

Diagnostic Utility of Fine Needle Aspiration Cytology (FNAC) of Breast Lesions in Females: A Study at a Rural Tertiary Care Centre in Faridabad

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Abstract—Fine-needle aspiration cytology (FNAC) is a crucial diagnostic tool for evaluating breast lumps, aiding in the differentiation between benign and malignant conditions. In this study, 56 female patients with breast lumps underwent FNAC. The majority of cases (62.5%) were benign, with fibroadenoma (28.57%) being the most prevalent diagnosis. Malignant lesions were identified in 23.21% of cases, while inflammatory conditions accounted for 14.28%. The highest incidence of breast lumps was observed in the 31-40 years age group (35.71%), followed by 21-30 years (26.78%). A significant proportion of patients (76.78%) belonged to lower socioeconomic backgrounds. These findings emphasize the importance of FNAC as a reliable, minimally invasive, and cost-effective diagnostic tool for early detection and management of breast lesions.

Index Terms—Fine Needle Aspiration Cytology (FNAC), Breast Carcinoma, Malignancy, Histopathology

I. INTRODUCTION

Breast lump is the commonest presentation in most of the breast diseases. The 2nd commonest cancer among women in India is Breast cancer [1]. Most of the breast lumps observed in general population are benign [2]. FNAC of breast lumps is a highly sensitive, low risk of complications, rapid, easy to perform, minimally invasive and low cost first line high diagnostic accuracy test that can be carried out at outpatient department [3], [4]. It is a rapid and reliable procedure and helps in planning of treatment in the breast lump [5].

Increasing awareness, associated anxiety & stress among young women who perceive every lump in

breast as carcinoma, leads the patient to seek medical advice. It is sometimes difficult to determine whether a suspicious lump is benign or malignant simply from clinical assessment and fine needle aspiration cytology (FNAC) is helpful in reaching definitive diagnosis and helps in determining the exact histopathology and cytomorphological spectrum which further helps the clinician for selection of drug of choice. In India, the incidence of breast cancer has increased by more than 20 % while mortality rate due to breast cancer has increased by 145 % due to rapid urbanization, changes in lifestyle and increased life expectancy. The risk factors for breast cancer include low parity, low age at first childbirth, late menopause, etc. The incidence of breast cancer is highest in the age group of 41-60 years. [6]

II. OBJECTIVES

1. To study the breast lumps in female patients by FNAC to find out the incidence of various breast lesions in a tertiary health care centre.
2. Diagnose their cytomorphological spectrum of different clinical manifestations.
3. To study various socio-epidemiological factors like age, socio-economic status, menstrual and marital status in cases of palpable breast lumps.

Inclusion Criteria –

All female patients of all age group with palpable breast lumps were included in the study.

Exclusion Criteria –

1. Inadequate sampling.
2. Non palpable breast lump.
3. Uncooperative patient.

II. MATERIALS AND METHODS

This is a retrospective study and a total of 56 female patients including all age groups presenting with palpable breast lump in FNAC clinic of our institute over a period of 4 months are included in our study. FNAC was conducted with 24 Gauge disposable needles attached to 5 cc syringes. Smears were fixed by air drying and in 95% ethyl alcohol and stained with field stain and Papanicolaou stain. Field stain was done on air dried smears.

Place of Study – Department of Pathology, Al Falah School of Medical Sciences and Research Centre, Dhauj, Faridabad (121004)

III. RESULTS

Out of total 56 cases, maximum incidence (n=20, 35.71%) of breast lump was seen in 31-40 years age group, followed by, in 21-30 years (n=15, 26.78%), and then, in 41-50 yrs (n=10, 17.85%). Youngest patient in the present study was of 21 years while oldest one was of 65 years. There was no specificity for side of breast involvement by various lumps. 46.5% (n=26) cases were with right breast involvement, 43.5% (n=24) with left breast and 10.0% (n=06) with bilateral involvement. Out of 56 female patients in the present study, 76.78% (n=43) were married while 23.21% (n=13) were unmarried.

80.35% (n=45) were premenopausal while 19.64% (n=11) were postmenopausal. Out of total 56 cases, maximum 76.78% (n=43) cases of breast lumps were seen in lower socioeconomic status followed by 8.92% (n=5) cases in middle and, 14.28% (n=8) in lower middle socioeconomic status.

