Common Breast Disorders in Women: A Radiological - Pathological Correlation

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Abstract

Aims and objectives: To recognize, describe the radiological manifestations and correlate pathologically the common breast disorders. To ascertain the value of the different radiological modalities in such disorders

Materials and Methods: This is an observational prospective study of 75 women who presented with breast complaints. They were subjected to X-ray mammography, sonomammography and MR mammography with contrast if needed. All reports were histologically verified and correlated

Results: Of the 75 women evaluated in the age group 30 to 70 years, the following diseases were diagnosed: Fibroadenoma (n=24, 32%), breast cancer (n=22, 29.3%), Fibrocystic disease (n=11, 14.7%), Breast abscess (n=6, 8%) Cystosarcoma phyllodes (n=4, 5.3%) Galactocele (3, 4%), Mastitis (n=2, 2.7 %), Lipoma(n=2,2.7 %), Gynecomastia (n=1,1.3%). Of the 75 women evaluated, sonomammography upstaged the X-ray mammography BIRADS category for 20 women which also corresponded with the HPE findings, X-ray mammography upstaged the sonomammography BIRADS category for 5 women, X-ray mammography and sonomammography showed similar findings in 40 women and MRI was used in indecisive cases, in 10 women, where the findings correctly predicted the HPE outcome.

Conclusion: Familiarity with the imaging spectrum of breast disorders is essential in today's scenario. It would be a better practice to always perform USG evaluation in all women referred to X-ray mammography for breast complaints and to use MR mammography for indecisive cases.

Keywords: Breast disorders, x-ray mammography, Sonomammography, MR mammography, HPE

Introduction

Breast cancer is the most common cancer in Indian women. Mammography, Ultrasonography and MRI are effective diagnostic modalities for detection of breast pathologies. Mammography however has well recognised limitations.USG is used as an adjunct to mammography to further evaluate breast lesions, especially in women with dense breasts. MRI seems to be ideally useful for breast imaging due to it's ability to depict excellent soft tissue contrast. Successful management of the women with breast disorders requires an understanding of normal and pathological clinical and imaging findings associated with breast in these women.

Aims & Objectives

1. To recognize the common breast disorders.
2. To describe the most common radiological manifestations of each disorder and the value of different diagnostic procedures.
3. To categorize the detected breast lesions according to BI-RADS.
4. To discuss the pathological correlation of the imaging findings in these disorders

Materials And Methods

In this study, 75 women who presented with breast complaints to a South Indian tertiary care hospital

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were evaluated with X-ray mammography, sonomammography and MR mammography with contrast if needed.

All cases were histologically verified; their findings were reviewed and compared to radiological findings.

