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A hospital based prospective study on role of ultrasound guided fine needle aspiration cytology in diagnosis of breast lumps

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Abstract
Introduction: In India, breast carcinoma is the second most common malignant neoplasm next to cervical cancer in females. It is the leading cause of morbidity and mortality. Breast cancer is now the most common cancer among Indian females (around 30%) and has speedily replaced cervical cancer. All breast lesions are not malignant, and all the benign lesions do not progress to cancer; however, the accuracy of diagnosis can be increased by a combination of preoperative tests. The minimally invasive method includes fine needle aspiration cytology (FNAC). It is a simple technique readily tolerated by patients, does not require anesthesia.
Materials and Methods: This prospective hospital-based study was conducted in the department of pathology in tertiary care hospital. The patients suffering from breast lump were included in the present study. All the details were observed and noted like clinical history and meticulous physical examination including the duration, size, consistency and mobility. 22-24G needles attached to 10cc syringes were used for the FNAC FNA. The prepared smear from the aspirates was fixed in 95% ethyl alcohol and then those smears were stained with Papanicolaou and Hematoxylin and Eosin (H and E) stains. Air dried aspirates smear was stained with Giemsa and for the study of cytological diagnosis of granulomatous disease Ziehl-Neelson (ZN) staining was performed. The biopsy specimens were fixed in 10% formalin for 24 hours for histopathological examinations and then gross examination and cut section findings were done. From each block, sections were cut at 4-5 microns thickness and stained with H and E.
Results: Total 50 patients having breast lumps were studied; all patients were female with age group 15 years to 60 years. Among 50 patients 40 (80%) were benign and 10 (20%) were malignant. The maximum benign cases were studied in age range of 15-20 years of age 20 (40%) and malignant cases ranged from 21 to 60 years with a majority of cases in the age group of 41-50 years 6 (60%). All the palpable breast lumps were in the range of 1-5 cm and 23 breast lumps measured 1.1-2 cm, among them 4 cases (17.40%) were malignant, followed by range of 2.1-3 cm, 3.1-4 cm, less than 1 cm and more than 4.1 cm cases were 15, 6, 5 and 1 respectively. Among total patients 26 (52%) cases were in right breast and 24 (48%) cases were in left breast. Among all the four quadrants, superolateral quadrant was the most common for breast lesions 26 (52%). 40 (80%) cases were benign with the majority of cases 15 (37.5%) being fibroadenoma, followed by fibrocystic change 11 (27.5%), inflammatory/ mastitis 6 (15%), galactocele or lactational changes 5 (12.5%), gynecosmastia 2 (5%) and one case was benign phyllodes tumour (2.5%).
Conclusions: Breast lump is a common clinical presentation with wide differential diagnosis including malignancy which has increased incidence in recent times. FNAC is a very important preliminary diagnostic test in breast lesions; the results show a high degree of correlation with the final histopathology report with USG.

Keywords: breast lump, FNAC, benign, malignant, carcinoma

Introduction
In India, breast carcinoma is the second most common malignant neoplasm next to cervical cancer in females [1]. It is the leading cause of morbidity and mortality [2]. Breast cancer is now the most common cancer among Indian females (around 30%) and has speedily replaced cervical cancer [3, 4]. All breast lesions are not malignant, and all the benign lesions do not progress to cancer; however, the accuracy of diagnosis can be increased by a combination of preoperative tests (like physical examination, mammography, fine-needle aspiration cytology, and core needle biopsy). Breast lump is a matter of worry to the patient as well as to clinician hence need for reliable, accurate and quick method for correct diagnosis. These modalities are more accurate, reliable, and acceptable when compared with a single adopted diagnostic procedure despite of having their own technical limitations [5, 6]. During the last century much

progress has been made for diagnosis, treatment and prevention of breast cancer [7]. The minimally invasive method includes fine needle aspiration cytology (FNAC). It is a simple technique readily tolerated by patients, does not require anesthesia [8, 9]. FNAC of the breast has two main goals. One is to confirm a radiological and clinical benign lesion and to avoid unnecessary surgery. The other is to confirm a malignant diagnosis allowing definite treatment plan [10, 11]. FNAC is a quick, simple, reliable and inexpensive procedure in diagnosing breast lumps. It is reported in different studies that FNAC have 80% to 98% sensitivity and more than 99% specificity [12]. Although fine-needle aspiration (FNA) biopsy of the breast has been shown to be a safe and accurate technique, many surgeons question whether it is reliable enough to replace excisional biopsy. If FNA biopsy is followed by an excisional biopsy for confirmation, it would seem that the cost of diagnostic workup would be increased, but it has been seen that FNA biopsy is cost effective even when followed by an excisional or frozen section biopsy for confirmation. It is considered safe and reasonable to expand its use to smaller hospitals where the personnel may be initially less experienced with the technique [13, 14].