Table 1 presents the cytological findings of fine-needle aspiration cytology (FNAC) in breast lump cases, categorizing them into inflammation, benign breast diseases, and malignant lesions. Inflammatory lesions accounted for 8 cases (15.27%), including mastitis (3 cases, 5.35%), abscess (4 cases, 7.14%), and granulomatous mastitis (1 case, 2.78%). Benign breast diseases were the most common category, comprising 35 cases (62.5%), with fibroadenoma being the predominant diagnosis (16 cases, 28.57%). Other benign conditions included proliferative breast disease with no atypia (10 cases, 17.85%), proliferative breast disease with atypia (3 cases, 5.35%), fibrocystic disease (4 cases, 7.14%), and galactocele (2 cases, 3.57%). Malignant lesions were identified in 13 cases (23.21%), highlighting the importance of FNAC in differentiating between benign and malignant conditions.

The findings indicate that benign breast diseases are the most frequently encountered category, with fibroadenoma being the predominant diagnosis. Malignant lesions accounted for nearly a quarter of the cases, underscoring the significance of FNAC as a diagnostic tool for early detection and differentiation of breast lumps.

FNAC Diagnosis		No. of Cases	%age
Inflammation	Mastitis	3	5.35%
	Abscess	4	7.14%
	Granulomatous Mastitis	1	2.78%
Benign Breast Diseases	Fibroadenoma	16	28.57%
	Proliferative Breast Disease with no Atypia	10	17.85%
	Proliferative Breast Disease with Atypia	3	5.35%
	Fibrocystic		
	Galactocele	4	7.14%

		2	3.57%
Malignant Lesions		13	23.21%

Table 1: Cytological Diagnosis of Breast Lump Aspiration

Table 2 presents the distribution of cases based on clinical presentation. The most common presentation was a palpable lump, observed in 44 cases (78.57%), indicating that most patients sought medical attention due to a noticeable mass. Other associated symptoms

included lump with palpable lymph nodes in 6 cases (10.71%), lump with bloody discharge in 4 cases (7.14%), and lump with pain and milky discharge in 2 cases (3.57%). These findings highlight that while a solitary lump is the predominant

Clinical Presentation	No. of Cases	%age
Lump	44	78.57%
Lump, Pain, Milky Discharge	2	3.57%
Lump, Palpable Lymph Nodes	6	10.71%
Lump, Bloody Discharge	4	7.14%

presentation, a subset of patients also exhibited additional symptoms, which may provide valuable diagnostic clues in differentiating between benign and malignant conditions.

Table 2: Distribution of Parts on Basis of Clinical Presentations

Table 3 illustrates the distribution of patients across different age groups. The highest number of cases was observed in the 31-40 years age group, with 20 patients, followed by the 21-30 years age group, which had 15 patients. The number of cases declined with increasing age, with 10 patients in the 41-50 years age group, 6 patients in the 51-60 years category, and the

lowest count of 5 patients in individuals aged above 60 years. These findings suggest that breast lump cases are more prevalent in younger and middle-aged individuals, with a peak incidence in the third and fourth decades of life. This distribution highlights the importance of early screening and diagnostic interventions in younger age groups.

