

BI-RADS(BREAST IMAGING REPORTING AND DATA SYSTEM); AN UPDATE

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Introduction

History:

- BI-RADS initiative, instituted 1986 by the ACR
, 1st edition 1993, more editions 1995 ,98 ,2003 upto currently 5th edition(2014)
- Goal – address lack of standardization and uniformity in mammography practice reporting.
- The old reporting systems & medical practices were inconsistent,
- “New reporting system”(BI-RADS)

BI-RADS= Breast Imaging Reporting And Data Sytem

ACR= American College of Radiology

Equipments(US, Mammo, MRI) others modalities for staging CT, Bone Scintigraphy etc)



Table 1 Comparison of imaging classification systems

Category	BI-RADS	NBCC	RCRBG
0	Assessment incomplete. <i>Need to review prior studies and/or complete additional imaging</i>		
1	Negative. <i>Continue routine screening</i>	No significant abnormality. <i>There is no significant imaging abnormality</i>	Normal/no significant abnormality. <i>There is no significant imaging abnormality</i>
2	Benign finding. <i>Continue routine screening</i>	Benign findings. <i>No further imaging is required</i>	Benign findings. <i>The imaging findings are benign.</i>
3	Probably benign finding. (<i><2% chance of malignancy</i>) <i>Short-term follow-up mammogram at 6 months, then every 6–12 months for 1–2 years</i>	Indeterminate/equivocal findings. <i>Requires further investigation, usually FNA cytology/core biopsy</i>	Indeterminate/probably benign findings. <i>There is a small risk of malignancy. Further investigation is indicated.</i>
4	Suspicious abnormality. <i>Perform biopsy, preferably needle biopsy</i>	Suspicious findings of malignancy. <i>Requires further investigation. May require excisional biopsy</i>	Findings suspicious of malignancy. <i>There is a moderate risk of malignancy. Further investigation is indicated.</i>
5	Highly suspicious of malignancy: appropriate action should be taken. <i>Biopsy and treatment, as necessary.</i>	Malignant findings. <i>Requires further investigation, even if non-excision (percutaneous) sampling is benign</i>	Findings highly suspicious of malignancy. <i>There is a high risk of malignancy. Further investigation is indicated.</i>
6	Known biopsy-proven malignancy, treatment pending. <i>Assure that treatment is completed</i>		

BI-RADS, American College of Radiology Breast Imaging Reporting and Data System; NBCC, Australian National Breast Cancer Centre; RCRBG, Royal College of Radiologists Breast Group; FNA, fine-needle aspiration.

BI-RADS

- **BI-RADS** is an acronym for **Breast Imaging Reporting And Data System**
- BI-RADS is a quality assurance guide designed to standardize breast imaging reporting and facilitate outcome monitoring.
- It serves as a comprehensive guide providing standardized breast imaging terminology, report organization and assessment structure, as well as a classification system for **Mammography, US, MRI**

BI-RADS = Breast Imaging Reporting And Data System

▶ System components:

1. Lexicon of descriptors for breast lesion
2. Recommended reporting structure including
 - ▶ final assessment categories
 - ▶ management recommendations
3. Framework for data collection and auditing

Advantages of BI-RADS

- Reduces risk of misinterpretation of findings(terms).
- Improves communication b/n referring clinicians and imaging staff & b/n multi-disciplinary teams.
- Facilitates the recording of information for audit and quality assurance purposes.
- The reported likelihood of malignancy acts as a readily communicated report summary that informs the decision about further mgt.

BI-RADS LEXICON OF DESCRIPTIVE TERMS

A. Masses: A mass occupies space and should be seen in two different projections.

Shape *(select one)*

Oval

Round

Irregular

Orientation *(select one)*

Parallel

Not parallel

Margin *(select one)*

Circumscribed

Not circumscribed*

Indistinct

Angular

Microlobulated

Spiculated

Description

Elliptical or egg-shaped (may include 2 or 3 undulations, i.e. "gently lobulated" or "macrolobulated")

Spherical, ball-shaped, circular, or globular

Neither round nor oval in shape

Description

Long axis of lesion parallels the skin line ("wider than tall" or horizontal)

Long axis, not oriented along the skin line ("taller than wide" or vertical, includes round)

Description

A margin that is well defined or sharp, with an abrupt transition between the lesion and surrounding tissue

The mass has one or more of the following features: indistinct, angular, microlobulated or spiculated

No clear demarcation between a mass and its surrounding tissue

Some or all of the margin has sharp corners, often forming acute angles

Short cycle undulations impart a scalloped appearance to the margin of the mass

Margin is formed or characterized by sharp lines projecting from the mass

SELECT THE TERM THAT BEST DESCRIBES THE DOMINANT LESION FEATURE

Lesion Boundary *(select one)*

- Abrupt interface
- Echogenic halo

Echo Pattern *(select one)*

- Anechoic
- Hyperechoic
- Complex
- Hypoechoic
- Isoechoic

Posterior Acoustic Features *(select one)*

- No posterior acoustic features
- Enhancement
- Shadowing
- Combined pattern

Description

The sharp demarcation between the lesion and surrounding tissue can be imperceptible or a distinct well-defined echogenic rim of any thickness

No sharp demarcation between the mass and surrounding tissue, which is bridged by an echogenic transition zone

Description

Without internal echoes

Having increased echogenicity relative to fat or equal to fibroglandular tissue

Mass contains both anechoic and echogenic components

Defined relative to fat; masses are characterized by low-level echoes throughout (e.g. appearance of a complicated cyst or fibroadenoma)

Having the same echogenicity as fat (a complicated cyst or fibroadenoma may be isoechoic or hypoechoic)

Description

No posterior shadowing or enhancement

Increased posterior echoes

Decreased posterior echoes; edge shadows are excluded

More than one pattern of posterior attenuation, both shadowing and enhancement

Normal sonographic anatomy of the breast.

