

ORIGINAL ARTICLE

Mammographic Evaluation of Mass Lesions of Breast, Correlation with Histopathological Findings

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Abstract:

Objective: To evaluate the usefulness of Mammogram in the diagnosis and differentiation of mass lesion of Breast.

Method: This cross sectional study was carried out in the Department of Radiology and imaging, Dhaka Medical College Hospital during the period from July 2005 to 2007. Cases were collected from both surgery and gynaecology outdoors and indoors. Cases were also selected from BIRDEM, National institute of Cancer Research and Hospital, Dhaka in the same period.

Result: The peak incidence of breast malignancy was found to be in 4th to 5th decades comprising 41.67%. Out of 50 selected cases mammographically benign breast lesion were 39 (78%) and malignant breast lesions were 11(22%). 38 (76%) cases were diagnosed as benign breast diseases and 12 (24%) cases were diagnosed as malignant disease by histopathology. Mammographic abnormalities were found mostly in the upper and outer quadrant of the breast. In my study I found mammographic abnormality in 50 (100%) cases of which 12 (24%) were diagnosed as malignant. Among these 25 (50%) were in the upper and outer quadrant of breasts. Mass alone represents the most common abnormality. It comprises 37 (74%) of which 3 (8%) cases were malignant and 34(91%) were benign. The overall diagnostic accuracy of mammography was 90% and the sensitivity and specificity of positive diagnosis were 75%, and 94.74% respectively. **Conclusion:** The study concludes that mammography is the effective diagnostic tool and also an easier and reliable method for evaluation of mass lesions of breast non invasively.

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Introduction

In female, complex breast structure and extreme sensitivity to endocrine influences to a number of pathological conditions. Most disease of breast present as palpable lump, inflammatory lesions, nipple secretions, or mammographic abnormalities. There are several type of benign tumor, (non cancerous) & inflammatory lesion that at may develop with in different areas of the breast. For example ac chronic mastitis, fibrocystic diseases, fibroadenoma etc.¹ The

term Breast cancer, refers to a malignant tumor that has developed from cells in the breast. Breast carcinoma is the most common cancer among women and is the second leading cause of cancer death among women between 40 & 55 years of age. Common forms of breast cancer are lobular carcinoma in situ, ductal carcinoma in situ, infiltrating ductal carcinoma. Less common forms of breast cancer are medullary carcinoma, mucinous carcinoma, tubular carcinoma, inflammatory breast cancer, Paget's disease of the nipple, phylloides tumor etc.²

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Breast cancer is most common cause of cancer death in women and overall fifth common cause of cancer deaths in the world.³ Breast cancer most commonly occur in woman with a positive family history than general population (Russet, 2000). In Bangladesh remarkable increase of breast Cancer has occurred in the recent year. National Institute of Cancer Research showed cervical cancer ranked 1st & breast cancer ranked 2nd from 1996 to 2000. The management of patients with carcinoma breast can be improved if a definitive diagnosis is obtained preoperatively by Radiological Examination and/or needle biopsy cytology. Early detection of breast cancer offers an important prospect of improving the out come of disease.⁴

Mammography is special type of x-ray imaging that uses low dose x-ray, high contrast, high resolution film, and an x-ray system designed specifically for mammography to create detailed images of the breast. Although breast x-rays have been performed since 1920s, modern mammography has only existed since about 1970. Modern mammography systems use extremely low-levels of radiation; usually about 0.1 to 0.2 rad dose per x-ray (rad is the scientific unit of measure of radiation energy dose).

A study in Bangladesh done by Mahmuda Begum et al.⁵ has shown that clinical examination and mammography combined has a 90% sensitivity, 90% specificity and 97% accuracy in the diagnosis of malignant breast lump.

This study is designed to establish the mammography as a sensitive modality in the diagnosis and differentiation of mass lesions of

breast by correlating the findings with histopathological examination.

