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Pathology

CORRELATION OF FINE NEEDLE ASPIRATION CYTOLOGY RESULTS OF BREAST LESIONS WITH CORRESPONDING ULTRASOUND BIRADS SCORE.

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ABSTRACT **Objective:** Breast cancer is the leading cause of cancer deaths among women worldwide. The aim of this study is to assess how accurate ultrasound is in diagnosis of definite breast cancer according to BIRADS, and correlate with result of FNAC. **Method:** This is a prospective study conducted in the Department of Pathology, SMIMER Hospital, Surat, Gujarat, who presented with clinically palpable breast lump. Sensitivity, Specificity, Accuracy, Positive and Negative predictive value of ultrasonography in relation to BIRADS score and FNAC were calculated. **Results:** In this study, diagnostic accuracy for Breast FNAC was found to be better than that of ultrasonography. Both FNAC and ultrasonography have same sensitivity but FNAC tends to have higher specificity. **Conclusion:** Present study confirms the higher combined sensitivity, specificity and accuracy for ultrasonography and FNAC.

KEYWORDS : FNAC, BIRADS, Breast Lesions

INTRODUCTION

Breast lumps are localised swellings that feel different from the surrounding breast tissue and it is a sign for a variety of condition. Approximately 10% of breast masses ultimately leads to diagnosis of malignancy.[1]

An accurate evaluation of breast lump can maximise cancer detection and minimise unnecessary testing and procedures.[1]

The diagnosis of any breast lesion requires a multi-dimensional approach. A confident diagnosis can be made in 95% of the cases through combination of clinical examination, imaging and fine needle aspiration cytology (FNAC) known as triple assessment.[1]

In the present study we aim to compare the diagnostic accuracy of BIRADS (Breast Imaging Reporting and Data System) Score in detecting Infective, benign and malignant lesions with FNAC (Fine Needle Aspiration Cytology) Results which is used for the final diagnosis in patients presenting with breast lumps, thus helping in avoiding unnecessary surgical procedures.[2]

Radiology reporting -BIRADS scoring	Cytology reporting
0. Incomplete	Unsatisfactory
I. Negative	Benign - non specific
II. Benign	Benign -specific diagnosis
III. Benign but follow up is required	Atypical / indeterminate
IV. Suspicious of malignancy	Suspicious malignancy
V. Suggestive of malignancy VI. Known biopsy having malignancy	Malignant

AIM AND OBJECTIVE

Aim

To evaluate the diagnosis of various breast lesions by triple assessment method

Objective

To correlate the Radiological diagnosis (BIRADS Score) with that of Cytological diagnosis (FNAC) in various breast lesions.

MATERIAL AND METHODS

This is a prospective study conducted in the Department of Pathology of a tertiary care hospital on 100 patients in 6 months of time period from July-December 2023 , who were presented with clinically palpable breast lump. The term "Palpable Breast Lump" means an area of denser breast tissue from the surrounding tissue. Samples for the study were selected according to the inclusion and exclusion criteria.

Inclusion Criteria

1. Female patients of all ages with complaint of breast lump.
2. Patient who underwent breast imaging (including BIRADS scoring) and FNAC.

Exclusion Criteria

1. Male Patients.
2. Pregnant and Lactating Females.
3. Patients with history of prior irradiation to the breast due to any lesion.

The clinician obtained a full history, performed breast examination and then patients were sent for ultrasonography to the radiology department. The images obtained were analysed and categorised using the BIRADS score as infective, benign and malignant. Then, these patients were sent to pathology department for FNAC and its results were obtained which helped in further management of the patients.

FNAC was done with 23G needle attached to 10mL disposable plastic syringes, smeared on standard microscope glass slides and stained with haematoxylin and eosin (H&E Stain), Geimsa stain and PAP stain. The slides were reviewed under light microscopy.

Statistical analysis were performed to compute the sensitivity, specificity, accuracy, positive and negative predictive values of ultrasonogram in relation to the BIRADS score and FNAC.

RESULTS AND DISCUSSION

Table - 1

Age wise Distribution	
Age Group (In Years)	**Number of cases (Out of 100)**
15-25	38
26-35	23
36-45	23
46-55	06
56-65	05
66-75	04
75-80	01

The study included 100 patients with breast lump. The youngest patient was of 17 years while eldest was of 76 years. Maximum number of cases were seen in 15-25 years age group. In Navya B N et al study [1] also, same age group had maximum number of cases.

Table -2

	Number of cases according to different categories of diagnosis				
	Infective	Benign	Suspicious for Malignancy	Malignant	Total
Radiological Diagnosis (Sonography, BIRADS Score)	10 (BIRADS II)	59 (BIRADS II)	00 (BIRADS IV)	31 (BIRADS V)	100
Cytological Diagnosis (FNAC)	11	62	01	26	100

Out of 100 cases, 59 cases were diagnose as benign on radiology where as 62 cases through FNAC. 31 cases were diagnose as malignant on radiology and 26 cases through FNAC.

The discordance cases are discussed in Table-3.

Table –3

	Discordance Cases	
	Cytological Diagnosis (FNAC)	Radiological Diagnosis (BIRADS Score)
1)	Benign Breast Lesion with apocrine florid metaplasia.	BIRADS V
2)	Proliferative Breast Lesion without Atypia.	BIRADS V
3)	Epithelial hyperplasia with atypia with florid apocrine metaplasia.	BIRADS V
4)	Breast Absecss	BIRADS V
5)	Benign Proliferative Breast Disease.	BIRADS V

The above table suggests -
Concordance Rate : 95%
Discordance Rate : 05%

So, out of 100 cases there were 95 cases in which the cytological and radiological diagnosis were same where as there were 5 cases in which it differed.

Follow-up of those 5 cases was done, for which for the 4 cases gold standard Histopathological Diagnosis correlated with the Cytopathological (FNAC) Diagnosis.

The one case which was malignant (V) through radiology and was suspicious for malignancy in cytopathology was found benign – Usual Ductal Hyperplasia in histopathology.

The high concordance rate are line with the Mohson Khaleel study[3].

Table - 4

	FNAC	Ultrasonography (BIRADS Score)
Sensitivity	100%	100%
Specificity	98.6%	93.2%
Positive Predictive Value	96.2%	83.8%
Negative Predictive Value	100%	100%
Diagnostic Accuracy	99%	95%

The sensitivity of FNAC and Ultrasonography was found to have 100% suggesting no true positive cases were misdiagnose and therefore the negative predictive value was also 100% for both.

The specificity of FNAC (98.6%) was higher than that of Ultrasonography (93.2%) suggesting false positivity was given higher through ultrasonography than that of FNAC.

Above discussion suggests higher diagnostic accuracy (99%) of FNAC than that of Ultrasonography (95%).

The study of Puja B. Jarwani et al.[4] , Ambedkar Raj Kulandai Velu et al. [5]has been found to have sensitivity ranging from 82% to 97.5% and specificity of more than 99%. In our study, sensitivity of FNAC and ultrasonography was found to have 100% which was also seen in Wasan et al study[6].

CONCLUSION

- Ultrasonography is a primary imaging technique for evaluation of breast lump which is complimentary to FNAC and when both modalities are used together they can diagnose majority of lesions which reduces more invasive procedure.
- Considering patient's comfort, lack of requirement of anaesthesia , rapid analysis and reporting and an absence of false positive results, FNAC could be considered an ideal initial diagnostic modality in breast lumps recognized by means of imaging techniques.
- Further advancement in the technique of both these procedures like FNAC under imaging guidance, addition of immunohistochemistry in cytology and addition of Doppler in USG may increase their accuracy.

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