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Spectrum of Cytological Findings in Breast Lesions Diagnosed on Fine Needle Aspiration Cytology Two Year Retrospective Study in a Tertiary Care Centre.

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Abstract:
Background: *Breast lumps are the commonest point of concern in outpatient departments due to growing awareness in the general population. In Indian women breast carcinoma is the second most common malignancy preceded by cervical cancer. Hence early detection and to distinguish non-neoplastic from neoplastic breast lesions is very important prior to definitive management. The global protocol of "Triple Assessment" in breast lump diagnosis includes a combined approach by clinical examination, imaging (mammography / ultrasound) and fine needle aspiration cytology (FNAC).FNAC can be done as an OPD procedure,it is minimally invasive ,rapid,reliableand cost effective procedure. The aim of the study was to analyses the cytomorphological spectrum of palpable breast lesions in female patients by FNAC.*
Materials and methods: *The present study was conducted in L.N.medical college , department of Pathology for the period of Two year (Jan2018 to Dec 2019) in female patients with palpable breast lesions the outpatient department as well as the admitted one. The detailed history of the patient including age, site and duration of palpable breast lumps with any other significant findings was noted.*
Results: *Considering the cytomorphological spectrum, out of 220 breast lump aspirates, neoplastic breast lesions* ***(81.36%)*** *were more common than non-neoplastic breast (18.7%) lesions. In the neoplastic category, the benign lesions of fibroadenoma were 75cases (58.13%) which were more than malignant tumors of ductal carcinoma (50 cases=27.93%). The most common affected age group was 21-30 years accounting for 73 cases (33.1%).*
Conclusion: *FNAC of palpable breast lumps is a quick to perform, patient friendly, cost effective and reliable diagnostic tool which if performed and interpreted accurately can obviate the need for another surgical biopsy prior to definitive surgery for malignancy.*
Keywords: *,fine needle aspiration cytology ,palpable breast lumps ,FNAC, Fibroadenoma, Breast cancer.*

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I. Introduction

Breast pathologies have a varied spectrum and range from developmental abnormalities, inflammatory lesions, and benign epithelial and stromal proliferations to various malignant neoplasms. Breast lumps are common complaints of women visiting to health clinics of which 80 to 85% are benign and rest are malignant [1-3]. The clinical presentation of these lesions encompasses a wide range of symptoms, the most common being palpable lumps or they may be incidental detection [1, 2]. In Indian women breast cancer is the most common and leading cause of cancer related deaths preceded by cervical cancer, comprising 22.2% of all cancer diagnosis and 17.2% of all cancer related deaths [3]. The worldwide-accepted protocol for diagnosis of breast lumps is the "Triple Assessment" which encompasses the triad of clinical examination, mammography and pathological diagnosis. Fine needle aspiration cytology (FNAC) has gained importance as a diagnostic tool to assess the nature of palpable breast lumps due to its cost effectiveness, patient friendly procedure, simplicity, rapidity and its ability to display the abnormal cellularity along with nuclear & cytoplasmic details [1,3, 5, 6,]. FNAC has a good sensitivity, specificity and accuracy in the diagnosis of both neoplastic and non-neoplastic breast lumps thereby assisting in early diagnosis and further management. [8].It reduces the anxious waiting moments of the patient and place a very vital emotional booster in ruling out malignancies. The accuracy of the procedure ranges from just over 50% to 95 % depending on the experience of the aspirator and the interpreter. The present study was

undertaken to study the incidence and the different cytomorphological patterns of palpable breast lesions in female patients by FNAC and subsequently compare the results with other published studies in literature.

II. Materials And Methods

The present study was conducted in the DEPARTMENT OF PATHOLOGY, L.N. MEDICAL COLLEGE , BHOPAL in all cases of female presenting with a complaint of breast lump ,over a period of Two year , from January 2018 to December 2019. A total of 220 cases were studied with detailed clinical history and clinical examination and imaging. FNAC was carried out using 22/23 Gauge needle and 10 /20 cc disposable syringe . Material obtained was smeared on glass slides , Air dried as well as 95% alcohol fixed smears were prepared. Air dried smears were stained with May Grunwald Giemsa (MGG) stain and alcohol fixed smears were stained with Papanicolaou stains. Slides were studied under light microscope & cytological diagnosis was made under the standard cytological diagnostic protocol.

Inclusion Criteria
All female patients presenting with palpable breast lumps.
Exclusion Criteria
Female patients not willing for the procedure and Male patients with palpable breast lumps.

