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ORIGINAL ARTICLE

SCREENING MAMMOGRAPHY IN 35-60 YEARS AGE GROUP

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ABSTRACT: OBJECTIVE: Screening mammography among 35-60 years of age group of patients has been clearly shown to reduce mortality from breast cancer. **METHODS**: Patients were selected from OPDs of various departments. Patients of 35-60 years of ages were included as part of the study. Detail family and menstrual history were taken and then mammography of both breasts was performed. **RESULTS:** Out of 60 cases coming for screening mammography, 42 were found to be some type of lesions in mammography; however 18 patients were with no findings. Commonest breast density found to be scattered areas of fibro glandular density followed by heterogeneously dense breasts. Most of the patients with heterogeneously dense breast density were found to be in their luteal phase of menstrual cycle. Lesions were classified according to BIRADS category. **CONCLUSION:** Screening mammography can detect various breast lesions both in symptomatic and asymptomatic individuals and thereby helping patient managements.

KEYWORDS: Menstrual cycle, Luteal phase, Follicular phase, Breast, Mortality.

INTRODUCTION: The use of mammography has increased rapidly over the last decade. The justification for mammographic examinations is the potential benefit they provide in detecting breast cancer at an early stage and reducing mortality. However, this benefit must be balanced against the associated potential risk of radiation carcinogenesis, economic costs, and a number of other factors. Most publications to date have used radiation risk factors and data from studies that were published over a decade ago, which now have been superseded by the results of more recent epidemiological studies.[1]

It is recommended that women age 40 and older have regular mammograms. Screening is important because the earlier cancer is detected the better the chances are for successful treatment and survival. When detection occurs before any spread, the five-year survival rate is 97%. After spread to the local lymph nodes, it is 76%. After metastasis to other organs, the five-year survival rate is 20%.[2]

Mammography is useful in discovering tumors too small to be felt. The procedure involves taking an X-ray of the breast with a very low radiation dose. It has been shown that there is little risk from the exposure for women over 35 who have annual mammograms. However, for younger women who are at high risk for breast cancer due to their BRCA status, exposure to X-rays may lead to an increase in risk.[1]

Screening mammograms can find cancers and cases of ductal carcinoma in situ (DCIS, a noninvasive tumor in which abnormal cells that may become cancerous build up in the lining of breast ducts) that need to be treated. False-positive results occur when radiologists decide mammograms are abnormal but no cancer is actually present. False-positive results are more common for younger women, women who have had previous breast biopsies, women with a family history of breast cancer, and women who are taking estrogen (For example, menopausal hormone therapy).

False-negative results occur when mammograms appear normal even though breast cancer is present.

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Overall, screening mammograms miss about 20 percent of breast cancers that are present at the time of screening. The main cause of false-negative results is high breast density. Breasts contain both dense tissue (i.e., glandular tissue and connective tissue, together known as fibro glandular tissue) and fatty tissue. Fatty tissue appears dark on a mammogram, whereas fibro glandular tissue appears as white areas. Because fibro glandular tissue and tumors have similar density, tumors can be harder to detect in women with denser breasts. False-negative results occur more often among younger women than among older women because younger women are more likely to have dense breasts. As a woman ages, her breasts usually become more fatty, and false-negative results become less likely.[3]

Recently, a panel of experts who participated in the National Institutes of Health Consensus Conference on Breast Cancer Screening for Women emphasized a new approaches to improve the performance of mammography among younger women.[4,5] One such approach may be to screen women at a time in their menstrual cycle that is optimal in terms of the accuracy of screening.[6]

A recent study by Baines et al.[7] reported a sensitivity of 60% for women in their forties who were screened during the follicular phase of their menstrual cycle compared with 49% for women who were screened during the luteal phase. Evidence for such an association is supported by pathologic studies.[8-10] of changes in the breast structure during the menstrual cycle and by studies[11-14] that show a hormonal influence on mammographic breast density.

MATERIALS AND METHODS: The present study was conducted in the Department of Radiology, Gauhati Medical College & Hospital from June 2013 to May 2014. 60 patients who were referred to the Department of Radiology from outdoor units for screening were evaluated. BIRADS category was assigned to every breast lesion based on mammography & USG.

