



## CYTOMORPHOLOGICAL STUDY OF PALPABLE BREAST LUMPS BY ASPIRATION CYTOLOGY

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### ABSTRACT

**Aim and Objective:** To determine the distribution of various cytomorphological patterns of clinically palpable breast lumps by Fine Needle Aspiration technique.

**Materials and Methods:** A retrospective study over a period of 3 years 270 breast aspirates who attended the surgery outpatient department in Shri devi Institute of Medical sciences and research Hospital Tumkur from January 2015 to December 2018 were studied with clinical correlation and cytological analysis. Smears were stained with H&E stain, and correlation with imaging studies was done.

**Results and Analysis:** Total of 270 cases were studied, out of these 191 (70.74%) were found benign and 50 (18.51%) were malignant. 20 (7.40%) cases given un-satisfactory results. Out of 270 cases of analysis, Fibroadenoma was the most common benign lesion found in 133 (49.25%) patients, followed by fibrocystic disease 28(10.37%) and mastitis/Breast abscess 8(2.96%) were common breast lesions on cytology. Malignant breast lesions constitute 50(18.51%) cases, among which Invasive Duct cell carcinoma 47(17.40%) cases were commonest type.

**Conclusion:** Benign breast lesions are common than malignant lesions, Fibroadenosis and fibrocystic disease are more common in benign disease. Maximum number of lesions (34%) was seen in age group of 20 to 30 years, whereas IDC accounts for the highest number of malignant lesions. Fine-needle aspiration cytology is a rapid and effective method for the cardinal categorization of palpable breast lumps into benign, malignant, atypical, suspicious, and unsatisfactory categories.

**KEYWORDS :** Palpable, Breast Lumps, Cytomorphology, FNAC.

### INTRODUCTION

Breast is an appendage of skin, lumpy breasts are a very common complaint for women of all ages, but are more so during their reproductive years. Swelling in the breast may occur spontaneously or incidentally. Evaluation of a breast mass can be a difficult task. It may be difficult for the patient because of the anxiety associated with breast malignancy. Majority of breast symptoms or lesions will prove to be of a benign etiology. Benign and malignant breast lesions are quite common in Indian population. It is the second most common cancer site after cancer cervix in Indian females. Breast carcinoma is the most common malignant neoplasm and the leading cause of death from cancer in women. Rates of breast cancer are highest in the age group 60-64. Only 11% of people presenting with breast lumps turn out to have breast cancer, many breast cancers are localized and can be treated effectively if diagnosed early. Some benign diseases are associated with a slightly increased risk of cancer in future, depending on that patient's medical history, family history and risk factors. The use of various investigations depends on the history and examination findings. Scanning is used in screening for breast cancer to detect breast lumps that cannot be felt. While a mammogram can identify suspicious features in breast lump, it cannot determine whether a lump is benign or not. Ultrasound is an appropriate first investigation for women who are under 30 years old or pregnant and have a breast lump. It is also useful in patients with a palpable breast lump and an abnormal mammogram result. Ultrasound can demonstrate if a mass is cystic or solid and can also be used to guide aspiration or biopsy. Fine needle aspiration is minor procedure; needle inserted into the breast lump and the syringe plunger is drawn out (aspirate) to obtain a sample of cells. The tissue or fluid sample taken can be examined for the presence of any cancerous cells. FNA can also be used to treat a breast cyst, by aspirating the fluid inside the cyst itself. Core needle biopsy (CNB) is more invasive procedure than FNA in the detection of breast cancer. It uses a larger, hollow needle that allows better sampling of the tissue within the lump, which can then be examined for malignancy. The "triple test" is a combination of physical examination, breast imaging and biopsy (FNA or CNB) to calculate a triple test score. The only hope of reducing morbidity/mortality due to breast cancer is in the early detection of the lesion by aspiration cytology.

FNAC is not only useful in diagnosis but also further planning of treatment without need for biopsy, Cytology is also helpful in prognostication of the tumor factors such as nuclear grading, mitotic index, hormone receptor status and DNA contents [3].

### AIM AND OBJECTIVES

To assess the distribution of various cytomorphological patterns of

clinically palpable breast lumps by Fine Needle Aspiration Cytology technique.

### MATERIALS AND METHODS

A retrospective study carried out at Shri Devi Medical College, Tumkur from Jan 2015 to Dec 2018 over a period of 3 years on 270 female patients with clinically palpable breast lumps which were referred to the department of pathology for FNAC of breast. Physical examination with palpation followed by Fine Needle Aspiration Cytology was done by using 23 gauge needle attached to 10 cc disposable syringe. The sample was obtained with aspiration and non-aspiration techniques with minimum passes to minimize hemorrhage. Palpable axillary lymph nodes were aspirated to exclude metastasis. Wet fixed smears were stained with Haematoxylin and Eosin (H&E) stain, one for Papanicolaou stain whenever necessary, data was taken regarding the age of the patient, site of involvement, size of the lesion, cytological diagnosis and presence of metastasis in case of malignancies, correlation with available imaging studies was done.

