Original Research Article

Study of clinical, imaging and pathological assessment of breast lumps: an observational study

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ABSTRACT

Background: A palpable lump in a woman's breast could be benign or malignant and it requires prompt evaluation to confirm or exclude cancer. This study aims to establish the correlation between clinical and radiological parameters for provisional diagnosis of breast lumps and the role of histopathology for final diagnosis of these breast lumps.
Methods: Total 275 female patients with palpable breast lumps were included in the study, where a detailed history was recorded and clinical examination was done. All patients underwent ultrasonography of the breast along with fine needle aspiration cytology or histopathology, wherever indicated.
Results: Benign breast lumps were found more commonly in 18-30 years of age group whereas malignant breast lumps were seen more commonly in the 41-60 years age group and the incidence increased with age. Fixity to skin was present in 5.1% and fixity to chest wall was present in 5.8% respectively, and all of these cases turned out to be malignant.
Conclusions: Attributing factors for suspicion of malignant lumps are advanced age, fixity to surrounding structures, presence of ulceration and peau'd orange breast skin appearance. Although for confirmation of malignancy from a suspected breast lump requires either cytology or histopathology of the excised specimen.

Keywords: Carcinoma breast, Suspicious breast lumps, Triple test

INTRODUCTION

Carcinoma breast is third most common cause of malignancy in Indian women and the incidence is increasing over the past decade.[1] Although majority of breast lump in a young patients are benign in nature, the probability of malignancy is never ruled out. Evaluation of a palpable breast mass starts with components of the triple test which includes clinical breast examination, mammography and fine needle aspiration alone or in combination.[2] Mammography is not very specific and sensitive in young women with dense breasts plus the non-availability of mammography machine at many health care centers, the need to include ultrasonography instead of mammography to the triple assessment was initiated and the modified triple test score (MTTS) was introduced which is an integration of clinical breast examination, fine needle aspiration cytology and ultrasonography.[3,4]

Fine needle aspiration cytology (FNAC) predicts the presence of malignancy almost accurately, but in inconclusive reports, an additional test of Tru-cut needle biopsy is recommended. While open biopsy provides more data, it results in undesirable cosmetic problems.[5,6] The aim of present longitudinal study was to find out the

correlation between components of modified triple assessment tools in the diagnosis of breast lumps.

METHODS

The present study included 275 female patients of age more than 18 years who presented with palpable breast lumps with or without co-morbidities to the surgical outpatient departments between 1st November 2017 and 31st October 2019 at a tertiary health care center located at Nagpur. Patients refusing to undergo relevant investigations and surgical excision whenever required; acute or chronic breast abscess and clinically non palpable breast lump but detected on mammography were excluded from the study. A detailed history was recorded and clinical examination was done. All patients underwent ultrasonography of the breast along with fine needle aspiration cytology. The patients with inconclusive FNAC findings were subjected to Tru-cut core biopsy and/or histopathology for excised specimen.

Statistical analysis

Simple comparisons of clinical features from that of radiological findings and histopathological findings between benign and malignant breast lumps were performed by chi-square/t test. The quantitative data was expressed in terms of mean and standard deviations. Chi square and t-test was applied to observe the differences between proportions. P value<0.05 was considered significant.

RESULTS

On analyzing the results, out of 275 cases, the incidence of breast lumps (35.4%) was found most commonly in patients of age group between 21-30 years, followed by 19.4% in age between 31-40 years, 16.7% had age less than 20 years, 15.6% had age between 41-50 years, 11.0% had age between 51-60 years and 1.9% in patients with age group more than 60 years. 130 patients (47.3%) gave a history of breast lump less than six months duration, 92 patients (33.5%) had duration of breast lump for less than a year and 51 patients (19.3%) gave history of breast lump for more than one year duration. 223 patients (81.1%) had no pain associated with breast lump whereas 52 patients (18.9%) presented with painful breast lump.

Of 275 breast lumps studied, 118 (42.9%) were present in upper outer quadrant, 111 (40.4%) in upper inner quadrant, 35 (12.7%) in lower outer quadrant, 10 (3.6%) in lower inner quadrant and 1 (0.4%) had involvement of all the quadrants. 233 patients (84.7%) had size <5 cm and 42 patients (15.3%) had size >5 cm in the study group. Distribution of final diagnosis of breast lump differs significantly between group of cases with lump size <5 cm and group of cases with lump size >5 cm in the study group (p<0.001). Distribution of malignant diagnosis of breast lump is significantly higher in the group of cases who had lump size >5 cm compared to group of cases who had lump size <5 cm in the study group (p value<0.001).

