Approach to Asymmetric Breast Densities in Mammogram

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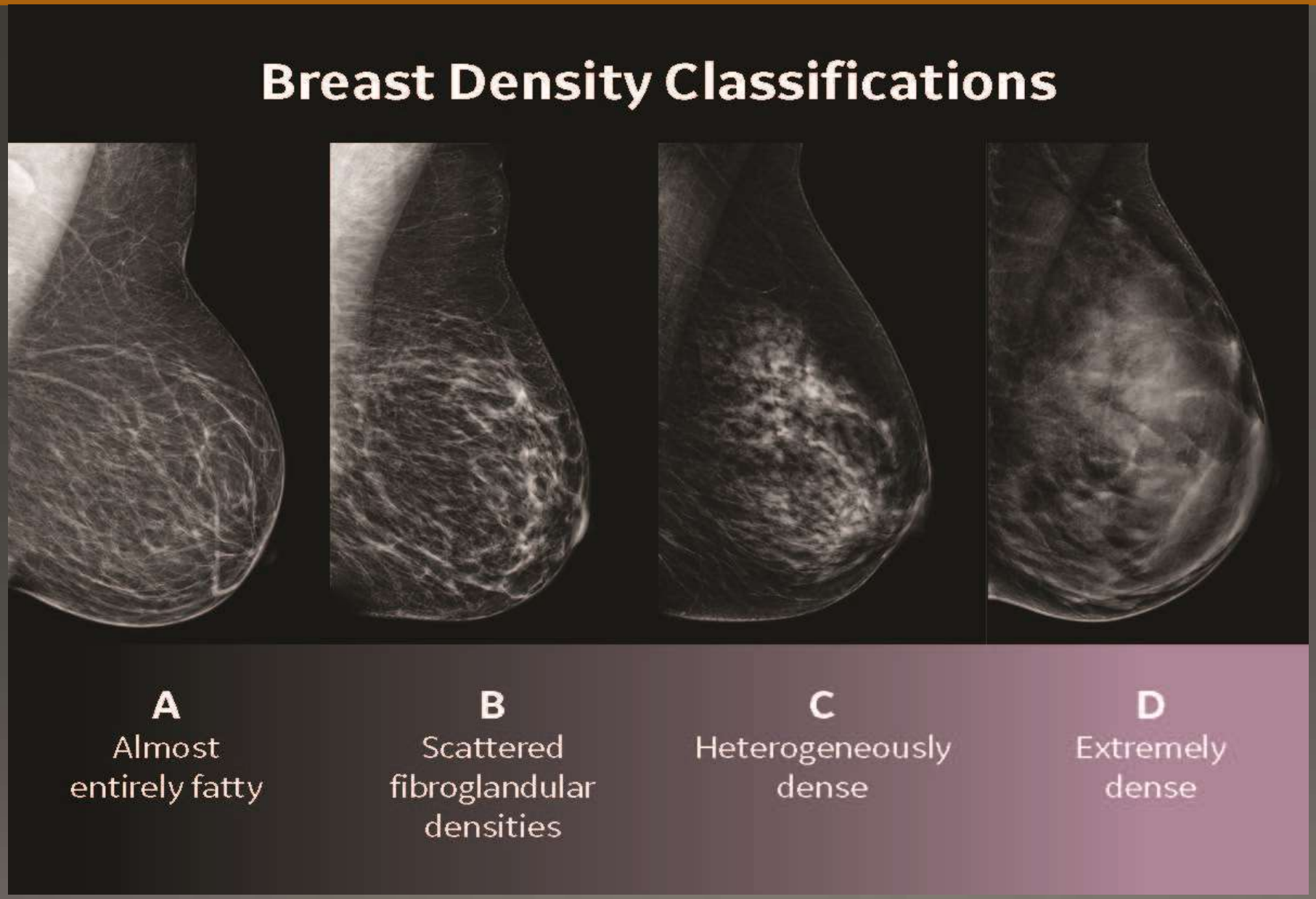
Types of mammographic density



Final Assessment Categories

Category		Management	Likelihood of cancer
0	Need additional imaging or prior examinations	Recall for additional imaging and/or await prior examinations	n/a
1	Negative	Routine screening	Essentially 0%
2	Benign	Routine screening	Essentially 0%
3	Probably Benign	Short interval-follow-up (6 month) or continued	>0 % but ≤ 2%
4	Suspicious	Tissue diagnosis	4a. low suspicion for malignancy (>2% to ≤ 10%) 4b. moderate suspicion for malignancy (>10% to ≤ 50%) 4c. high suspicion for malignancy (>50% to <95%)
5	Highly suggestive of malignancy	Tissue diagnosis	≥95%
6	Known biopsy-proven	Surgical excision when clinical appropriate	n/a

Final Assessment Categories

Category		Management	Likelihood of cancer
0	Need additional imaging or prior examinations	Recall for additional imaging and/or await prior examinations	n/a

Use

- Use if additional mammographic imaging is needed: additional mammographic views, spot compression
- Use if prior mammography or US are required to make a final assessment
- In screening mammogram

DON'T

Don't use in diagnostic mammogram

Final Assessment Categories			
Category		Management	Likelihood of cancer
1	Negative	Routine screening	Essentially 0%

Negative:
There **is nothing to comment on**.
The breasts are symmetric and no masses, architectural distortion or suspicious calcifications are present.

BI-RADS 1
DO
1.Use BI-RADS 1 if there are no abnormal imaging findings (even if palpable abnormality with normal imaging)-----→ possible a palpable cancer,

Use BIRADS 1 BUT add a sentence recommending surgical consultation or tissue diagnosis if clinically indicated.

Final Assessment Categories

Category		Management	Likelihood of cancer
2	Benign	Routine screening	Essentially 0%

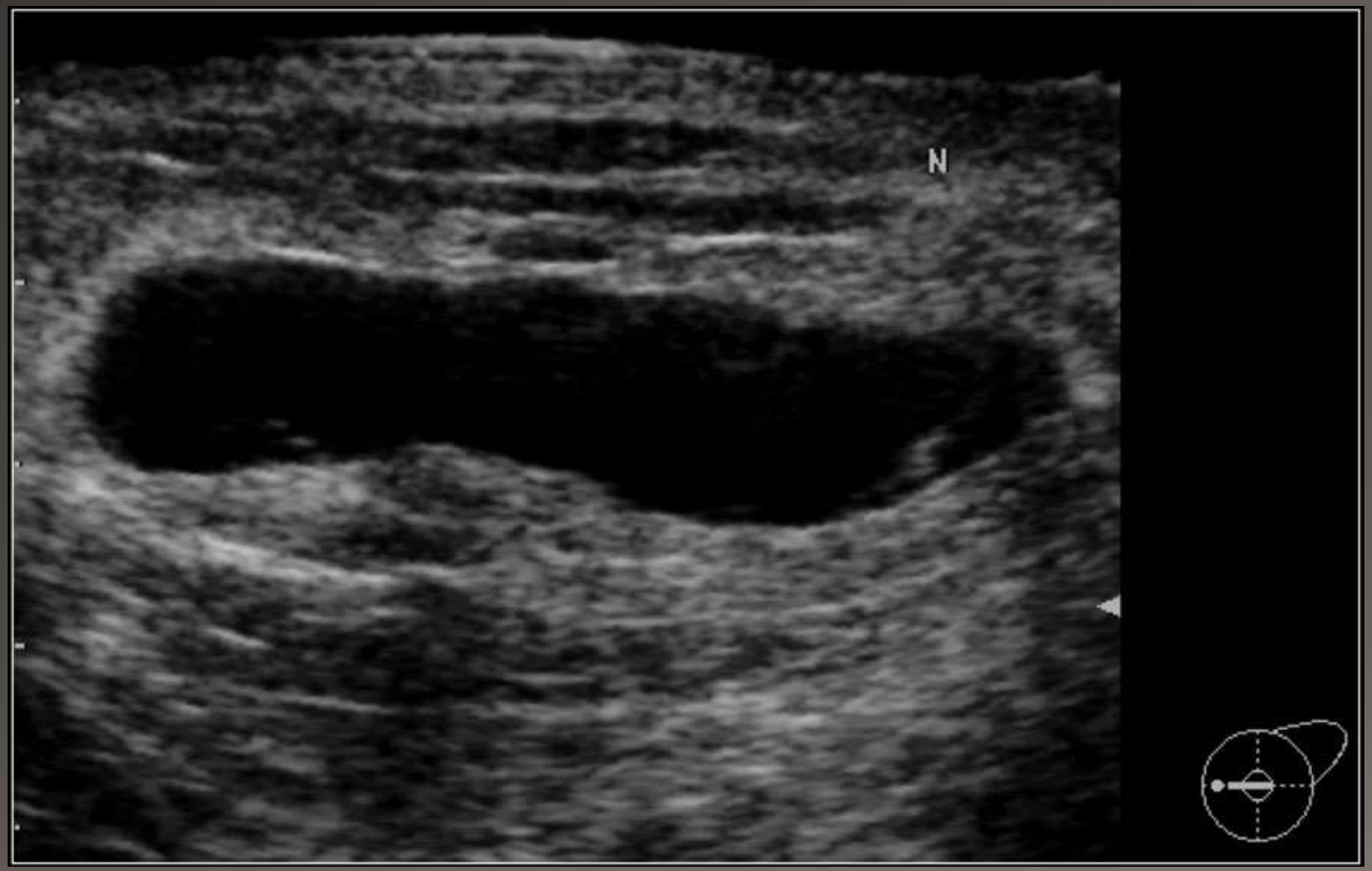
BI-RADS 2

Benign Finding:

Like BI-RADS 1, this is a normal assessment, but here, the interpreter chooses to describe a benign finding in the mammography report, like:

- Follow up after breast conservative surgery
- Involuting, calcified fibroadenomas
- Multiple large, rod-like calcifications
- Intramammary lymph nodes
- Vascular calcifications
- Implants
- Architectural distortion clearly related to prior surgery.
- Fat-containing lesions such as oil cysts, lipomas, galactoceles and mixed-density hamartomas

BIRADS 2



Final Assessment Categories

Category		Management	Likelihood of cancer
3	Probably Benign	Short interval-follow-up (6 month) or continued surveillance	>0 % but ≤ 2%

BI-RADS 3

Probably Benign Finding

Initial Short-Interval Follow-Up Suggested:

A finding placed in this category should have less than a 2% risk of malignancy.

→ **Lesions appropriately placed in this category include**:

- Non-calcified circumscribed mass on a baseline mammogram (unless it can be shown to be a cyst, an intramammary lymph node, or another benign finding),
- Focal asymmetry which persist on spot compression view
- Solitary group of punctate calcifications

BIRADS 3

- Don't use in a screening examination
- Don't use in a diagnostic examination if additional imaging is required to make a final assessment
- Don't use if a lesion, previously assessed as Category 3 has increased in size or extent, like a mass on US with an increase of 20% or more of longest dimension. Then use category 4

BIRADS 3

BIRADS 3

6 month follow up (Single side Us or mammo) that best showing lesion Except focal asymmetry Bilateral mammogram

If stable BIRADS 3

6 month follow up (Single side Us or mammo) that best showing lesion Except focal asymmetry Bilateral mammogram

If stable BIRADS 3

follow up after 1 year (bilateral Us or mammo)

If at any time of follow up :

- If decrease or disappear → BIRADS 2
- If increase in size 20% within 6 months → suspicious BIRASDS 4 biopsy

Final Assessment Categories

Category		Management	Likelihood of cancer
4	Suspicious	Tissue diagnosis	4a. low suspicion for malignancy (>2% to ≤ 10%) 4b. moderate suspicion for malignancy (>10% to ≤ 50%) 4c. high suspicion for malignancy (>50% to <95%)

use *Category 4a* in findings as:

- Partially circumscribed mass, suggestive of (atypical) fibroadenoma
- Intraductal lesion
- complex cystic and solid cyst
- Probable abscess

use *Category 4b* in findings as:

- Group amorphous or fine pleomorphic calcifications
- Nondescript solid mass with indistinct margins
-unexplained developing asymmetry
-Architectural distortion (not due to surgery or biopsy)

