



Review of Definite Benign Breast Calcifications on Mammography

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Abstract

Purpose: To review the various types of definite benign calcifications that would be considered Breast Imaging Reporting and Data System (BI-RADS) category 2 assessment on either a screening or diagnostic mammogram.

Overview: Calcifications in the breast are found with great frequency on mammography, and radiologists must determine if they are benign, malignant or indeterminate. The morphology, distribution, size, number, variability, and stability of calcifications provide clues in determining the most appropriate strategy for patient management. This abstract will review the various types of benign calcifications in the breast such as: dermal calcifications, vascular calcifications, coarse or “popcorn-like” calcifications, large rod-like calcifications, round or punctate calcifications, lucent center calcifications, eggshell or rim-like calcifications, milk of calcium, sutural calcifications or dystrophic calcifications.

Conclusions: Breast calcifications are extremely common in women and often are associated with a benign breast condition unrelated to cancer. Proper detection and diagnosis of definite benign calcifications is paramount so that unnecessary percutaneous or excisional biopsies can be avoided.

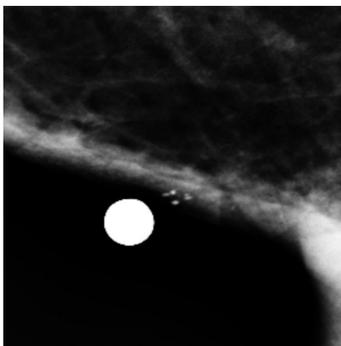
Background

- Breast calcifications are a common finding, present in up to 86% of mammograms, and their incidence increases with age [2]
- Benign calcifications are more easily seen than those associated with malignancy [2]
- The presence of breast calcifications and their categorization using descriptors as indicated in the BI-RADS can help radiologists to stratify the risk of malignancy [3]
- Breast calcifications are divided into three groups based on various characteristics: typically benign, intermediate concern, and higher probability of malignancy [1]
- The diagnostic criteria used to classify breast calcifications include size, shape, distribution, morphology and temporal changes [3]
- Examination of breast calcification characteristics can identify those features that are definitely benign and require **no further follow-up or intervention** [1]
- In order to reduce the number of unnecessary biopsies as well as to prevent missing a more serious condition it is imperative for the radiologist to distinguish between benign and malignant calcifications

Definitely Benign Calcifications - Identification

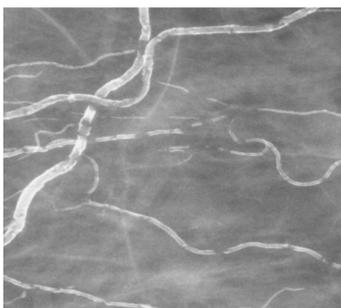
Dermal or Skin Calcifications:

- Usually round or oval shaped, lucent-centered, or widely scattered
- Can be seen along the inframammary fold, the axilla, the medial breast or the areola
- Form in dermal sweat glands after low grade folliculitis and inspissation of sebaceous material
- Often have lucent centers and can be identified with a radiopaque marker placed using tangential views



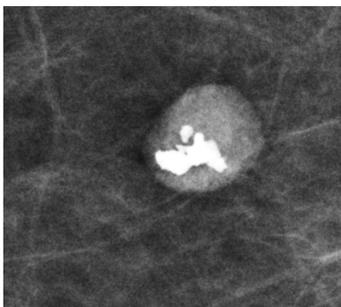
Vascular Calcifications:

- Appear as linear calcifications or parallel tracks that are often continuous with noncalcified blood vessels
- In patients under 50, may be associated with coronary artery disease, diabetes, and chronic renal disease



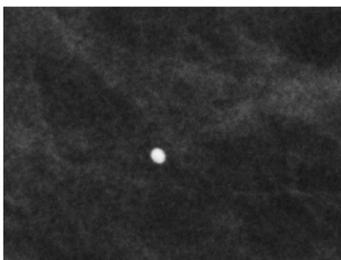
Coarse or “Popcorn-like” Calcifications:

- Typically larger, can be >2-3 mm
- Associated with involuting fibroadenomas



Round Calcifications:

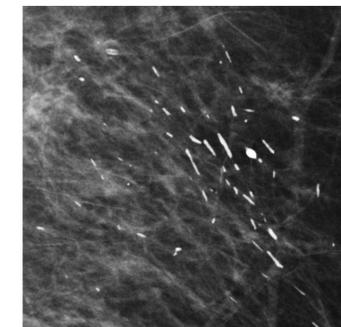
- Can be benign when scattered
- Usually <1mm in size with a smooth margin
- “Punctate” when <0.5 mm
- May form in acini of lobules



Definitely Benign Calcifications - Identification

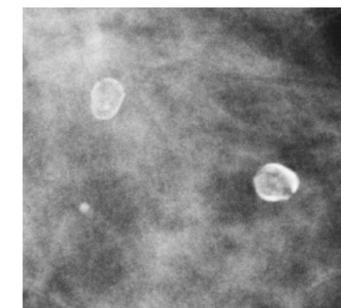
Large Rod-Like Calcifications:

- Usually bilateral and seen in women over 60-years-old
- Typically solid or discontinuous, smooth and rod or needle-like
- Usually greater than 1 mm in diameter
- Typically coarse and have a linear distribution following the ducts and radiating towards the nipple
- Can have lucent center if calcium is in the wall of the duct



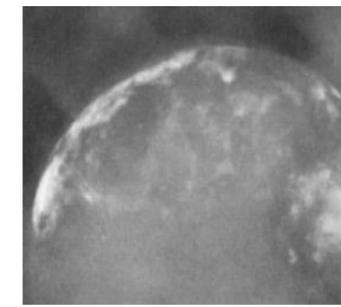
Lucent Center Calcifications:

- Range in size from <1mm to >1cm
- Thicker wall than “egg-shell” type
- Round or oval with smooth surface
- Fat necrosis can also produce similar thin deposits



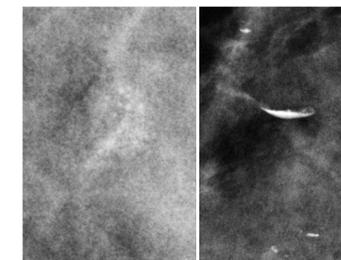
Eggshell Calcifications:

- Thin calcium deposits on the wall or surface of a sphere, usually an oil cyst
- Calcium deposition thickness <1mm
- Fat necrosis can also produce similar thin deposits



Milk of Calcium:

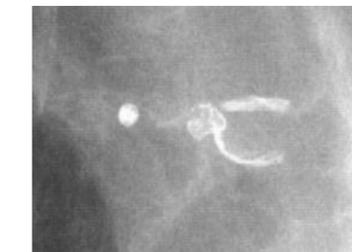
- Appear smudgy and amorphous on the CC view and crescent (“tea-cup”) or linear on a lateral view
- Pathognomonic layering in the dependent portion of the cyst on true lateral view



Definitely Benign Calcifications - Identification

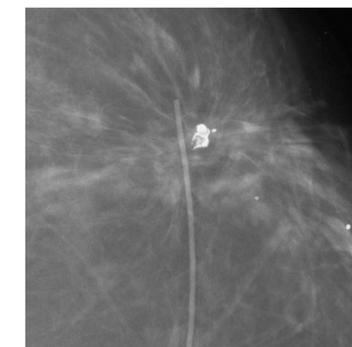
Sutural Calcifications:

- Calcium deposition onto suture material
- Linear or tubular in appearance, though variable when deposited onto knots



Dystrophic Calcifications:

- Appear coarse, irregular, linear or amorphous along areas of prior trauma, biopsy, surgery or radiation
- Typically larger than 0.5 mm
- Sometimes have lucent centers in areas of fat necrosis
- Comparison with the pre-biopsy or pre-treatment images is helpful, however biopsy is required if there are any changes over time



Conclusion

- Definite benign calcifications of the breast are present in the majority of mammograms. It is important for radiologists to identify these calcifications as definitely benign when present in order to avoid unnecessary biopsies, unindicated follow-up imaging and patient distress.

References

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