Materials And Methods:

This cross sectional study was carried out in the Department of Radiology and imaging, Dhaka Medical College Hospital during the period from July 2014 to 2016. Cases were collected from both surgery and gynaecology outdoors and indoors. Cases were also selected from BIRDEM, National institute of Cancer Research and Hospital, Dhaka in the same period. All mammograms were done using the film screen technique and consisted of at least 2 views for each breast (craniocaudal and medio-lateral). Supplemental views were obtained when considered necessary for adequate visualization. By standard questionnaire case history, Mammographic findings and histopathology reports. All the collected data was compiled and tabulated on a master sheet. Further statistical analysis of the result was done by using computer software device with statistical package for social scientists (SPSS).

Results:

Table-I

Age distribution of the study subject

Age in years	Malignant cases		Benign case	
	No	%	No	%
31-40	3	25	33	86.84
41-50	5	41.67	5	13.16
51-60	4	33.33	0	00
Total	12	100	38	100

Table-II

Location of mammographic abnormalities

Breast location	Number o mammographic abnormalities	Percentage (%)
Upper & Outer Quadrant	25	50
Lower & Outer Quadrant	6	12
Upper & Inner Quadrant	6	12
Lower & Inner Quadrant	10	20
Retroareolar	3	6

Table-III

Histopathology proved diagnosis

Diagnosis	Number o mammographic abnormalities	Percentage (%)
Benign	38	76
Malignant	12	12

Table-IV
Mammographic & pathology correlation

Findings	Total number	Malignant	Benign
Mass only	37	3(8.11%)	34(91.89%)
Micro calcification	1	1(100%)	-
Asymmetric density	1	1(100%)	-
Mass with micro calcification with speculation	3	3(100%)	
Mass with speculation	3	3(100%)	
Mass with macrocalcification	4	-	4(100%)
Mass with enlarged axillary lymph node	1	1(100%)	-
Total	50	12	38

Table-V
Classification of patients based on test results

Mammography Test result	Histopathology True state of patient		Total Patients with positive
	True Positive	False Positive	
Positive (Malignant)	9	2	11
Negative (Benign)	3	36	39
Total	12	38	50

Sensitivity : 75%
 Specificity : 94.74%
 Accuracy : 90%
 Positive predictive value : 81.80%
 Negative predictive value : 92.31%