The age group of the patients ranged from 35 yrs. to 60 yrs.

The common symptoms of these patients were mastalgia, nipple discharge, lump in the breast, nipple retraction etc. Some of the patients were asymptomatic.

Methods: Detail clinical history of the patients referred to the Department of Radiology was taken. The history comprised of chief complaints, occupational history, and personal history, family history of breast cancer and past history. Menstrual history was taken about the length of the cycle and last date of menstruation. The date of the next menstrual period was estimated by adding the cycle length to the date of the last period. Because the luteal phase of the menstrual cycle is fairly consistently the 12–15 days before menstrual bleeding, independent of cycle length.[15] We defined phase of menstrual cycle by counting backward from the estimated date of the next cycle.

Imaging: Following complete physical examination, mammography was done using M-IV Screen Film Mammography System (Model-ASY-00534).Standard craniocaudal & mediolateral oblique views were obtained routinely. Additional views (Spot compression view, magnification view, rolled view, tangential view) were taken as & when required. An assessment conforming to one of the seven categories in the BI-RADS was done. BI-RADS are an acronym for Breast Imaging-Reporting and Data System, a quality assurance tool originally designed for use with mammography. The system is a collaborative effort of many health groups but is published and trademarked by

The American College of Radiology (ACR).The system is designed to standardize reporting, and is used by medical professionals to communicate a patient's risk of developing breast cancer.

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BI-RADS Assessment Categories are:

- Incomplete.
- Negative.
- Benign finding(s).
- Probably benign.
- Suspicious abnormality.
- Highly suggestive of malignancy.
- Known biopsy – proven malignancy.

RESULTS AND OBSERVATIONS:

The age distribution was as per table below:

Age group	Number of patients	Percentage (%)
35-40	36	60 %
41-50	20	33.3%
51-60	4	6.6%
61-70	0	0%

Table 1: Age distribution of patients coming for screening mammography

Maximum number of patients (60%) belonged to age group of 35-40 years. Minimum age was 35 years & maximum age was 60 years.

Composition	No. of cases	Percentage (%)
a (Breast are entirely fatty)	6	10 %
B (Scattered area of fibro glandular densities)	28	46.6%
C (Heterogeneously dense)	24	40%
D (Extremely dense)	2	3.3%

Table 2: Breast composition in mammography

Maximum number of breast composition we found in our study is b (Scattered area of fibro glandular densities) (46.6%) followed by c (heterogeneously dense) (40%).

Total number of patients: 24

Menstrual period	Number of patients	Percentage (%)
Follicular phase	4	16%
Luteal phase	20	83%

Table 3: Menstrual history of patients who has breast density of heterogeneously dense

Most of the patients having breast density heterogeneously dense, found to be in their luteal phase of menstrual cycle (83%).

Number of patient with no findings	18(30%)
Number of patients with findings	42(70%)

Table 4: Lesions detected on Mammography

So 30 % of the patients were normal in our study and 70% were with positive findings.

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Out of 60 patients in our study we have found positive findings in mammography in 42 patients. The age distribution is as follows.

Age group	Number of patients	Percentage (%)
30-40	24	57%
41-50	14	33%
51-60	4	9.5 %

Table 5: Age distribution of patients with positive findings in mammography

The maximum number of patients with positive findings in mammography is in 30-40 years of age group in our study (57%).

		Smooth	Irregular	Spiculated	
Malignant	No of lesions	1	10	9	20
	%	5%	50%	45%	100%
Benign	No of lesions	21	1	0	22
	%	95.4 %	4.5%	0%	100%

Table 6: Margins of Benign & Malignant breast masses on Mammography

Out of 22 benign lesions, 21(95.4%) had smooth margins & none of them showed spiculated margins. 19 of the 20 malignant lesions had irregular & spiculated margins.

Micro calcifications	Present	Absent	Total
Benign	1	21	22
Malignant	13	7	20

Table 7: Presence of micro calcifications in Benign & Malignant lesions on Mammography

Micro calcification was present in 13 of the total 20 (75%) malignant lesions with scattered distribution being the most common pattern.

