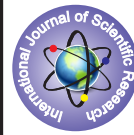


## Oncology

## A Study of Clinicopathological and Radiological correlation of Breast diseases



**KEYWORDS:** Breast lump, Triple assessment, Clinical breast examination, Histopathology, Radiology.

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## ABSTRACT

**Introduction:** Breast lump among females, is a fairly common complaint in every surgical out patient department. Breast lump have a variety of etiologies ranging from benign to malignant. These patients are

usually evaluated on basis of Triple assessment namely clinical examination, imaging mammography/breast ultrasonography and FNAC/core biopsy.

**Aims and Objectives:** To Find Correlation between Clinical Breast examination, Radiological assessment and Histopathological assessment of breast diseases

**Materials and Methods:** This prospective study was conducted at a tertiary teaching center from 1 January 2015 to 31 July 2016. A total of 394 patients who presented with breast lump in the Breast Diseases Unit of the Institute during this period were enrolled by simple random sampling method without any bias. These patients were examined with a detailed history and clinical examination. Upon clinical assessment, radio and pathological assessment was done as deemed appropriate.

**Results:** 284 (72.1%) out of 394 were classified under benign lesions clinically and rest 110 (27.9%) as malignant. Radiological assessment was performed for 331 patients. 248 (74.9%) patients were diagnosed as radiologically benign and remaining 83 (25.1%) patients were found to be malignant. The association between radiological assessment and clinical assessment was found to be statistically significant with chi square value 201.911 and p value 0.001. Histopathological diagnosis was made for 200 patients of which 103 (51.5%) were benign and 97 (48.5%) malignant cases. The association between histopathological assessment and clinical assessment was found to be statistically significant with chi-square value 141.160 and p value 0.001. The correlation between clinical examination and radiological examination, histopathological and radiological examination and that between clinical and histopathological examination were found to be statistically significant with p value 0.001. Clinical and radio-logical assessment are similar in terms of sensitivity (92.8% v/s 94.7%), Positive predictive value (90.9% v/v 87.8%), negative predictive value (93.1% v/s 93.5%) and false negative rates (7.2% v/s 6.5%).

**Conclusion:** The high sensitivity, negative and positive predictive values of Clinical Breast examination, radiological and histopathological assessment continue to uphold this triad as the gold standard for assessment of breast diseases.

## Introduction

Breast lump among females, is a fairly common complaint in every surgical out patient department. Breast lump have a variety of etiologies ranging from benign to malignant. The lump can be benign for example Aberrations of Normal Development and Involution (ANDI), duct ectasia / periductal mastitis, fibroadenoma, hamartomas or adenomas, abscesses, galactocele, sebaceous cysts, fat necrosis etc. Fibroadenoma is the most common benign breast mass whereas invasive ductal carcinoma remains the most commonly diagnosed malignancy<sup>1</sup>. General population has become increasingly aware of breast cancer and its prevalence. As a result, women presenting with breast complaints are extremely anxious about the possibility of being diagnosed with cancer. Clinicians evaluating women with breast complaints should provide comprehensive, efficient, and timely consultation and establish a reliable preoperative diagnosis as early as possible with a view to institute proper treatment and reduce cost, morbidity and mortality rates. These patients are usually evaluated on basis of Triple assessment namely clinical examination, imaging mammography/breast ultrasonography and FNAC/core biopsy. In our study we have tried to find out the correlation between clinical, radiological (mammography/sonography) and histopathological/cytological findings of various breast lesions both benign and malignant and to confirm if the relationship of Triple assessment tests still hold true with the current standard of care.

## Methods:

This prospective study was conducted at a tertiary teaching center from 1 January 2015 to 31 July 2016. The study was approved by the ethical committee of the hospital. A total of 394 patients who presented with breast lump in the Breast Diseases Unit of the Institute during this period were enrolled by simple random sampling method without any bias. These patients were examined with a detailed history and clinical examination. Upon clinical assessment, radio and pathological assessment was done as deemed appropriate. Radiological assessment was done using BIRAD score ranging from 0 to 6. Those lesions with BIRAD score 0, 1 and 2 are classified as Radiologically benign lesions and those with score 4, 5 and 6 are classified as Radiologically malignant lesions. Those with score 3 are classified according to their histopathological findings as benign or malignant. Histopathological assessment was done using Fine needle aspiration cytology (FNAC), trucut biopsy, frozen section or a combination of above into histopathologically benign or malignant lesions. In a total of 394 patients, 331 radiological and 200 histopathological assessment was done.

