Mammographic Classification Of Breast Lesions Among Women Presenting At A Tertiary Hospital In Western India

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Abstract: Background: This study aims at mammographic classification of breast lesions amongst 132 women presenting at our tertiary hospital,Ahmedabad. BIRADS grading system recommended by American college of radiology has been used to classify the lesions. Materials and Method: Electronic medical records of 132 womenaged between 22-75 years presenting with breast lesions during the year 2019 were reveiwed retrospectively. Data reviewed included demographics, indication for mammography, distribution of breast lesions and BIRADS category. Result: Mean age of women with breast cancer in our study was 46.7years.Majorityof patients diagnosed with BIRADS grade 4 and 5 fell in the age group of 41-50 years. Breast lump followed by mastalgiawere the leading indications for performing mammograms. Left breast and upper outer quadrant was found to harbor maximum number of breast lesions. Conclusion: Mammography combined with BIRADS grading is highly sensitive, accurate and cost-effective diagnostic tool for the screening and detection of breast cancer. [Bhojwani N Natl J Integr Res Med, 2020; 11(2):21-26]

Key Words: Breast cancer, mammography, BIRADS, demographics.

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Introduction: Breast cancer is the commonest female cancer worldwide.[1] Women from less poor countrieshave been reported to be more prone for breast cancer compared to more developedones.[2]

In India the age adjusted incidence rate of breast cancer has been reported to be 25.8 per 100 000.[3] Compared to western world, there is a significant increase in the incidence and cancer-associated morbidity and mortality of breast cancer in Indian subcontinent.[4-8] One of the reason being the unmet need of early diagnosis of cancer owing to lack of healthcare infrastructure in India. Early diagnosis of breast cancer with diagnostic imaging can halt disease progression and help in long term patient survival.[9]

Mammography is a common diagnostic investigation performed to evaluate breast lesions by using low energy X-ray beams. It has been reported to be the most sensitive diagnostic investigation for imaging of breast lesions.[10] It can detect microcalcification in a breast lesion which cannot be delineated by clinical examination or other breast imaging modality.[11-12]

Breast lesions can be benign or malignant. Benign breast lesions include developmental abnormalities, inflammatory lesions, epithelial or stromal proliferations and benign neoplasms. Accurate diagnosis of these benign lesions can be accomplished by the use of Mammography and so surgical intervention can be avoided with these benign lesions.[13]Malignant neoplasms are of ductal or lobular in origin. They appear as irregularly shaped, spiculated margins, infiltrative margins with or without microcalcification.[14]

BIRADS grading system was developed by American college of Radiology to classify breast lesions.[15] It has made reporting of breast lesions more objective on mammograms. Benign lesions fall in 2-3 BIRADS grade and malignant lesions are in 4-6 of BIRADS grading system.[16]

Purpose/Objective: To report and classify mammographic findings of 132 women with breast lesions presenting at Radiology department of civil hospital Ahmedabad using BIRADS grading method.

Material and Methods: We retrospectively reviewed electronic medical records of 132 women presenting with breast lesions during the period of January 2019 till December 2019. The study was conducted at Radiology department of ourtertiary level public Civil Hospital at Ahmedabad (CHA). Data reviewed included demographics, indication for mammography, distribution of breast lesions. The mammography equipment used in our study was done withStandard Digital Mammography machine by HOLOGIC SELENIA DIMENSIONS; USA. Mammography examination was performed in cephalocaudal (CC) and mediolateral oblique (MLO) projections. The images were analysed by a senior radiologist.The BI-RADS classification used in this study is as per the American College

of Radiology (ACR) recommendation[16], which is as follows:

BI-RADS 0: Incomplete. Needs additional imaging evaluation

BI-RADS 1: Normal.

BI-RADS 2: Typically, benign.

BI-RADS 3: Probably benign. A short interval follow-up is recommended; 6 months follow-up.

BI-RADS 4: Suspicious abnormality; a biopsy should be considered.

BI-RADS 5: Highly suggestive of malignancy. Biopsy or surgery should be performed.

BI-RADS 6: Histologically proven malignancy. Imaging is performed for cancer staging or evaluation after chemotherapy.

Results: We retrospectively reviewed the medical records of 132 women presenting with breast complaints. Table 1 shows age wise distribution of patients included in our study. The mean age was 46.72 years with arrange from 22 to 75 years. Highest number of patients reviewed in our study fell in the age group of 41 – 50 years (35.6%; n=47 viz). This age group was followed by 31-40 years age group contributing to 28% (37). Only 3 women (the lowest number) in our study were in the aged group of 71-80 years.

Table 1: Age Distribution Of Patients

Age(Years)	Number	Percentage
21-30	7	53
31-40	37	28
41-50	47	35.6
51-60	20	15.15
61-70	18	13.6
71-80	3	2.27
Total	132	100

Table 2 shows the clinical indications for performing mammography. In our study, breast lump was the commonest indication for perfoming mammography (72%; n=96). This was followed by mastalgia(24.24%; n=32). Nipple discharge, family history and routine breast screening (lowest in our study) completed the list of clinical indications.