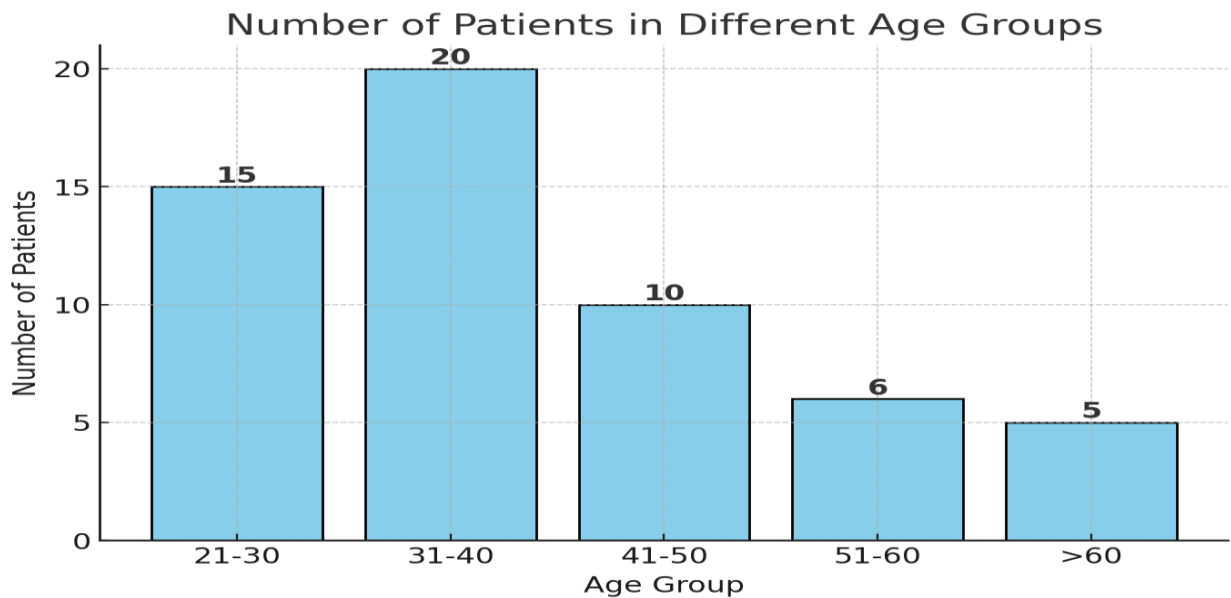
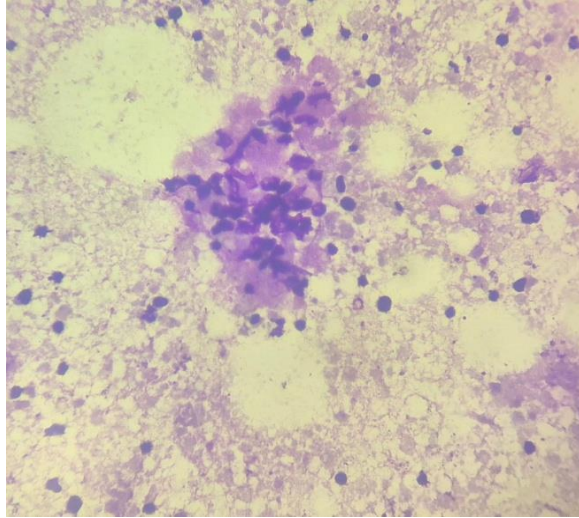
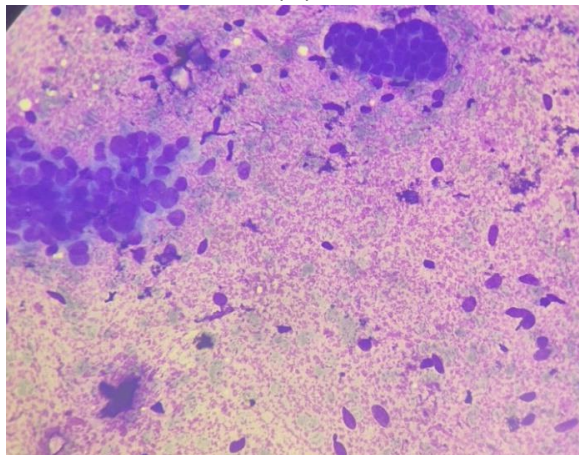


Table 3

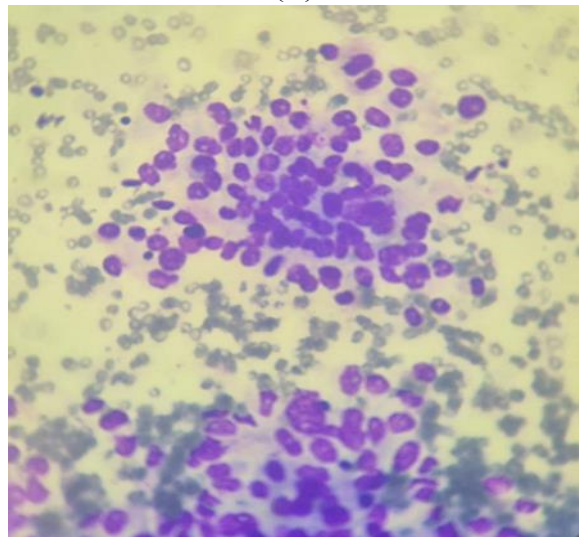
The following images depict cytopathological slides observed during the study, illustrating key microscopic findings relevant to the research.