Procedure: The breast was examined and lump was palpated. The suspicious area was cleaned with spirit. The skin over the lump was stretched, lump was stabilized with one hand and multiple passes at different angles were made in the lump with a 10 cc disposable syringe fitted with a 23 G disposable needle till sufficient material was obtained in the needle hub. The axillary swellings if present and palpable were also aspirated in the similar manner. The aspirated material was sprayed and smeared on the properly labelled glass slides which were submitted for staining as per the protocol. The stained smears were then submitted for microscopic examination and cytology reports were interpreted accordingly.

III. Results

During the study period, a total of 220 FNACs were performed from breast lumps, all in female patients. The patient's age ranged from 12 to 88 years with median age of 55.5 years. The most common affected age group was 21-30 years comprising of 33.1% cases followed by 31-40 years having 20.11% cases (Table1). There was slight preponderance in left breast involvement (48 %) followed by right breast involvement (45%) and bilaterality was seen in 7cases (Table2). Breast lumps were commonly seen in upper outer quadrant in 51.22 cases followed by upper inner quadrant 28.58% cases .

Considering the cytomorphological spectrum (Table 3), neoplastic breast lesions 81.36%) were more common than non-neoplastic breast (18.64%) lesions. In the neoplastic category, the benign neoplastic lesions 129 cases(58.6%) were more than malignant tumors (50 cases) (22.7%).Benign neoplastic lesions encountered more was fibroadenomas (Fig 1). In our case study, 5 cases of fibroadenoma showed cystic change. In malignant category (48 cases) 21.8%) were of ductal carcinoma (Fig 3) out of which 4 cases showed axillary lymph node metastasis. In non-neoplastic category, total 41 cases (18.6%) were observed out of which most commonly found was fibrocystic disease (25 cases) (11.36%). In the inflammatory category of breast lesions, 4 case of acute mastitis (1.8%) (Fig 2) and 3 cases of granulomatous mastitis (1.3%) (Fig 4) were found. We also observed 1 case of galactocele (0.45%) in a postpartum female patient.

Table No -1: Breast lesions FNAC: Age distribution

Age Group (years)	Number of cases	Percentage (%)
11-20	23	10.33
21-30	73	33.1
31-40	44	20.11
41-50	36	16.46
51-60	18	8.05
61-70	13	5.95
71-80	11	5
81-90	2	1

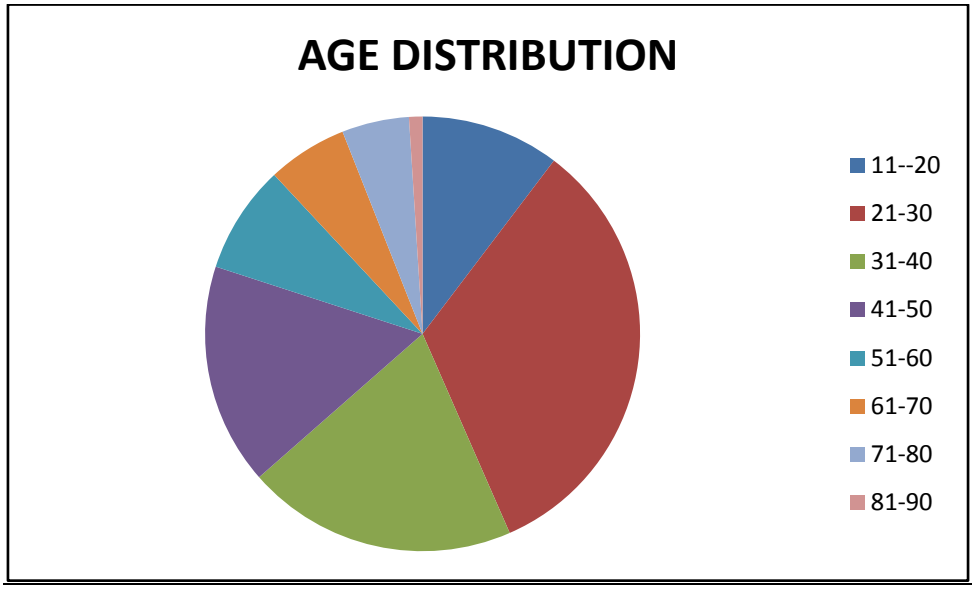

Table No- 2: Breast lesions FNAC: Side distribution

	right breast	left breast	Bilateral
% of Cases	**45**	**48**	**7**
Number of Cases	99	106	15

Table No - 3: Breast lesions FNAC: Cytomorphological spectrum.