**Case 1, 32 year old lactating woman, left breast:**
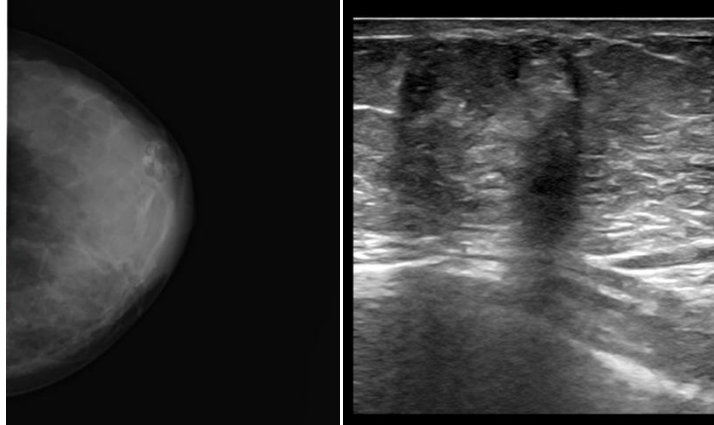
1. USG shows a heteroechoic lesion with macrocalcifications, minimal posterior acoustic shadowing and minimal peripheral vascularity, in 4'o clock position – BIRADS 2.
2. X-ray mammo shows an ill defined soft tissue opacity mass with areas of fat and macrocalcification within it in retroareolar region – BIRADS 2.
3. Features suggestive of galactocele with pseudohamartomatous appearance/hamartoma
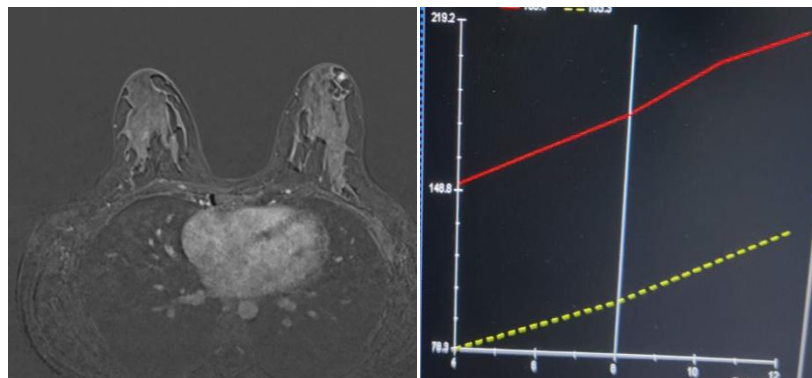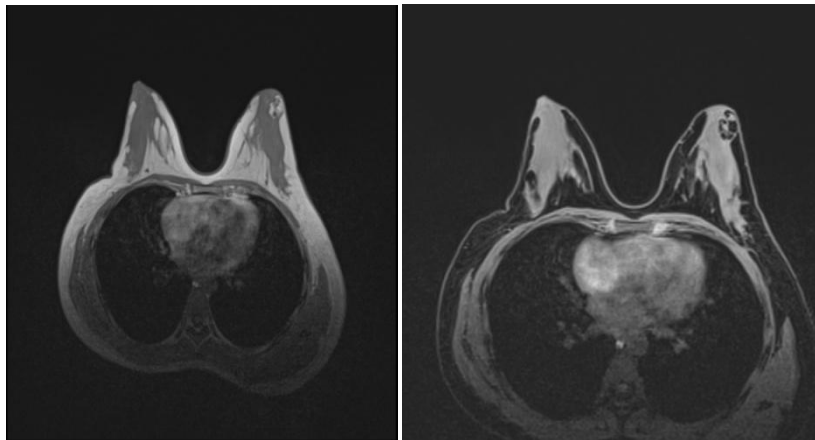
1. MR shows well defined oval shaped heterointense lesion noted in lower outer quadrant of left breast just below the nipple areolar complex.
2. The lesion shows fat suppression with hypointense areas suggestive of calcification.
3. The lesion shows septal and rim enhancement on contrast.
4. Type I kinetic curve was observed
5. Features suggestive of BIRADS 2 lesion, possibly chronic infected galactocele mimicking features of pseudohamartoma
6. HPE- Galactocele