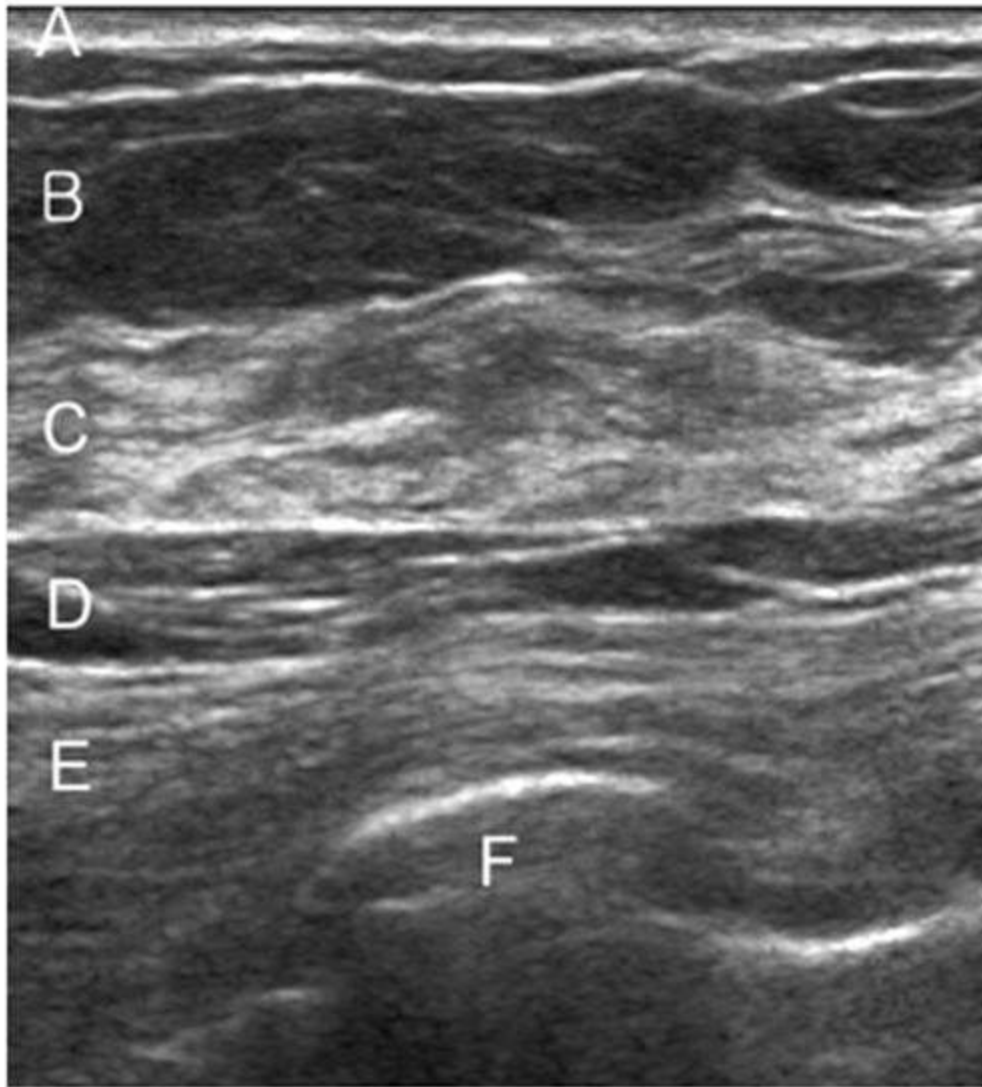


Figure 1: A, Skin; B, Subcutaneous fat; C, Breast parenchyma; D, Retromammary fat; E, Pectoralis muscles; F, Rib.

“Indeterminate category” (=probably benign)

- It's use currently obsolete (since 2003, 4th edition of BI-RADS ACR)
- Has been replaced by the term “probably benign” (was based on literature demonstrating that follow-up rather than Bx is safe and effective mgt for a clearly defined subset of findings that are very likely benign)
- Probability that the abnormality seen represent cancer is < 2%

