Radiology

ULTRASOUND AND MAMMOGRAM EVALUATION OF BREAST LESIONS WITH FNAC CORELATION

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Introduction:-

Breast carcinoma is the most common causes of cancer related death among women accounting to approximately 6,22,000 in the year 2021. It is the most commonly diagnosed cancer among women which now represents one in four of all cancers in women.

All detected breast lesions are not malignant and all the benign masses do not progress to malignancy. Accuracy of the final diagnosis can be increased by radiological imaging like ultrasonography, mammography, and pathological diagnosis.

The study includes evaluation of the breast lesions according to BI-RADS with correlation of FNAC .

Aims and objectives:-

1. To study ultrasonography with mammography in diagnosing benign and malignant breast lesions.
2. To categorize and correlate the breast lesions according to BI-RADS with FNAC.

MATERIALS AND METHODS:-

A Cross-sectional study of 55 patients with history of breast lesions in Females more than 40 years of age having BI-RADS 2 and above on imaging. All the patients were subjected to mammography, ultrasonography and FNAC under USG guidance .The study was done in SMT.KASHIBAI NAVALE MEDICAL COLLEGE PUNE, Maharashtra .All 55 patients were subjected to Conventional mammography Allengers MAM VENUS, Ultrasonography ACUSON S2000 ultrasound machine, Disposable needles (21-27 gauge) and Fixative (95% ethanol).

METHOD:-

Mammography:- Mammography of the breast is obtained by compression of the breast tissue. X-rays are transmitted through the tissue and anatomical structures are projected onto a image sensor. Two imaging projections of each breast are obtained craniocaudal (CC) and mediolateral oblique (MLO) views.

ULTRASONOGRAPHY:-The high frequency linear probe had been used to image the breast tissues in the patient lying in supine position. The transducer was glided in radial and anti-radial direction to see for any abnormality.

FNAC:-FNAC was done under ultrasound guidance. The skin was disinfected and then needle was inserted near one of the short sides of the transducer and passed along a trajectory lying parallel to the long axis of the transducer till the lesion was penetrated, Aspiration was then done and the tip is moved in various directions to collect multiple samples. The collected specimen was then sent for histopathological examination.
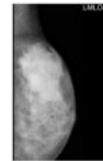
INCLUSION CRITERIA
- Females more than 40 years with complaints of breast pain
- History with or without lump or nodularity in the breast.
- Females more than 40 years coming for routine breast screening, which found to have BI-RADS-2 and above.

EXCLUSION CRITERIA
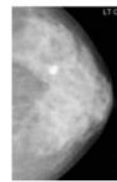- Pregnant women
- Postoperative patients

CASE 1

An ill-defined radiodensity noted in the upper outer quadrant of left breast. No e/o calcification noted. BIRADS IV.
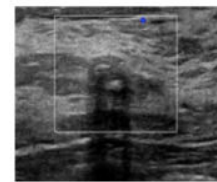
USG of same patient shows Lobulated, thick walled cystic lesion with thick internal echoes - BIRADS IV.

FNAC - Suppurative inflammatory lesion.

Case 2

Calcified fibroadenoma is noted in the upper-outer quadrant of left breast- BIRADS II.

USG of same patient shows hypoechoic lesion with calcification - BIRADS II

FNAC -benign proliferative fibroepithelial cells.

Discussion:-

A total of 55 female patients who were found to be have breast lesions with positive findings on both mammography and ultrasonography were included in the study.

The higher percentage of lesions for malignancy was in the age group ranging from 40-60 years which was 65.7%. 50% of the benign lesions were found in upper outer quadrant and the retroareolar quadrant had the highest Percentage (30%) for malignant lesions.

All the proven malignant lesions were irregular in shape on ultrasound and showed pleomorphic type of calcification on mammogram which were positive for malignancy, Studies have shown that pleomorphic calcification seen within a mass are typically invasive ductal carcinoma.

In this study all well-circumscribed with no obvious microcalcification lesions on ultrasonography were proven to be benign.

All the lesions with spiculated margins on mammography, i.e. 35% and with microlobulations on ultrasonography, i.e. 45% were found to be positive for malignancy .

3 cases that were given a grade of BI-RADS 5 had positive malignant lymphadenopathy with loss of fatty hilum.

Mammographic BI-RADS with FNAC was 80% sensitive and 73% specific.

Ultrasonography BI-RADS with FNAC was 88% sensitive and 93% specific for benign lesions, while the sensitivity was 95% and the specificity was 84% for malignant lesions.

The specificity and sensitivity was more accurate when both the modalities (sonography and mammography) was combined with FNAC yielded the best results with the sensitivity of 95% for benign lesions and 98% for malignant lesions.

RESULTS:-
The study group comprised of a total number of 55 patients with the age distribution of the study group varies from 40 to 60 years. The highest number of patients with breast lesion belonged to the age group of 40 to 50 years. 15% of the study population had a family history of breast cancer.28 out of 55 patients had mainly come for complaints of lump in the breast followed by 27 who were evaluated for pain in the breast.

Out of the 55 patients, 35% had fibro-fatty breast tissue. 30 of breast lesions were in found in the upper outer quadrant.

On mammography there was an equal distribution of round and oval shaped lesions. 23 of the 55 lesions had well defined margins while 7 of them were indistinct, 9microlobulated and the rest 4 had spiculated Margins. Only a single lesion was fat containing. 82% of breast lesions had no calcifications seen on mammography. The overlying skin was normal in 49 of the patients while 4 of them had skin retraction and 2 of them had skin thickening on mammography.

On mammography, 43% of the patients had benign lesions (BI-RADS-2) in the breast, while it was 13.0% of the lesions were highly suspicious for malignancy (BI-RADS 5)

Characterization of breast lesions on ultrasound shows Oval shaped lesions at 50.1% were more than round lesions at 48.1% when visualized on ultrasonography, the most common type of lesion on ultrasound was well circumscribed and the least common was spiculated margins.89.1% showed no skin retraction while 9.0% of the lesions showed skin retraction Ultrasonography showed 58.6% of patients had benign lesions (BI-RADS 2) in the breast while 13.1% had lesions highly suspicious for malignancy (BI-RADS 5).

Comparison of ultrasound and mammographic findings with FNAC showed that out of the total 55 lesions, 40 of them were benign and 15 were positive for malignant cells.

The positive predictive value of ultrasonography was 97.5% and the negative predictive value was 2.6% for both benign and malignant lesions.

Combining both the modalities had a sensitivity of 95.2% for benign lesions and 97.4% for malignant lesions. The specificity after combining both modalities was 97.4% for benign lesions and 93.2% for malignant lesions.

In FNAC proven malignancy cases, the most common site was the retroareolar region. Commonest site was upper outer quadrant for benign lesion.

CONCLUSION:-
Breast ultrasound showed more accuracy than mammography in women who are young. Ultrasound appeared to be superior to mammography in dense breasts and could be used as an initial imaging in those women. Whereas the accuracy of mammogram increases with fatty breasts in older age group patients.

The primary features of benign and malignant lesions were correlated with FNAC, if the lesion is found to be benign BI-RADS 2 category in USG and mammography, FNAC has avoided.

All the lesions which were detected as BI-RADS 4 or 5 in Ultrasonography or mammography or both were found to be 100 % malignant.

USG and mammography in combination yielded the best result and can be used as a screening modality to detect malignancy early.

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