### RESULTS AND ANALYSIS

A total of 270 FNAC of palpable breast lumps were done in the cytopathology department of Shri devi Medical College Tumkur. The age of the patients in the present study varied from 17-75 years. Maximum number of lesions (34%) was seen in age group of 20 to 30 years, followed by 30 to 40 years (27%), and 50 to 60 years (22%). In >70 years age only 2 lesions (0.8%) were noticed (table-1).

**Table 1: Distribution of lesions according to age groups**

Age group in years	Number of cases	Percentage (%)
<20 yrs.	25	10
21 – 30	85	34
31 – 40	68	27
51 – 60	55	22
61 – 70	15	6
71 – 80	2	0.8

The cytological spectrum of various breast lesions in the present study shows that out of the total 270 cases, benign lesions were 191(70.7%), atypical cases 7(2.5%), suspicious cases 2(0.7%), frankly malignant 50(18.5%), unsatisfactory 20(7.4%) were reported (table-2).

**Table 2: Cytological spectrum of various palpable breast lesions**

Cytological type	Number of cases	Percentage (%)
Benign	191	70.7
Atypical	7	2.5

Suspicious	2	0.7
Malignant	50	18.5
Unsatisfactory	20	7.4
<b>Total</b>	<b>270</b>	<b>100</b>

Total of 50 malignant breast lesions were analyzed. Out of 270 breast aspirates 20(7.4%) cases yielded inadequate aspiration material (or) diagnosis was equivocal. Out of 270 cases, benign breast lesions 191(70.74%) were most common lesions in young females, among which fibroadenoma constitute 133(49.25%) cases were the commonest presentation. Among total 133 fibroadenomas, 2(1.5%) were Giant fibroadenomas, 3 (2.2%) cases show bilateral breast involvement, 5(3.7%) cases were located at axillary tail of Spence. Out of 270 breast aspirates, (table-3) fibrocystic disease were 28(10.37%), benign epithelial hyperplasia were 6(2.22%), breast abscess 8(2.96%), duct ectasia 4(1.48%), simple cyst 2(0.7%), granulomatous mastitis 2(0.7%), fat necrosis 2(0.7%), and galactocoele 2(0.7%) cases were reported. Out of total 270 aspirates 50(18.51%) cases were reported as malignant lesions. Among which Duct cell carcinoma constitute 47(17.40%) cases, lobular carcinoma, mucinous carcinoma and recurrent phyllodes tumour each 1(0.37%) case was reported.

**Table 3: Cytological diagnosis of breast lesions by FNAC (n=270)**

Category	Cytological diagnosis	Number of cases	Percentage (%)
1. Inflammatory and Benign Lesions	Acute mastitis/abscess	8	2.96
(191 Cases-70.74%)	Granulomatous mastitis	2	0.7
	Fat necrosis	2	0.7
	Duct ectasia	4	1.48
	Fibroadenoma	133	49.25
	Fibrocystic disease	28	10.37
	Simple cyst	2	0.7
	Epithelial hyperplasia	6	2.22
	Galactocoele	2	0.7
	Benign phyllodes tumor	2	0.7
	Papillary lesion	2	0.7
	2. Atypical/indeterminate-probably benign	Epithelial hyperplasia with atypia	7
3. Suspicious of Malignancy	Atypical cells suspicious of malignancy	2	0.70
(02 cases-0.7%)			
4. Malignancy (50 cases -18.51%)	Ductal carcinoma	47	17.40
	Lobular carcinoma	1	0.37
	Mucinous carcinoma	1	0.37
	Recurrent malignant phyllodes tumor	1	0.37
5. Unsatisfactory		20	7.40
<b>Total</b>		<b>270</b>	<b>100</b>

**Table 8: comparative study of cytological lesions**

Cytological type	Present study (270)	Mohammed et al. (157)	Yeoh and Chan (1533)	Park and Ham (669)	Rocha et al (809)	Dominguez et al. (1398)
Benign	191 (70.7%)	112 (71.3%)	1121 (73.12)	384 (57.4)	615 (76.02%)	1087 (77.75%)
Atypical	7 (2.5%)	2 (1.3%)	51 (3.32%)	24 (3.6%)	-----	-----
Suspicious	2 (0.7%)	2 (1.3%)	19 (1.23%)	7 (1.0%)	26 (3.21%)	20 (1.14%)
Malignant	50 (18.5%)	38 (24.2%)	68 (4.43%)	85 (12.7%)	97 (12%)	149 (10.65%)
Unsatisfactory	20 (7.4%)	3 (1.9%)	274 (17.83%)	169 (25.3%)	71 (8.77%)	142 (10.15%)