Case 2, 33 years old woman:
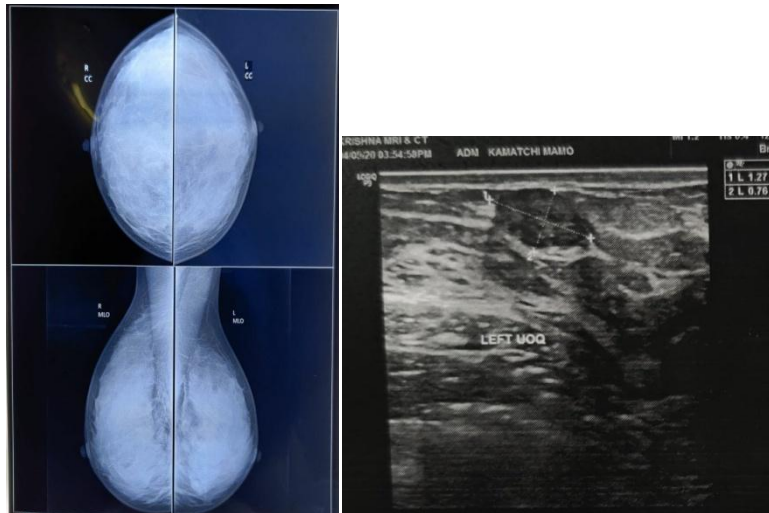
1. X ray mammo
   a. Bilateral dense breasts, no obvious mass lesion. BIRADS 1
2. USG mammo
   a. Hypoechoic subcentimetric lesions with well defined margins noted in bilateral breasts, suggestive of fibroadenoma. BIRADS 2
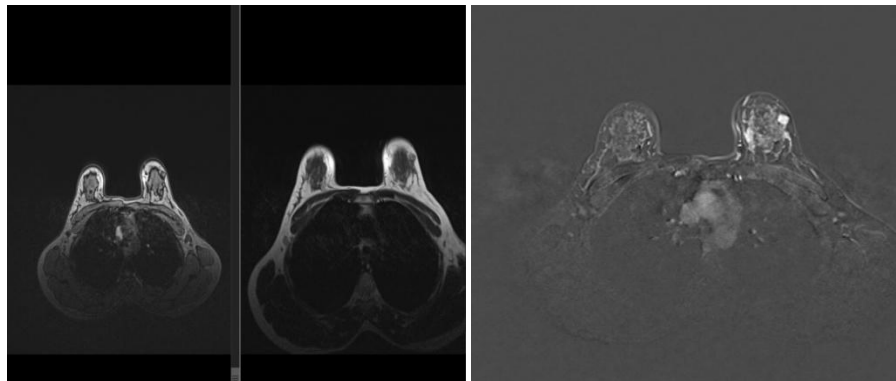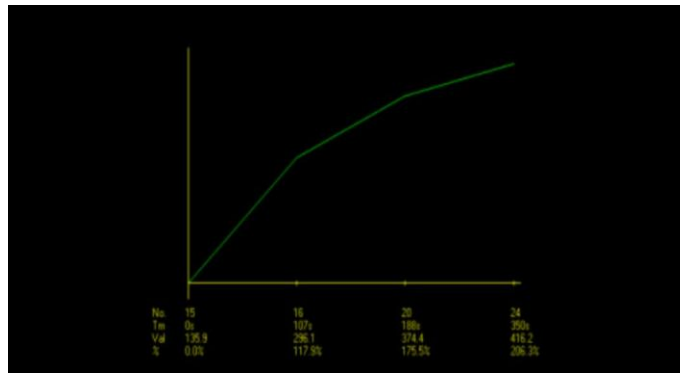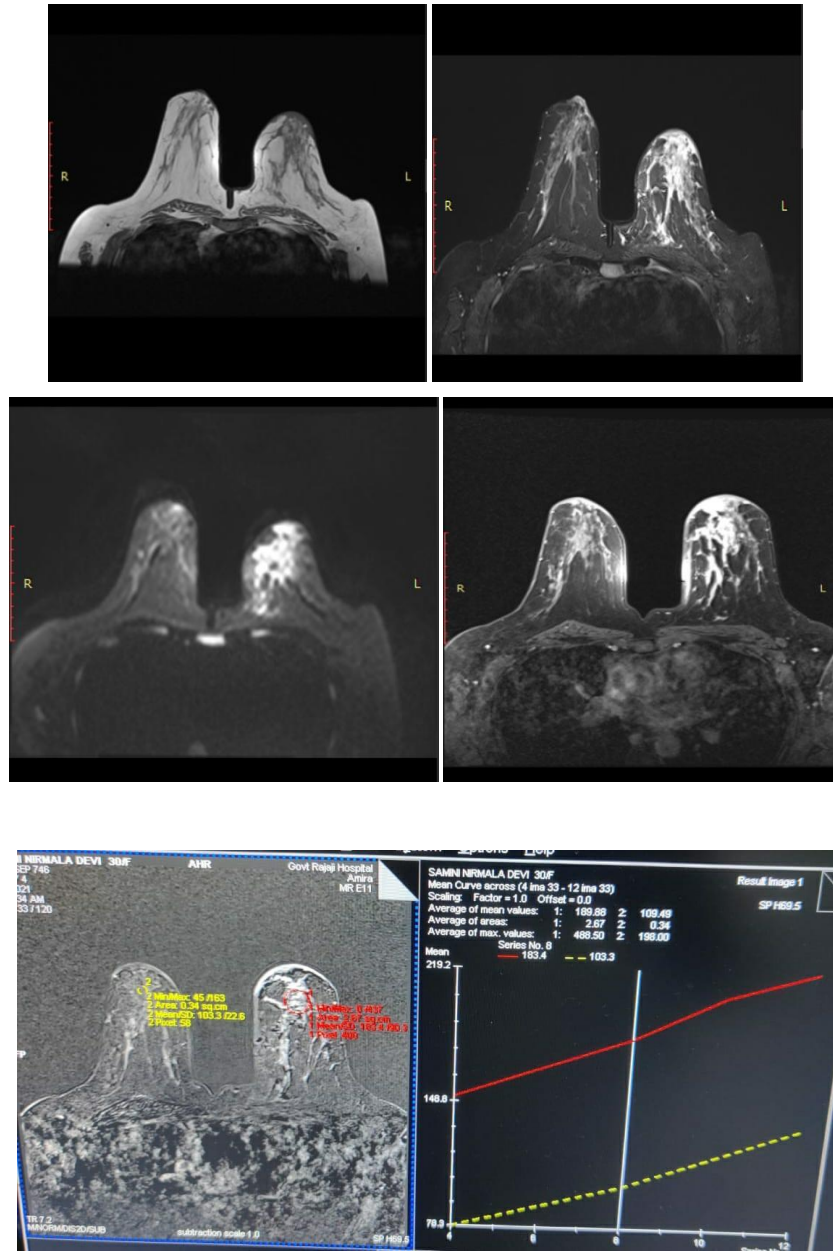
1. MR shows:-
2. Prominent fibroglandular tissue seen in both breasts
3. Two subcentimetric T1 hypo and T2 isointense lesions seen, one in upper outer quadrant of left breast and the other in lower inner quadrant of right breast, which show homogeneous enhancement on contrast with Type I kinetic curve
4. Features suggestive of bilateral fibroadenoma, BIRADS 2
5. HPE- Multiple fibroadenomas

