



MAMMOGRAPHIC EVALUATION OF BREAST CALCIFICATIONS

Radiodiagnosis

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ABSTRACT

Microcalcifications can be the early and only presenting sign of breast cancer. The aim is to evaluate the different types of breast calcifications. Mammography not only helps diagnosing malignancy in a nonpalpable stage but can also help determine the extent of the disease. Study of 150 (mammograms) of both benign and malignant breast lesions with calcification and histopathological confirmation was done. This study used data of 150 mammograms of both benign and malignant lesions which were evaluated at radiology department of Dhiraj hospital, Piparia, Waghodia. On mammographic examination 54% cases were benign, 13% indeterminate and 33% malignant.

KEYWORDS

INTRODUCTION:-

Breast calcifications are deposits of calcium salts in the breast, which are radio-opaque on mammography. Microcalcifications can be the early and only presenting sign of breast cancer. Mammography is used worldwide to detect microcalcifications. With the help of mammography, we can not only diagnose cancer in a nonpalpable stage but can also detect the extent of the disease. Proper evaluation of various calcifications is required to decide whether they are benign or malignant. A biopsy can be avoided if the calcifications appear absolutely benign on mammography and the patient can be followed-up with annual screening mammography. Thus, it is necessary to distinguish between benign and malignant lesions and one of the parameters is analysis and characterization of calcification on mammography in terms of morphology, distribution, size, number, variability and stability from prior mammograms.

AIMS AND OBJECTIVE:-

Analysis of various types of breast calcifications on mammography and distinguishing between benign and malignant lesions.

MATERIAL AND METHODS:-

Study of 150 mammograms of both benign and malignant lesions with calcification and their histopathological confirmation was done from August 2019 to February 2020. Detailed history was taken with clinical examination and follow up of suspected/proven cases was done.

Mammography of each patient was performed using full field digital Siemens mammography machine. Craniocaudal and oblique views of each breast were taken. Results of the study were correlated with the histopathological analysis.

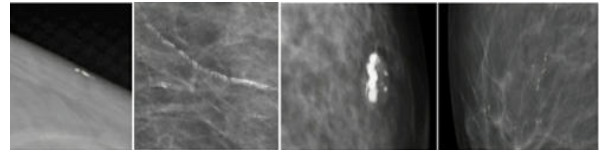
Indications for mammogram were: Mass in the breast (n=58), screening (n=54), nipple discharge (n=12), follow-up (n=10), mammography before Hormone Replacement Therapy (n=10), mass in the breast with nipple discharge (n=4), mass in axilla (n=2).

DISCUSSION:-

- The most important characteristic indicative of the likely histologic origin of the calcifications is morphology. Irregular, pleomorphic, fine linear branching, or amorphous microcalcifications are most likely within ducts and are suspicious in nature; whereas round, smooth, and punctate microcalcifications are more likely in lobules and therefore benign.
- The second most important analysis point is distribution of calcifications. Grouped, clustered or segmentally distributed calcifications are more typical of malignancy because of their ductal orientation.
- Although malignant calcifications are most often small (<200 µm in diameter), the size of the calcifications is much less important than their morphology and distribution in determining whether they have a benign or malignant appearance. Coarse, lucent-centered, eggshell, and dystrophic calcifications are usually stromal in origin and also benign.

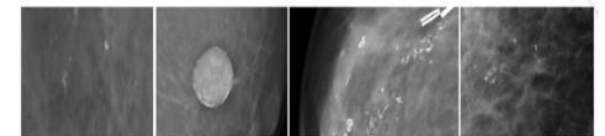
- Stability of greater than 2 years suggests, but does not confirm, a benign etiology. Calcifications having a suspicious morphology should not be ignored because of lack of interval change. Conversely, many new calcifications need not be biopsied if their morphology is benign.
- Benign patterns of calcifications** include the following types: skin, coarse, large rod-like, milk-of-calcium, round, lucent-centered, egg-shell or rim, dystrophic, vascular calcifications, sutural, and punctate.
- Malignant calcification**: was found that breast cancers are associated with malignant calcifications in about 50% of cases. They tend to occur in clusters.

Ductal carcinoma in situ presents as microcalcifications in at least 90% of cases. Presence of fine linear branching calcifications is associated with a positive predictive value >90%. The greater the number of microcalcifications in an area, the more suspicious for malignancy.

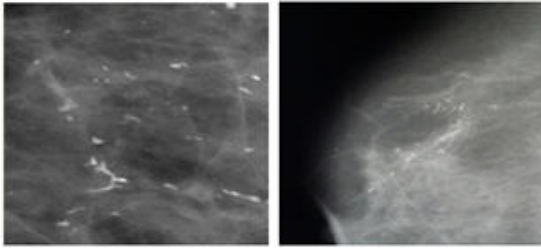


- Skin calcifications have a typical lucent center and polygonal shape.
- Vascular calcifications can be seen as parallel tracks or linear tubular calcifications that run along a blood vessel.
- Popcorn calcifications are typically found in involuting fibroadenomas

Large rod-like calcifications are typical of secretory disease but not of breast cancer. They are usually >1mm, are occasionally branching, and may have lucent centers.



- Smooth round calcifications are associated with a benign process. They may vary in size in a cluster. When <1mm they are often found in the acini of lobules. When <0.5mm the term punctate is used.
- These are thin calcifications that surround all or part of the margin of a mass. They are typically found in the wall of cysts. Breast cancer rarely produces this type of calcifications.
- Dystrophic calcifications are irregular in shape but they are usually large, i.e. >0.5mm in size. They often form in the irradiated breast or after trauma to the breast.
- Calcifications that are of immediate concern are **indistinct or amorphous microcalcifications**. They may appear as round or flake-shaped calcifications that are sufficiently small or hazy such that their morphology cannot be reliably ascertained.



- Heterogeneous or pleomorphic calcifications in and of themselves are not associated with a benign or malignant process. However, a cluster of calcifications irregular in shape, size, and tend to be <0.5mm raises suspicion.
- High probability of malignancy - These are thin, irregular calcifications that appear linear from a distance. Closer examination reveals that they are distinct and <1mm in width. They result from irregular calcifications of necrotic tumor in the lumen of a duct involved irregularly by breast cancer.

RESULTS

- Patients were mostly in the 40-50 year age group followed by 50-60 year age group.
- 22% patients had past medical history of Ca breast and 13% had family history of Ca breast.
- Most common indication for mammography was mass in breast followed by routine checkup.
- On mammographic examination 56% cases were benign, 15% indeterminate and 29% malignant. In benign calcification commonest type was round followed by rod like and lucent centered.
- 86% of patients had clustered microcalcifications and 14% had scattered microcalcifications.
- Study shows that chance of malignancy increases with increased number of microcalcifications.
- Density of microcalcifications is useful in the detection of malignant calcifications. 71% of patients with malignant disease had low mean density of calcifications while 29% of malignant diseases had high mean density.
- 83% of malignant lesions with clustered microcalcifications had irregularity in size of microcalcifications which is a statistically significant criterion in diagnosing malignant calcifications.
- 75% of malignant diseases with microcalcifications had linear, branched or vermicular configuration, which is rare in benign diseases.

CONCLUSION:-

Attention to detail is paramount in the correct identification and assessment of microcalcifications on mammography. Excellent quality images of high contrast and spatial resolution are a necessity. Mammography is an important tool to distinguish between benign and malignant lesions by analysis of various patterns of calcification - morphology, distribution, size, number, variability, and stability from prior mammograms ;by doing so it helps in early detection of malignancy.

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