BI-RADS Category (3): Probably benign

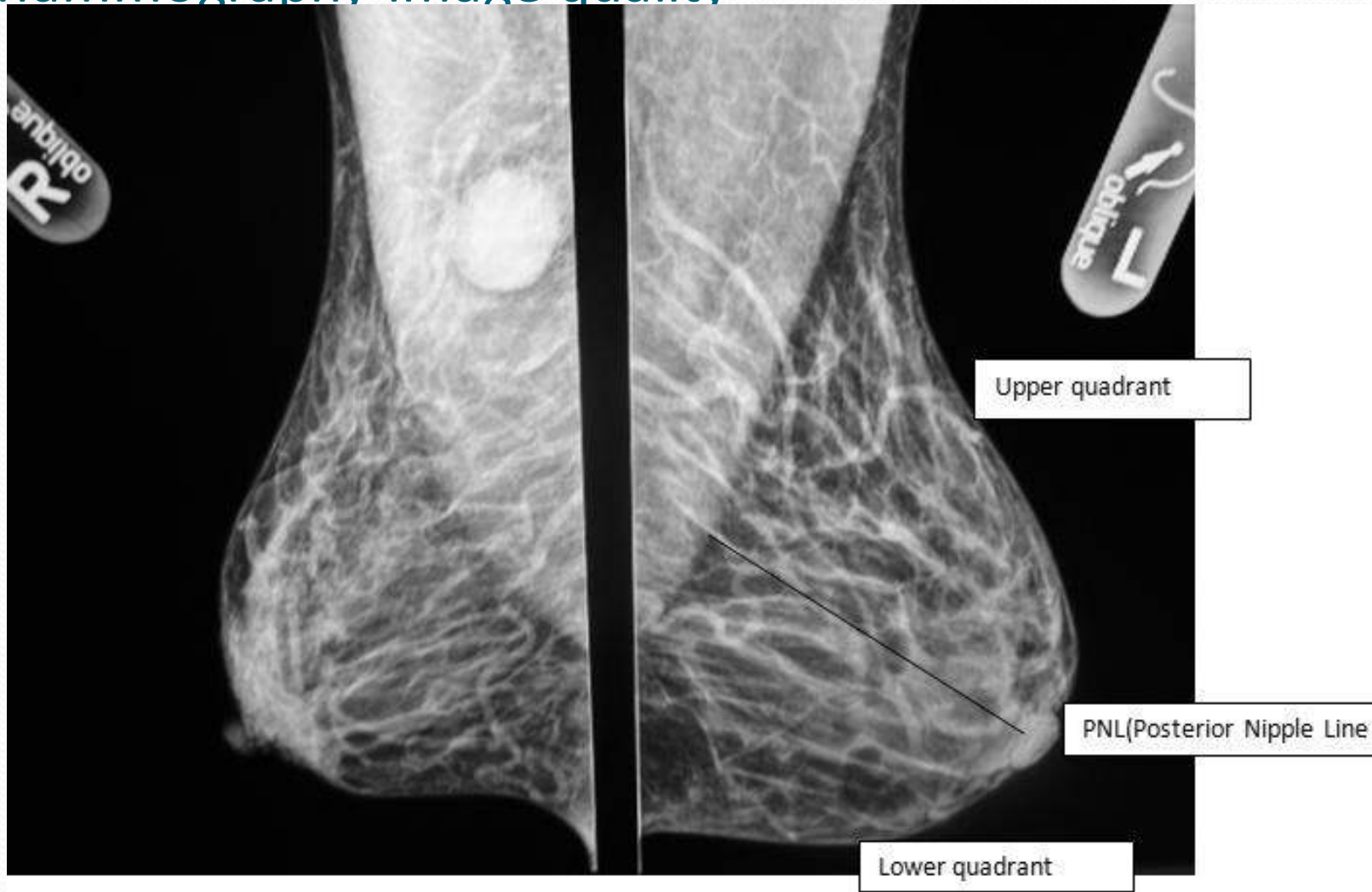
Findings that should be included in this category are:

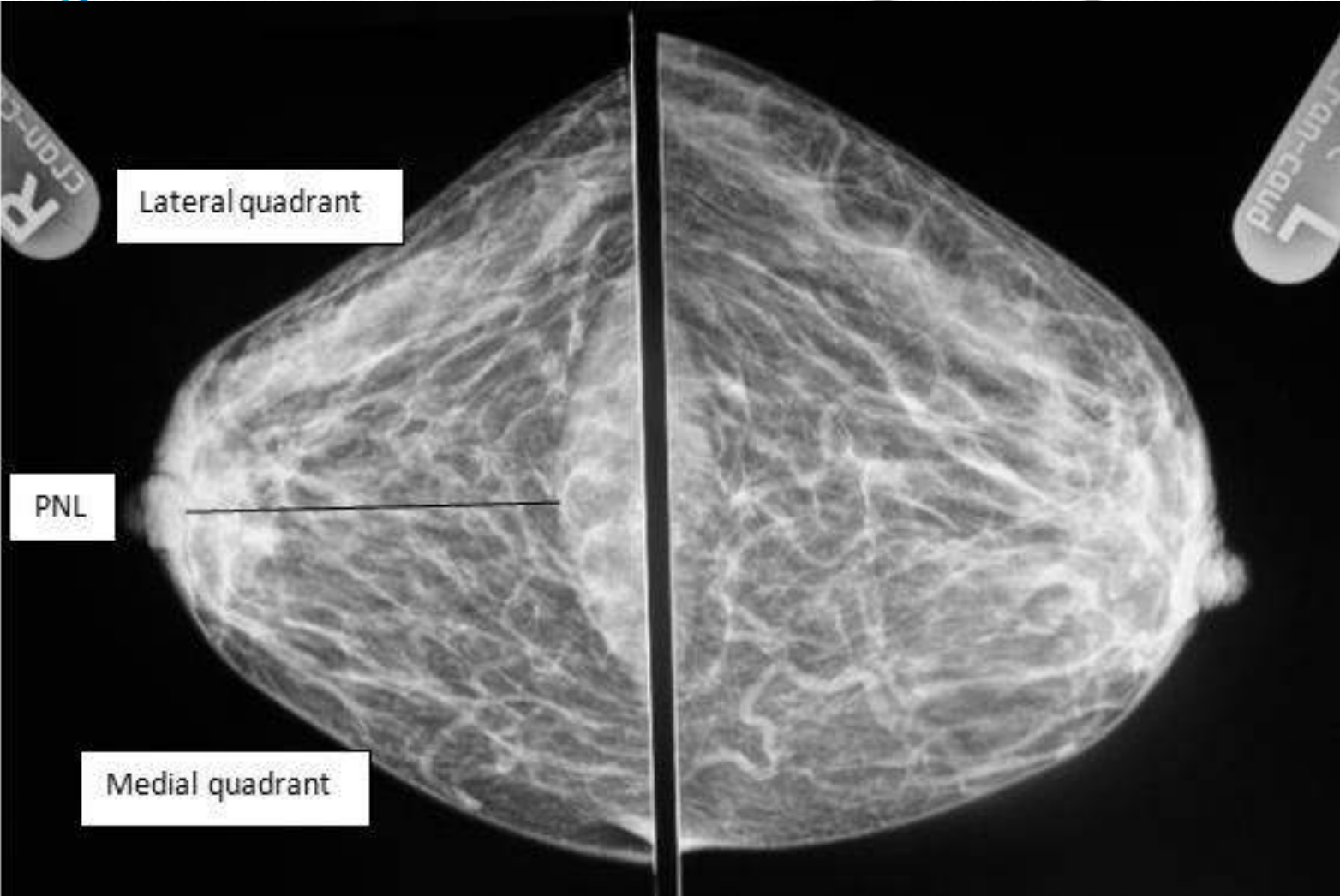
1. Circumscribed masses,
2. Asymmetric parenchymal densities that are not associated with palpable masses
3. and, occasionally, clusters of smooth, round, similar-appearing microcalcifications.

Initial short-interval follow-up suggested

2%, F/U 6/12 twice to determine stability of pathology thereafter yrly x 3

Mammography Image quality

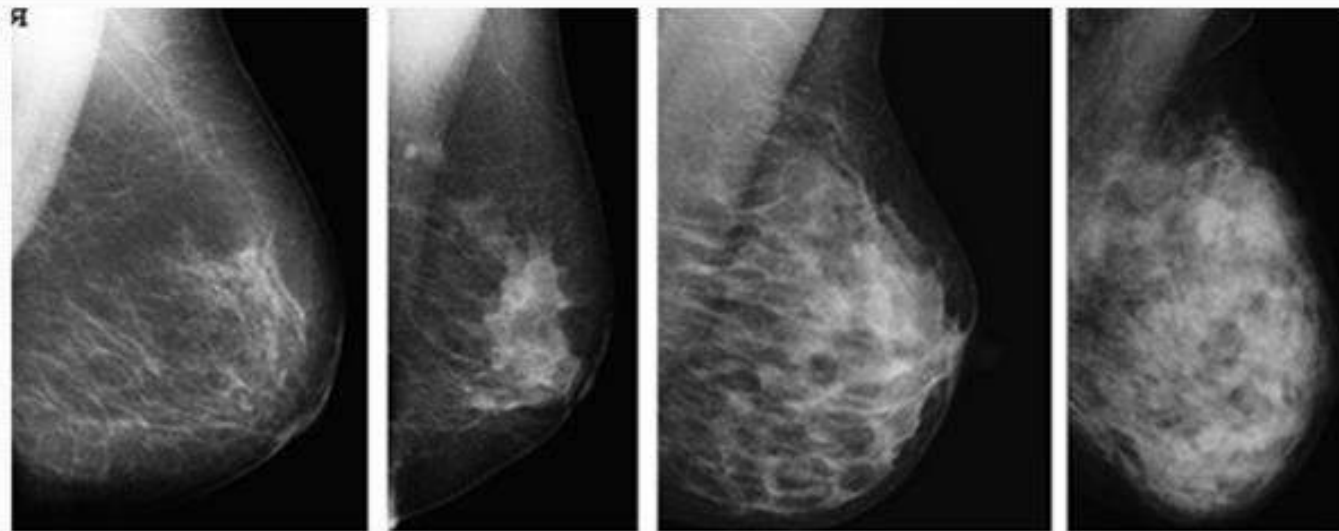




Lexicon for mammo

Almost entirely, scattered fibroglandular densities, Heterodense, Extremely dense.

