



# A Study to Evaluate The Role of Mammography and Fine Needle Aspiration Cytology in the Diagnosis of Breast Lesions

## KEYWORDS

Breast lump, FNAC Breast, Mammography, Benign breast disease, Malignant breast disease.

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**ABSTRACT** AIMS AND OBJECTIVES : To study the efficacy of fine needle aspiration cytology and mammography in evaluation of breast lesions and correlation between them.

To describe age distribution and spectrum of various breast lesions in the study subjects.

**MATERIAL AND METHODS** : Present study comprises of 184 patients with breast lesions who presented to the surgical and radiology department of MGM hospital over a period of 3 years between August 2012 and 31 July 2015. All patients presented with breast lump underwent sequential mammography and FNAC. In all cases FNAC was performed after mammography.

**RESULTS** : Among the 184 cases of breast lesions, 90 cases were of BI-RADS category 2, 24 cases of category 3, 12 cases of category 4 and 48 cases of category 5. 10 cases were found to have normal study i.e. they belonged to category 1. Out of the 184 cases of breast lesions with mammographic abnormality, 114 cases were benign and 60 cases showed malignant findings. For this, BI-RADS categories 2 and 3 were considered benign while categories 4 and 5 were considered malignant.

Out of the 184 cases which were opined on FNAC, 120 cases were benign and 64 cases were malignant. Mammographically, 10 cases were of normal study while 114 had benign features and 60 cases showed features of malignancy. These 10 cases of mammographically normal study turn out to be 6 malignancies and 4 benign cases on FNAC

**CONCLUSION** : From the above study it can be concluded that –

Incidence of breast lesions was maximum in the age group of 21-30 years and a female preponderance was observed. The occurrence of lesions was more in the right breast .

On FNAC, benign lesions were more common than malignant ones. The most common breast lesion was fibroadenoma. Among the malignancies, infiltrating ductal carcinoma – not otherwise specified constituted 95.31% of cases.

Out of 10 cases, which were normal on mammography, 6 cases turned out to be benign and 4 cases were malignant by FNAC. Which indicates mammographic false negative cases and the diagnostic superiority of FNAC over mammography. Hence diagnostic accuracy improved when combinations of diagnostic tools were employed.

If malignancy is suspected, it should be evaluated for further investigations. Multidisciplinary approach reduces the errors in diagnosis.

## INTRODUCTION

Among breast lesions, a palpable breast lump is a common diagnostic problem to a clinician. Sometimes it is difficult to determine whether a lump is benign or malignant just by clinical examination in which case a method for definite diagnosis at the outpatient clinic is needed. This method should be accurate, easy to perform, reproducible and acceptable to patients.

Fine needle aspiration cytology (FNAC) is a cheap, minimally invasive procedure which can be performed with ease in a palpable breast lump. It can be done in outpatient clinic and the results are available faster than that of biopsy. With the introduction of mammography, it is being increasingly used for the evaluation of breast lumps. But this method is fraught with its own disadvantage and a large number of

cases are reported as indeterminate or suspicious.

The accuracy of mammography and FNAC varies in different institution which may be due to the high dependency of all the two modalities on training and experience. Before introducing any diagnostic modality, its efficacy and predictive value has to be evaluated. This provides the clinician with an estimate of the reliability of the test.

Hence, this study was undertaken to evaluate the role of FNAC in breast lesions and to evaluate the efficacy of individual methods i.e. mammography and FNAC and also their combined efficacy in the evaluation of breast lesions.

## METHODOLOGY

The present prospective diagnostic study comprises of 184

patients with breast lesions who presented to the Surgical and Radiology department of M.G.M Hospital over a period of 3 years between 1<sup>st</sup> August 2012 and 31<sup>st</sup> July 2015. All the patients presented with breast lump and underwent sequentially mammography and fine needle aspiration cytology (FNAC) respectively.

#### INCLUSION CRITERIA:

All the patients presented to the Surgical and Radiological department of M.G.M Hospital with breast lump are included in the study if they have met the following criteria.

1. Patients with palpable lump without any symptoms.
2. Patients with palpable lump associated with symptoms.
3. Patients with palpable lump bilateral or unilateral.