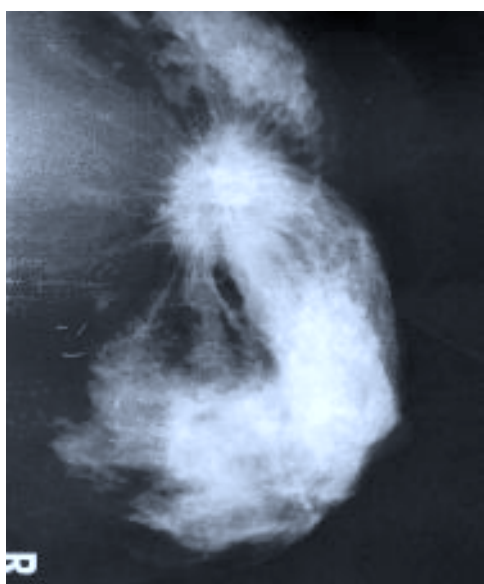


Fig.-1: *Invasive ductal carcinoma*

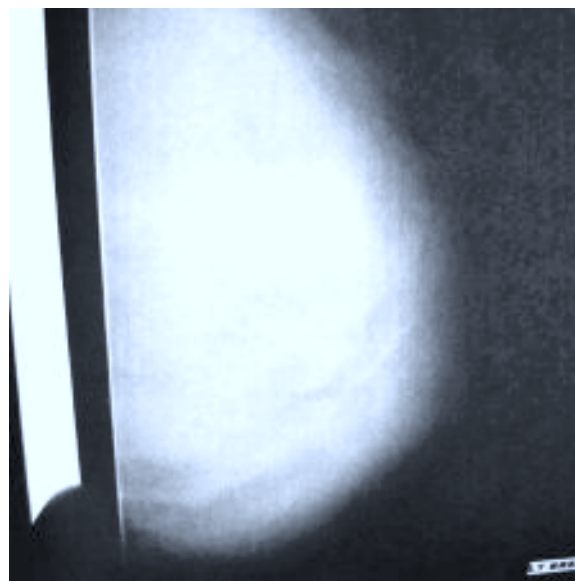


Fig.-2: *Galactocele*

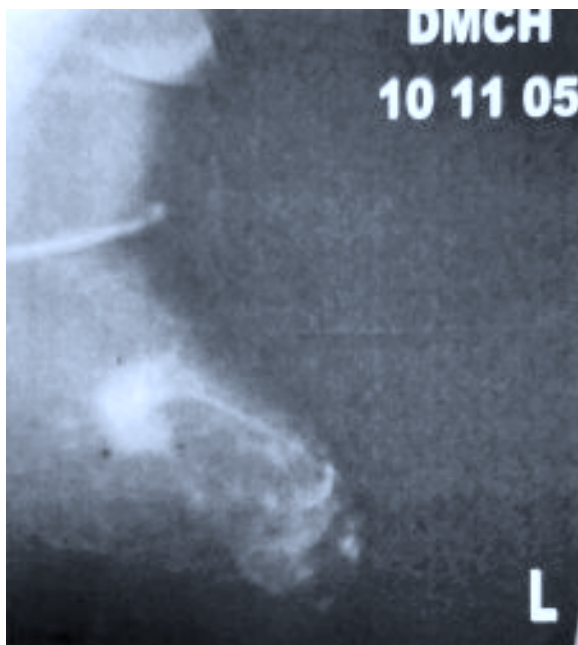


Fig.-3: *Infiltrating ductal carcinoma*

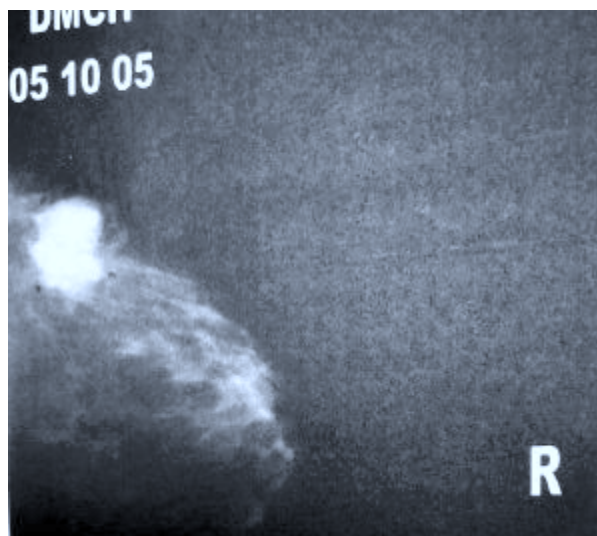


Fig.-4: *Infiltrating ductal carcinoma*

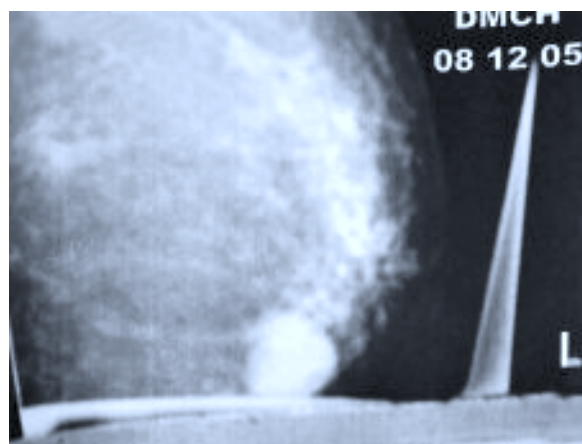


Fig.-5: *Fibroadenoma*

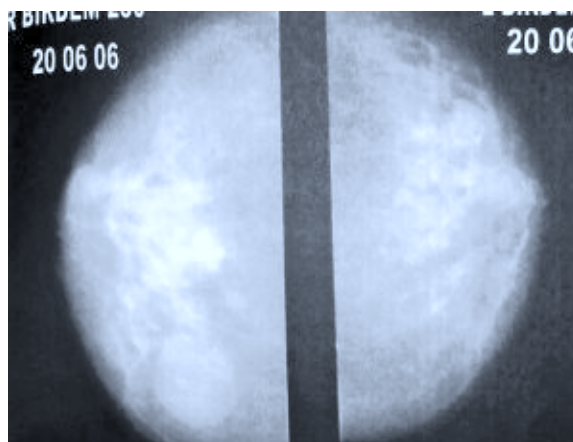


Fig.-6: *Fibrocystic changes*

Discussion:

Breast masses are common in female and amongst all the breast masses, malignant masses are the most feared.^{6,7} Breast cancer is the commonest cause of cancer mortality in females³ whereas breast cancer in men accounts for only 0.7% of all breast cancers.⁸ The cross-sectional study was carried out to determine the diagnostic value of mammography and correlation with histopathology for the evaluation of mass lesion, the present study findings were discussed & compared with previously published relevant studies.

