

Original Research

Correlation of clinical findings, ultrasonography, mammography and FNAC in cases of lump breast

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ABSTRACT:

Background: The present study was conducted to correlate clinical findings, Ultrasonography, mammography and FNAC in cases of lump breast. **Materials & Methods:** 40 patients presenting with breast lumps underwent ultrasound or mammography, fine needle aspiration cytology (FNAC) or core needle biopsy. **Results:** Sensitivity of FNAC was found 100% in both the benign and malignant cases in comparison to biopsy findings. Sensitivity of mammography was 100 % with benign cases and 90.90% in malignant cases while comparing with biopsy reports. Sensitivity of USG was 84.47 % with benign cases and 90.90% in malignant cases while comparing with biopsy reports. Sensitivity of clinical examination in malignant cases was 100 % and 94.73% in benign cases while comparing with biopsy reports. **Conclusion:** Triple assessment is a very useful diagnostic tool to evaluate patients with breast lumps and to detect patients with breast cancers with an overall accuracy of 96.66%. TT is cost effective, easy to perform and time saving approach

Key words: Triple assessment, USG, Breast lump.

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INTRODUCTION

Lumps in a woman are often caused by fibrocystic changes, fibroadenomas and cysts. Fibrocystic changes are painful and symptoms are usually worse right before menstrual period, and then improve after period starts. Fibroadenomas are lumps that feel rubbery and move easily inside the breast tissue. Like fibrocystic changes, they occur most often during the reproductive years and are not tender.¹ Cysts are fluid-filled sacs that often feel like soft grapes, these can sometimes be tender, especially just before menstrual period. Breast cancer is one of the commonest cancers in women in India. It is also one of the curable cancers if detected early. Breast cancer incidence increases with age; the older the woman, the more aggressive the evaluation techniques employed. Nevertheless, younger women with breast

lumps are at a far greater risk for breast cancer in comparison to asymptomatic women of the same age group and to older women.²

Breast cancer mostly occurs in women over the age of 50 years, and the risk is especially high for women over age 60 years. Clinical examination aids in early diagnosis of breast cancer. A lump felt during the examination can roughly give clues as to the size of the tumour, its texture, and details such as whether it is mobile etc.³ If the initial suspicions are well-warranted, the patient will be counseled to seek more detailed investigations. Revolutions in information technology have bombarded us with information about advances in basic and applied sciences in the last two decades and many more patients are being diagnosed and cured early.⁴ The present study was conducted to correlate

clinical findings, Ultrasonography, mammography and FNAC in cases of lump breast.

MATERIALS & METHODS

This prospective study was conducted in patients presenting with breast lumps who undergo various diagnostic modalities and are admitted in General Surgery wards of M.B. Govt. Hospital. Those patients who undergo surgery, their biopsies were correlated in terms of sensitivity of the clinical and diagnostic modalities used.

A process called triple assessment is used to diagnose breast lumps. There are three stages in triple assessment. Clinical Examination - Medical history and examination of the breast is done. Imaging – Pictures of the inside of breast are created using ultrasound or mammography. Biopsy – In this either Fine needle aspiration cytology(FNAC) or core needle biopsy in which a sample of breast tissue is removed and sent to a laboratory for testing to determine whether the cells are cancerous(malignant) or non cancerous (benign).

Mammography using low-energy X-rays (usually around 30 kVp) to examine the human breast was performed. Mammogram results are often expressed in terms of the BI-RADS Assessment Category, often called a "BI-RADS score." The categories range from 0 (Incomplete) to 6 (Known biopsy – proven malignancy). In the UK mammograms are scored on a scale from 1-5 (1 = normal, 2 = benign, 3 =

indeterminate, 4 = suspicious of malignancy, 5 = malignant).

Ultrasound was also performed in all patients uses sound waves to make a picture of the tissues inside the breast. A breast ultrasound can show all areas of the breast, including the area closest to the chest wall, which is hard to study with a mammogram.