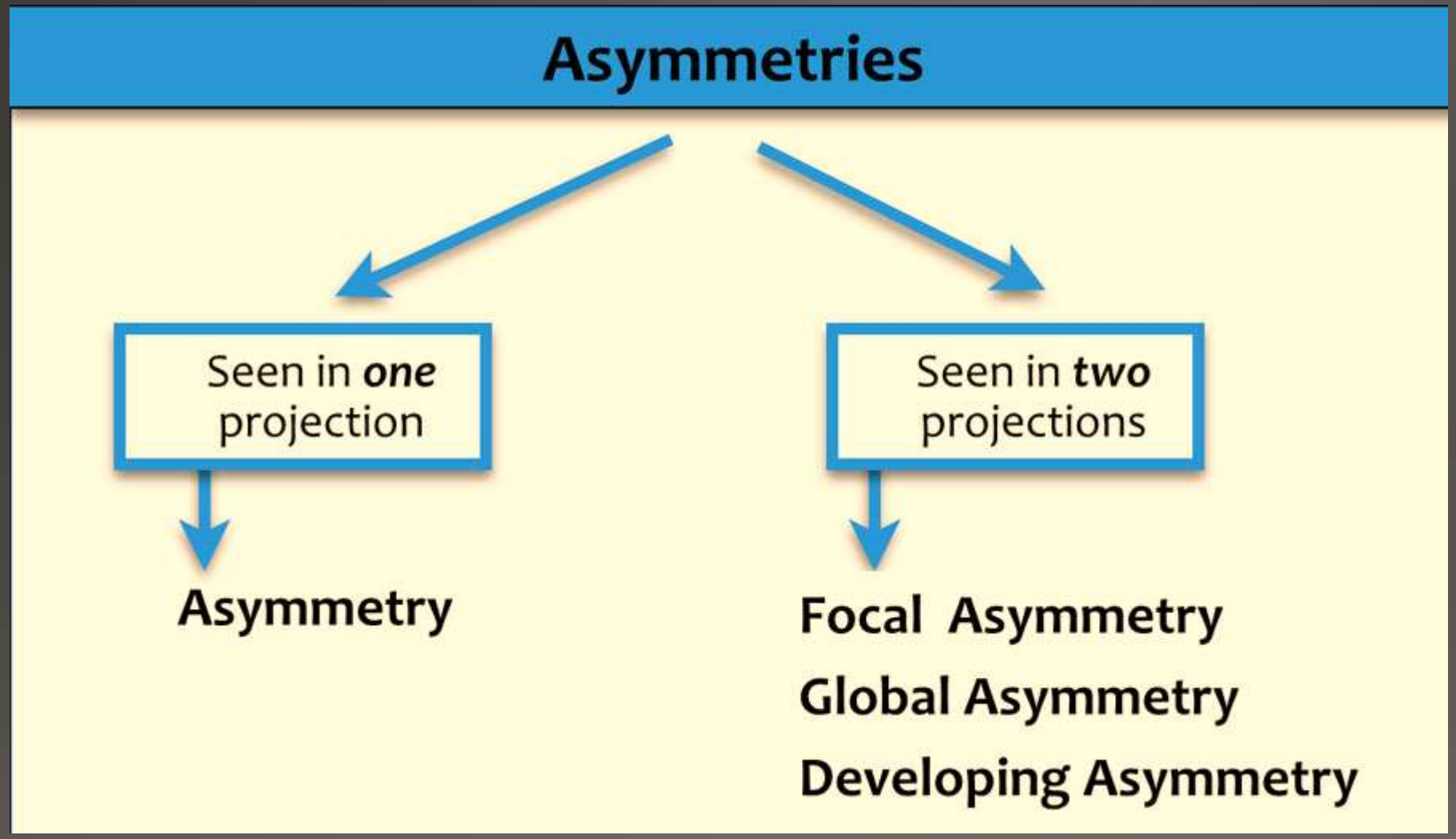
use Category 4c in findings as:

- New group of fine linear calcifications
- New indistinct, irregular solitary mass

Final Assessment Categories			
Category		Management	Likelihood of cancer
5	Highly suggestive of malignancy	Tissue diagnosis	≥95%

BIRADS 5
Highly Suggestive of Malignancy.
Appropriate Action Should Be Taken:
BI-RADS 5 must be reserved for findings that are classic breast cancers, with a >95% likelihood of malignancy.

BIRADS 5 include
- Spiculated, irregular high-density mass.
- Segmental or linear arrangement of fine linear calcifications.
- Irregular Spiculated mass with associated pleomorphic calcifications.


Asymmetries
Seen in one projection
Seen in two projections
Asymmetry
Focal Asymmetry
Global Asymmetry
Developing Asymmetry

Types of Asymmetries

Asymmetry

Asymmetry as an area of fibroglandular tissue visible on only one mammographic projection, mostly caused by superimposition of normal breast tissue.

Focal asymmetry

visible on two projections, hence a real finding rather than superposition. This has to be differentiated from a mass.

Global asymmetry

Global asymmetry consisting of an asymmetry over at least one quarter of the breast and is usually a normal variant

Developing asymmetry

Developing asymmetry new, larger and more conspicuous than on a previous examination.

Asymmetry Findings that represent unilateral deposits of fibroglandular tissue not conforming to the definition of a mass.

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Asymmetry versus Mass

Asymmetry versus Mass

- All types of asymmetry have different border contours than true masses
- also lack the conspicuity of masses.
- Asymmetries appear similar to other discrete areas of fibroglandular tissue except that they are **unilateral**, with **no mirror-image correlate** in the opposite breast.

- An asymmetry demonstrates concave outward borders
- usually is interspersed with fat,

- a mass demonstrates convex outward borders
- appears denser in the center than at the periphery.

When you seen breast asymmetry in mammogram

Proper history /clinical examination

Comparison with previous mammogram

Additional mammographic views/tomosynthesis

Additional imaging modalities

+ **US**

Proper history /clinical examination

- family history
- Surgery , intervention
  Trauma
- Hormone replacement therapy
- Significant weight loss

Tomosynthesis

1. Resolve asymmetry due to summation of shadows.
2. Localize the asymmetry /lesion seen in one view
3. Decrease the screening recall rate of asymmetries.
4. Decrease false positive results so increasing sensitivity
5. Increase sensitivity of FFDM by increasing cancer detection rate in dense breast

focal asymmetry

- visible on two projections
- hence a real finding rather than superposition.
- This has to be differentiated from a mass.

Causes of focal asymmetry

Normal variation
- Accessory breast
- Ectopic breast tissue.

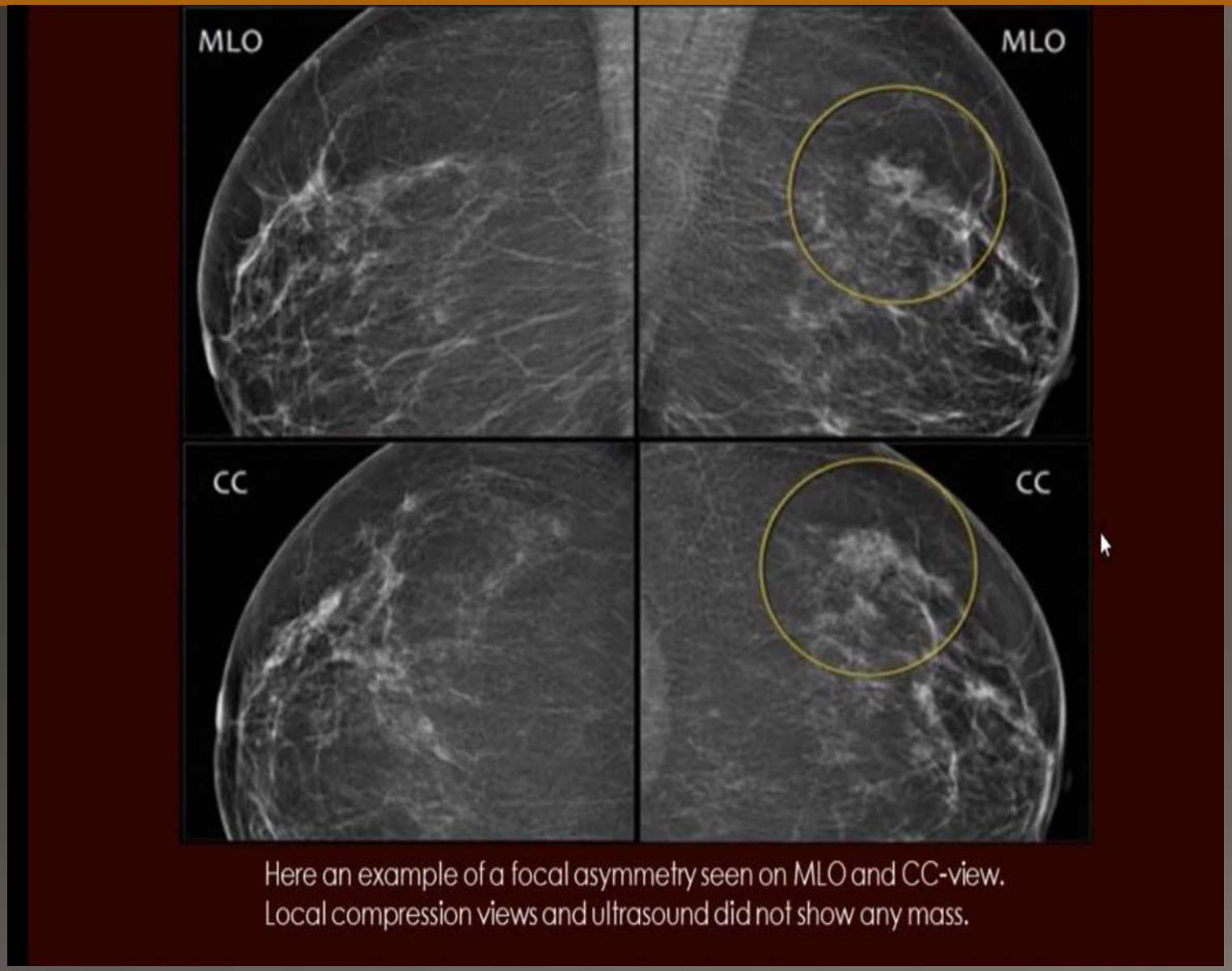
Post traumatic
- Fat necrosis
- Surgical scar
- Hematoma

Benign cause
- Inflammation
- PASH
- FCC
- Focal fibrosis.
- Sclerosing adenosis

Malignant cause
- Lobular carcinoma.
- IDC
- tubular carcinoma.
- primary breast lymphoma

Suspicious focal asymmetry

- Corresponding Palpable abnormality
- Associated with architectural distortion.
- Associated with micro calcification
- Associated suspicious mass
- If there is suspicious US correlate



Here an example of a focal asymmetry seen on MLO and CC-view.
Local compression views and ultrasound did not show any mass.

When you see focal asymmetry

Clinical history

Comparison with previous mammogram

Recall the patient for additional diagnostic work up
Tomosynthesis or spot compression view

- If present previously and stable in size and density **(for more than 2 years)**
- Not palpable
- No US correlate
- No suspicious findings

BIRADS 2

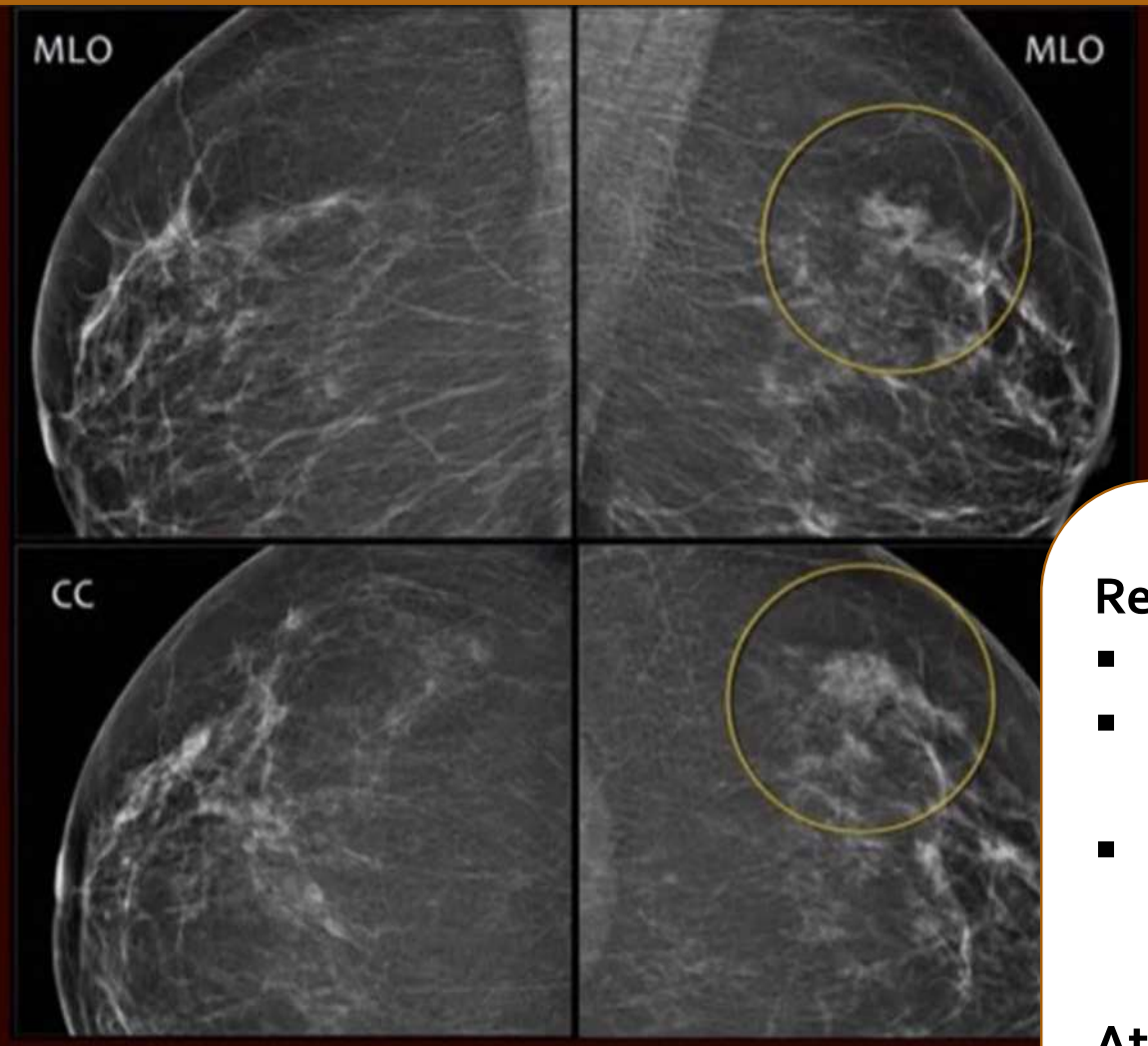
- If no previous mammogram (or stable less than 2 years)
- Not palpable
- No US correlate
- No suspicious findings

BIRADS 3

- If not present previously or appear larger on new mammogram (developing asymmetry)
- Or palpable
- With suspicious findings

BIRADS 4

Baseline screening mammogram



Here an example of a focal asymmetry seen on MLO and CC-view. Local compression views and ultrasound did not show any mass.