BI-RADS Category	No. of lesions	Percentage (%)
0	0	0 %
I	18	30%
II	18	30%
III	4	6.6%
IV	12	20%
V	8	13.3%
VI	0	0 %

Table 8: BI-RADS category of lesions on Mammography

So maximum number of patients was diagnosed as BIRADS I and II.

Total number: 24

	Benign	Malignant
Breast composition “c”	6	18
	25%	75%

Table 9: Heterogeneously dense breast (Composition “c”) density in benign and malignant lesions

So, 75% of malignant lesions in our study showed breast composition “c”

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DISCUSSION: In our present study the maximum number of patients coming for screening mammography was (60%) belonged to age group of 35-40 years followed by 41-50 years of age group (33%). The minimum age was 35 years & maximum age was 60 years.

Maximum number of breast composition we found in our study is "b" (Scattered area of fibro glandular densities) (46%) followed by "c" (Heterogeneously dense) (40%). Out of the 36 cases between 30-40 years of age group, 18 cases and out of 20 cases between 41-50 years age group, 6 cases showed heterogeneously dense breast density.

Out of the 24 patients with heterogeneously dense breast density, 20 were found to be in their luteal phase of menstrual cycle (83%). Mammographic breast density, which is a measure of the proportion of the breast occupied by connective and epithelial tissue, would vary by time in the menstrual cycle as a result of the effects of variation in the levels of circulating hormones. Evidence suggests that increased hormone levels are associated with increased breast density. Premenopausal women have more dense breasts than postmenopausal women of the same age.[16-18] numerous studies have suggested a link between breast tissue patterns, as defined with mammography, and risk for breast cancer. McCormack et al.[19] conducted a systematic review and meta-analysis of publications on mammographic patterns in relation to breast cancer risk & concluded that in well-conducted studies, breast density is one of the strongest risk factors for breast cancer. 30% of the patients were normal in our study and 70% were with positive findings in mammography.

The maximum number of patients with positive findings in mammography is in 30-40 years of age group in our study (57%).

In a study by Evans et al,[20] round or oval or slightly lobulated, low density soft tissue masses with well-defined margins were the features seen in majority of benign lesions on mammography.

Jackson VP.[21] did a detailed analysis of diagnostic mammograms & laid stress on presence of spiculated masses, areas of asymmetry or architectural distortion & micro calcification as predictors of malignancy.

In our study, micro calcification was present in 75% malignant lesions with scattered distribution being the most common pattern. Out of 22 benign lesions, 1 shows coarse calcification which was categorized as BIRADS II lesion. Major breakthrough which set the stage for screening mammography as a modality in the evaluation of breast cancer was made by Raoul Leborgne (1951).

He was the first to report on the significant association of radiographically detectable micro calcifications & sub-clinical carcinoma.[22] Ciatto et al (1987) in a study of 512 non-palpable lesions correlated mammographic appearance with histological diagnosis. Their study revealed that 88% of infiltrating ductal carcinomas showed micro calcifications on mammogram.[23]

Mercidyl Gelig Thurfjell.[24] investigated the association between mammographic appearances & histological diagnosis of non-palpable breast cancers. 317 consecutive clinically non-palpable breast cancers were studied. Spiculated mass without calcifications & calcifications alone accounted for three of four cancers. A spiculated mass without calcifications was strongly associated with invasive cancers.

Calcifications alone were strongly associated with ductal carcinoma in situ. Fine linear & breaching calcifications alone were associated with not only DCIS nuclear grades 3 & 2 but also with invasive ductal carcinoma. They concluded that mammographic appearance can be a predictor of histological diagnosis in three of four non-palpable breast cancers.

CONCLUSION: A total of 60 cases were evaluated with mammography in 35-60 years of age group. Out of 60 patients, 32 were with positive findings in the form of both benign and malignant lesions.

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Breast density is one of the strongest risk factors for breast cancer. 75% of malignant lesions in our study showed breast composition "c". Also, in high breast density, chances of missing a lesion are high. In patients with heterogeneously dense breast density, 83% were found to be in their luteal phase of menstrual cycle. So to improve the performance of mammography, one should screen women at a time in their menstrual cycle that is optimal in terms of the accuracy of screening. At last screening mammography is an important tool in early detection of breast lesions and thus improving the patient care.