**Case 3, 32 years old woman, left breast:**
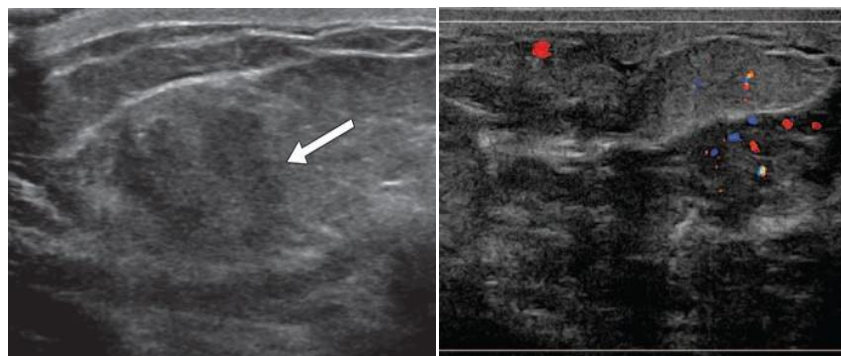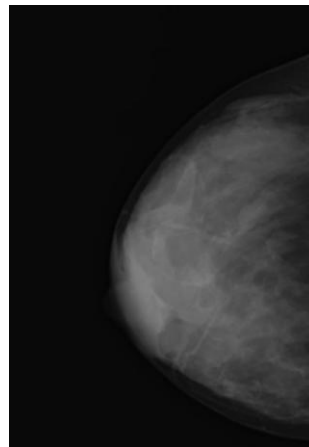
1. X-ray mammo shows dense breast with ill defined patchy radiodensities in retroareolar region. – BIRADS 2.

2. USG mammo shows ill defined hypoechoic areas in all quadrants with prominent ducts and increased vascularity predominantly close to the areola. Subcutaneous edema noted in retroareolar region. – BIRADS 2

Features suggestive of mastitis

1. MR shows in left breast:-

2. Parenchymal thickening with duct dilatation noted in upper inner quadrant.

3. Thin rim of subareolar fluid noted.

4. On contrast benign pattern of abnormal enhancement noted showing Type I kinetic curve.

5. Features more in favor of puerperal mastitis on left

6. Follow up: Patient recovered with antibiotics

Case 4, 52years old woman:
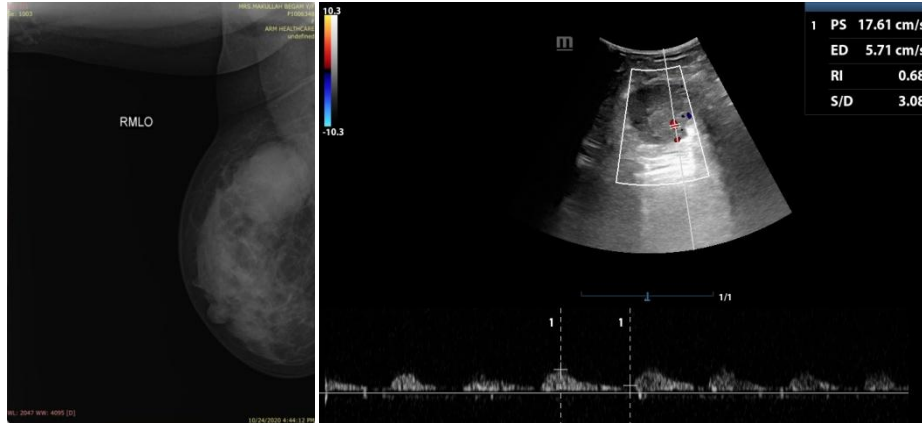
1. X ray mammo :Ill defined dense mass noted in the upper outer quadrant of right breast with irregular spotty microcalcification and architectural distortion, likely to be malignant. BIRADS 4