Table 2: Clinical Indication For Mammography

Clinical Indication	Number	Percentage
Breast lump	96	72.72
Breast pain	32	24.24
Nipple discharge	11	8.33
Family history of breast cancer	6	4.54
Screening	4	3

Table 3 highlights distribution of side of breasts affected. Left breast was affected in 47.7% (n=63) and right breast was affected in 34 % patients (n=45). Bilateral lesions were noted in 18% patients (n=24).

Table 3: Distribution Of Side Of Breast Affected

Side Of Breast	Number	Percentage
Right	45	34
Left	63	47.7
Bilateral	24	18.2
Total	132	100

Table 4 shows quadrant wise distribution of breast lesions on mammography. Upper Outer quadrant accounting for 34.8% (n= 46) was the most commonly affected in our study. This was followed by Upper Inner (21.9%); Retroareaolar (18.1%); Lower outer (14.3) and Lower Inner (10.6) in this descending order of frequency of affection.

Table 4: Quadrant Wise Distribution Of Breast Lesions.

Quadrant	Number	II	III	IV	V	VI	Percentage
Upper Outer	46	5	9	14	17	1	34.8
Upper Inner	29	4	4	15	5	1	21.9
Lower Outer	19	2	3	8	4	2	14.3
Lower Inner	14	1	4	6	3	0	10.6
Retro-areolar	24	3	10	8	3	0	18.1
Total	132	15	30	51	32	4	100

Table 5 highlights BIRADS classification of lesions. Grades 2-3 mammograms which were considered benign lesions comprised of 45 women (34.09 %). Grade 4 with suspicious malignant breast lesion included 51 women (38.63%) s and Grade 5 included 32 (24.24%) women who had highly suspicious malignant lesions. In our study 4 (3%) women had Class 6 biopsy proven Breast malignancy.

Table 5: BI-RADS Classification Of The Lesions

BIRADS Grades	Number	Percentage
II	15	11.36
III	30	22.72
IV	51	38.63

V	32	24.24
VI	4	3
Total	132	100

Table 6 shows age bracket and BIRADS grading of lesions. In our study we noted majority of malignant breasts lesions (BIRADS Grade 4-6) in the age group of 41- 50 years (65.91%). Whereas highest number of benign lesions were seen in the age group of 31- 40 years (34.09 %).

Table 6: BI-RADS Grading According To Age.

Age (Years)	BI-RADS GRADING				
	II	III	IV	V	VI
15 – 20	0	0	0	0	0
21 – 30	3	2	2	0	0
31 – 40	4	17	11	5	0
41 – 50	6	4	23	10	4
51 – 60	1	4	9	6	0
61 – 70	0	3	6	9	0
71 – 80	1	0	0	2	0
Total	15	30	51	32	4
Percentage %	11.36	22.72	38.63	24.24	3

Discussion: Breast cancer is a common cause of death among women[17].Early diagnosis andtreatment of breast cancer are keys to reduce mortality rates.[10-11] Although breast self-examination and regular clinical examination have enhanced early detection of breast cancer, imaging still remains the gold standard examination to rule out occult disease.[18]

Mammography is the commonest screening test performed to detect breast cancer in our country.[2]We reviewed mammograms of 132 women referred to our radiology department of CHA Ahmedabad during the time period from January 2019 to December 2019. Women withincomplete mammograms and normal mammograms (BIRADS GRADE 0&1) were excluded from our study. Maximum number of women examined during the study period were in the age group of 41- 50 years. This was also found to be the most vulnerable age group for breast malignancy in our study. Similar findings have been noted by various studies conducted in other parts of India and abroad.[19-21]Malvia et al have reported that Indian women getting breast cancer are atleast a decade younger compared to the western women.[2] Majority of Indian studies have reported the peak age for breast cancer in Indian women to be between 40-50 years.[22-24]Breast cancer tends to be more aggressive at younger age of onset.[25]In our study also the mean age of women with breast cancer was 46.7 years which supports the reported young age of onset of breast cancer in our region.

Women with palpable breast masses and breast pain constituted the commonest indications to visit our hospital and getting referred for mammograms. Breast pain or mastalgia usually drives women to get checked is associated with some grade of inflammation which rarely occurs with breast malignancy. It is interesting to note that the lowest number of women getting mammograms belonged to the screening group. This indicates poor cancer awareness or medical illiteracy present throughout our country.
We noted predominant affection of left breast with 47.7% in our study. This is in agreement with published literature on Indian women with breast cancer.[21-24]Bilateral affection was noted in 18.2% women in our study.