Materials and Methods

This prospective hospital-based study was conducted in the department of pathology in tertiary care hospital. The patients suffering from breast lump were included in the present study. All the patients were gone through the counselling about the procedure and then informed consent was taken. All the details were observed and noted like clinical history and meticulous physical examination including the duration, size, consistency and mobility. 22-24G needles attached to 10cc syringes was used for the FNAC FNA. One to two passes were given and the aspirated material was smeared onto glass slides. The prepared smear from the aspirates was fixed in 95% ethyl alcohol and then those smears were stained with Papanicolaou and Hematoxylin and Eosin (H and E) stains. Air dried aspirates smear was stained with Giemsa and for the study of cytological diagnosis of granulomatous disease Ziehl-Neelson (ZN) staining was performed. During the FNAC FNA in some cases fluids were collected, for the diagnosis of those collected fluid are centrifuged and then from sediment smear were prepared and stained with the above staining methods. Criteria for adequacy were at least six clusters of ductal cells on each smear comprising 10 cells per cluster. National cancer institute consensus conference on breast FNA5 (1997) guidelines were followed for categorizing lesions. The biopsy specimens were fixed in 10% formalin for 24 hours for histopathological examinations and then gross examination and cut section findings were done. From each block, sections were cut at 4-5 microns thickness and stained with H and E.

Results

Total 50 patients having breast lumps were studied, all patients were female with age group 15 years to 60 years. Among 50 patients 40 (80%) were benign and 10 (20%) were malignant. The maximum benign cases were studied in age range of 15-20 years of age 20 (40%) and malignant cases ranged from 21 to 60 years with a majority of cases in the age group of 41-50 years 6 (60%).

Table 1: Distribution of age with breast lesions

Age (Years)	Total number of cases and percentage (%) (n = 50)	Benign cases (%) (n = 40)	Malignant cases (%) (n = 10)
15-20	20 (40%)	20 (50%)	0 (0%)
21-30	14 (28%)	12 (30%)	2 (20%)
31-40	5 (10%)	5 (10%)	0 (0%)
41-50	7 (14%)	1 (10%)	6 (60%)
51-60	4 (8%)	2 (%)	2 (28.6%)
Total	50 (100%)	40 (100%)	10 (100%)

All the palpable breast lumps were in the range of 1-5 cm and 23 breast lumps measured 1.1-2 cm, among them 4 cases (17.40%) were malignant, followed by range of 2.1-3 cm, 3.1-4 cm, less than 1 cm and more than 4.1 cm cases were 15, 6, 5 and 1 respectively.

Table 2: Size of breast lump

Max dimension (cm)	Number of breast lump		
	Benign	Malignant	Total
≤ 1 cm	5 (100%)	0 (0%)	5
1.1-2 cm	19 (82.60%)	4 (17.40%)	23
2.1-3 cm	11 (73.33%)	4 (26.66%)	15
3.1-4 cm	4 (66.67%)	2 (33.33%)	6
≥ 4.1 cm	1 (100%)	0 (0%)	1

Among total patients 26 (52%) cases were in right breast and 24 (48%) cases were in left breast. Among all the four quadrants, superolateral quadrant was the most common for breast lesions 26 (52%).

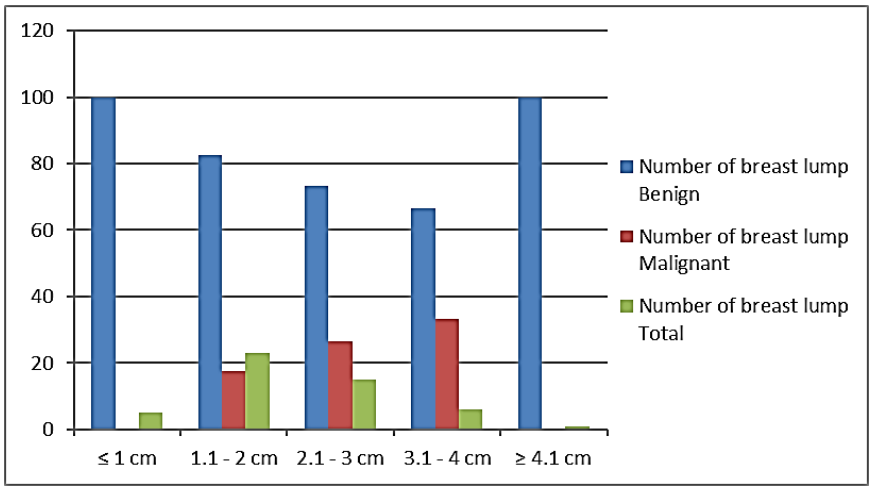

Fig 1: Size of breast lump

Table 3: Side and location of breast lump (n = 50)

