1 out of 7 (14.3%) among grade 2 lesions. All the 3 cases of FNAC diagnosed grade 3 lesions had concordance with histopathogical diagnosis. Compared to our study, Phukan et al showed the concordance rate of 50%, 83.3% and 83.3% among grade 1, grade 2 and grade 3 tumours respectively.[7] Sood et al. found highest concordance (75%) in grade 1 tumors and lowest (60%) in grade 3 tumors with overall concordance of 68.67%.[10] In our study all the discordance had only one grade difference compared to histopathology which is comparable to previous similar studies.[11,12]

Some of the factors contributing to false negative results may be due to the small size of the tumor; hypocellularity; inadequate sampling during aspiration; lack of experience in interpreting samples and the presence of both malignant and benign lesions in the same sample.[13] The diagnostic accuracy of FNAC can be improved by Triple test which includes clinical examination and mammogram in addition to FNAC[14-17] as triple test has an accuracy of 99% in diagnosing both benign and malignant breast lesions.

## Conclusion

FNAC is a simple, fast, reliable and cost effective method in diagnosing nature of the breast lesion and if interpreted carefully can be used as a tool to determine the grade of the lesion especially in the neoadjuvant approach and in cases where surgery has to be done at the earliest. However histopathology should be performed wherever feasible as this is still the gold standard in determining the grade of the tumor.

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