- Not palpable
- No associated finding
- Targeted US : negative just breast tissue

BIRADS 3

Recommendation of BIRADS 3 focal asymmetry :

- 6 month bilateral mammogram→ Stable (BIRADS 3)
- Then 6 month bilateral mammogram→ stable (BIRADS 3)
- Then diagnostic mammogram after 1 year -->If stable → BIRADS 2

At ay follow up if become larger --→ BIRADS 4 (biopsy)

Developing asymmetry

Developing asymmetry is focal asymmetry new or more conspicuous than previous mammogram

- Moderate risk of malignancy **BIRADS 4B**
- **Overall malignancy rate 15%**
- Occur in 13 % of screening mammogram and 27% of diagnostic mammogram

When you diagnose Developing asymmetry

Developing asymmetry → History /clinical exam → Tomosynthesis Or spot compression → Targeted US

Targeted US → No US correlate (Non explained developing asymmetry)

No US correlate (Non explained developing asymmetry) → Still suspicious BIRADS 4B

(Mammographic guided stereotactic biopsy)

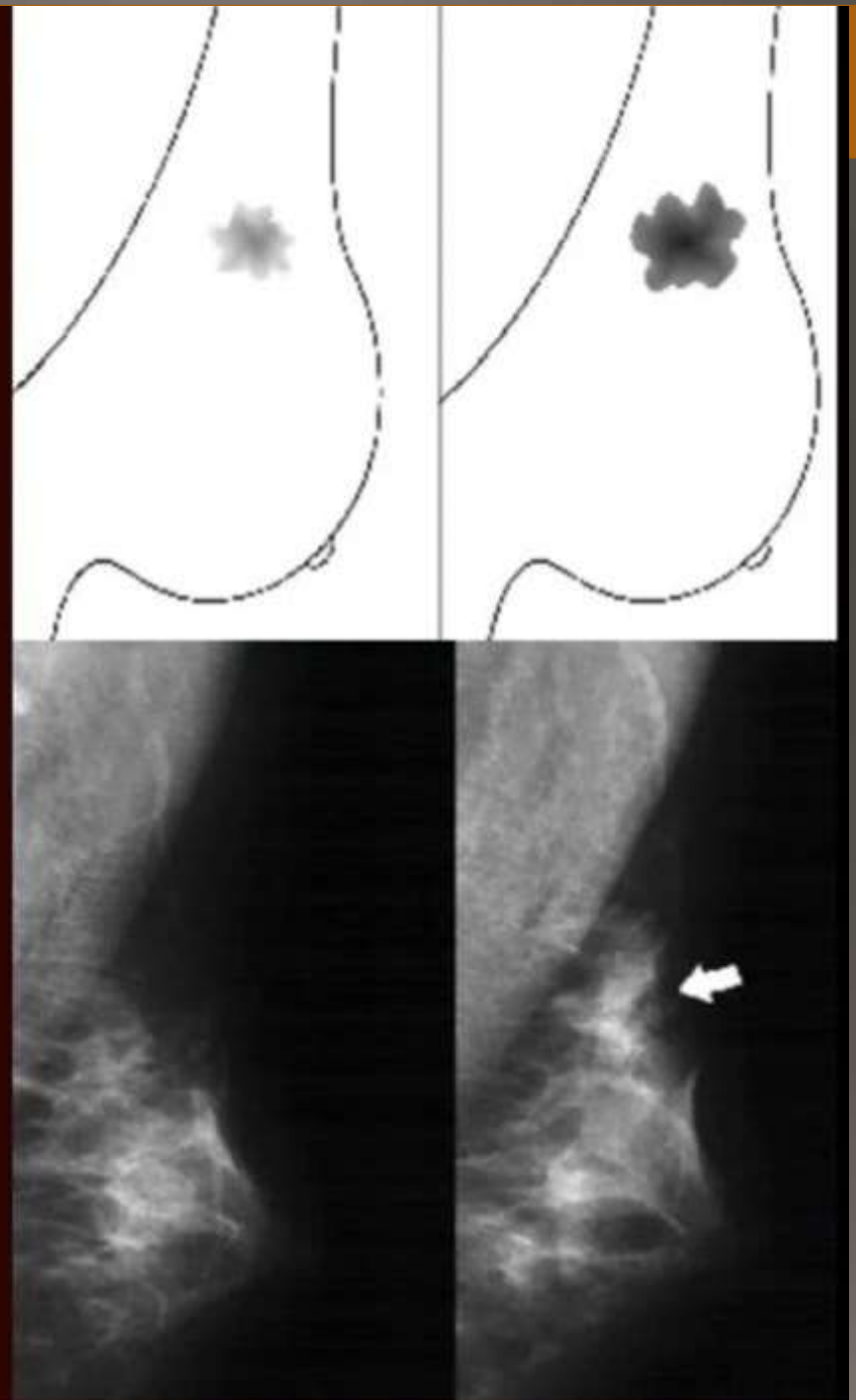
Targeted US → If there is US correlate that explain developing asymmetry Then BIRADS accordingly

If there is US correlate that explain developing asymmetry Then BIRADS accordingly →

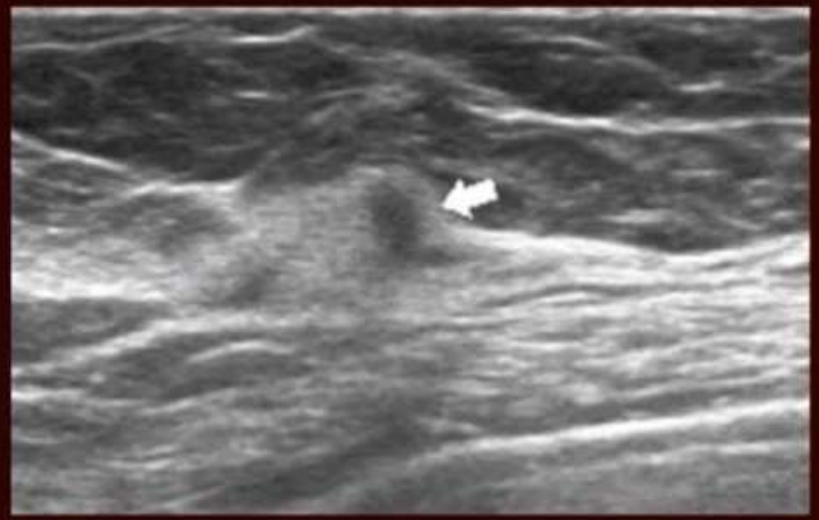
- Simple cyst BIRADS 2
- Typical FA BIRADS 3
- Suspicious findings BIRADS 4 or 5 US guided biopsy

Developing asymmetry. (a) Schematic shows a developing asymmetry that is larger and denser on current examination (right) than on previous one.

(b) A developing asymmetry is seen as a new focal asymmetry (arrow) on follow-up MLO view obtained 2 years after baseline mammogram (left).

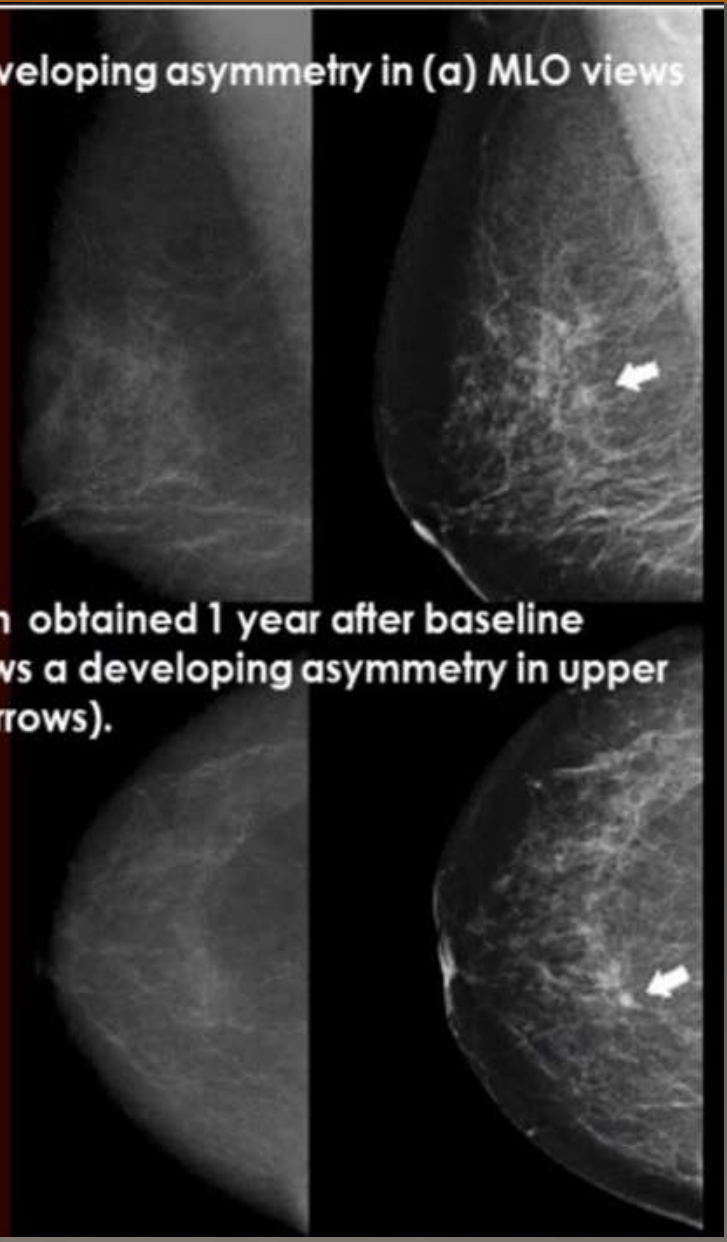


Malignancy seen as developing asymmetry in (a) MLO views and (b) CC views.



US scan shows a corresponding ill-defined nonparallel mass (arrow)

Follow-up mammogram obtained 1 year after baseline mammogram (left) shows a developing asymmetry in upper center of right breast (arrows).



invasive ductal carcinoma was confirmed

Global asymmetry

- Asymmetry involve at least one quadrant
- Seen in two views
- Usually normal variant **(if not palpable , no suspicious findings or associated feature)**

Associated findings that should be excluded

- associated palpable concern
- nipple retraction.
- Skin thickening
- Distorted breast parenchyma
- Suspicious ipsilateral axillary LN
- Ipsilateral nipple discharge
- Change in size of breast (either increase size or decreased size as compared with contralateral side)
- Associated breast erythema or edema