Quadrant	Number of cases (%)		
	Right	Left	Total
Upper-outer	14	12	26 (52%)
Lower-outer	1	1	2 (4%)
Sub-areolar	5	5	10 (20%)
Upper-inner	5	5	10 (20%)
Lower-inner	1	1	2 (4%)
Total	26 (52%)	24 (48%)	50 (100%)

40 (80%) cases were benign with the majority of cases 15 (37.5%) being fibroadenoma, followed by fibrocystic change 11 (27.5%), inflammatory/ mastitis 6 (15%), galactocele or lactational changes 5 (12.5%), gynecosmastia 2 (5%) and one case was benign phyllodes tumour (2.5%).

Table 4: Cytological subclassification of benign breast lump (n = 40)

Cytological diagnosis	No. of cases	Percentage (%)
Fibroadenoma	15	37.5%
Fibrocystic change/other cystic lesion	11	27.5%
Inflammatory/mastitis/abscess	6	15%
Lactational change/galactocele	5	12.5%
Gynecomastia	2	5%
Benign phyllodes	1	2.5%
Total	40	100%

Discussion

Breast carcinomas are one of the leading causes of cancer in women. Most cases of breast lumps are benign, but sometimes, it is difficult to determine whether a suspicious lump is benign or malignant, simply by doing a clinical examination [15]. There is increasing awareness and the associated anxiety and stress among women, who perceive every symptom in breast as carcinoma, compels the patients to seek medical advice. Early screening and diagnosis of breast lesions help in timely prevention and management of breast pathologies. FNAC is a useful tool in the preoperative evaluation of breast lumps [16]. FNAC of breast lumps is an important part of triple assessment (clinical examination, imaging, and FNAC) of palpable breast lumps. The application of FNAC for the diagnosis of palpable breast masses was first introduced by Martin and Ellis in 1930 [17]. FNAC is simple, cost effective and less traumatic as well as highly sensitive and specific method for assessment of breast lumps. Among 50 patients 40 (80%) were benign and 10 (20%) were malignant. Yeoh *et al*. [18] studied 1, 533 breast masses on FNAC and found that 70.4% cases were benign and 4.4% cases were malignant. Similarly, Ganiat *et al*. [19] studied 757 cases on FNAC and found that the majority of cases were benign (50.2%), which was followed by malignant cases (31.4%), suspicious malignant cases (9.5%) and inflammatory cases (7.4%). In the present study shows that more common age group was 15-20 years, however Farkhanda and co-authors, Chandanwale *et al.* Reporded 20-30 years as more prevalent age group [20, 21]. In other similar study done by Haque *et al*. reported 30-40 years as most common age group [22]. 40 (80%) cases were benign with the majority of cases 15 (37.5%) being fibroadenoma, followed by fibrocystic change 11 (27.5%), inflammatory/mastitis 6 (15%), galactocele or lactational changes 5 (12.5%), gynecosmastia 2 (5%) and one case was benign phyllodes tumour (2.5%). Aslam *et al*. [23] also documented fibroadenoma as the most common benign lesion (71.3%) in their study. Unlike our study, Jayaram *et al.* [24] in their study of 543 cases of FNAC found fibrocystic disease (39.8%) as the most common lesion. Pattari *et al*. [25] studied 71 histologically confirmed cases and documented infiltrating ductal carcinoma as the most common lesion (24/71).

All the palpable breast lumps were in the range of 1-5 cm and 23 breast lumps measured 1.1-2 cm, among them 4 cases (17.40%) were malignant, followed by range of 2.1-3 cm, 3.1-4 cm, less than 1 cm and more than 4.1 cm cases were 15, 6, 5 and 1 respectively. Ballo *et al*. [26] studied 112 cases of the lumps with a size range of 1-12 cm and reported that 73.8% of the lumps with a larger size (> 2 cm) and 28.38% with a size < 2 cm were malignant.

Conclusion

Breast lump is a common clinical presentation with wide differential diagnosis including malignancy which has increased incidence in recent times. FNAC is a very important preliminary diagnostic test in breast lesions, the results show a high degree of correlation with the final histopathology report. There is increasing awareness and the associated anxiety and stress among women, who perceive every symptom in breast as carcinoma, compels the patients to seek medical advice. Early screening and diagnosis of breast lesions help in timely prevention and management of breast pathologies.

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