#### EXCLUSION CRITERIA

1. Previously diagnosed cases of benign disease and breast malignancies.
2. Cases undergoing treatment.
3. Diagnosed cases of carcinoma breast on follow up for residual disease or recurrence.

#### TECHNIQUE OF MAMMOGRAPHY

Mammography was performed using a "Siemens Mammomat 3000 Nova" unit. For each case, both cranio-caudal and Medio lateral views were obtained. The mammograms were reported by the Radiologists as per the Breast Imaging Reporting and Data System (BI-RADS) published by American College of Radiology.

#### TECHNIQUE OF FNAC

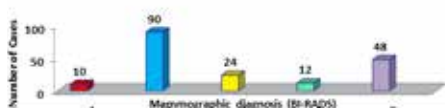
After informed consent and cleaning and draping the patient lump was uncured with 23-25 gauge needle attached to a 10cc disposable syringe. Aspirated material was expressed on clean slides and smeared and were fixed immediately in 95% ethanol & Carnoy's fixative and stained with H&E staining.

#### RESULTS

Of the 184 patients the age of patients ranged from 18 to 68 years, with a mean age of 36.15 years. The maximum number of lesions were seen in the age group of 21-30 years (34.23%), followed by 31-40 years (23.91%) and 41-50 years (16.84%). The least number of cases were seen in patients of age group of >60 years (4.89%). Among the 184 cases of breast lesions, it was observed that right breast was more commonly involved comprising of 102 cases (55.43%). Left breast was involved in 80 cases (43.47%) and bilateral involvement of breast was seen in only 2 cases (1.08%).

Among the 184 cases of breast lesions, 90 cases were of BI-RADS category 2, 24 cases of category 3, 12 cases of category 4 and 48 cases of category 5. Ten cases were found to have normal study i.e. they belonged to category 1. Out of the 184 cases of breast lesions with mammographic abnormality, 114 cases were benign and 60 cases showed malignant findings (For this, BI-RADS categories 2 and 3 were considered benign while categories 4 and 5 were considered malignant.)

Figure 1: DISTRIBUTION OF CASES BASED ON MAMMOGRAPHY (about here)



FNAC diagnosis of 184 breast lesions included 79 cases of fibroadenoma, 64 cases of carcinoma, 19 cases of fibrocystic disease, 12 cases breast abscess and 10 cases of papilloma. 120 cases were benign and 64 cases were malignant. Among the 64 cases of malignant lesions of breast, 61 cases were infiltrating ductal carcinoma – not otherwise specified (IDC-NOS), 2 were Medullary carcinoma and 1 case was mucinous carcinoma.

Out of 10 cases of mammographically normal study turn out to be 4 malignancies and 6 benign cases on FNAC.

#### DISCUSSION

Breast carcinoma has been reported in only 4% of patients with breast symptoms, and even among palpable lesions undergoing biopsy, a large number of lesions turned out to be benign<sup>17</sup>.

#### MAMMOGRAPHY

The role of mammography is to rule out malignancy for any palpable abnormality and to avoid further intervention. It helps in earlier intervention for a mass with malignant features along with screening for additional lesions in the ipsilateral and contralateral breast. It also useful in assessing the extent of malignancy when cancer is diagnosed. Mammography is the only screening modality, which has been proven to reduce mortality from breast cancer through early detection. Mammography can identify breast cancers too small to palpate on physical examination and theoretically beneficial to diagnose even non invasive lesions.

FIGURE 2: Invasive Ductal Carcinoma Mammogram showing a spiculated mass lesion with irregular borders (about here)



#### LIMITATIONS OF MAMMOGRAPHY

Sensitivity of mammography in detection of breast cancers in the screening set up ranges from 83 to 95 percent. However the false negative rate of mammography for breast cancer in patients with palpable abnormalities of the breasts has been reported to be as high as 16.5 %.