On further clinical examination, 267 patients (97.1%) had no nipple retraction and 8 patients (2.9%) had nipple retraction. 7 out of these 8 patients (87.5%) were clinically diagnosed case of malignancy and had recent retraction. 1 patient gave remote history of nipple retraction. These 7 patients on further evaluation by cytology and histopathology were proven to have carcinoma breast, thus giving 100% diagnostic accuracy for prediction of breast malignancy with recent history of nipple retraction (p value<0.001) (Table 1).

Table 1: Correlation of nipple retraction with that of final diagnosis of breast lump.

Nipple retraction	Final diagnosis					
	Benign		Malignant		Total	
	N	%	N	%	N	%
Absent	207	77.5	60	22.5	267	100.0
Present	1	12.5	7	87.5	8	100.0
Total	208	75.6	67	24.4	275	100.0
P value	0.001***					

P value by Chi-Square test, p value<0.05 is considered to be statistically significant, ***p value<0.001

Fixity of breast lump to the overlying skin was seen in only 14 patients (5.1%) out of 275 patients. All of these patients on follow up with cytology or histopathology were diagnosed of carcinoma breast, attributing fixity to skin as 100% accuracy of clinically diagnosing carcinoma breast. Fixity to skin was absent in all finally diagnosed benign lesions (208 patients). Rest of the 53 patients on final diagnosis of carcinoma breast didn't show fixity to skin because of lower tumor stage. Therefore, the prediction of malignant diagnosis of breast lump is significantly higher in the group of cases with fixity to skin compared to group of cases with no fixity to skin in the study group (p value<0.001) (Table 2).

Table 2: Correlation of fixity to skin with final diagnosis of breast lump.

Fixity to skin	Final Diagnosis					
	Benign		Malignant		Total	
	N	%	N	%	n	%
Absent	208	79.7	53	20.3	261	100.0
Present	0	0.0	14	100.0	14	100.0
Total	208	75.6	67	24.4	275	100.0
P value	0.001***					

P value by Chi-Square test, p value<0.05 is considered to be statistically significant, ***p value<0.001

Similarly, fixity to chest wall was seen in 16 patients (5.8%), and all these patients were proved to have carcinoma breast on further evaluation with cytology/histopathology. Of 275 breast lumps studied,

222 (80.7%) patients had no clinical axillary lymphadenopathy and 53 (19.3%) patients had axillary lymphadenopathy in the study group. Out of 222 patients with no axillary lymphadenopathy, 30 patients (13.5%) patient had malignant lesion and 53 patients with palpable axillary lymph nodes, only 37 patients (69.8%) had final diagnosis of malignant breast lesion. Thus, presence of axillary lymphadenopathy doesn't predict malignancy accurately (p value>0.05) (Table 3).

Table 3: Correlation of axillary lymphadenopathy with final diagnosis of breast lump.

Axillary Lymphad-enopathy	Final Diagnosis					
	Benign		Malignant		Total	
	N	%	N	%	N	%
Absent	192	86.48	30	13.5	222	100.0
Present	16	30.18	37	69.82	53	100.0
Total	208	75.6	67	24.4	275	100.0
P value	0.35					

P value by Chi-Square test, p value<0.05 is considered to be statistically significant.

All 275 patients underwent sonomammography for further evaluation of breast lump. 259 patients (94.2%) had benign diagnosis on sonomammography and 16 patients (5.8%) had malignant diagnosis. Distribution of final diagnosis of breast lump differs significantly between group of cases with firm consistency and group of cases with hard consistency in the study group with fair to moderate range Cohen-Kappa value of 0.322 (p value<0.001). Cohen-kappa value of 0.322 indicates that there is a moderate range agreement between BIRADS and histopathology for the diagnosis of breast lumps in the study group.

Table 4: Correlation of FNAC with final histopathology.

FNAC	Final Histopathology		Total
	Benign	Malignant	
Benign	190	2	192
Malignant	0	61	61
Inconclusive	18	4	22
Total	208	67	275
Sensitivity of FNAC: 91.34%			
Specificity of FNAC: 89.55%			
Diagnostic accuracy: 90.90%			

On FNAC of all the 275 breast lumps studied, 22 patients (8.0%) had inconclusive reporting, 192 (69.8%) had benign diagnosis and 61 (22.2%) had malignant diagnosis on FNAC in the study group. These 192 patients were followed up for final histopathology where 2 patients turned out to be having malignancy. FNAC was inconclusive in 22 patients, a Tru-cut biopsy revealed malignancy in 2 patients and final histopathology confirmed malignancy in 4 patients. The sensitivity, specificity and diagnostic accuracy of FNAC is shown in

Table 4. On multivariate logistic regression analysis it is evident that, relatively higher age, presence of fixity to skin or chest wall, lump size and hard consistency are the clinical and statistically significant independent determinants of malignant breast lump. A combination of assessment in triple test can have more than 90 % diagnostic accuracy in predicting presence or absence of malignancy in a breast lump.