Fine- needle aspiration cytology (FNAC) used categorization in a five-tier system, with categories ranging from insufficient materials (C1),benign (C2), atypical (C3),suspicious of malignancy (C4), or frankly malignant (C5) Histologic tumor grade (sometimes called the Bloom-Richardson grade, Nottingham grade, Scarff- Bloom-Richardson grade, or Elston-Ellis grade) is based on the arrangement of the cells in relation to each other: whether they form tubules; how closely they resemble normal breast cells (nuclear grade); and how many of the cancer cells are in the process of dividing (mitotic count). This system of grading is used for invasive cancers but not for in situ cancers. Grade 1 (well differentiated) cancers have relatively normal-looking cells that do not appear to be growing rapidly and are arranged in small tubules. Grade 2 (moderately differentiated) cancers have features between grades 1 & 3. Grade 3 (poorly differentiated) cancers, the highest grade, lack normal features and tend to grow and spread more aggressively. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of patients as per age groups

Age (years)	Cases	Benign breast disease	Malignant breast disease
10 – 20	5 (12.5%)	5	0
21- 30	9 (22.5%)	8	1
31 – 40	13 (32.5%)	10	3
41 – 50	6 (15%)	4	2
>50	7 (17.5%)	1	6
Total	40	28	12

Table I shows that benign cases (n=23, 57.5%) were more in age group < 40 years where as malignant cases (n=8, 20%) were more in women >40 years.

Table II Signs in cases of breast lump

Clinical findings	No. Of Cases (%)	BENIGN BREAST DISEASE (n=28)		MALIGNANT BREAST DISEASE(n=12)	
		NO	%	NO.	%
LUMP	40	28		12	
SOFT	0	0	0	0	0.0
HARD	8 (20 %)	0	0	8	66.66
FIRM	32 (80%)	28	100	4	33.33
SITE					
UOQ	21 (52.5%)	15	53.57	6	41.66
LOQ	6 (15%)	4	14.28	2	25
UIQ	7 (17.5%)	5	17.85	2	25

LIQ	6 (15%)	4	14.28	2	25
SIZE					
<2X2cm	16 (40%)	16	57.14	0	0
2X2-5X5 cm	16 (40%)	10	35.71	6	50
5X5-10X10cm	6 (15%)	2	7.14	4	33.33
>10X10cm	2 (5%)	0	0	2	16.66
Fixity					
Breast Tissue/Skin	13(32.5%)	4	14.28	9	75
Tenderness	20 (50%)	13	46.42	7	58.33
Peau D Orange	2 (5%)	0	0	2	16.66
Axillary Nodes	12 (30%)	3	10.71	9	75
Skin Inflammation	10 (25%)	4	10	6	50
Nipple Retraction	4 (10%)	1	3.5	3	25
Nipple Discharge	2(5%)	1	3.5	1	8.3

Table II shows signs in breast lump patients.

Table III Distribution of patients as per mammographic findings (birads categorization)

NATURE OF DISEASE	No. of cases as per FNAC	MAMMOGRAPHIC FINDINGS (BIRADS CATEGORY)				
		1 Normal	2 Benign	3 Indeterminate	4 Suspicious of malignancy	5 Malignant
BENIGN	28	21 (52.5)	7 (17.5%)	0	0	0
MALIGNANT	12	0	1 (2.5%)	1(2.5%)	7 (17.5%)	3(7.5%)

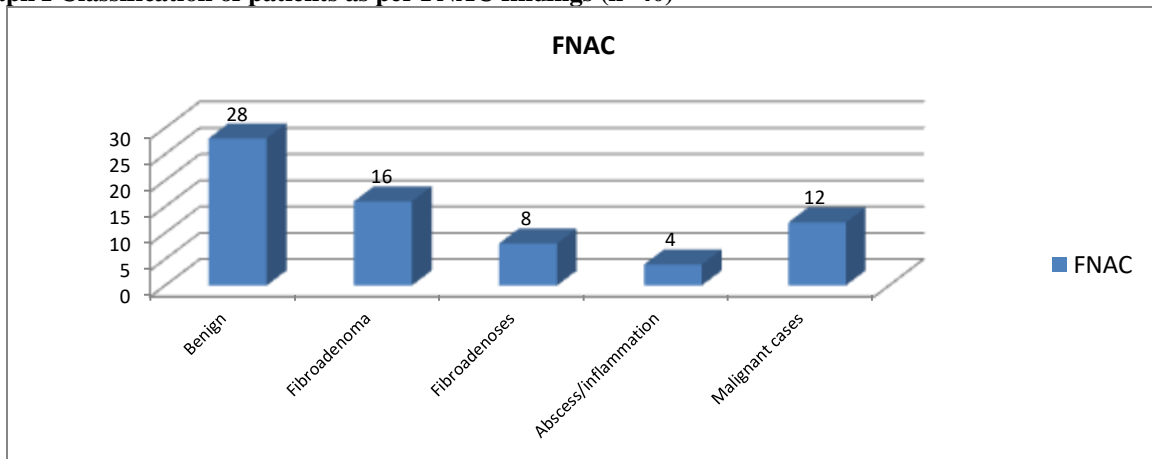
Table III shows that on Mammography cases presented were BIRADS 1 or 2 (n=29, 72.5 %), BIRADS 3(n=1, 2.5%), BIRADS 4 (n=7, 17.5%), BIRADS 5 (n=3, 7.5%).