Breast lesions	No. of cases	Percentage (%)
NON-NEOPLASTIC BREAST LESIONS		
ACUTE MASTITIS	**4**	**2**
GRANULOMATOUS MASTITIS	**7**	**3**
GALACTOCELE	**5**	**2.3**
FIBROCYSTIC DISEASE	**25**	**11.4**
NEOPLASTIC BREAST LESIONS		
BENIGN	**129**	**58.6**
MALIGNANT	**50**	**22.7**

TABLE NO 4: DISTRIBUTION OF BENIGN LESIONS

DIAGNOSIS	Number of Cases
EPIDERMOID CYST	3
GALACTOCELE	1
FIBROADENOMA	75
FIBROCYSTIC DISEASE	37
BENIGN BREAST DISEASE	4
LIPOMA	3
PROLIFERATIVE BREAST DISEASE	6
TOTAL	**129**

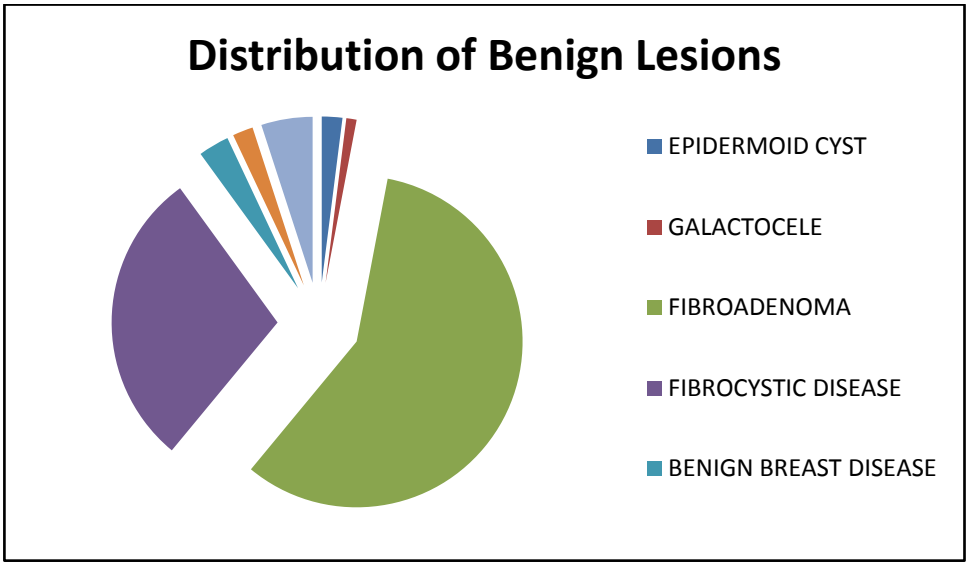

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TABLE NO 5 : DISTRIBUTION OF MALIGNANT LESIONS

DIAGNOSIS	**TOTAL NO. OF CASES**
INVASIVE CARCINOMA NOS	48
MUCINOUS CARCINOMA	1
MEDULLARY CARCINOMA	1
INTRACYSTIC PAPILLARY CARCINOMA	0
METASATSIS	0
TOTAL	50

Fig 1: Fibroadenoma, smear showing tight cohesive clusters of benign ductal epithelial cells with scattered bare bipolar nuclei. (PAP stain 100X)

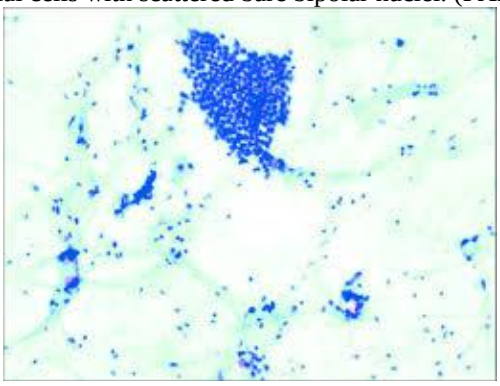


Fig 2: Acute mastitis, smear showing numerous neutrophils. (PAP stain 100X)