Definition of **dense** breast(ACR 4th edition)



<25%

25-50%

51-75%

>75%

BI-RADS density category 3&4 respectively

6 breast cancers staged 1-2 were diagnosed accurately on sonography

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Breast cancer detection using sonography in women with mammographically dense breasts

[Jimmy Okello](#) , [Harriet Kisembo](#), [Sam Bugeza](#) and [Moses Galukande](#)

BMC Medical Imaging 2014 **14**:41
<https://doi.org/10.1186/s12880-014-0041-0> | © Okello et al.; licensee BioMed Central. 2014
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Metrics

Article accesses: 4251

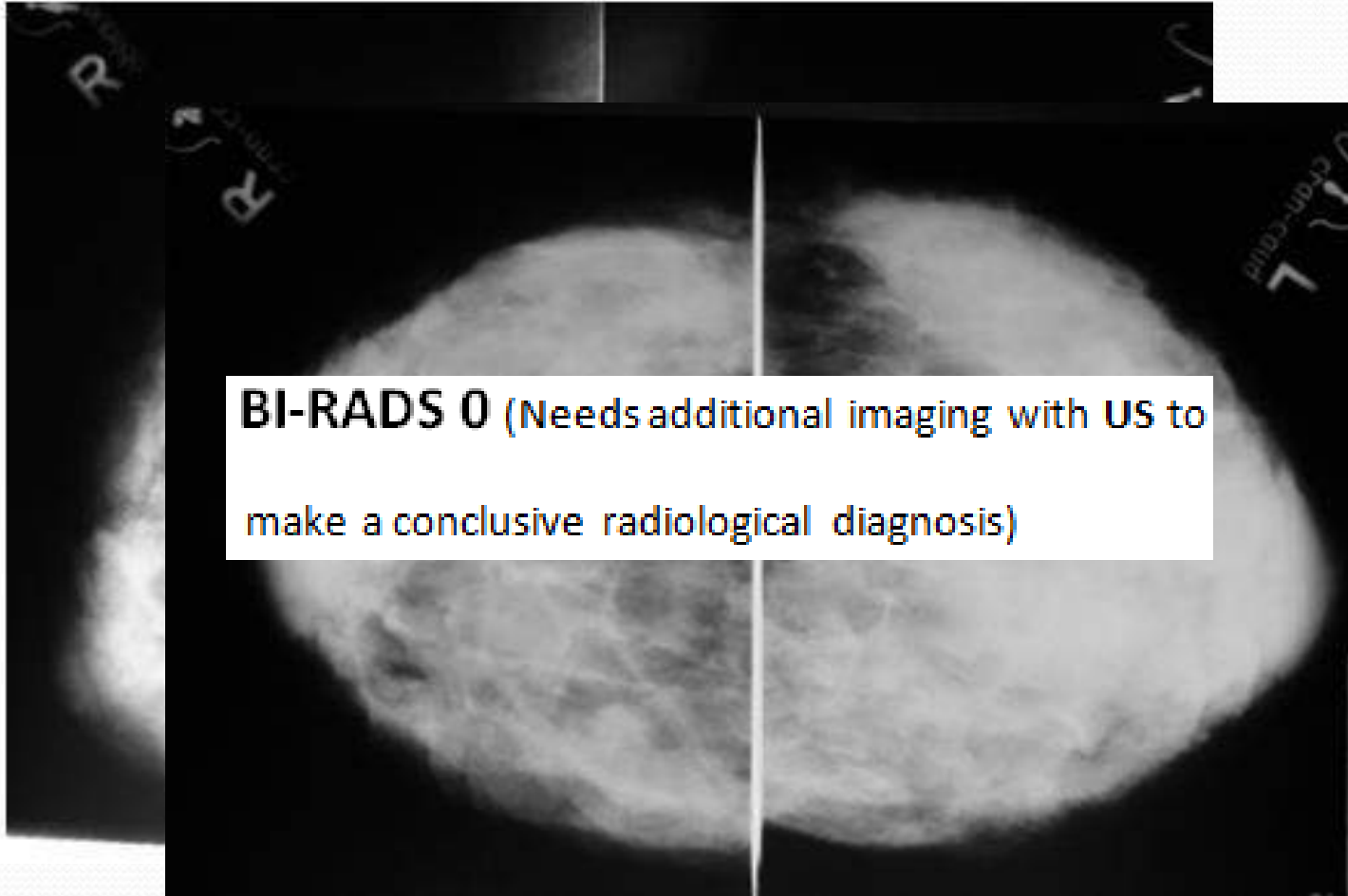
Citations: 5 [more information](#)

Altmetric Attention Score:

C. ARCHITECTURAL DISTORTION

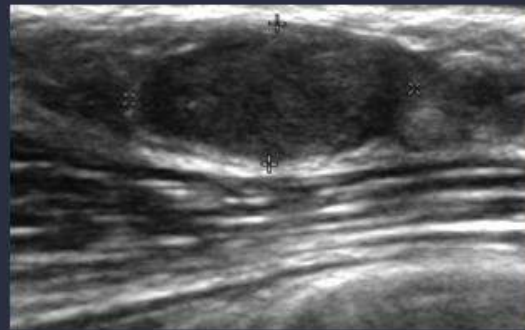
The normal architecture is distorted with no definite mass visible. This includes thin lines or spiculations radiating from a point and focal retraction or distortion of the edge of the parenchyma. Architectural distortion can also be associated with a mass, asymmetry or calcifications. In the absence of appropriate history of trauma or surgery, architectural distortion is suspicious for malignancy or radial scar and biopsy is appropriate.

