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Original Research Paper

Pathology

FNAC OF BREAST LESIONS WITH SPECIAL REFERENCE TO IAC STANDARDIZED REPORTING AND COMPARATIVE STUDY OF CYTOHISTOLOGICAL CORRELATION OF BREAST LESIONS

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ABSTRACT

Introduction: Benign as well as malignant breast lesions are quite common in Indian population. FNAC is a minimally invasive, safe and reliable method to provide effective diagnosis to breast lesions. International Academy of Cytology (IAC) have established a process to produce comprehensive and standardized approach to fine needle aspiration (FNAC) reporting. They have categorized the breast lesion in C1to C5 (C1-Insufficint material, C2-Benign, C3-Atypia, C4- Suspicious, C5-Malignant). **Clinical Profile:** This study includes 303 patients presenting with breast lumps during the period of Jan 2022 to June 2023. The study was conducted in the Department of Pathology, in a tertiary care center. Routine FNAC was performed on all the patients and smears were studied. **Aim:** To classify various breast lesion (C1 to C5) and to study the cytohistological correlation of breast lesions. **Results:** A total of 303 patients were include in the study of which 9 were males and 294 were females.C1 lesions were found in 12 patients, C2 in 214 patients,C3 in 10 patients,C4 in 3 patients and C5 in 64 patients. Cytohistological correlation was found in 78 patients. Discussion: Out of the 303 patients, 224 patients had benign lesions and 67 patients had malignant lesions and the other 12 were unsatisfactory. Benign breast lesions was most common in the younger patients in 11 – 35 age group. Malignant was common in the old age group from 41-75 years. The most common benign breast lesion was Fibroadenoma which accounted for 102 patients and the most common malignant lesion was ductal carcinoma which accounted for 64 patients. **Conclusion:** FNAC is an effective and valid tool as first line diagnostic motality in preoperative diagnosis of malignant and benign breast lesions. Cytological categorization based on IAC structured reporting will enhance the reproducibility of reports among the pathologist and clinicians.

KEYWORDS : Breast lump, FNAC, Fibroadenoma, IAC, Ductal Carcinoma

INTRODUCTION

According to National Cancer Registry Programme, India 2022, breast cancer has become the most common malignancy in Indian women, surpassing cervical cancer (1). Benign as well as malignant breast lesions are quite common in Indian population (2). FNAC is a minimally invasive, safe and reliable method to provide effective diagnosis to breast lesions (2). Bethesda sponsored conference on uniform approach to breast FNAC had recommended that tumor grading on FNAC material should be incorporated in FNA reports for prognostication. International Academy of Cytology (IAC) have established a process to produce comprehensive and standardized approach to fine needle aspiration (FNAC) reporting (3).

As per the IAC guidelines (Yokohama grading) the breast lesion are categorized into C1 to C5 (3).
C1-Insufficint material
C2- Benign lesions
C3-Atypical, probably benign
C4- Suspicious of malignancy
C5-Malignant

Structured reporting can empower the quality, clarity, and reproducibility of reports across departments, cities, countries, will assist patient management, improve breast health care, and facilitate further research.

AIMS And OBJECTIVES

To classify various breast lesion according to IAC grading (C1 to C5) and to study the cytohistological correlation of breast lesions.

MATERIALS AND METHODS

This study includes 303 patients presenting with breast lumps. The study was conducted in the Department of Pathology, in a tertiary care center during the period of Jan 2022 to June 2023. Routine FNAC was performed on all the patients and smears were studied.

FNAC was done by using 10 cc syringes with 22-23$_G$ needle under all aseptic precautions. Air dried smears were stained with Giemsa stain and wet smears were stained with Hand E and PAP stain. H and E stain was done for histopathology.

RESULTS

Amongst the 303 patients studied 294 were females and 9 were males.