{A}



{B}



{C}

{A} Mastitis - Smears show inflammatory infiltrate along with small cluster of benign ductal epithelial cells [H&E Stain_10x]

{B} Fibroadenoma – Stained Smear shows cohesive clusters of benign ductal epithelial cells with few bipolar nuclei [May Grunwald-Giemsa Stain 10x]

{C} Malignancy – Stained Smear shows loose clusters of atypical ductal epithelial cells with nuclear enlargement and absence of myoepithelial cells [Giemsa Stain 40x]

IV. DISCUSSION

Breast lump may be either benign or malignant; however, fear of malignancy is the main reason to compel the patients report to the clinician. For relieving the stress of the patients, it is necessary to investigate these patients according to standard guidelines [7]. FNAC is extensively recognized as a reliable procedure for the initial examination of palpable breast masses. It is minimally invasive, inexpensive, safe, simple, rapid, and sensitive as compared to biopsy [8], [9]. The main objective of FNAC is to distinguish malignant lesions from benign lesions to plan for the treatment protocol and follow-up [10].

In this study, the spectrum of breast lesions on cytomorphological interpretation was benign in 35 cases (62.5%), malignant in 13 cases (23.21%) and inflammatory lesions in 8 cases (14.28%). Benign breast lesions were the commonest lesions in our study similar to findings of study done by Bukhari MH et al. [6], Rocha PD et al. [11] and Feichter GE et al. [12]. Malignant lesions were seen in 13 (23.21%) cases in our study. Fibroadenoma was the commonest lesion (28.57%) in this study. Most studies have found fibroadenoma to be most common lesion [13, 14, 15]. In the present study, maximum cases of fibroadenoma were in the age group of 21-30 years which is similar to results shown by Kochhar et al [16], Khanzada et al [17], Iyer et al [18], Akhtor et al [19] & Irabor et al [20].

Benign breast diseases were the most prevalent, making up 62.5% of cases, with fibroadenoma (28.57%) being the most frequently diagnosed. Proliferative breast disease without atypia was found in 17.85%, while the atypical variant accounted for

5.35%. Other benign conditions included fibrocystic disease (7.14%) and galactocele (3.57%). Inflammatory lesions were identified in 15.27% of cases, comprising mastitis (5.35%), abscess (7.14%), and granulomatous mastitis (2.78%). Malignant lesions were detected in 23.21% of cases, underscoring the critical role of FNAC in differentiating benign from malignant conditions for appropriate clinical management.

Out of total 56 cases, maximum 76.78% (n=43) cases of breast lumps were seen in lower socioeconomic status followed by 8.92% (n=5) cases in middle and, 14.28% (n=8) in lower middle socioeconomic status. These results are in compliance with the socioeconomic setup of the population residing in nearby rural areas of our hospital. Our findings correlate well with those of Hussain MA et al [21] who also reported maximum cases from lower socioeconomic class. On the contrary, studies from western countries showed higher incidence of breast cancer in upper-socioeconomic status [22]. These studies as well as the present work indicate that the major burden of breast lesions is on the active and economically productive young age group. Thus, there is the need for early and accurate diagnosis and management of these patients.

V. CONCLUSION

This study highlights the predominance of benign breast diseases (62.5%), with fibroadenoma (28.57%) being the most common diagnosis, followed by proliferative breast diseases and inflammatory lesions. Malignant cases accounted for 23.21%, underscoring the significance of FNAC in distinguishing benign from malignant conditions. The highest incidence of breast lumps was observed in women aged 31-40 years, with a majority belonging to lower socioeconomic backgrounds. Given the considerable burden on younger, economically active women, early detection, and prompt management through FNAC play a crucial role in optimizing patient outcomes.

Financial Support and Sponsorship - Nil.

Conflicts of Interest - There are no conflicts of interest.

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