37/F C/O Bilateral breast lumps(on&off x 1yr)

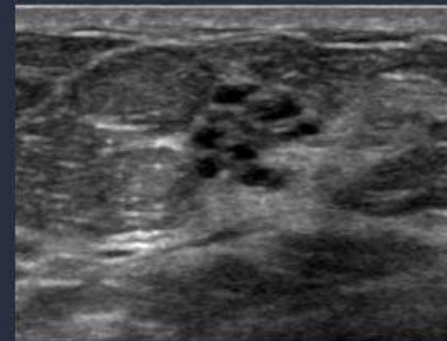
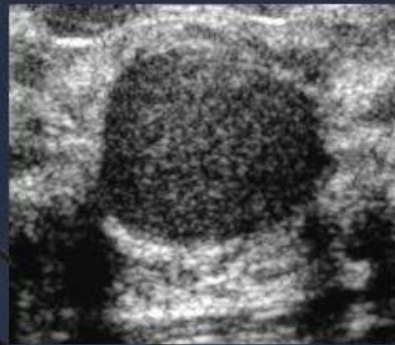


BI-RADS 3(2%),
4(20-35%),
5(>95% chance)

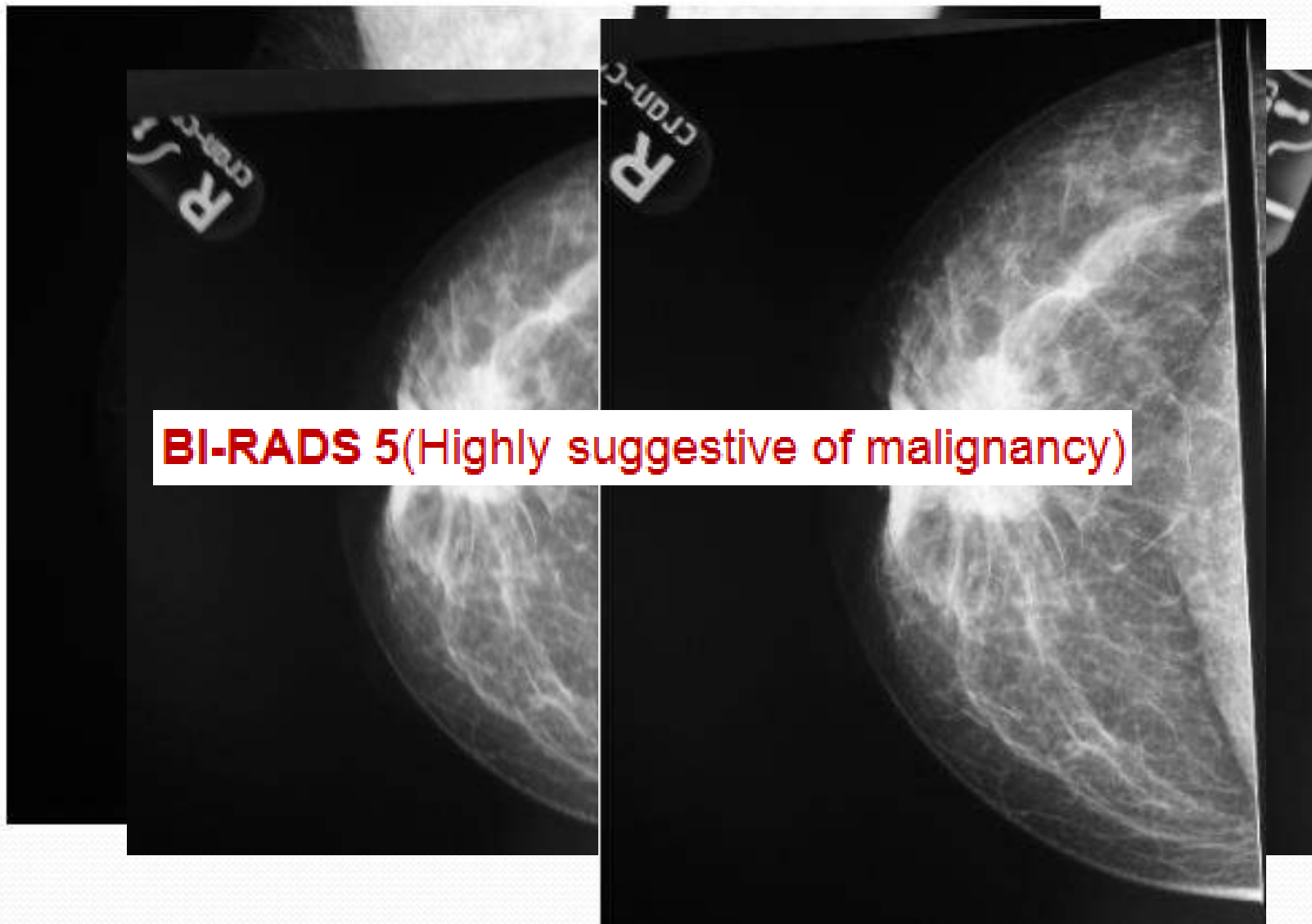
BIRADS 3



- Solid, oval, circumscribed, parallel
- Complicated cyst
- Clustered microcysts



39/F with palpable Rt. Breast lump noticed 4months ago



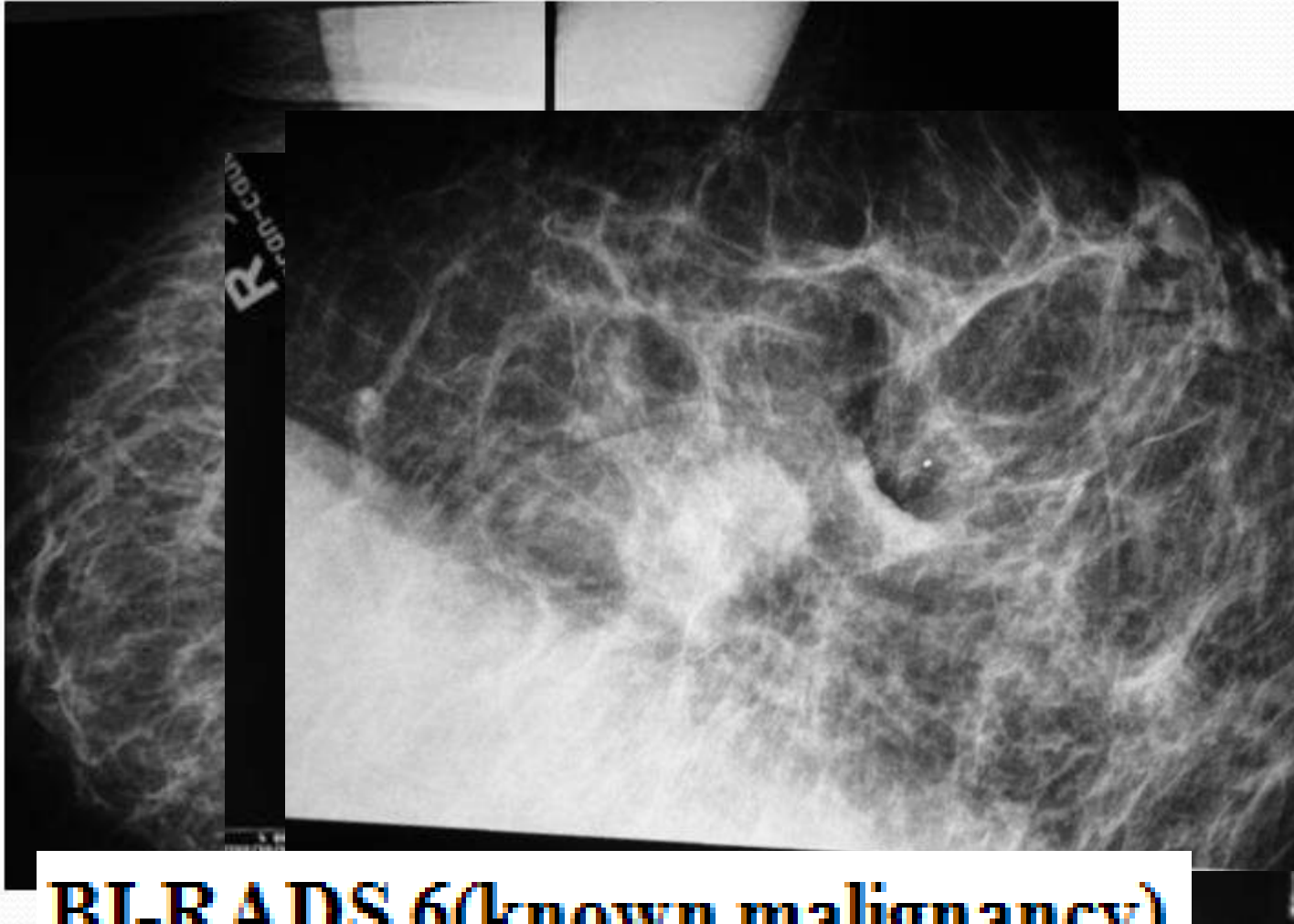
BI-RADS 5(Highly suggestive of malignancy)



BI-RADS 4(Suspicious): US guided biopsy recommended

33 yr/F lumpectomy 2001 followed by chemo-radiotherapy

P/C: Breast lump noticed 3/52 ago in the same quadrant of the affected breast



BI-RADS 6(known malignancy)



Diagnosis Right Here

BIO-IMAGING

MUYENZI PLAZA
(Remera-Kisementi)
KN 5 RD



+250-780303958

BREAST ULTRASOUND SCAN REPORT

NAME: xxxxxxxxxxxxxxxxx

AGE: 38years

DATE: 30th April 2019

INDICATION: Breast Lump noticed month ago

FINDINGS: There is a solitary hypoechoic mass 3.8x.2.2x2.1 cm in size at 4' O clock 4cm from the right nipple,

The mass has irregular shape with spiculated margins & shows increased internal vascularity, internal calcifications as well as surrounding architectural distortion

No axillary Lymphadenopathy noted

No ductasia noted

Normal, nipple skin, subcutaneous tissues, pectoralis muscles noted

Left breast appears normal.