2. USG mammo

   a. Ill defined hypoechoic lesion with irregular margins, posterior acoustic shadowing and increased vascularity is seen

   b. Enlarged axillary lymph nodes noted with loss of fatty hilum

   c. Suggestive of malignancy. BIRADS 5
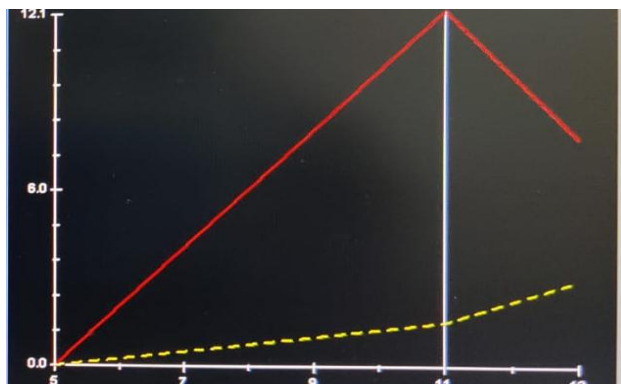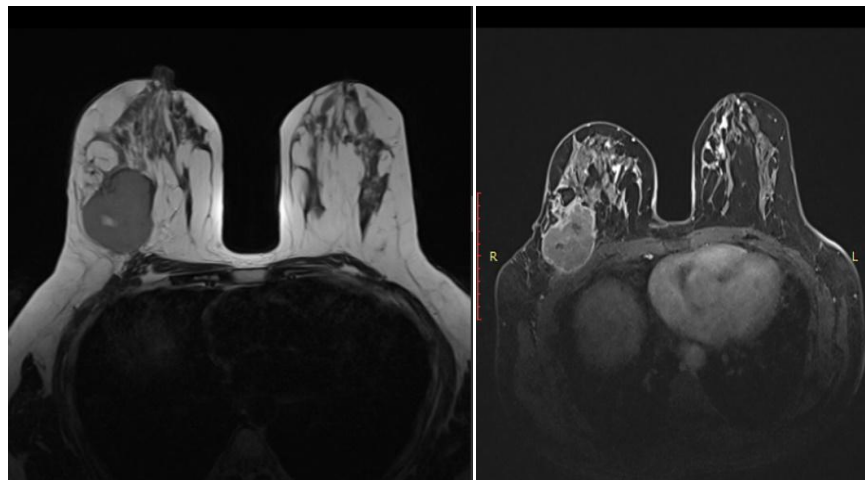
1. MR shows:-

2. A lobulated lesion noted in upper outer quadrant of right breast showing internal cystic areas causing focal architectural distortion

3. Lesion shows heterogeneous enhancement on contrast

4. Kinetic type III curve noted

5. Axillary nodes noted which show homogeneous enhancement with loss of fatty hilum

6. BIRADS 5, suggestive of malignancy
7. HPE – invasive ductal carcinoma

Results:

Distribution of patients based on X ray mammographic grade of lesion (BI-RADS)

Distribution of patients based on Sonomammographic grade of lesion (BIRADS)

Distribution of patients based on MR mammographic grade of lesion (BIRADS)