Global asymmetry

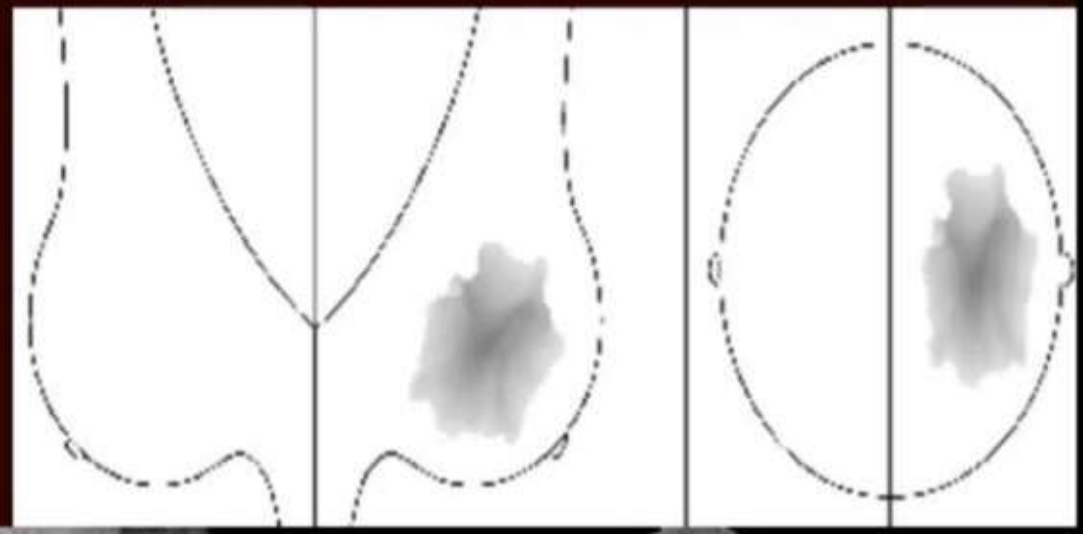
Benign
BIRADS 2

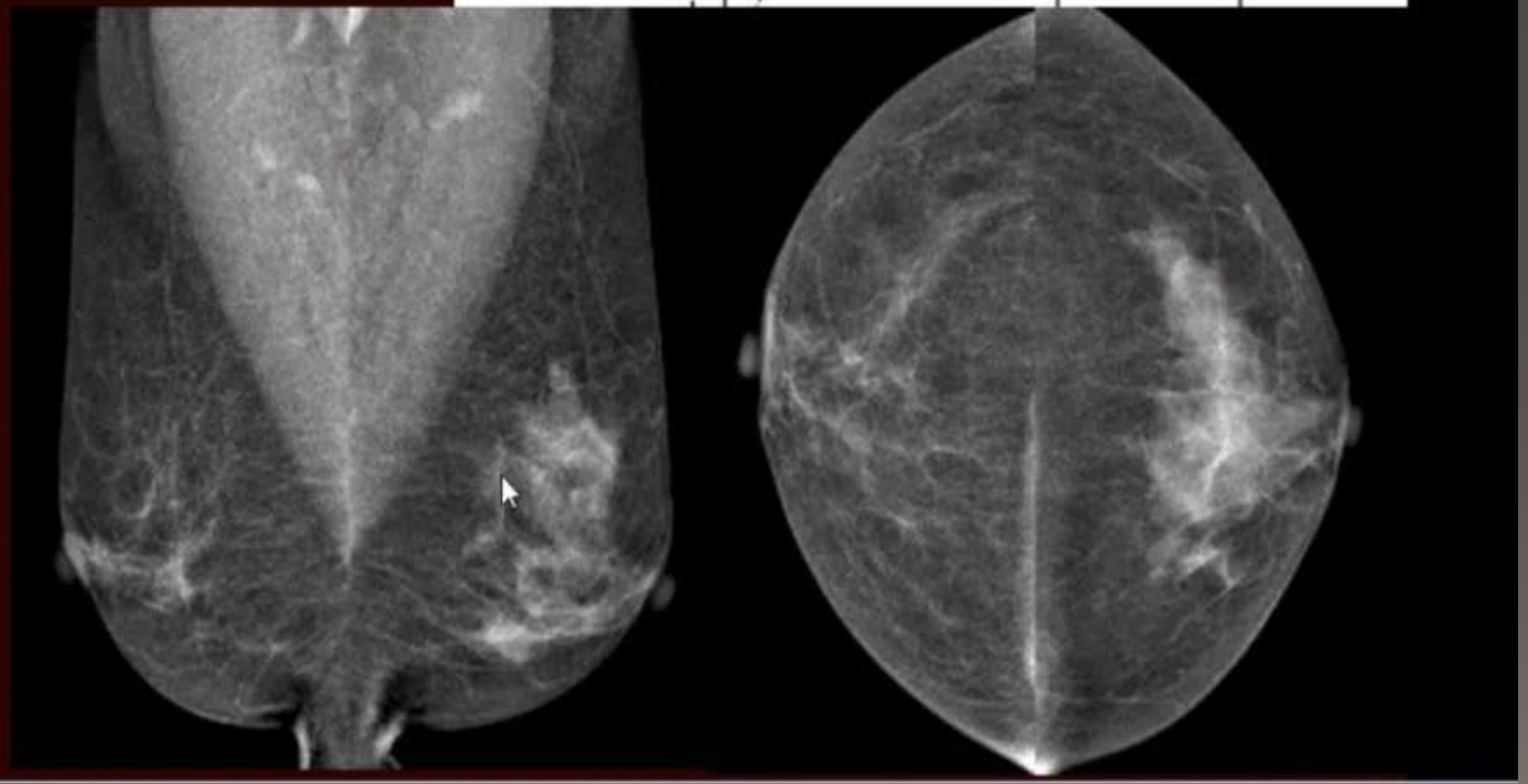
No such findings

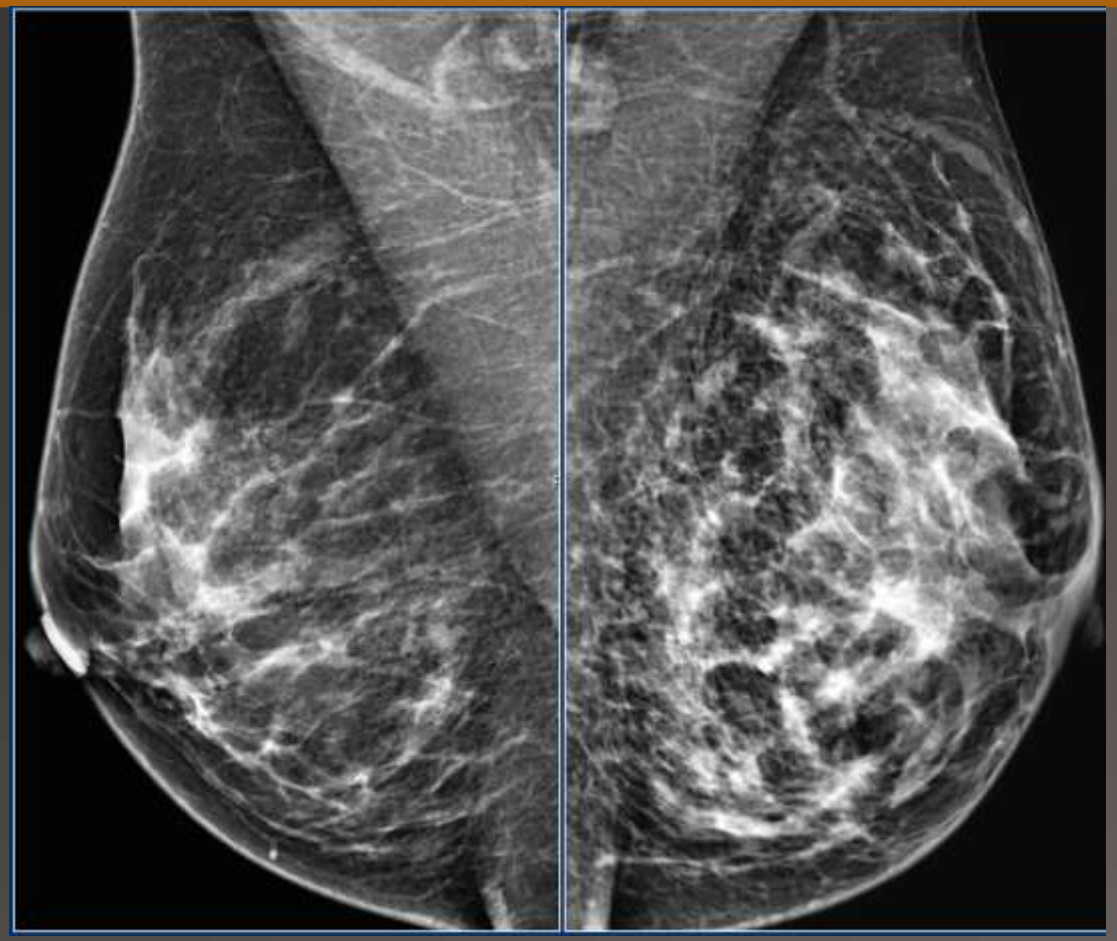
suspicious
Or malignant
(BIRADS IV OR V)

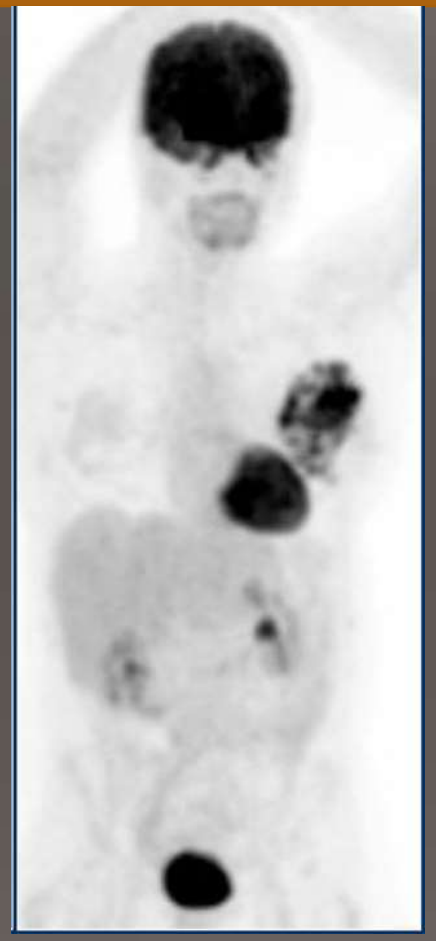
- associated palpable concern
- nipple retraction.
- Skin thickening
- Distorted breast parenchyma
- Suspicious ipsilateral axillary LN
- Ipsilateral pathological nipple discharge
- Change in size of breast (either increase size or decreased size as compared with contralateral side)
- Associated breast erythema or edema

Global asymmetry seen in (a) schematic, (b) MLO views, and (c) CC views. A much greater volume of breast tissue is seen over a substantial portion of the left breast relative to the corresponding region in the right breast, but there is no associated mass, suspicious calcifications, or architectural distortion.









The PET-CT shows diffuse infiltrating carcinoma

In this patient this is not a normal variant, since there are associated features, that indicate the possibility of malignancy like skin thickening, thickened septa and subtle nipple retraction.

Ultrasound (not shown) detected multiple small masses that proved to be adenocarcinoma.

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Asymmetry

- Area of fibroglandular tissue.
- Visible on only one mammographic view.
- Mostly caused by superimposition of normal breast tissue
- Interspersed by fat

Asymmetry

Technical cause

- Summation shadow (80% of cases)
- Inadequate breast compression.
- Location of the lesion.

Not seen in MLO ……..located in inferior medial tissue
Not seen in CC view …… far medial , far lateral , high up lesion

Cancer

- Mainly ILC (seen in CC view > MLO)
- IDC

Asymmetry

Make sure that :

- **The lesion is sufficiently anterior to chest wall (involved in FOV) .**
- **Not obscured by surrounding dense tissue**

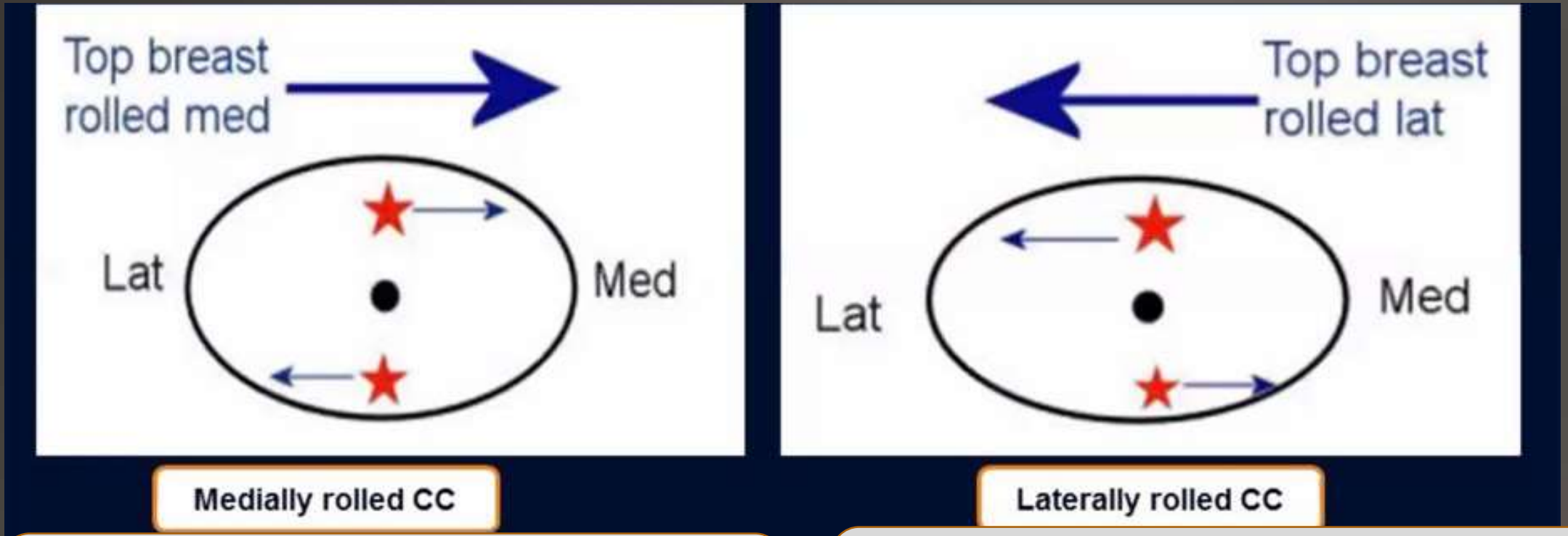
Asymmetry : to locate lesion in the other view

Note : If Tomosynthesis available , it replace any additional view
If not available → additional view

If asymmetry seen only in CC view	→	Do rolled CC view
If asymmetry seen only in MLO view	→	Do true lateral view (triangulation)

Single view findings in CC view not seen in MLO

Do rolled CC view



Rolled medial CC
Upper part of breast rolled medially

Rolled lateral CC
Upper part of breast rolled laterally

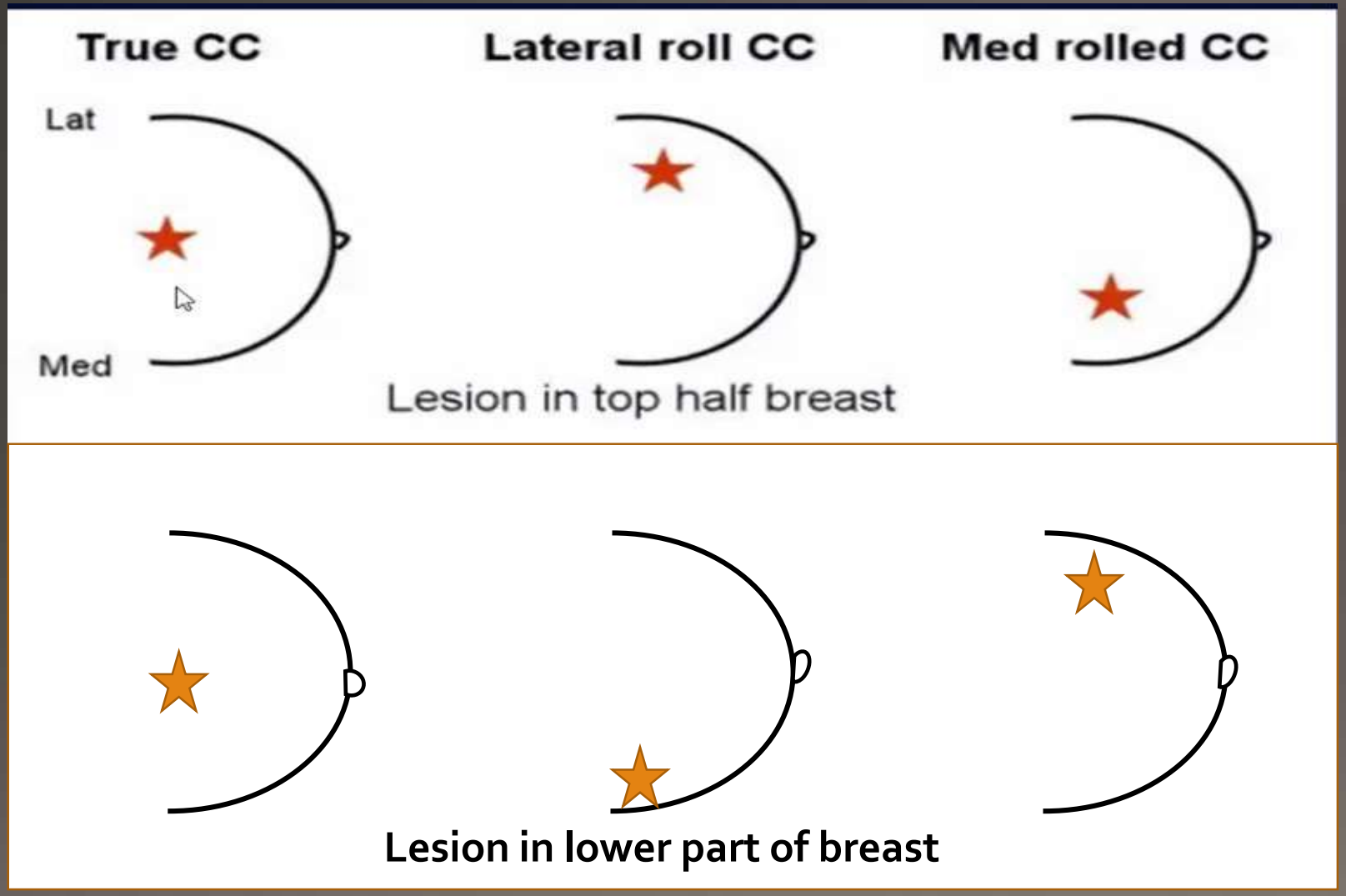
Asymmetry : to locate lesion in the other view