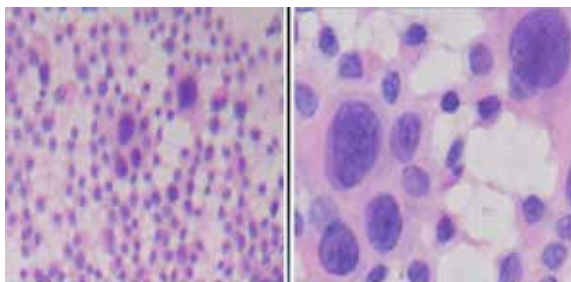
Mammographic sensitivity for breast cancer declines significantly with increasing breast density and is independently higher in older women with dense breasts. It decreases to as low as 30 to 48 percent in patients with radiographically dense and glandular breasts<sup>3</sup>.

#### FNAC

FNAC of breast lumps is an accepted and established method for determining the nature of breast lumps with a high degree of accuracy. FNA procedure is a safe method with only a few reported complications. It has been reported in the literature that the incidence of tumor transplantation along the needle track by FNA procedure is

only about 0.0045%, and even much lower in superficially located tumors. FNAC is cost effective and can prevent unnecessary surgery. As FNAC became more reliable in diagnosing malignancy and thereby the use of frozen-section histology had been reduced by about 80%. Tissue diagnosis can be quick, provided with in minutes rather than days as in biopsy.

**FIGURE 3 : Invasive Ductal Carcinoma FNAC Smear showing highly pleomorphic ductal epithelial cells in discohesive clusters with hyperchromatic nuclei.**



#### LIMITATIONS OF FNAC

Some false negative results are inevitable. Sampling errors and interpretation errors are responsible for false negative results. Appropriate training and experience is essential to consistently achieve optimal material for diagnosis. Poor cellularity of the aspirated sample and suboptimal cytopreparation.

The age range in the present study, who presented with breast lumps to was from 18–68yrs with a mean age of 36.15 years. The maximum number of lesions were seen in the age group of 21-30 years (34.23%). The mean age of the present study is comparable to Mande N et al.<sup>1</sup>, Randa ZA Khair et al.<sup>7</sup>, Tiwari M et al.<sup>8</sup> which showed 48, 41 ± 15.3, 32 years respectively. In the present study incidence of breast lesions was maximum with 63 cases being in the age group of 21 – 30years, out of 184 cases. Aslam et al<sup>6</sup>, study revealed maximum number of cases being 22 in the age group of 31 – 40yrs, out of 56 cases. The same observation was found in Jayadeva et al.<sup>5</sup>, study with maximum number of cases that is 16 in the age group of 31 – 40years out of total 75 number of cases.

In the present study, FNAC diagnosis of breast lesions included 79 cases of fibroadenoma, 64 cases of carcinoma, 19 cases of fibrocystic disease, 12 cases of breast abscess and 10 cases of papilloma. Jayadeva et al<sup>5</sup>, study revealed out of 75 cases, 32 cases of fibroadenoma, 1 case of fibrocystic disease, 14 cases of fibrocystic disease, 26 cases of papilloma, 02 cases of carcinoma, majority being fibroadenoma cases that was comparable with the present study.

**TABLE 1: Comparison of distribution pattern of various breast lesions in different studies with present study**

Studies	Mande N et al. <sup>1</sup>	Kaufman Z et al. <sup>2</sup>	Ahmed I et al. <sup>4</sup>	Present Study
Total no. of cases	200	234	35	184
Benign	66 (33%)	124 (52.99%)	19 (54.28%)	120(65.21)
Malignant	134 (67%)	110 (47%)	16 (45.71%)	64(34.78)

#### CONCLUSION

From the above study it can be concluded that –

Incidence of breast lesions was maximum in the age group

of 21-30 years (34.23%) and a female preponderance was observed. The occurrence of lesions was more in the right breast (55.43%) and in the upper outer quadrant (54.54%).

On FNAC, benign lesions were more common than malignant ones (65.21% and 34.78% respectively). The most common breast lesion was fibroadenoma (42.93%). Among the malignancies, infiltrating ductal carcinoma – not otherwise specified constituted 95.31% of cases.

Out of 10 cases, which were normal on mammography, 6 cases turned out to be benign and 4 cases were malignant by FNAC. Which indicates mammographic false negative cases and the diagnostic superiority of FNAC over mammography. Hence diagnostic accuracy improved when combinations of diagnostic tools were employed.

If malignancy is suspected, it should be evaluated for further investigations. Multidisciplinary approach reduces the errors in diagnosis.

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