Table IV Distribution of patients as per mammographic findings

Nature of disease	No. Of cases	Mammographic findings					
		Breast mass			Rest of breast tissue		
		Microcalci fications	Well defined mass	Irregular mass / spiculated Margins	Homogenously dense mass	Heterogen ously dense Breast	Abscess/ inflammatio n
Benign	28	0	9(22.5%)	0	2 (5%)	16(40%)	2(5%)
Malignant	12	5(%)	2 (12.5%)	9(22.%)	0	4 (10%)	0

Table IV shows that most of the benign cases presented as well defined mass (n=9, 22.5%) in heterogeneously dense breast whereas most malignant cases showed irregular mass with speculated margins (n=9, 22.5%) with microcalcifications.

Graph I Classification of patients as per FNAC findings (n=40)



Graph I shows that benign cases were seen in 28 such as fibroadenoma in 16, fibroadenoses in 8, abscess in 4 and malignant cases in 12 cases.

Table V Sensitivity of FNAC in relation to biopsy reports

Nature of disease	No of cases as per FNAC	No of cases as per Biopsy	FNAC sensitivity wrt Biopsy
BENIGN	19	19	100
MALIGNANT	11	11	100

Table V shows that sensitivity of FNAC was found 100% in both the benign and malignant cases in comparison to biopsy findings.

Table VI Sensitivity of mammography in relation to biopsy reports

Nature of disease	No of cases as per Mammography	No of cases as per Biopsy	Mammography Sensitivity wrt biopsy
BENIGN	19	19	100
MALIGNANT	10	11	90.90

Table VI shows that sensitivity of mammography was 100 % with benign cases and 90.90% in malignant cases while comparing with biopsy reports.

Table VII Sensitivity of USG in relation to biopsy reports

Nature of disease	No of cases as per Ultrasonography	No of cases as per Biopsy	Mammography Sensitivity wrt biopsy
BENIGN	16	19	84.47
MALIGNANT	10	11	90.90

Table VII shows that sensitivity of USG was 84.47 % with benign cases and 90.90% in malignant cases while comparing with biopsy reports.

Table VIII Sensitivity of clinical examination in relation to biopsy reports

Nature of disease	No of cases as per Biopsy	No of cases as per Clinical examination	Clinical examination Sensitivity wrt biopsy
BENIGN	19	18	94.73
MALIGNANT	11	11	100

Table VIII shows that sensitivity of clinical examination in malignant cases was 100 % and 94.73% in benign cases while comparing with biopsy reports.

Table IX Triple test assessment

TRIPLE TEST	NO OF CASES	%
CONCORDANT	29	96.66
NON CONCORDANT	01	3.3
TOTAL	30	100

Table IX shows that the triple test was concordant in 29 cases (96.66%) and non-concordant in 1 case (3.3%). The triple test (TT) was scored as concordant if the elements had either all malignant or all benign results. The triple test was non-concordant if the elements had neither all malignant nor all benign results.

DISCUSSION

The present prospective study was conducted in 40 female patients who presented to us with chief complaints of breast lump to RNT medical college and associated M.B government hospital, Udaipur. Most of them were anxious of any possibility of lump being malignant so triple assessment study was carried out on them.

30 patients out of 40 underwent surgery and 10 patients were managed conservatively. Detailed history and physical examination was carried out as per established

protocol. Each of these patients underwent clinical evaluation, mammography, Ultrasound and FNAC. The reports were finally compared with each other in terms of sensitivity of tests and finally triple assessment is done.

Out of 40 cases, 28 cases (70%) were benign while remaining 12 cases (30%) were malignant. Among them, benign cases (n=23, 57.5%) were more in age group < 40 years where as malignant cases (n=8, 20%) were more in women >40 years. Domchek SM et al⁵ noticed that the longer a woman lives without cancer ,

the lower her risk of developing breast cancer and women aged >70 years has a >7 % lifetime risk of developing breast cancer. These studies support our observations.