If the lesion move with direction of rolled → Located in upper breast

If the lesion move against rolled direction → Located in lower breast

Single view findings in CC not seen in MLQ view

Do rolled CC view

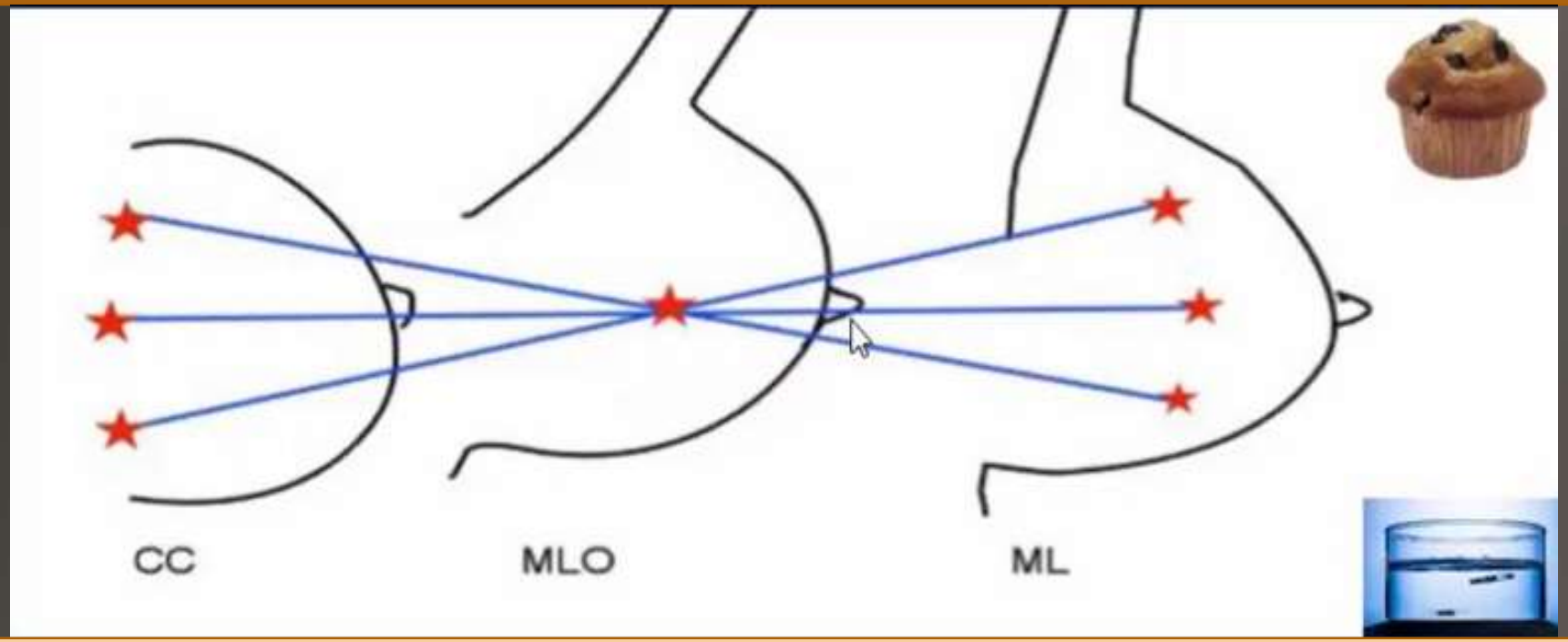


Single view findings in MLO view not seen in CC Do true lateral view (Triangulation)

- ✓ Prove its true lesion VS superimposition
- The asymmetry disappear in the other view
  its summation artefact
- The asymmetry persistent …….it is true lesion

- ✓ Locate the lesion in single view so you can localize it in the other view and in US

Single view findings in MLO view not seen in CC….. Do true lateral view

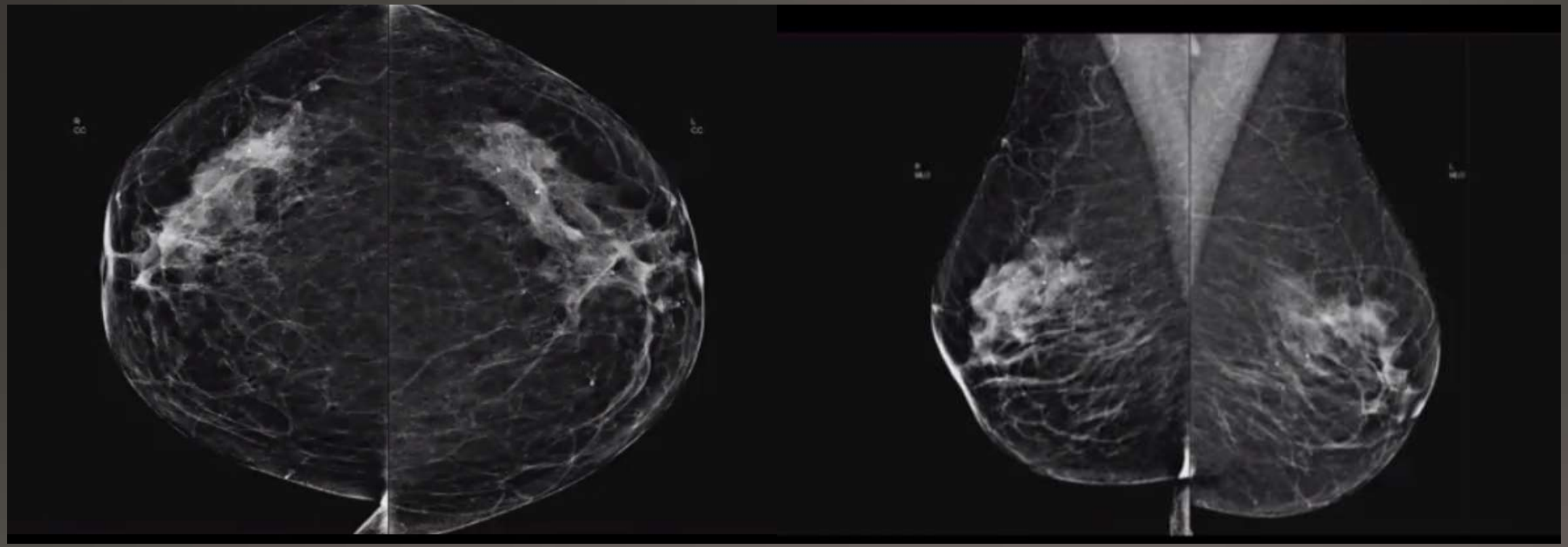


Muffun raise → medially located in CC → XCCM/ CV views

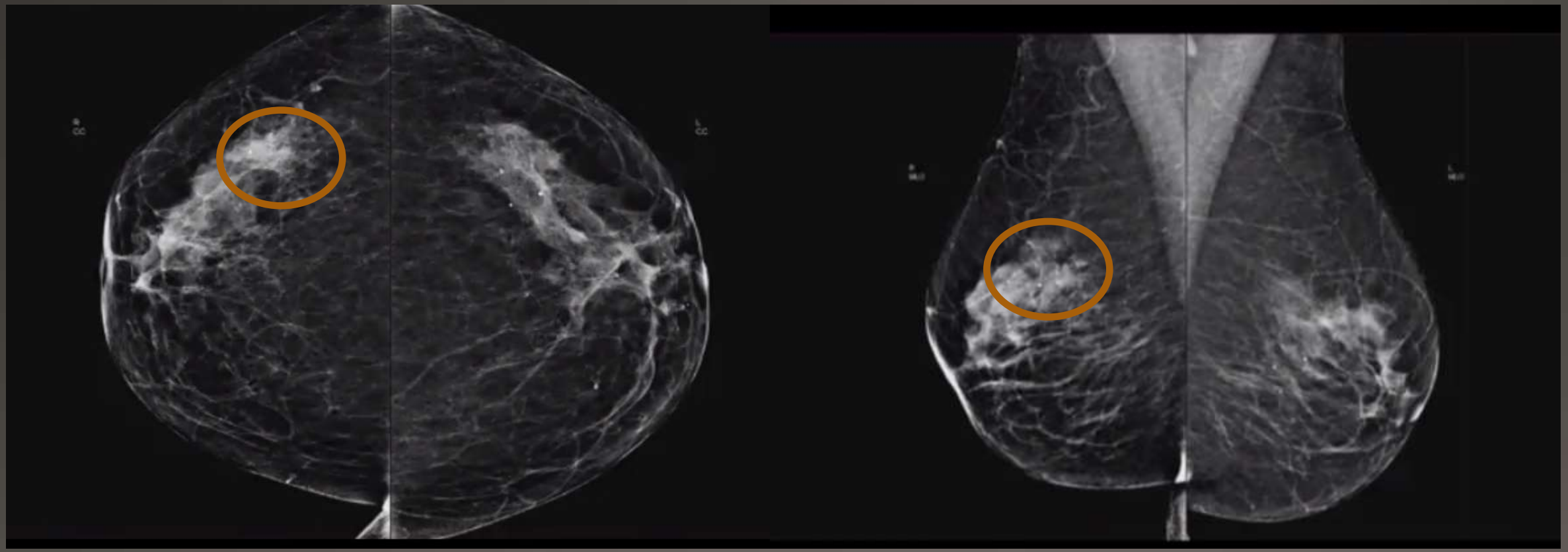
Lead sink → Laterally located in CC → XCCL view