In the present study fibroadenoma (49.25%) followed by fibrocystic disease (10.37%) and mastitis/breast abscess (2.96%) were the most common breast lesions on cytology, which is in agreement with Dominguez et al., [8] (34.49%, 32.17%, and 1.55% respectively). Where as in study by Tiwari [9] and Qasim et al., [10] fibroadenoma (56.25% and 82.14%) followed by mastitis/breast abscess (20.31%) and 10.71% and fibrocystic disease (7.81% and 3.57%) were the most common breast lesions. In the present study 50 malignant lesions were seen. While in study by Dominguez et al., [8] 147 cases were seen. Duct cell carcinoma was most common in the present

Out of 50 malignant cases 9(18%) presents with palpable axillary lymph nodes. Out of that, 3 cases show metastatic lymphadenitis.

**Table 4: Classification of breast lesions according to size of the lesion**

S.No.	Size of the lump (cm.)	Number of cases	Percentage (%)
1.	<5	190	70.3
2.	5-10	55	20.3
3.	>10	25	9.25
	<b>Total</b>	<b>270</b>	<b>100</b>

Regarding size of the breast lump, maximum size >10cm in 25(9.25%) cases, minimum size <5 cm in 190(70.3%) cases were noticed (table-4).

**Table 5: Side wise distribution of breast lesions**

Side	Quadrant					Total
	U.O	U.I	L.O	L.I	Central	
Right	35	16	21	15	23	110 (40.7)
Left	50	27	24	23	36	160 (59.2%)

Regarding side wise distribution, left side was most commonly involved (59.25%), out of that left upper outer quadrant were most commonly involved (Table-5).

**Table 6: Presenting symptoms of malignant neoplastic lesions (n=50)**

S.No.	Presenting symptom	Number	Percentage (%)
1.	Painless lump in the breast	16	32
2.	Nipple retraction	10	20
3.	Palpable axillary lymph nodes 2 or more	9	18
4.	Pain full lump	5	10
5.	Ulceration fungation of the mass	4	8
6.	Nipple discharge	3	6
7.	Signs and symptoms of metastasis	3	6

The clinical symptoms of patients presenting with suspected malignant lesion varies from painful lump (10%) to painless mass (32%), nipple retraction (20%), nipple discharge (6%) etc. (table-6).

**DISCUSSION**

Breast is an easily accessible site for fine needle aspiration cytology. There is a trend among our surgeons to confirm the diagnosis of the suspicious lesions at first consultation by some form of needle biopsy technique. The present research confirms the worth and clinical utility of fine needle aspiration cytology in the investigation of the patients with benign and malignant breast disease.

The present study accounted for more numbers of benign cases and less number of malignant cases, correlation with Mohammed et al., [4] Yeoh and Cha et al., [5] Park and Ham et al., [6] Rocha et al., [7] and Dominguez et al., [8]. Incidence of suspicious, atypical lesions in the present study is almost same as that in other studies. The finding of unsatisfactory cases in the present study is more than in the study by Mohammed et al., [4].

study with 47(17.40%) cases and 141(95.91%) in study by Dominguez et al., [8]. Mucinous carcinoma, lobular carcinomas were second most common tumors in this study with 1 (0.37%) case each, while in study by Dominguez et al., [8] also seen in 1 (0.68%) case. Lobular carcinoma was seen in only 1 (0.37%) case in this study, while it was second common tumor in study by Dominguez et al., [8] with 4 (2.72%) cases. As overall pattern of type of malignancy with IDC were accounting for >85% cases in both studies. In the present study we reported 2 benign phyllodes and 1 recurrent malignant phyllodes tumour. Zuk et al., [11] classified all aspirates into the

following groups: **Inadequate:** Either extremely hypo cellular with regard to epithelial cells or bloodstained to an extent that all other elements are obscured. **Benign:** Characterized by sheets of regular ductal cells with nuclear features of benign cells, often admixed with a large number of "stripped" nuclei. **Suspicious:** Hyper cellular specimen, which had an admixture of regular cells and others with abnormal nuclear and cytoplasm features falling short of a firm diagnosis of malignancy. **Malignant:** Hyper cellular specimen comprising cells with unequivocal cytological features of malignancy. Tabbara et al.,[12] recommended in the national comfort institute conference the use of a standardized approach for the reporting of breast FNAs. The classification system proposed at the conference places breast FNAs into one of five categories:

1. Benign
2. Atypical/indeterminate
3. Suspicious/probably malignant
4. Malignant
5. Unsatisfactory.

In the present study, maximum numbers of cytologically benign lesions were seen in the age group ranging from 17 to 45 years (table-1). This was similar to the findings by Khemka et al.,[13] and Rocha et al.,[7] who had maximum cytological benign cases in the age groups 15-44 years and 14-40 years respectively. Macintosh et al.,[14] had majority of benign cases in the age group 27-77 years. Maximum atypical category lesions were seen in the age group 31-68 years in the present study, while other studies do not mention this category in their study. In the present study, cytological suspicious lesions were most common in the age group 33-72 years almost similar findings have been reported by Macintosh et al.,[14] and Rocha et al.,[7] who reported maximum number of suspicious cases in the age groups 33-75 years and 31-75 years, respectively. Malignant lesions were common in the age groups 35-77 years in the present study, 35-84 years in the study by Khemka et al.,[13], 63-79 years in the study by Macintosh et al.,[14] and 41-75 years in the study by Rocha et al.,[7]. Unsatisfactory lesions were common in the age groups 19-55 years in the present study and 14-50 years in the study by Rocha et al.,[7]. So overall pattern of occurrence is as expected with benign lesions are seen in younger age group and suspicious and malignant in older age group. In the present study, both sides (right and left) were not equally involved by the different types of cytological lesions. This is in association with the findings of Reddy and

Reddy[15] and Clegg-Lamprey and Hodasi[16] in which the left side was slightly more common. Upper and outer quadrant was the most commonly involved quadrant (31.48%) in the present study. This is in agreement with the findings of other studies like Rocha et al.,[7] (45.20%), Zuk et al.,[11] (42.20%), Reddy and Reddy [15] (54.20%), and Clegg-Lamprey and Hodasi[16] (42.40%). The exact cause of this finding is not known. In the present study, more benign cases and less malignant were seen cytologically like studies by Mohammed et al.,[4] Kim et al.,[17] Park and Ham[6] and Choi et al.,[18]. This higher number of benign and lower number of malignant cases in other studies may be due to good follow up or more awareness amongst the patients. During aspiration, we found 9 of 50 breast carcinoma patients with palpable lymph nodes, 3 of them showed features of metastatic duct cell carcinoma and others were reactive nodes. This compared with Khan et al.,[19] had noticed more number of cases. Cytologically sometimes, lobular carcinoma can appear as poorly differentiated carcinoma, as no pattern is seen. Sometimes, mastitis cases can be confused with IDC. This may be because, in the background to heavy inflammation, few cells may appear more atypical. The exact cause of poor cellularity in some benign or malignant cases cannot be determined. The findings of Dey and Luthra et al.,[20] indicate that the presence of associated fibrocystic disease may be misleading because it can mask a malignancy. Hypocellularity and relatively mild nuclear atypia are the most common reasons for failure to diagnose a malignant breast lesion. In these cases careful attention to extreme nuclear pleomorphism and absence of naked bipolar cells along with radiologic suspicion should suggest a diagnosis of malignancy [21, 22]. In this study, we have realized that one cannot overlook the importance of clinical and radiological assessment for diagnosing breast lumps. This is especially so in cases that is labeled on cytology as atypical or suspicious. In such conditions, triple assessment (which assigns a score to a breast lesion by taking into consideration the clinical diagnosis, mammography diagnosis and the cytology diagnosis together and not any one diagnosis in isolation) is must. Triple test is particularly beneficial in a false negative scenario,

in which the clinical decision to undertake a biopsy is usually based on index of suspicion and radiological imaging.

## CONCLUSION

Fine-needle aspiration cytology is a rapid and effective method for the primary categorization of palpable breast lumps into benign, malignant, atypical, suspicious, and unsatisfactory categories. Benign breast lesions are common than malignant lesions, fibroadenoma and fibrocystic disease are more common where as IDC accounts for the highest number of malignant lesions. Diagnostic accuracy of the procedure for malignant lesions is well established. More over FNAC can be repeated in cases of suspicious diagnosis or inadequate smear, further cases can be followed with biopsy for further confirmation. Due to rapid diagnosis we can reduce morbidity or mortality due to breast malignancies and prevent further complications. Thus it is proved that early detection by FNAC and prompt management helps in reducing the morbidity and restricting the disease progression at the very initial stage. It also avoids unnecessary surgical intervention.

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