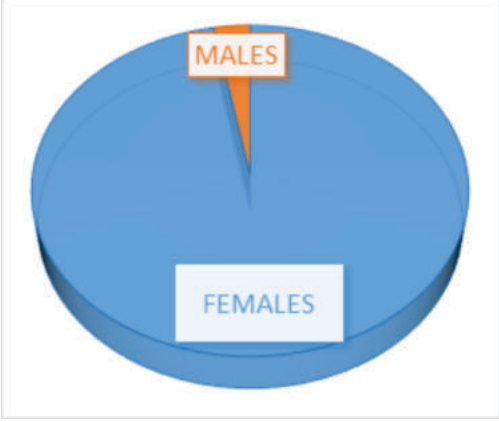

Chart 1:

Age Wise Distrubution Of Breast Lesions

In the age group of less than 20 years and 21-30 years, 21 and

47 patients had benign lesions of breast respectively and no malignant lesions were found out in these age groups.52 benign lesions and 4 malignant lesions were found in the age group of 31- 40 years.Similarly, 45 benign and 8 malignant lesions were found in the age group of 41-50 years.In the age group of 51-60 years, 36 benign and 11 malignant were found.Thus, concluding as the age increases, frequency of malignant lesions increases and benign lesion decreases.

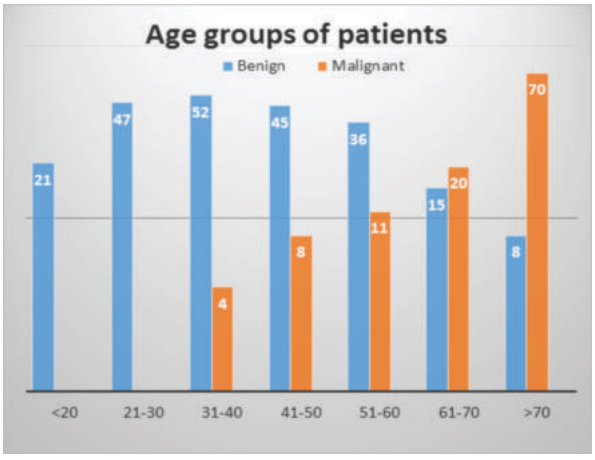

Chart 2

- According to the laterality of breast lesions

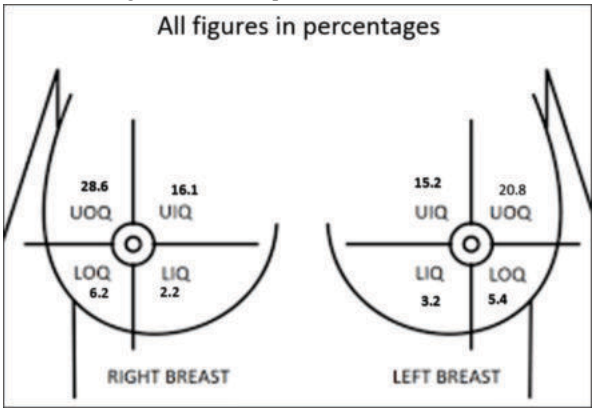

Chart 3:

In this study we found that amongst all the breast lesions , 161 (53.13%)patients had right sided breast lesion while 134 (44.22%) patients had left sided breast lesion.Bilteral lesions were found in 8 patients (2.64%).Upper outer quadrant is the most common quadrant involved by all types of cytological lesions.

Classification Of All The Lesions According To IAC Standardized Grading

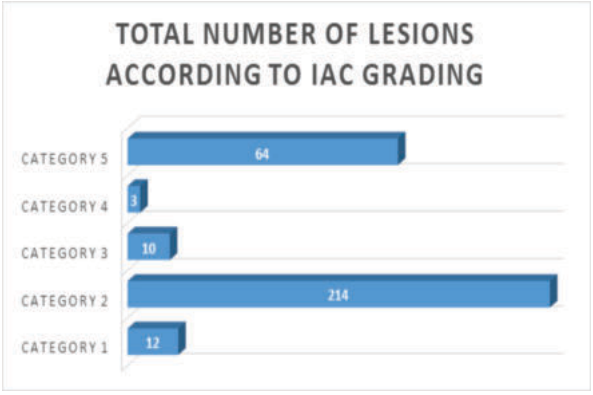

Chart 4:

Out of all the 303 cases,the final cytological report was given as per the IAC standardised grading and 64 lesions were graded under category 5 that is malignant lesions and 3 lesions were graded under category 4 that is suspicious of malignancy.Category 3 had 10 lesions which were atypical, probably benign.214 lesions were graded under category 2 which was benign lesions and 12 lesions were graded under category 1 which was insufficient material for evluation.