Also, interestingly we found that upper outer quadrantto be harbouring highest number of breast lesions in our study. The possible explanation for it could be the fact that upper outer quadrant of breast is known to have larger amount of epithelial tissue compared to rest of the quadrants.[25] It is also in accordance with study done by perkins et al and many other Asian studies.[26-28] Majority of reports have reported relatively better survival outcome with upper outer quadrant lesions compared to other quadrant breast lesions.[29]

The most recommended classification for differentiating benign from malignant breast lesions on mammography is the revised BIRADS grading by American College of Radiology (ACR).[16]It takes into account multiple terms to describe the morphology of micro calcifications. Each term is then used to rank lesions into categories to estimate their malignant potential. These categories include benign (Grade2-3), intermediate concern (grade 4), and a higher probability of malignancy (Grade 5,6).[15-16]

Using BIRADS classification, we found 34.09% (n= 45) of patients had benign breast masses (figure 1) and 62.87 % (n=83) had suspicious malignant lesions (figure2). 4 women had Grade 6 Biopsy proven malignant masses. We believe this discrepancy of more malignant breast lesions than benign ones could be due to inherent bias in

retrospective studies and also our study was conducted in a tertiary referral setup.

Image 1: Mediolateral Oblique (MLO) View In Patient Showing Well Defined, Oval Mass Lesion With Popcorn Classification(Arrow)In Left Breast Suggesting Bl-RADS Grade 2(Consistent With Fibroadenoma) On Mammography.

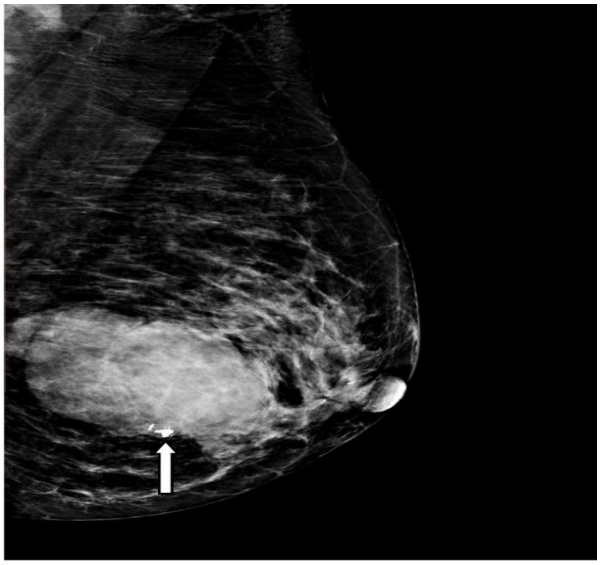

Image 2: (A) Craniocaudal view in a patient showing fine pleomorphic micro-calcification in the central inner quadrant of right breast. (B)Magnified view of the central inner quadrant (dotted square).
Histopathology revealed invasive ductal carcinoma.

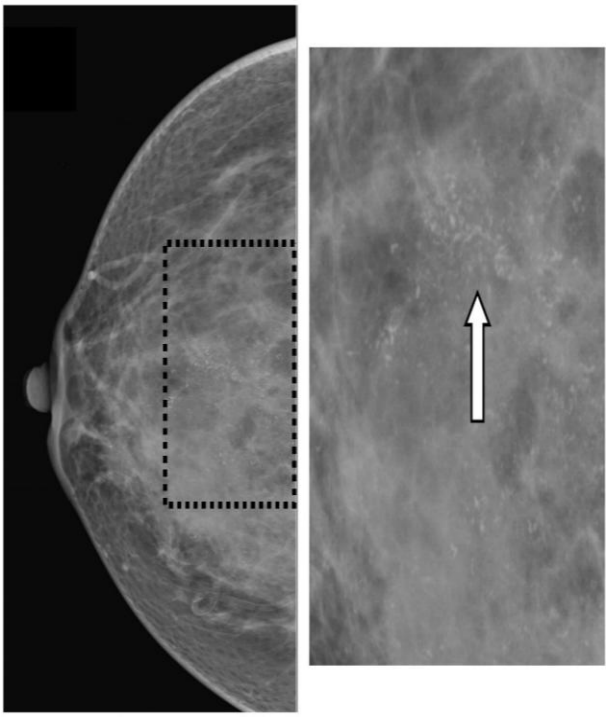

Image 3: Craniocaudal(CC) And Mediolateral Oblique(MLO) Views In A Patient Showing Speculated Mass (Circle) With Skin Retraction(Arrow) In The Upper Outer Quadrant Of Left Breast Suggesting Blrads Grade 5 On Mammography.

In the present study, the age group of 41-50 years represented the highest cancer risk age group with high grades of BIRADS. 37 out of 47 women belonging to this age group in our study was found to have breast malignancy (figure3). Similar age shift in Indian women have been reported by Chopra B et al.[19]

Like all studies our study also has certain limitations like retrospective nature, small subset of patients, single center for reporting. Nevertheless, it provides an insight on the demographics of breast cancer in western part of India.

Conclusion: Mammography combined with BIRADS grading is highly sensitive, accurate and cost-effective diagnostic tool for the screening and detection of breast cancer. BIRADS grading has not only objectified classification of mammograms with breast masses but also it is helpful in predicting malignant potential of breast lesions and guiding suitable treatment regimens.

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