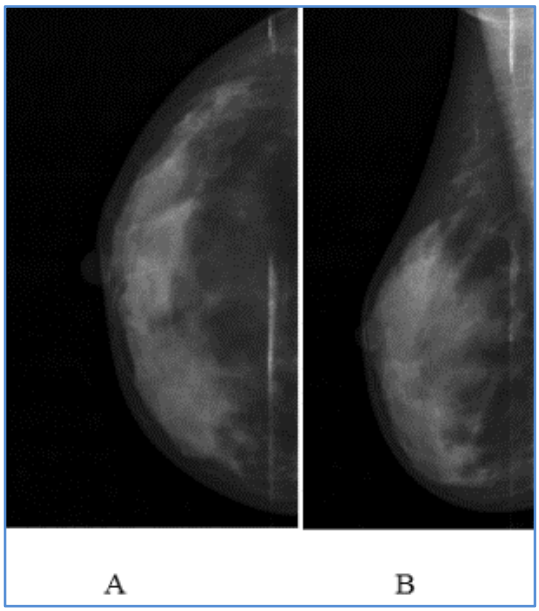

Fig. 1: (A & B) Mammogram (CC & MLO Views) does not reveal any abnormality

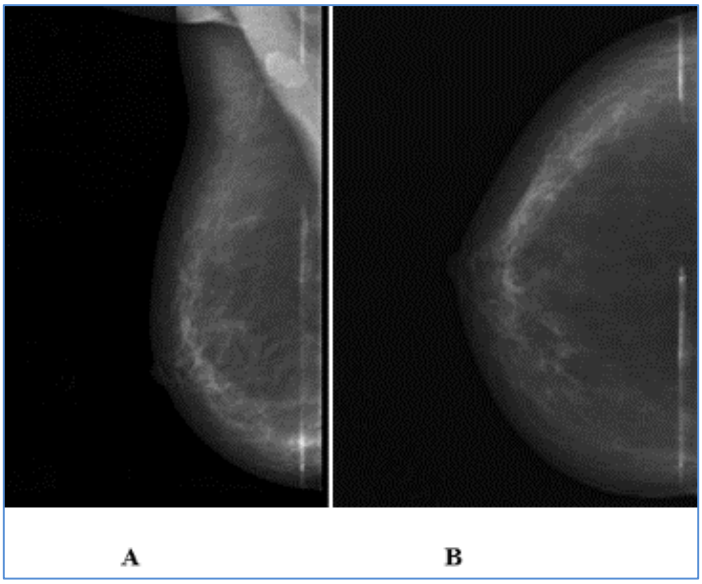

Fig. 2: (A & B) Mammography (MLO & CC Views) reveals predominantly fatty density in the breast (Composition "a")

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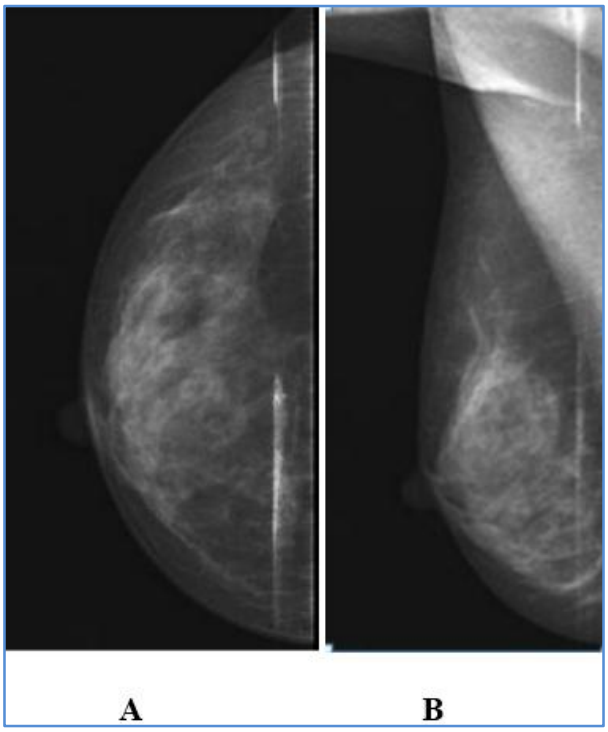

Fig. 3: (A & B) Mammography (CC & MLO Views) reveals scattered areas of fibro glandular density (Composition "b")