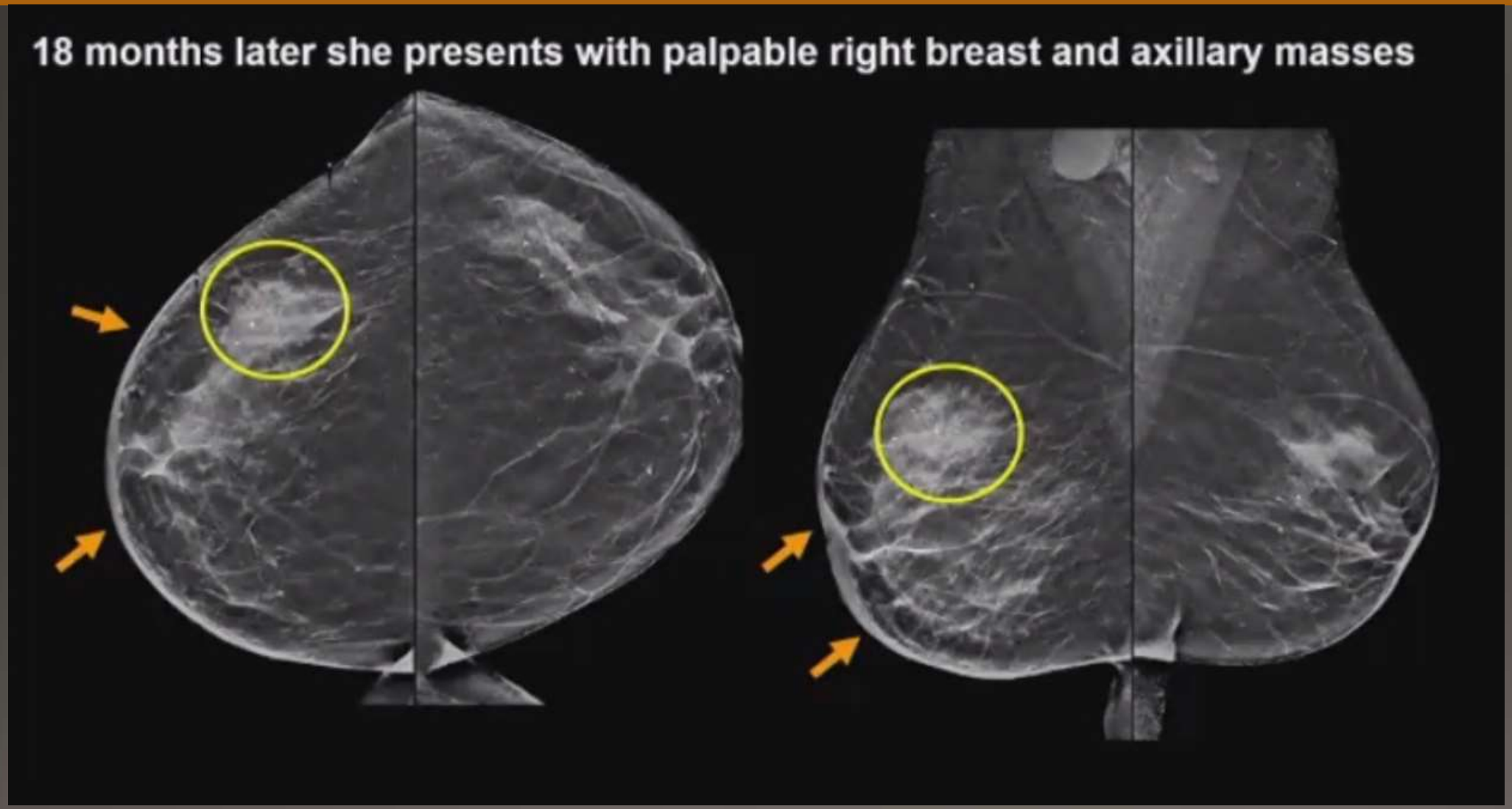
Central lesion will not move up or down

70 years old female regular screening mammogram

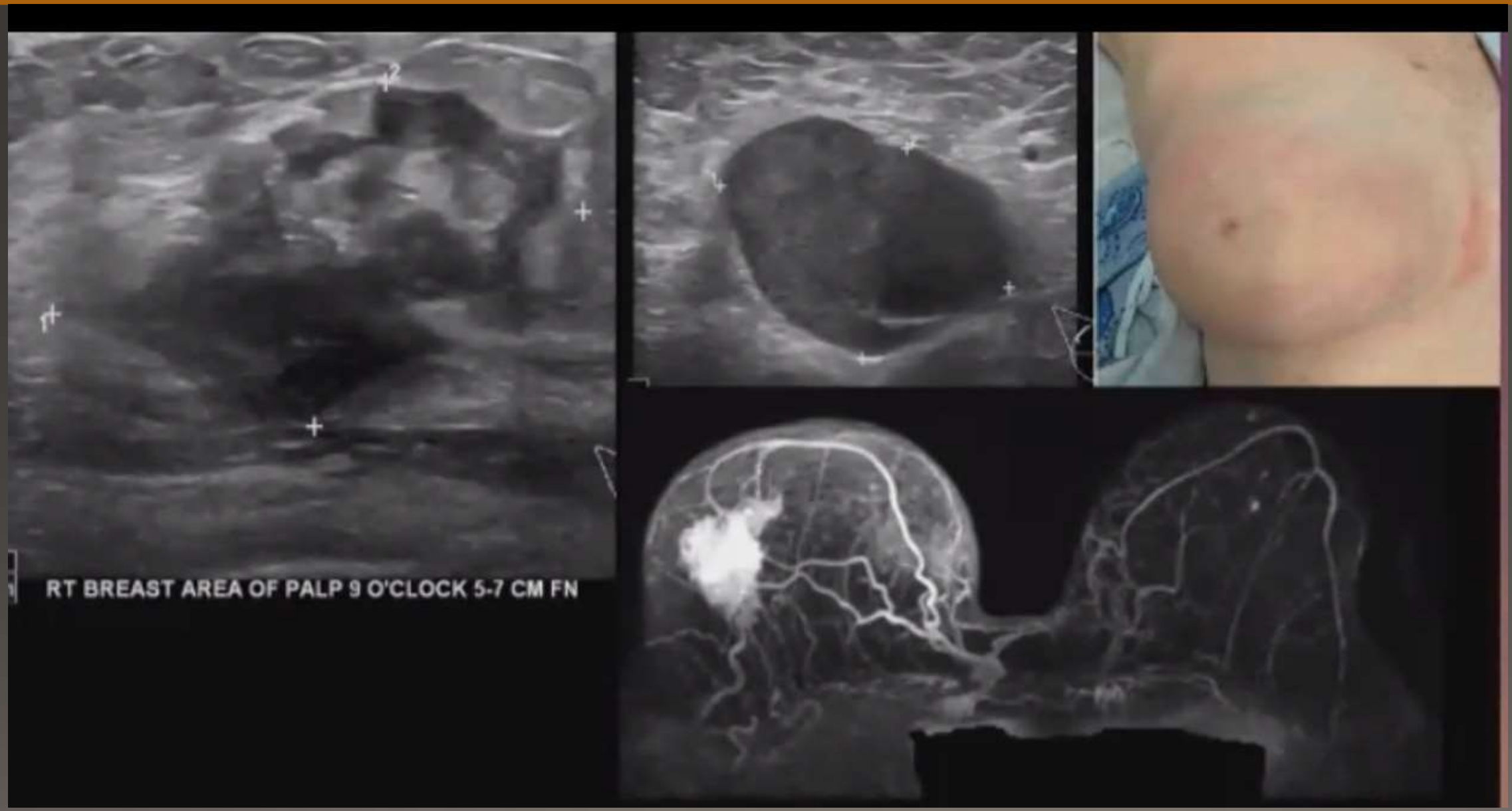


70 years old female regular screening mammogram

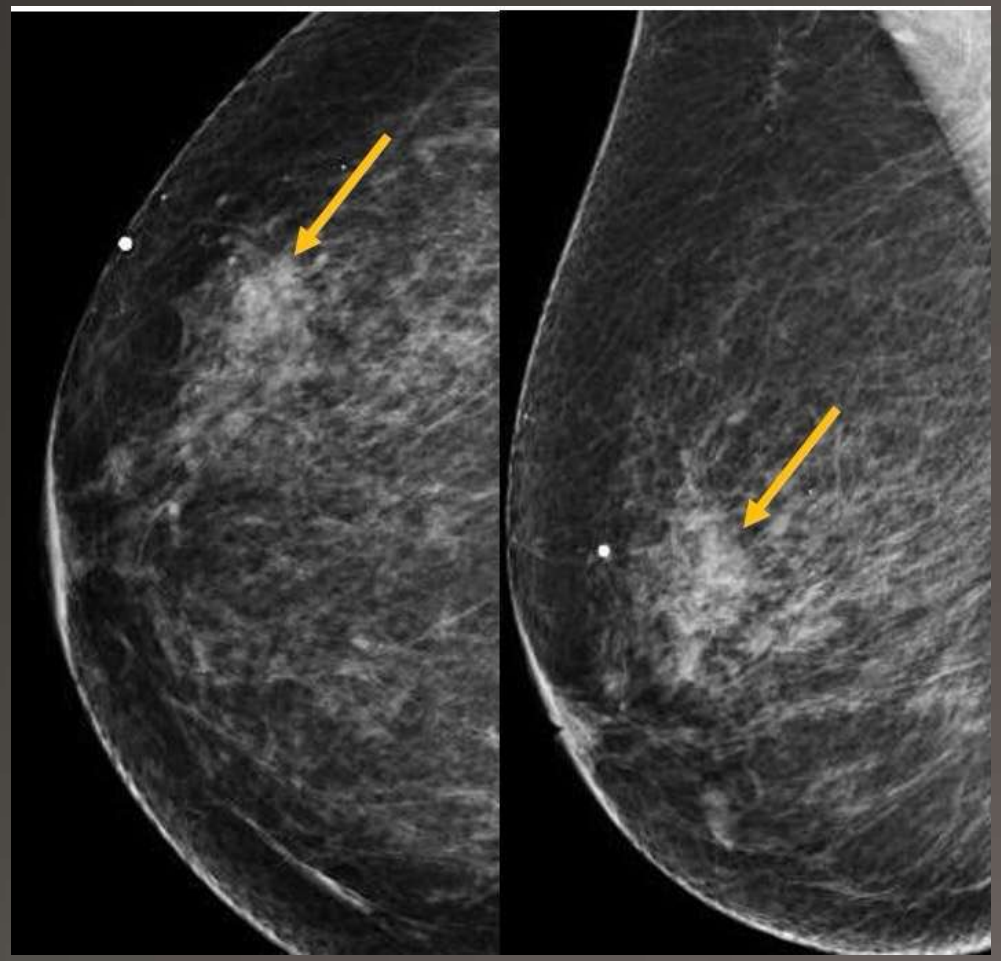


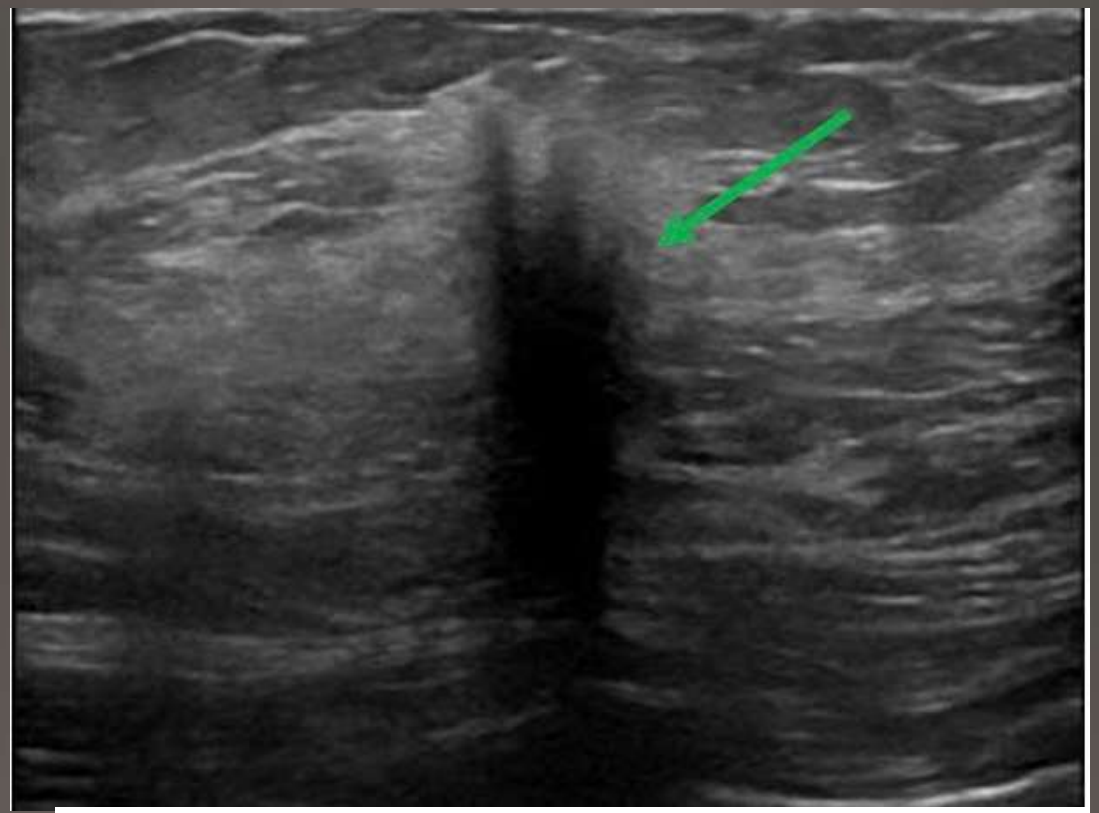

18 months later she presents with palpable right breast and axillary masses

Dxed as inflammatory breast cancer