## Results:

In our study, out of 394 patients maximum number of patients 208 (52.38%) were in 31-60 years age group. 6 (1.5%) out of 394 patients were male.

## Clinical assessment:

284(72.1%) out of 394 were classified under benign lesions clinically and rest 110 (27.9%) were classified as malignant. (Table 1)

		Frequency	Percent
<b>Age group</b>	0-30 years	162	41.1
	31-60 years	208	52.8
	61-90 years	24	6.1
<b>Sex</b>	Male	6	1.5
	Female	388	98.5
<b>Clinical Examination</b>	Benign	284	72.1
	Malignant	110	27.9
<b>Clinical diagnosis</b>	Breast abscess	6	1.5
	Benign breast disease	51	13
	Fibroadenoma	123	31.2
	Fibroadenoma+Fibroadenosis	1	.3
	Fibroadenosis	79	20.1
	Inflammatory breast disease	25	6.3
	Malignant breast disease	110	27.9
	Simple cyst	0	.0

**Table 1:** Distribution of breast diseases as per age, sex, clinical examination and final clinical diagnosis.

**Radiological Assessment:**

Of the total 394 patients, radiological assessment was performed for 331 patients . 248(74.9%) patients were diagnosed as radiologically benign and remaining 83(25.1%) patients were found to be radiologically malignant. Most commonly diagnosed were benign breast disease (103/331) 31.1%, malignant breast disease(83/331) 25.1% and fibroadenoma (66/331) 19.9% in that order. The least frequent were- bilateral duct ectasia, intraductal papilloma, papillary tumour and simple nodule one case(0.3%) each.

BIRAD scoring was done and results were shown in table 2.

BIRAD SCORING		
	Frequency	Percent
1.	50	16.4
2.	154	50.7
3.	29	9.5
4.	27	8.9
4A	3	1.0
4B	4	1.3
4C	3	1.0
5	27	8.9
6.	7	2.3
Total	304	100.0

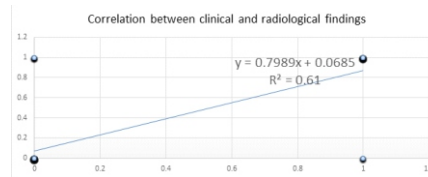
**Table 2:** Distribution of breast diseases as per BIRAD scoring

The association between radiological assessment and clinical assessment was found to be statistically significant with chi square value 201.911 and p value 0.001.(Table 3, Fig. 1)

Association between clinical examination and radiological examination					
		clinical examination			
		Benign	Malignant	Total	
Radiological examination	Benign	Count	231	17	248
		% within radiological examination	93.1%	6.9%	100.0%
	Malignant	Count	11	72	83
		% within radiological examination	13.3%	86.7%	100.0%
		% within clinical examination			
		Count	242	89	331
		% within radiological examination			
		73.1%	26.9%	100.0%	

	% within clinical examination	100.0%	100.0%	100.0%
Chisquare= 201.911, df=1, p = 0.001				

**Table 3:** Association between clinical examination and radiological examination.



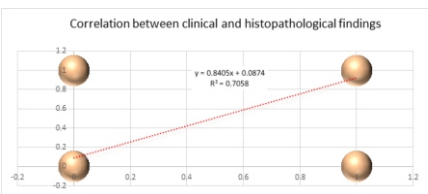
**Figure 1:** Correlation between clinical and radiological finding

**Pathological Assessment:**

Histopathological diagnosis was made for 200 patients of which 103(51.5%) were benign and 97(48.5%) malignant cases. Different histopathological techniques were used to diagnose the cases. FNAC was performed for 43 patients, trucut biopsy for 47 patients and 6 patients had frozen section. The association between histopathological assessment and clinical assessment was found to be statistically significant with chi-square value 141.160 and p value 0.001.(Table 4, Fig. 2).

Association between clinical examination and pathological examination						
		clinical examination				
		Benign	Malignant	Total		
Histopathological examination	Benign	Count	94	09	103	
		% within histopathological examination	91.3%	8.7%	100.0%	
	Malignant	Count	07	90	97	
		% within histopathological examination	7.2%	92.8%	100.0%	
		% within clinical examination				
		Count	101	99	200	
		% within histopathological examination				
		50.5%	49.5%	100.0%		
		% within clinical examination				
		100.0%	100.0%	100.0%		
Chisquare= 141.160, df=1, p = 0.001						