Initially seventy female patients with breast complaints with age ranging from thirty to sixty years were included in this study. Out of seventy patients of present study, eight patients refused to undergo mammogram. Sixty two patients underwent mammogram, but twelve patients refused to undergo surgical intervention. So these patients were excluded from this study because of no histopathological report. So the total number of the case was fifty.

Highest incidence of benign breast lesions was in between 31 to 40 years (86.84%) in this study

and the varieties were fibro adenoma and fibro cystic disease. Highest incidence of malignant mass lesion was 41 to 50 age group (41.67%) and was nil before age 30. another study was similarly described that common age incidence For breast carcinoma increases with age in the 4th to 6th decade.⁹

This study found 11 (22%) malignant cases mammographically and histopathologically proved cases were 12. Among these 12 malignant cases, 2 were non palpable. Out of 6 non palpable lesions, malignancy was found in 2 (33.33%) cases. The incidence of breast carcinoma among all non palpable mammographically detected lesion in this study fall within the 10 to 30 percent range, that most considered acceptable, if mammography is to be optimally reliable and cost effective.¹⁰

In this study it was found that mammogram was positive for 75% of the women and 25% women had false negative mammogram among malignant breast lesions. Another study reported that 78% women had positive mammogram and 22% women had false negative mammogram among 499 patients palpable carcinoma and were proven by biopsy.¹¹ This little dissimilarity of percentage of positive mammogram may be due to that, this study was done on a small group of patients (technical error).

In this study 3 malignancies were found in those masses interpreted as benign. According to Móskowitz mammographic masses are classified as highly suspicious, indeterminate, questionable or benign appearing. Also benign appearing masses over 1 cm in size had been reported as malignant in 2 to 6 percent of cases. Present study correlates with Meyer's work.¹²

It seems prudent to closely follow benign appearing masses (i.e. smooth borders, less than 1 cm) with repeat mammography and physical examination rather than indiscriminately biopsying all lesion.¹⁰

In the present series it was observed that malignant lumps were found more frequently in the left breast than in the right breast. Upper and outer quadrant of the breast was found frequently affected by the malignant tumor.

Mahmuda Begum et al did the study on Role of Physical Examination of Breast and Mammography in the diagnosis of breast lump which was conducted in the Department of Radiology and Imaging, Dhaka Medical College, Dhaka. All cases underwent physical examination first and then mammography was done. At first physical examination of breast was performed by the researcher. Examination was also done by a specialist radiologist. Mammogram of both breasts was performed in MLO and CC projection as per standard technique. One radiologist interpreted mammogram separately without knowing the finding of clinical examination. One radiologist interpreted the mammogram after doing the physical examination himself. All information was gathered separately. Then all the patients underwent fine needle aspiration cytology. This method of examination and interpretation excluded any possibility of biasness and resulted in higher sensitivity than the present series.

In this study shows sensitivity of mammography in the present series is 75%. Sensitivity of mammography in the detection of breast cancer obtained by various authors ranges from 57% to 90%. The present series correlates with these works. Specificity for mammography ranges in the collected series from 90%-97%. Specificity of the present series is 94.74%. The overall diagnostic accuracy correlates well with other studies.^{4,5,13,14}

Conclusion

Mammography is a valuable, useful, time relieving, non-invasive diagnostic tool in the early detection of breast carcinoma and in reducing mortality from this disease. We will get maximum benefit from mammography when applied rationally, with a thorough knowledge of both its limitations and significance of its many radiographic patterns and in conjunction with the relevant clinical perspective. Multiplicity of lump, calcification, architectural distortion, morphological characterization, lobulation and encapsulation are best seen in mammography. So, it can be used as mass screening both efficiently and inexpensively, to make it available and economically feasible for all women.

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