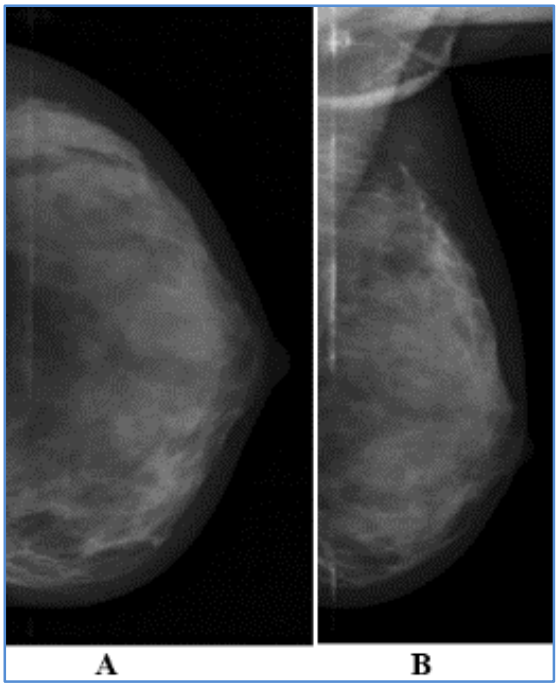

Fig. 4: (A & B) Mammography (CC & MLO Views) reveals heterogeneously dense breast density (Composition "c")

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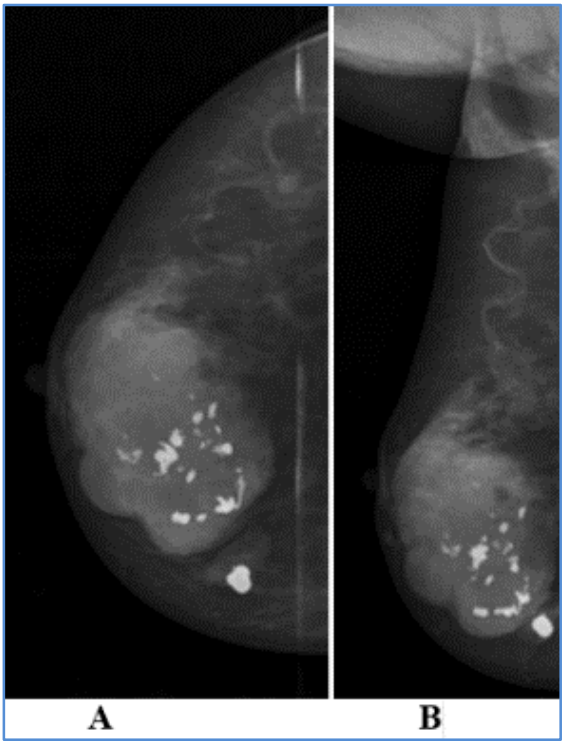

Fig. 5: (A & B) Mammography (CC & MLO Views) reveals well defined lobulated lesion in lower inner quadrant with calcifications (BIRADS II)