CONCLUSION: Features are highly suggestive of breast malignancy

BI-RADS category 5

US guided Tru cut biopsy recommended

INDICATIONS OF BREAST SCREENING MRI WITH MAMMOGRAPHY

- Women with BRCA₁ or BRCA₂ mutation (BRCA₁ is a gene, which, when altered, indicates an inherited susceptibility to cancer. BRCA₂ is a gene, which, when altered, indicates an inherited susceptibility to breast and/or ovarian cancer.)
- Women with a first-degree relative (mother, sister, and/or daughter) with a BRCA₁ or BRCA₂ mutation, if they have not yet been tested for the mutation
- Women with a 20% to 25% or greater lifetime risk of breast cancer, based on 1 of several accepted risk assessment tools that look at family history and other factors
- Women who have had radiation treatment to the chest between the ages of 10 and 30, such as for treatment of Hodgkin disease
- Women with the genetic disorders Li-Fraumeni syndrome, Cowden syndrome, or Bannayan-Riley-Ruvalcaba syndrome; or those who have a first degree relative with the syndrome

SOME COMMON INDICATIONS OF BREAST MRI

- Further evaluation of abnormalities detected by [mammography](#)
- Finding early [breast cancers](#) not detected by other tests, especially in women at high risk and women with dense breast tissue.
- Examination for cancer in women who have implants or scar tissue that might produce an inaccurate result from a mammogram. This test can also be helpful for women with lumpectomy scars to check for any changes.
- Detecting small abnormalities not seen with mammography or [ultrasound](#) (for example, MRI has been useful for women who have breast cancer cells present in an underarm lymph node, but do not have a lump that can be felt or can be viewed on diagnostic studies)
- Assess for leakage from a silicone gel implant
- Evaluate the size and precise location of breast cancer lesions, including the possibility that more than one area of the breast may be involved (this is helpful for cancers that spread and involve more than one area)
- Detecting changes in the other breast that has not been newly diagnosed with breast cancer (There is an approximately 10 percent chance that women with breast cancer will develop cancer in the opposite breast. A recent study indicates that breast MRI can detect cancer in the opposite breast that may be missed at the time of the first breast cancer diagnosis.)
- Detection of the spread of breast cancer into the chest wall, which may change treatment options
- Detection of breast cancer recurrence or residual tumor after lumpectomy

Summary

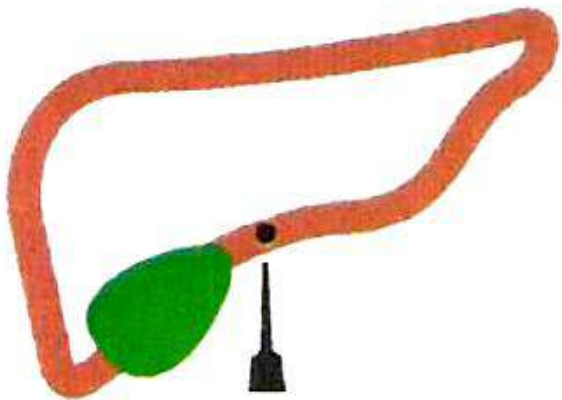
- The BI-RADS® atlas provides standardized breast imaging terminology, report organization, assessment structure and a classification system for mammography, ultrasound and MRI of the breast.
- BI-RADS reporting enables radiologists to communicate results to the referring physician clearly and consistently, with a final assessment and specific management recommendations.
- Through a medical audit and outcome monitoring, the system provides important mechanisms for peer review and quality assurance data to improve the quality of patient care.
- Standardized results permit maintenance and analysis of demographic and outcome data.

TAKE HOME MESSAGES

- Clinicians should get acquainted with the **BI-RADS**
- US ,Mammography , MRI are complimentary in role
- Intervention Radiology center; Bio imaging is already licenced with qualified experts to perform variety of quality services (Second opinion consults & interventional radiology procedures are being performed)

BIO-IMAGING

@UMUYENZI PLAZA
Remera- Kisementi)
KN 5 RD



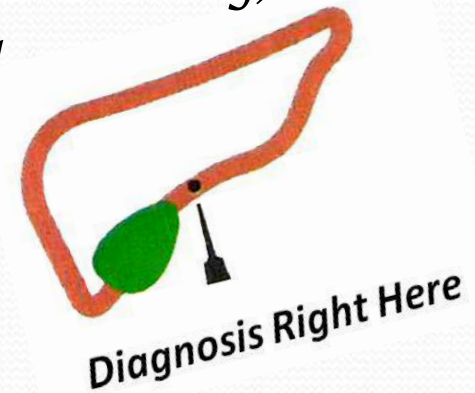
Diagnosis Right Here



0780303958

Services@ Bio-Imaging: All Image guided

- *Biopsies: Neck, Lung, Mediastinal, Liver, Kidney, abdominal, Pelvic, Retroperitoneal masses, Prostate. etc*
FNA of Thyroid, Lymph Node etc,
- *Catheter Drainages: Abscesses, Thora and Paracentesis*
 - ✓ *Percutaneous Nephrostomy and Antegrade Ureteric Stenting,*
 - ✓ *Percutaneous Cholangiogram and Biliary Stenting*
 - ✓ *Burton & regular PEG tubes: MIC-KEY*
- *IPCS:*
 - ✓ *Indwelling Peritoneal Catheter placement*
 - ✓ *Indwelling Pleural Catheter placements*
- *Microwave Tumor Ablation therapy*
- *Second Opinion Advanced Body CT and MRI scan Interpretation : DICOM CD Images*
- *Advanced Ultrasound Imaging*
- *Radiology Consultancy: Education, Clinical and Quality Assurance*





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