**Table 4:** Association between clinical and pathological examination



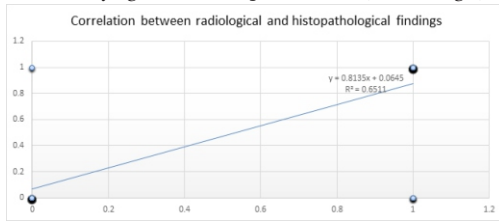
**Figure 2:** Correlation between clinical and histopathological findings

	Clinical Examination	Radiological examination	
Radiological Examination	Pearson Correlation	.781	
	Sig. (2-tailed)	.000 (significant)	
Histopathological examination	Pearson Correlation	.840	.807
	Sig. (2-tailed)	.000 (significant)	.000 (significant)

**Table 5:** Correlation between clinical, radiological and histopathological examination.

The correlation between clinical examination and radiological examination, histopathological and radiological examination and

that between clinical and histopathological examination were found to be statistically significant with p value 0.001.(Table 5, Fig.3)



**Figure 3:** Correlation between radiological and histopathological findings.

	Clinical Assessment (%)	Radiological Assessment (%)
<b>Sensitivity</b>	92.8	94.7
<b>Positive Predictive Value</b>	90.9	87.8
<b>Specificity</b>	91.3	85.3
<b>Negative Predictive Value</b>	93.1	93.5
<b>False Positive</b>	8.7	14.7
<b>False Negative</b>	7.2	6.5

**Table 6:** Statistical analysis of clinical and radiological assessment.

### Discussion

Breast cancer is the most common cancer affecting women worldwide. Any breast lump or nipple discharge invites tremendous anxiety not just in the minds of patient and her family but also the treating physician. It is vital that any breast symptom is systematically examined and investigated with the gold standard Triple test wherever deemed appropriate. We have in our study tried to appraise the triple test ( clinical, radiological and pathological examination) and acknowledge its robust standing even in the era of immunohistochemistry and molecular biology.

Benign breast diseases continue to dominate as most common diagnosis in breast diseases ranging from 50 to 70%<sup>2</sup>. In our study we had 284/394 (72.1%) benign cases that closely matches with that of Yeoh et al who studied 1533 breast masses on FNAC and found that 70.4% cases were benign and 4.4% cases were malignant. Our increased rate of malignant breast diseases may be due to change in trends of both lifestyle and diagnostics. Ganiat *et al.*,<sup>[3]</sup> also studied 757 cases on FNAC and found that maximum number of cases were benign (50.2%), which was followed by malignant cases (31.4%), suspicious malignant cases (9.5%), and inflammatory cases (7.4%). Malignant breast disease is rarely seen in males as exemplified by our study (1.5%).

Benign breast diseases continue to dominate in early age group whereas malignancy is more prominent in older ages. The patients in our study were between 16 and 64 years of age with maximum incidence in the age group of 31-60 years (125 cases, 60.8%). The age of all benign cases ranged from 16 to 64 years with a majority of cases between 16 and 30 years of age (54 cases, 94.7%). The age of malignant cases ranged from 26 to 72 years with a majority of cases in the age group of 31-60 years (76 cases, 60.8%). Hussain *et al.*,<sup>[4]</sup> and Khemka *et al.*,<sup>[5]</sup> studied 50 patients and they also found that the maximum number of patients were in the age group of 31-40 years. Khemka *et al.*,<sup>[5]</sup> observed that benign lesions of breast were more commonly seen in younger age groups with maximum number of patients found in the age group 30-34 years. Ganiat *et al.*,<sup>[3]</sup> reported maximum number of patients with malignant lesions in the fourth to seventh decade of life.

Clinical and radio-logical assessment are similar in terms of sensitivity (92.8% v/s 94.7%), Positive predictive value (90.9% v/s 87.8%), negative predictive value (93.1% v/s 93.5%) and false negative rates (7.2% v/s 6.5%). However specificity of radiological assessment dropped down to 85.3% with increased false positive results (14.7%) in comparison with clinical assessment (specificity-91.3%, False positive-8.7%) (Table 6). As per Takhellambam et al Sensitivity,

specificity, positive and negative predictive values of ultrasonography and FNAC in diagnosing malignant breast lump were respectively 94.74%, 100%, 100%, 97.22% and 90.48%, 100%, 100%, 95.24%.<sup>6</sup> Our low rates of specificity might be due to inter user variability.

### Conclusion:

The high sensitivity, negative and positive predictive values of Clinical Breast examination, radiological and histopathological assessment continue to uphold this triad as the gold standard for assessment of breast diseases.

**Conflict of Interest:** Authors report no conflict of interest. All the authors have equally contributed to the work.

### Acknowledgement:

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