Among the 214 - C2 lesions, maximum lesions (102 lesions) were of fibroadenoma. Amongst all the C3 lesions, 8 lesions were of proliferative breast lesion with atypia. All the C5 lesions were reported as ductal carcinoma.

Table 1:

Classification of Breast Lesions		
C1 (12)	Insufficient material	12
C2 (214)	Fibrodenoma	102
	Mastitis	09
	Fibrocystic disease	14
	Galactocele	10
	Gnyaecomastia	09
	Benign Phylloides tumor	05
	Breast abscess	06
	Benign Epithelial Proliferative lesion	17
	Duct ectasia	05
	Granulomatous mastitis	07
	Benign cystic lesion	19
	Benign Breast lesion	10
	Hyadatid cyst of breast	01
C3 (10)	Fibrocystic disease with mild atypia	01
	Proliferative lesion with atypia	08
	Fibroadenoma with atypia	01
C4 (03)	Suspicious of malignancy	03
C5 (64)	Ductal carcinoma	64

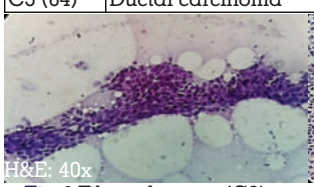

Fig:1 Fibroadenoma (C2)

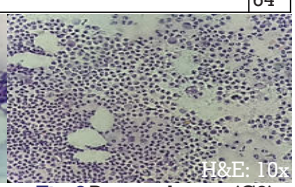

Fig:2 Breast abscess(C2)

Histopathological Correlation

Follow-up and histopathological correlation was available in 78 cases.In our study, the concordance amongst all the C2 to C5 lesions studied was 97.36 %. One was benign breast lesion and one was malignant breast lesion which were graded C1 (insufficient material) on cytology.Among all the C2(benign) graded breast lesions, 46 lesions were followed up which included 45 benign lesions and 1 was malignant lesion.Out of the 10 lesions graded as C3 (Atypia,probably benign) on cytology, 4 were followed up on histopathology and all were reported as benign breast lesion.In C4 lesions, 1 out of 3 cases were followed up on histopathology and reported as malignant.In C5 lesions, histopathological follow up was available in 25 cases amongst which all the 25 were reported as malignant breast lesions.

Table 2:

Correlation between IAC grading and histopathology				
IAC grading Cytology	**Histopathological follow -up**		**No follow-up**	**Total**
	Benign	Malignant		
C1 (02)	01	01	10	12
C2(46)	45	01	168	214
C3(04)	04	0	06	10
C4(01)	00	01	02	03
C5(25)	00	25	39	64
Total	50	28	225	303
	TOTAL -78			

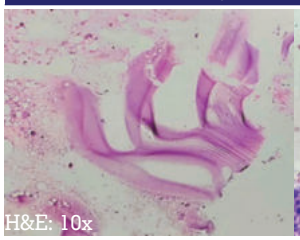

Fig:3 Hydatid cyst of breast (C2)

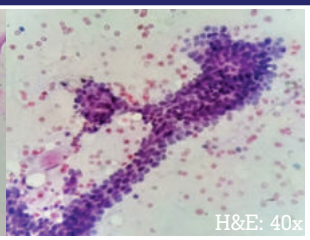

Fig:4 Proliferative breast disease with mild to moderate atypia(C3)

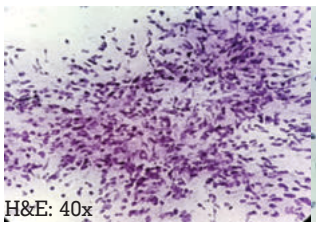

Fig:5 Phylloides tumor(C2)

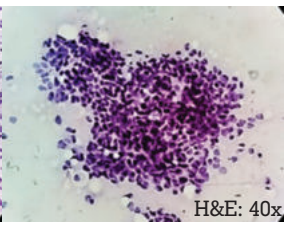

Fig:6 Ductal carcinoma(C5)