Distribution of patients based on FNAC report
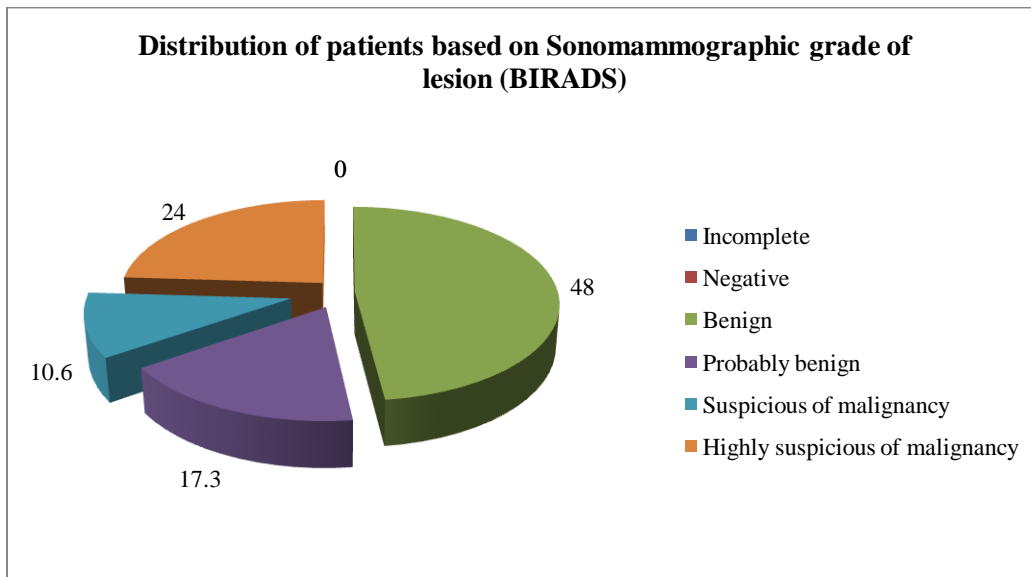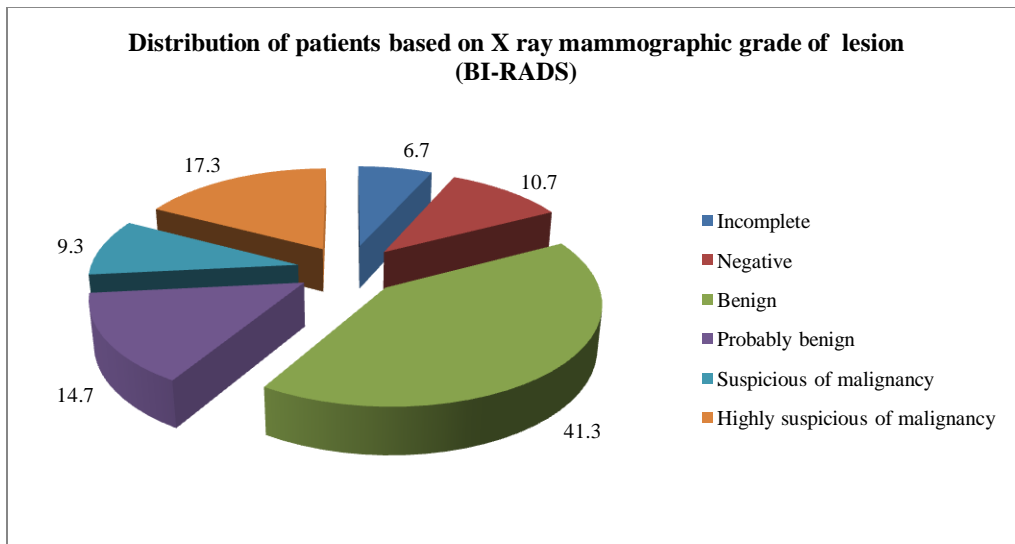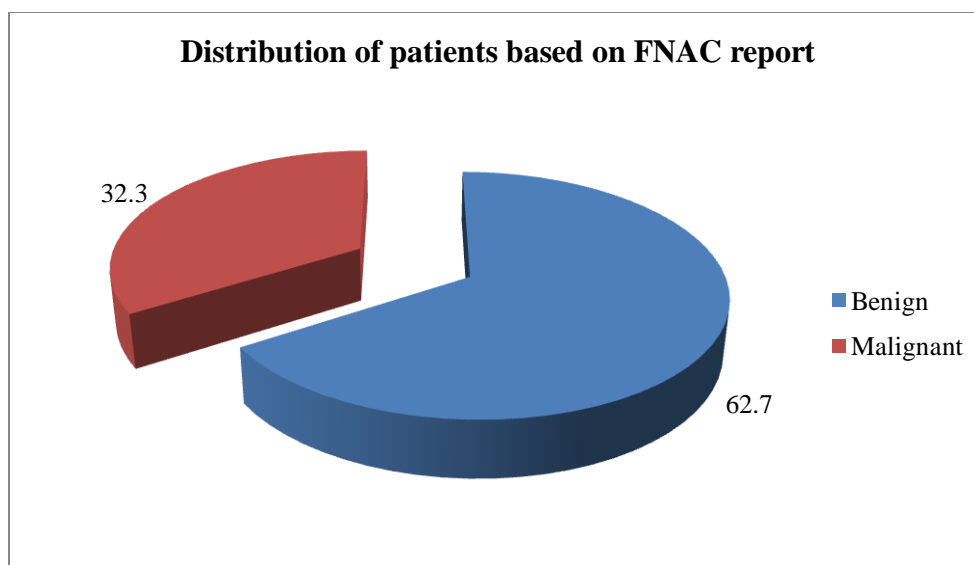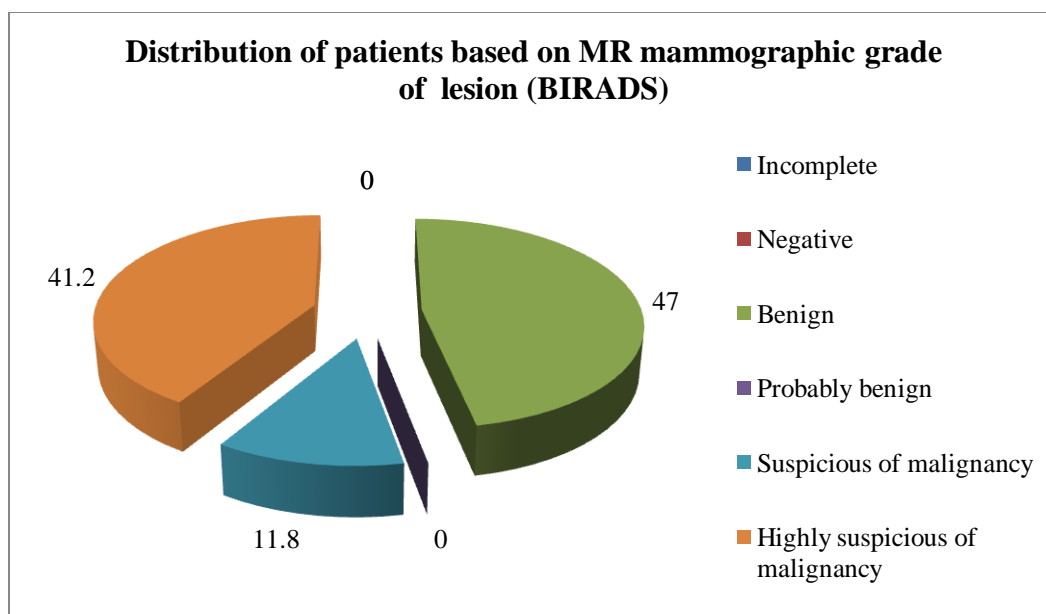
Distribution of patients based age with FNAC report
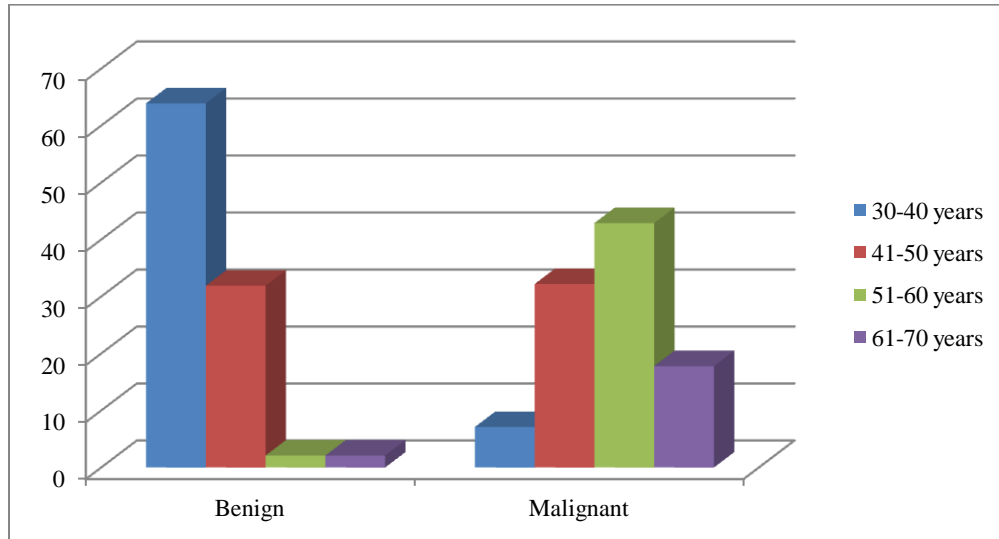
Of the 75 women evaluated in the age group 30 to 70 years, the following diseases were diagnosed: Fibroadenoma (n =24, 32%)