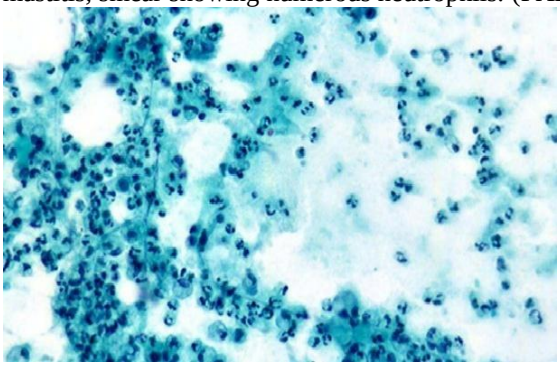


Fig 3: Ductal carcinoma, smear showing loose clusters of pleomorphic ductal epithelial cells. (PAP stain 400X)

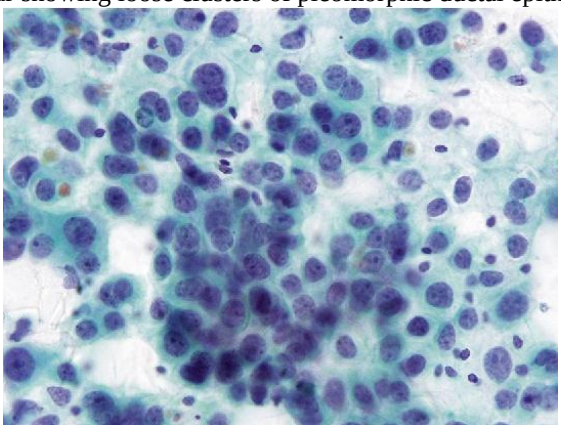
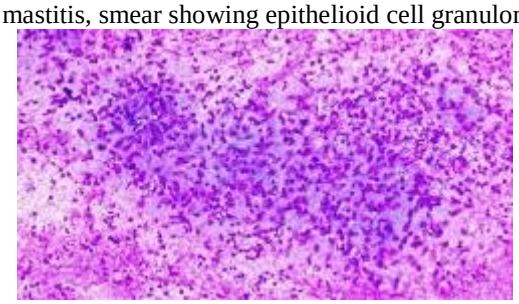


Fig 4: Granulomatous mastitis, smear showing epithelioid cell granuloma. (MGG stain 100 X)



IV. Discussion-

Fine needle aspiration cytology of breast lump is a simple, safe, cost effective and time saving procedure . In this present study, we included 220 breast lump cases, all female patients, . The inadequate samples were excluded from the study. The cytomorphological study was performed and cytological diagnosis were made. In our study, youngest patient was 14 years old and oldest was 85 years old female. The majority of the cases with palpable breast lumps occurred in females in third to fifth decades of life which correlated with studies by Chamdanwale *et al*. [12] & Likhar *et al*. [4] In our study, there was slight preponderance in left breast involvement (48 %) followed by right breast involvement (45%) study by Faiyaz Ahmed *et al*. [15] also showed left side involvement more common. The common site in present study was upper outer quadrant which was in accordance with previous studies in literature [11, 12].

In the present study, fibroadenoma was the most common benign lesion and maximum cases of fibroadenoma were observed in the age group of 21-30 years which was in accordance with results shown by Faiyaz *et al*. [15] Kochhar *et al*. [5], Khanzada *et al*. [6], Iyer *et al*. [13], Akhtor *et al*. [7] & Irabor *et al*. [17]. In malignant category, 96% cases were of ductal carcinoma (Fig 3) out of which 4 cases showed axillary lymph node metastasis while study performed by Rahman MZ *et al* showed 10.32 % of malignant cases with metastatic lymph nodes on FNAC [3].. Maximum numbers of malignant cases were in 41 to 50 years of age group which is similar to the results by Khan *et al*. [18]

In the inflammatory category of breast lesions, we observed 4 case of acute mastitis and 3 cases of granulomatous mastitis .Cases of granulomatous mastitis were non-caseating and negative for acid fast bacilli in ZN stain. other cases such as 1 case of galactocele & 25 cases of fibrocystic disease were also found which showed similarity in result with literature [8,9,10,11].

V. Conclusions

FNAC is a simple, patient –friendly, useful, rapid and reliable diagnostic technique with great practical importance. FNAC can be utilised as first line diagnostic procedure in patients presenting with breast lump especially in the developing countries with limited resources It forms the most important aspect of cytopathology as a component of triple assessment. It also aids in distinguishing non-neoplastic and neoplastic lesions of breast lump and thereby helps in definitive operative intervention. However we support the standard recommendation that the patient with breast masses should be diagnosed based on the combination of physical examination, radiological modalities and FNAC (the triple test).FNAC procedure has the major advantage of relieving patient anxiety by ruling out malignancy in a patient with breast lumps.Thus FNAC proves a stress buster for both clinicians and anxious patients with breast lesions.

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