72 years old female presented with palpable abnormaliy

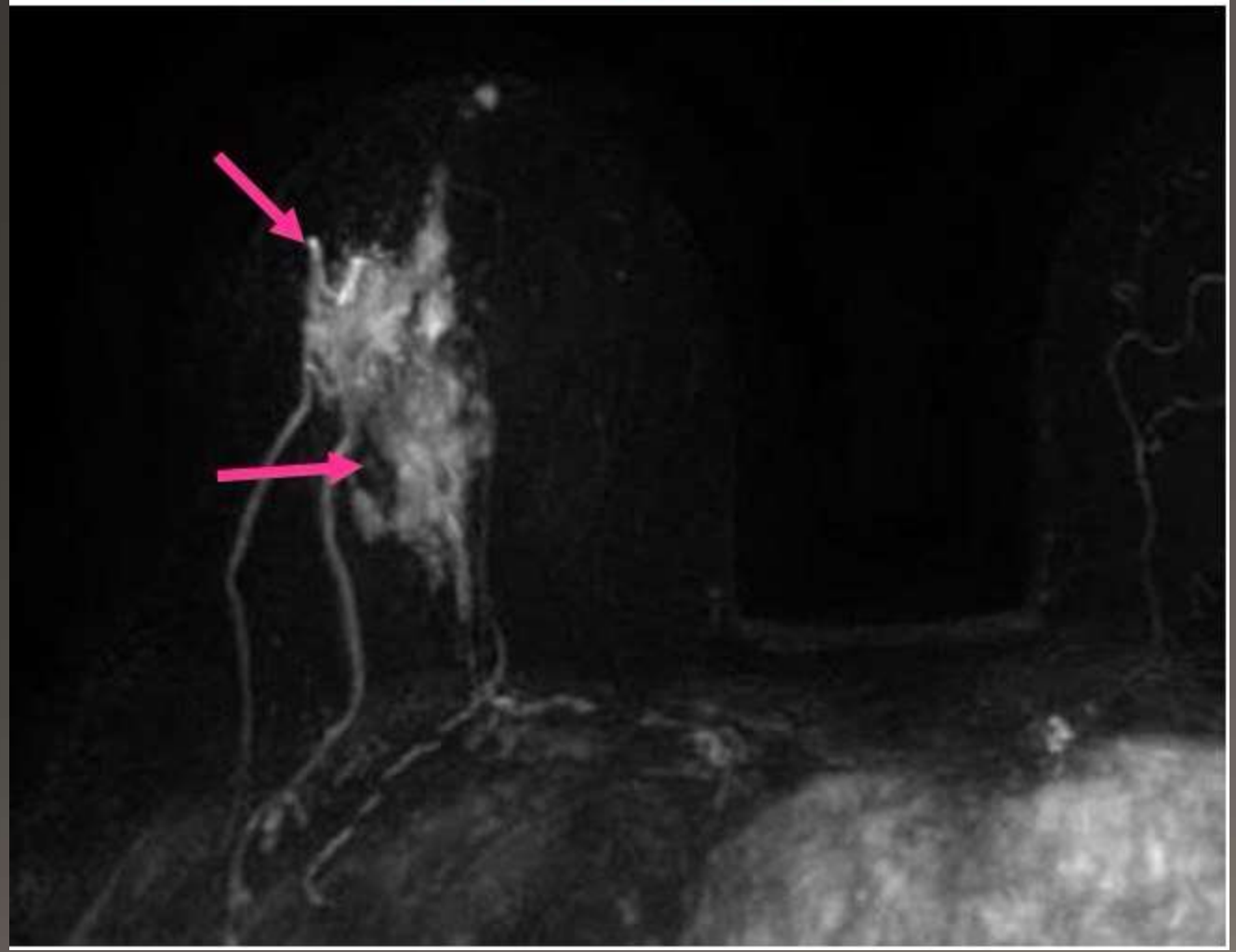




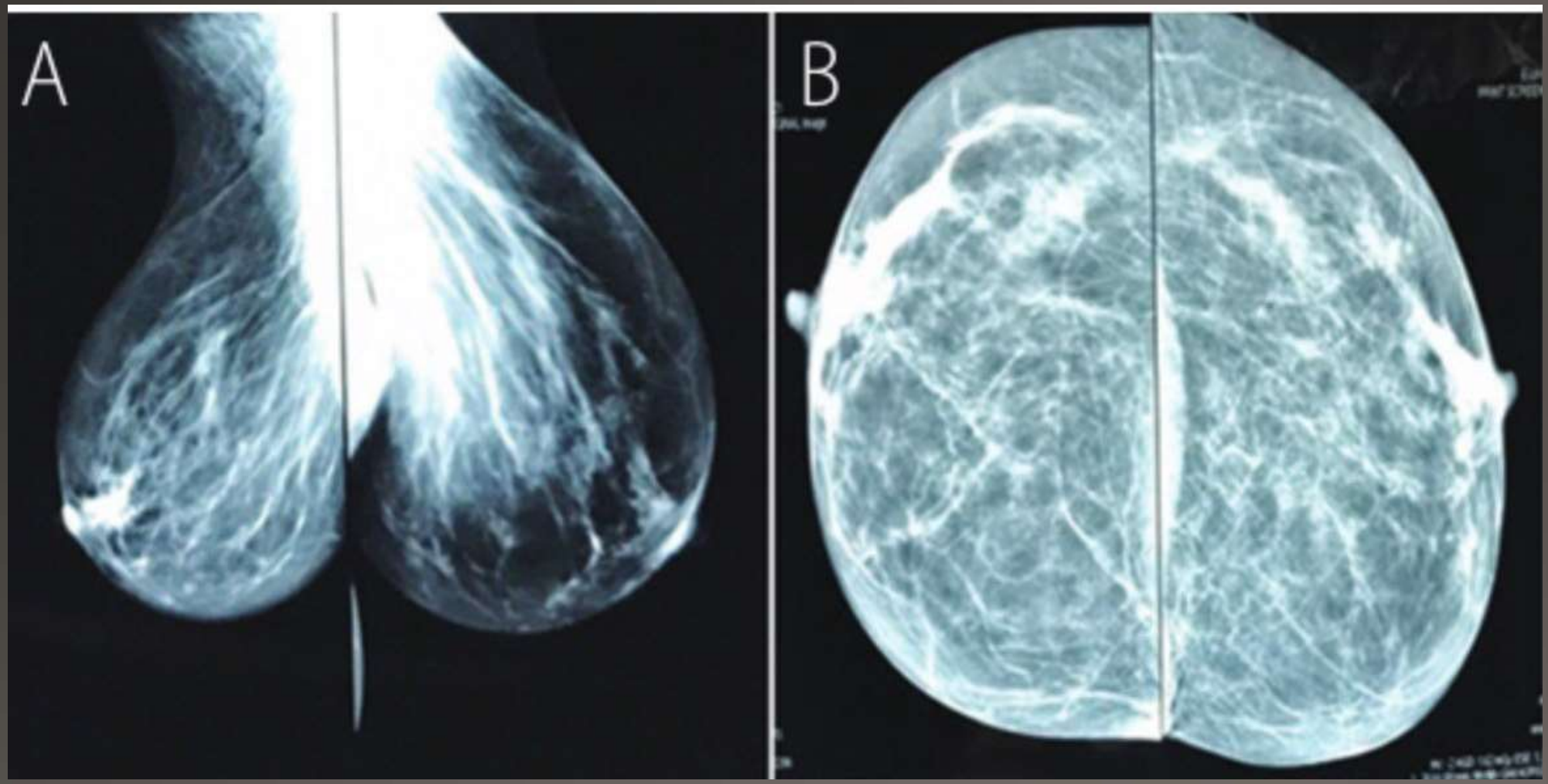
Irregular hypoechoic ***mass*** *with angular margins and posterior shadowing at US*

DX : invasive lobular cancer

*More extensive disease at MRI with segmental **nonmass enhancement***



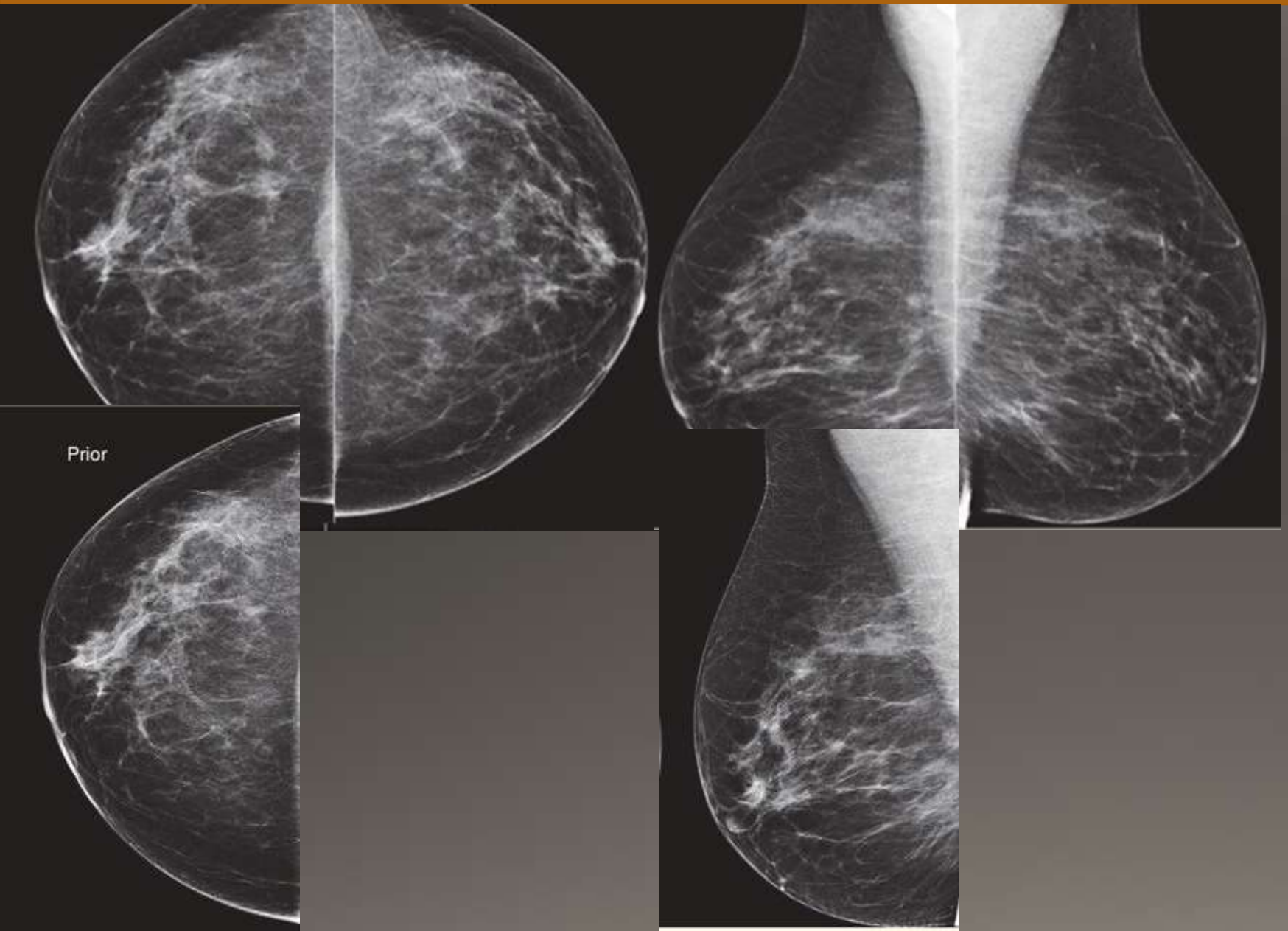
62 years old female for screening mammogram