1. Breast cancer (n=22, 29.3%)
2. Fibrocystic disease and cysts (n=11, 14.7%)
3. Breast abscess (n=6, 8%)
4. Phyllodes Tumour (n=4, 5.3%)
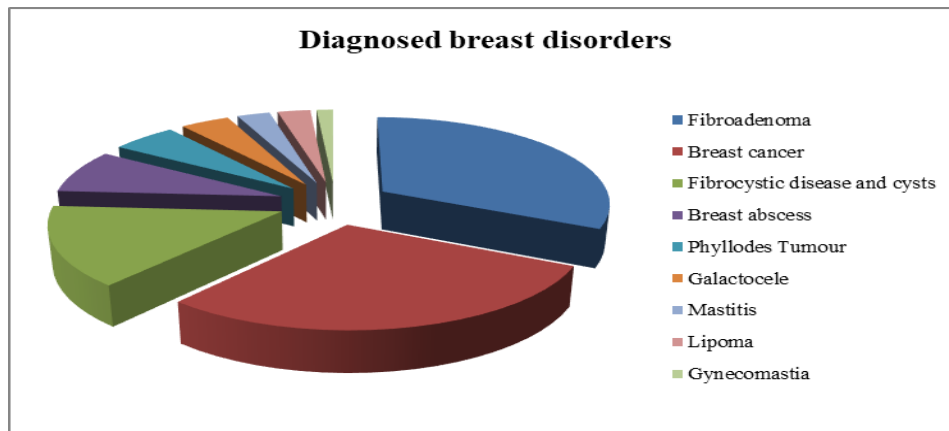5. Galactocele (3, 4%)
6. Mastitis (n=2, 2.7 %)
7. Lipoma (n=2, 2.7 %)
8. Gynecomastia (n=1, 1.3%).