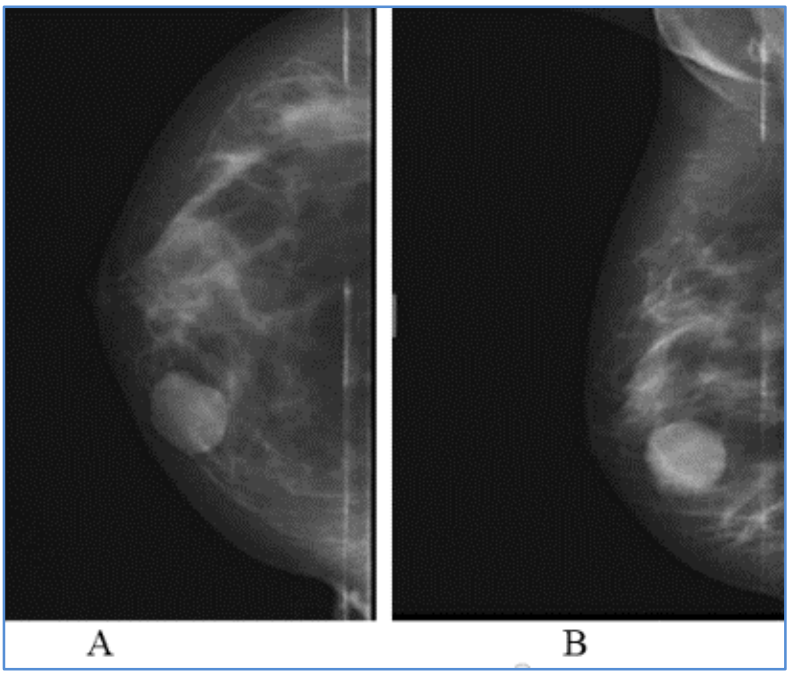

Fig. 6: (A & B) Mammogram (CC & MLO Views in CC & MLO views shown an well-defined hyper dense lesion in the left lower inner quadrant (BIRADS II/III)

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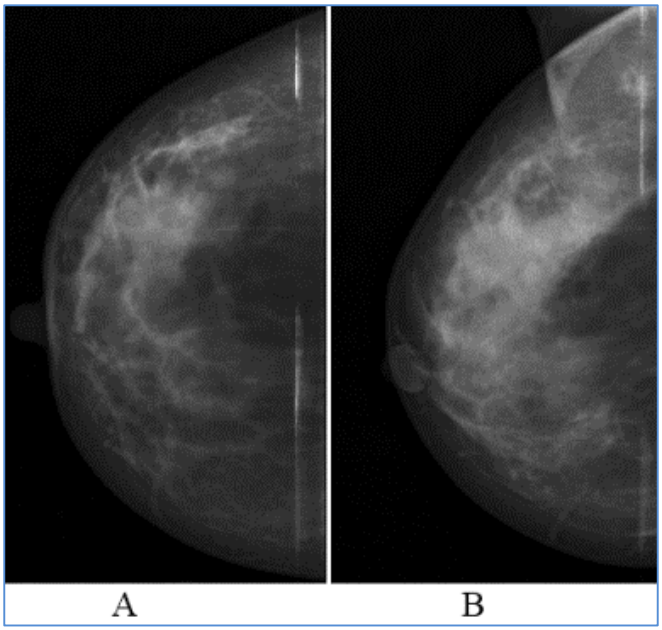

Fig. 7: (A &B): Mammogram (CC & MLO views) shows ill-defined lobulated mass in upper outer quadrant (BIRADS IV)

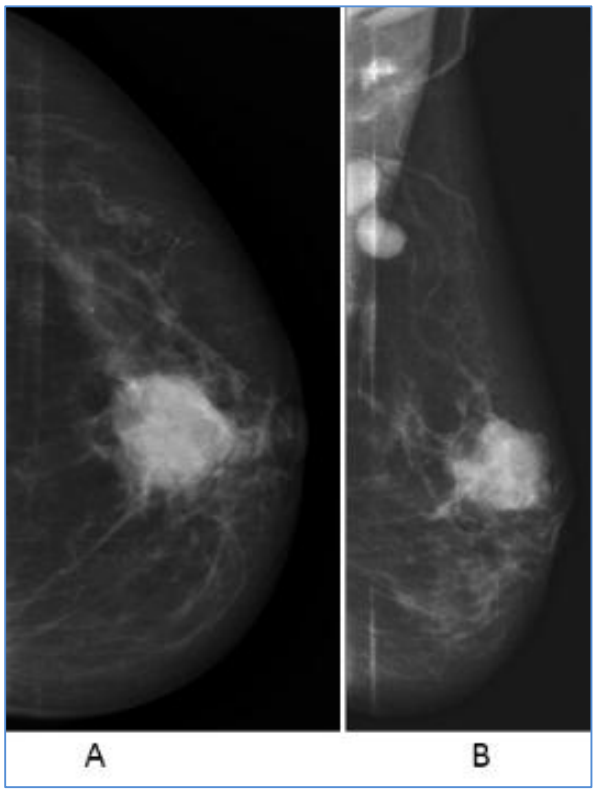

Fig. 8: (A & B): Mammogram (CC & MLO views) show an ill-defined hyperdense mass in the right upper outer quadrant (BIRADSV). Enlarged axillary lymph nodes are also seen in MLO view

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