In our study benign breast disease is found more in urban population (67.85% vs 32.14%) where as malignant breast diseases is seen more in rural population compared to urban population. (83.33% vs 16.66 %). According to NCIN (National cancer intelligence network), breast cancer incidence rates are higher in village areas (rural) by 8 % compared to urban areas. National cancer registry (2006) observed that incidence of breast cancer in urban population (23.3 per 100,000) was more as compared to rural population.

In our study, most of the patients were poor and middle class. Breast cancer is considered to be the consequence of affluence. This is because of high fat consumption and obesity. In terms of clinical signs, most common quadrant involved in breast mass was upper outer quadrant seen in (n= 21, 52.5%). Further, 53.57% benign cases and 50% malignant cases had lump in upper outer quadrant. Haagensen CD et al⁶ mentioned that 31 % of cancer of breast occurs in the upper outer quadrant.

In our study most breast masses had size < 5cm (n=32, 80 %) and only 8 cases presented with size> 5cm (n=8, 20%). Among these, 92.85% were benign cases and 50 % of malignant cases were up to 5cm in size. Breast masses which were fixed to breast tissue and with palpable lymph nodes (75%, n=9) comprised majority of malignant group. Tenderness on palpation was found in 50 % of total cases (n=20) with 46.42 % benign and 58.33% malignant cases showing tenderness.

On Mammography cases presented were BIRADS 1 or 2 (n=29, 72.5 %), BIRADS 3(n=1, 2.5%), BIRADS 4 (n=7, 17.5%), BIRADS 5 (n=3, 7.5%) and most of the benign cases presented as well defined mass (n=9, 32%) in heterogeneously dense breast whereas most malignant cases showed irregular mass with speculated margins (n=9, 75%) with microcalcifications. In our study BIRAD IV on mammography and slight atypical cells without frank malignancy on FNAC which were suspicious cases were taken as malignant. These turned out to be malignant at the end on the biopsy report.

In our study, overall sensitivity of mammography was 96.66% which was further 100 % sensitive in benign cases and 90.90% in malignant cases when compared with biopsy reports.

William E. Barlow et al (2002)⁷ in their study reported overall mammography sensitivity for breast cancer was 85.8%. Philip. J. Drew et al (1999) in their study mammography produced sensitivity 87.6%.

In our study overall sensitivity of USG was 86.66% which was further 84.47 % sensitive with benign cases and 90.90% sensitive in malignant cases when

compared with biopsy reports. Mubuuke et al⁸ found sensitivity of ultrasound in detecting breast lumps was 92.5%. On FNAC 70 % (n=28) cases were found to be benign and 30 % (n=12) of malignant variety. In our study sensitivity of FNAC was found 100% in both the benign and malignant cases when compared with biopsy reports.

In our study overall sensitivity of clinical examination was 96.66% which was further 100 % sensitive in malignant cases and 94.73% in benign cases when compared with biopsy reports. On comparison of sensitivities in our study, overall sensitivity of mammography was 96.66%, overall sensitivity of USG was 86.66%, overall sensitivity of FNAC was found 100% and overall sensitivity of clinical examination was 96.66%.

FNAC was most accurate with no false positive or false negative. Thus clinical examination, Mammography and FNAC have showed higher sensitivity of more than 95% where as Ultrasound was comparatively lesser sensitive diagnostic modality. Feig et al⁹ in their analysis mammography showed 82.76% sensitivity and FNAC showed 97.22% sensitivity. Our results are in agreement with the findings of Heywang & Ballo et al.^{10,11}

The triple test was concordant in 29 cases (96.66%) and triple test was non-concordant in 1 case (3.3%). This case was an early diagnosed malignancy on FNAC which was reportedly found benign on clinical examination and mammography. Dixon et al¹², in their study found the sensitivity in triple assessment when combined together was 100%. The concordance for the triple assessment was 99.3%. This was in accordance to our findings.

CONCLUSION

Authors found that triple assessment is a very useful diagnostic tool to evaluate patients with breast lumps and to detect patients with breast cancers with an overall accuracy of 96.66%. TT is cost effective, easy to perform and time saving approach, however, it can be applied only in those institutions where excellent imaging facilities as well as services of a cytopathologist are available.

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