Of the 75 women evaluated,

1. Son mammography upstaged the X-ray mammography BIRADS category for 20 women which also corresponded with the HPE findings
2. X-ray mammography upstaged the sonomammography BIRADS category for 5 women
3. X-ray mammography and sonomammography showed similar findings in 40 women
4. MRI was used in indecisive cases, in 10 women, where the findings correctly predicted the HPE outcome.

Discussion:

This study has described the radiological findings of the common disorders seen in the breast i.e., their

imaging appearances in x-ray mammography, sonomammography and MR mammography.

Sonomammography scored over X-ray mammography in accurately predicting the HPE outcome in 26.7% of the total women in this study.

X ray mammography scored over Sonomammography in accurately predicting the HPE outcome in 6.7% of the total women in this study.MR can be used for indecisive cases which has a high sensitivity and specificity. Fibroadenoma, the most common benign tumour of the breast are seen commonly in young women. Giant fibroadenomas are lesions that are ≥ 8 cms. Most of them are well circumscribed have a smooth contour. Some fibroadenomas, however, have shown 'a t y p i c a l' findings such as an ill-defined margin, irregular appearance, heterogeneous internal echo-pattern or posterior shadowing in USG(1) The Phyllodes tumour, previously called cystosarcoma phyllodes, is a benign tumour that can be quite large. Phyllodes tumours have around 10% chances of undergoing malignant change.Fibrocystic changes (FCCs) comprises one of the most frequently observed benign breast disorder. It is generally seen in premenopausal women aged between 30 and 50.(2) Cysts can be group into 3 types: simple, complicated and complex cysts (3) Another benign tumour of breast is the Lipoma, which is commonly seen as a solitary tumour and is made up of mature fat cells.(4)

An obstructed milk duct can lead to Galactocoeles ,a benign tumour that can occur at a short interval after breast feeding is stopped or during lactation.(5)

Abscesses may originate from infection of the subareolar ducts and/or preexisting galactocele (puerperal mastitis), or from ruptured ectatic ducts or cysts with initial chemical inflammation and subsequent bacterial superinfection

Breast cancer represents one in four of all the cancers occurring in women(6) and is now one of the leading causes of cancer related deaths among women.Studies show MRI is better than mammography and US in the detection of high-grade invasive cancers(7)

Conclusion

Familiarity with the imaging spectrum of breast disorders is very helpful for radiologists to provide the correct diagnosis and avoid delayed diagnosis of breast cancer and unnecessary surgery for benign lesions.

It would be a better practice to always perform USG evaluation in lactating women referred to X-ray mammography for breast complaints. It is also prudent to use MR mammography for indecisive cases.

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