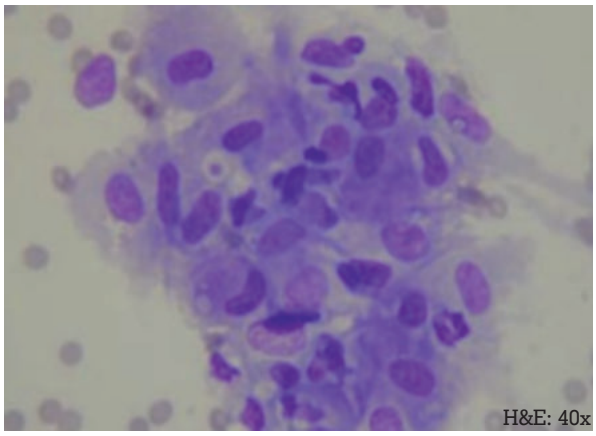

Fig:7 Granulomatous lesion (C2)

Amongst all the C1 cases: 2 - available for histopathology ,on which
- 1- Fibroadenoma (small size of the tumor < 2cm) and
- 1- Ductal carcinoma in-situ (inadequate cellularity , deep seated lesion)

Amongst All The C2 Cases Available For Histopathology :
- 1 -diagnosed as fibroadenoma on FNAC which turned out to be intracystic papillary carcinoma on histopathology(non-representative sampling)

Amongst all the C5 cases studied all the cases were diagnosed as ductal carcinoma on cytology but on histopathology 24 were classified as invasive ductal carcinoma
- 1 - Lobular carcinoma on histopathology.

Statistical Analysis

In this study, sensitivity and specificity of breast FNAC were 92.60% and 100% respectively, which were quite comparable with the findings of other studies. Diagnostic accuracy in our study was reported to be 97.36%.Similar results were found in the studies of Wong et al. [7], Kamatar et al.[8] and Arul et al. [5]

Table 3:

STATISTICAL ANALYSIS				
	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)
Madubogwu et al. [4]	90.0	95.5	94.7	91.3
Arul et al. [5]	93.1	99.0	97.6	97.0
Montezuma et al. [6]	98.2	54.7	68.2	98.6
Wong et al. [7]	98.8	99.4	96.4	97.6
Kamatar et al. [8]	94.5	98.9	98.5	95.7
Panwar et al. [3]	100	97	-	-
Present study	92.6	100	100	96.1

DISCUSSION

As per GLOBOCAN 2020, the number of new cancer cases diagnosed in 2020 was 19.3 million, and almost 10.0 million died due to cancer. [9]Accurate diagnosis of breast cancers can be made in 99% of cases by the combination of clinical examination , mammography and simple cost effective procedure of FNAC [10]. The Yokohama International Congress of cytology discussed regarding the 5- stage coding system that is C1 to C5. [11] Inadequate degree of cellularity –C1. This can be due to erroneous aspiration, smearing or staining.C2 or benign is for lesions showing cellular smears with ductal configuration, myoepithelium, bipolar nuclei and inflammatory background may also be seen.Smears with cellular crowding, discohesion and pleomorphism which are not seen in benign are categorized under C3.Aspirates with poor preservation, hypocellularity or components of benign smear precluding the diagnosis of malignancy are reserved for C4 or suspicious of malignancy.C5 lesions are aspirates with strong malignant findings.

Diagnosis of breast cancer can be accurately made by combination of clinical examination, mammography, and simple, non-invasive, cost-effective outpatient department procedure—fine-needle aspiration cytology (FNAC). Technique of FNAC has wide applicability and utility for the tumors which are easily palpable on external examination. Core needle biopsy is used in the developed countries. On the contrary, in developing countries like India, we still prefer FNA rather than core needle biopies as the former being cheaper, less invasive,sampling of different areas of the lesion in the same sitting at no added expenses and usually fetch good results the same day. The treatment of breast cancer starts with first hand diagnosis made on FNAC. [1]

CONCLUSION

FNAC is an effective and valid tool as first line diagnostic motality in preoperative diagnosis of malignant and benign breast lesions.

Cytological categorization based on IAC structured reporting will enhance the reproducibility of reports among the pathologist and clinicians. Histological correlation indicated FNAC to be a good diagnostic tool. A uniform reporting system for classification and diagnosis of breast lesions is useful as it is directly related to the risk of malignancy in each category.

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Conflict Of Interest

The authors declare they have no conflict of interest.

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