DISCUSSION

An Indian women presenting with lump in breast always carries a psychological and social concern. Carcinoma breast is one of the leading cause of morbidity and mortality among Indian women. In spite of advances in medical technologies to detect breast malignancy in very early stage by screening techniques or breast self-examination, Indian women present to clinician at a later stage.[7] The primary aim in evaluation of any breast lump is exclusion or detection of breast malignancy at an early stage so that timely intervention and management strategies could be laid out. A combination of clinical, radiological and histopathological examination were grouped under "triple assessment" for breast lump in late 1970s that included breast radio mammography and FNAC of breast lumps.[8] In young women due to density of breasts, the mammography loses its sensitivity and specificity, therefore sonomammography of breast was included instead of mammography and the modified triple test score (MTTS) was introduced. This study aims to find out the correlation between components of modified triple assessment tools in the diagnosis of breast lumps. On analyzing the results of this study, it was found out that 53.7% lumps were malignant in the age group 41-50 years and the incidence kept on rising up to 100% in the age group more than 60 years. The findings are similar to the studies done by Khoda et al and Patil et al.[9,10] In the present study maximum numbers of patients with malignancy were seen between 41-60 years, which was also shown by other authors like Sugathan et al and Ajitha et al.[11,12] Painless breast lump was the common predominant symptom. It was present in 30.8% malignant cases. Breast malignancies are usually painless and pain if present, could be due to secondarily infection of breast lump mostly after FNAC or Tru-cut biopsy, involvement of pain sensitive structures like epimycium, periosteum of ribs, pleura or due to sudden hemorrhage within the tumor. These findings are consistent with the study carried out by Egwuonwu et al.[13] On evaluating the size of the lump, it was observed that 84.7% lumps were less than 5 cms in size. The lumps which were more than 5 cms in size, the incidence of malignancy came out to be 57%. Hard consistency is pathogonomic of malignancy which was seen in 98.4% of malignant cases. Fixity to skin was present in 5.1% cases of which 100% were malignant. Skin fixity is mainly attributed to malignant infiltration. Similarly, fixity to chest wall was present in 5.8% of which 100% were malignant. Axillary lymphadenopathy was present in 19.3% cases of which 96.2% were malignant.

The present study included sonomammographic evaluation of breast lumps based on BIRADS classification developed by American college of Radiology (ACR). It includes descriptors of features such as mass, shape, orientation margin and posterior acoustic transmission. It was performed in all patients 94.2% were diagnosed as benign (BIRADS 1-3) and 5.8% were diagnosed as malignant (BIRADS 4-6). The sensitivity of sonomammography was 23.8% and specificity was 100%. Diagnostic accuracy was found to be 81.4% which was comparable as stated in other studies by Patil et al and Riche et al.[10,14]

On FNAC of all the 275 breast lumps studied, 22 patients (8.0%) had inconclusive reporting, 192 (69.8%) had benign diagnosis and 61 (22.2%) had malignant diagnosis on FNAC in the study group. These 192 patients were followed up for final histopathology where 2 patients turned out to be having malignancy. FNAC was inconclusive in 22 patients, a tru-cut biopsy revealed malignancy in 2 patients and final histopathology confirmed malignancy in 4 patients. The Sensitivity, specificity and diagnostic accuracy of FNAC were found to be 91.34%, 89.55% and 90.90%. It was comparable with the study of Khoda et al, where the sensitivity, specificity and diagnostic accuracy of FNAC were 91.6%, 100%, and 98%, respectively and also consistent with final results by Khemka et al, where FNAC had the sensitivity and specificity of 96% and 100% respectively.[9,15] It was found that relatively higher age, presence of fixity to skin or chest wall, larger lump size and hard consistency are clinically and statistically significant determinants of malignant breast lumps.

CONCLUSION

Modified triple assessment for diagnosis of breast lump is indeed a reliable and valid tool in the armamentarium of treating clinician with very high diagnostic accuracy. Attributing factors for suspicion of malignant lumps are advanced age, fixity to surrounding structures, presence of ulceration and peau'd orange breast skin appearance. Although for confirmation of malignancy from a suspected breast lump requires either cytology or histopathology of the excised specimen.

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