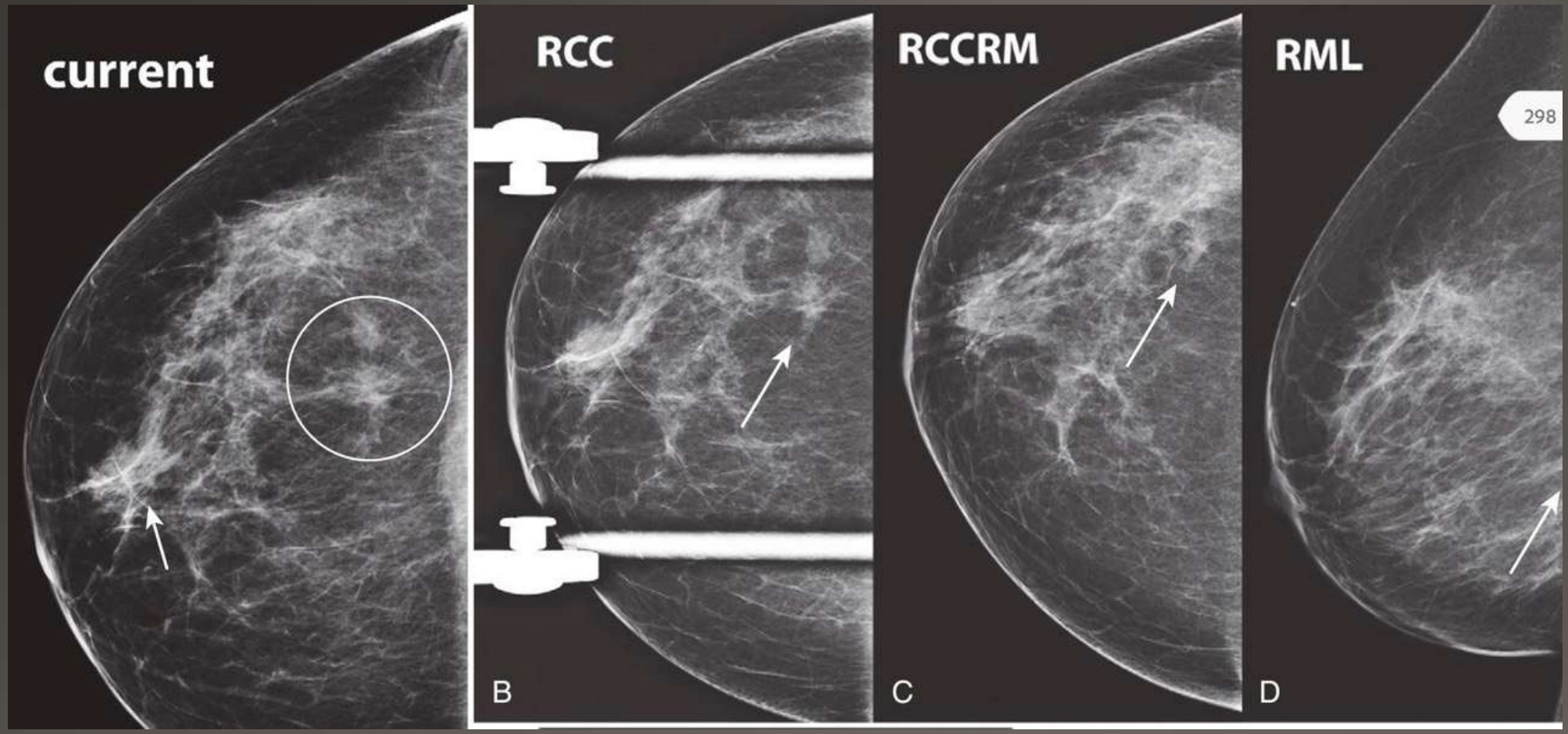
Intraductal lesion
BIRADS 4A

US guided biopsy : Intraductal papilloma

Screening mammogram on 45years old female



Next step

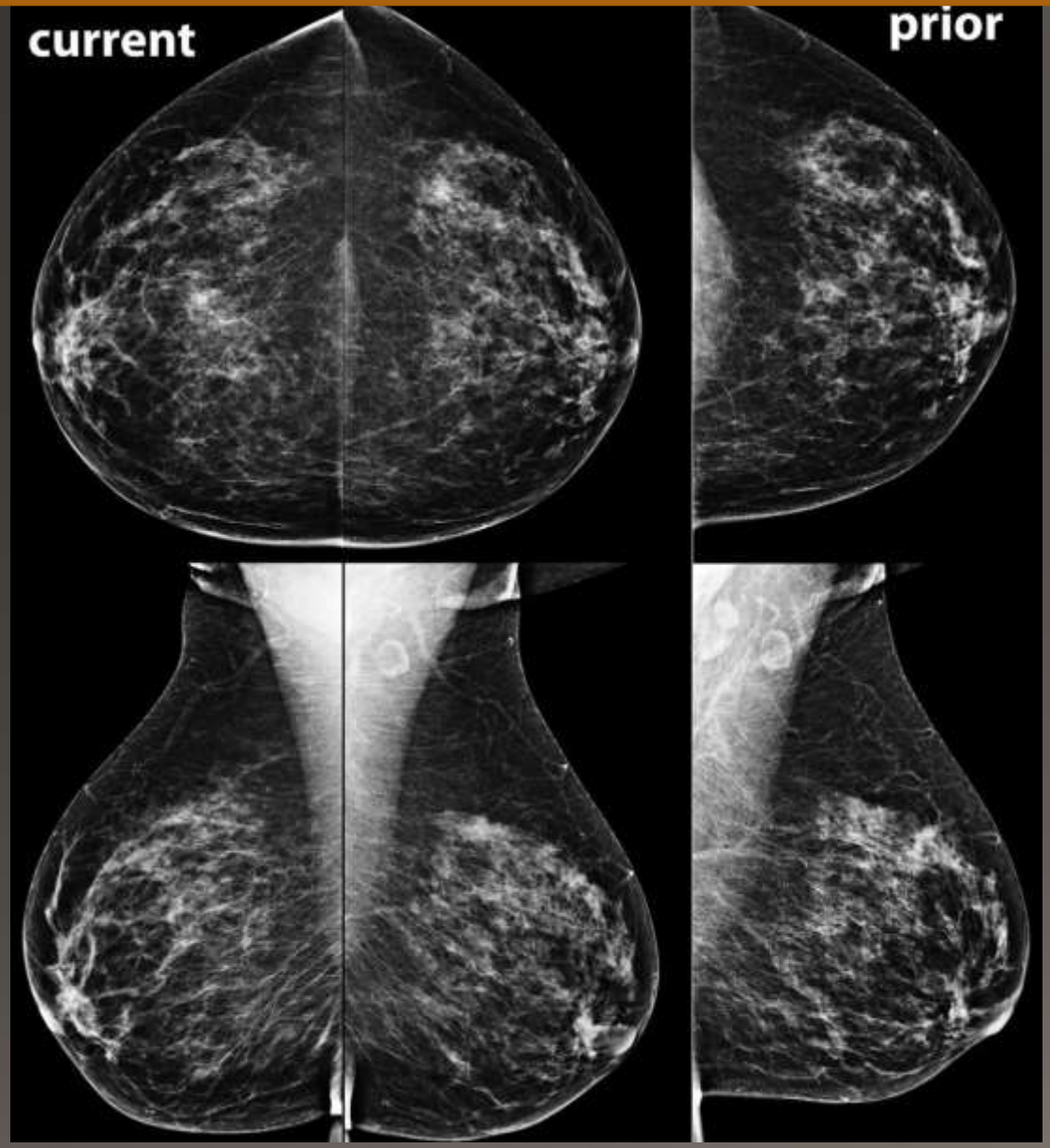


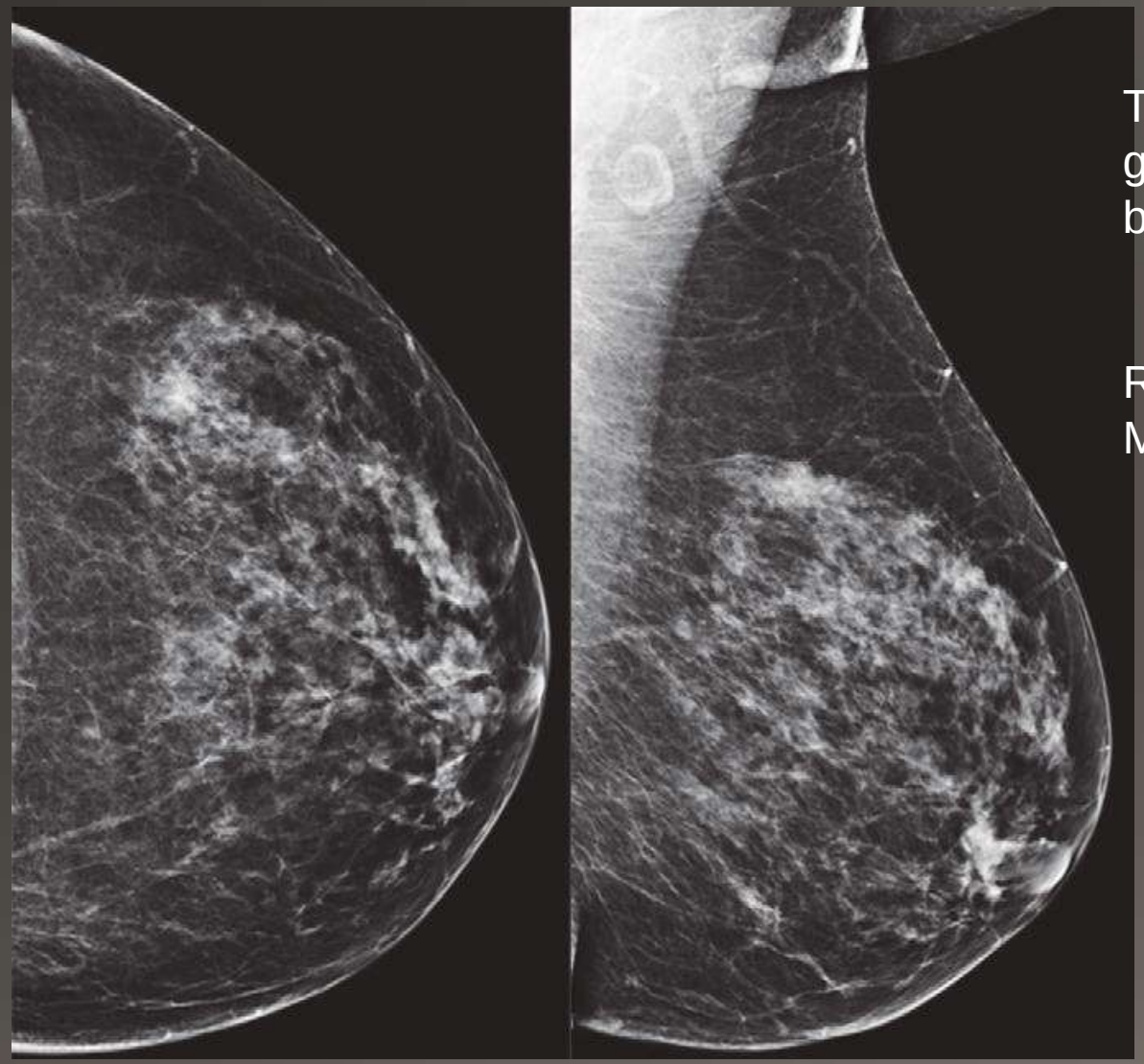
- Ultrasound guided biopsy
- **Result : invasive ductal carcinoma**

Screening mammogram on a 69-year-old woman.

How would you describe the abnormality? What are your BI-RADS assessment category and recommendation?

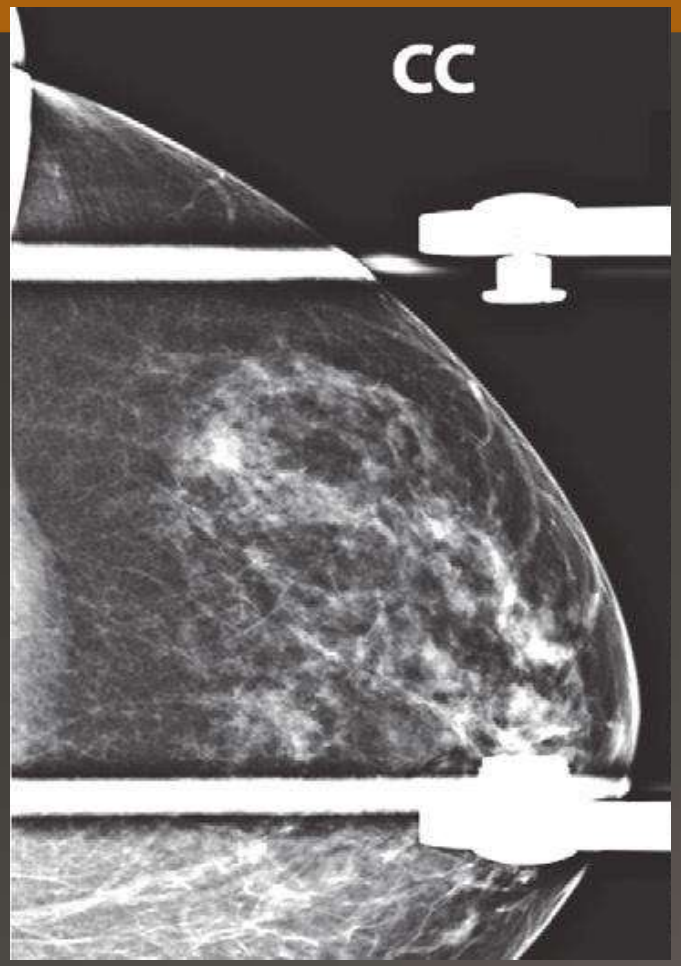
Screening mammogram on a 69-year-old woman.





There is a developing asymmetry at the edge of the fibro glandular tissue in the upper-outer quadrant of the left breast

Recommend spot compression views,
ML, with US



Spot compression CC view

On diagnostic images, the finding is confirmed and is shown to represent a mass with obscured margins

US shows a solid mass with indistinct margins in the 1 o'clock position.
The central echogenic focus on the lower US image corresponds to a calcification visualized on the mammogram. BI-RADS IV c.
Ultrasound-guided biopsy is recommended
Diagnosis: IDC.

Screening mammogram on a 58-year-old woman with no breast-related history.

First : comparison with previous mammogram-----stable for 4 years

N clinical history
Not palpable

There is a large focal asymmetry in the superior lateral quadrant of the left breast, middle third.
There is no evidence of associated mass, AD, or calcifications.

Because this finding has been stable for 4 years and there are no palpable abnormalities (screening examination),

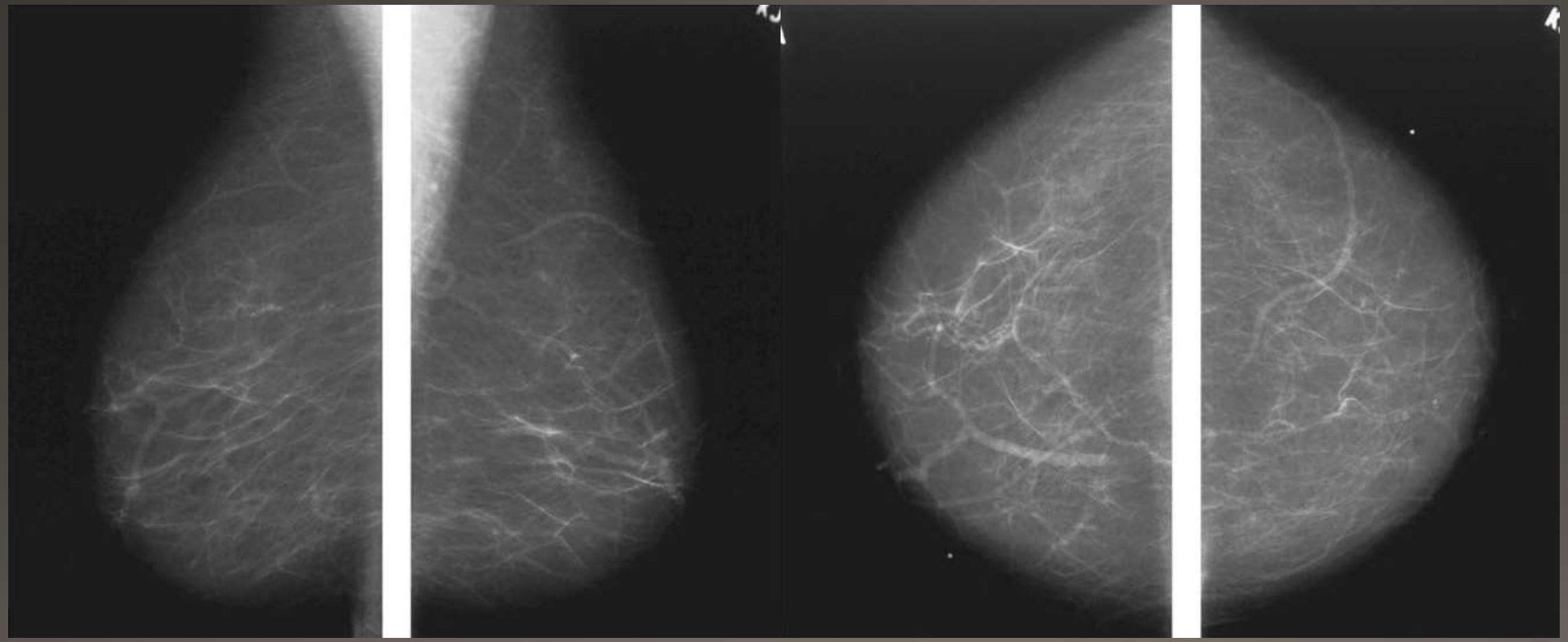
It is considered benign (BI-RADS 2) and no additional evaluation is indicated.

If it is stable for only one year ……..it is BIRADS 3 and need achieve stability for 2 years to become BIRADS 2

74-year-old woman presents for screening examination

74-year-old woman presents for screening examination

This her mammogram two years earlier



Bilateral increased breast density

DDX of bilateral increased breast density

- **Weight loss**
- **Lactation and pregnancy .**
- **Hormone replacement therapy (HRT)**
- **Systemic edema (heart or renal failure)**

55-year-old woman undergoing annual screening examination

55-year-old woman undergoing annual screening examination

Comparison with previous mammogram

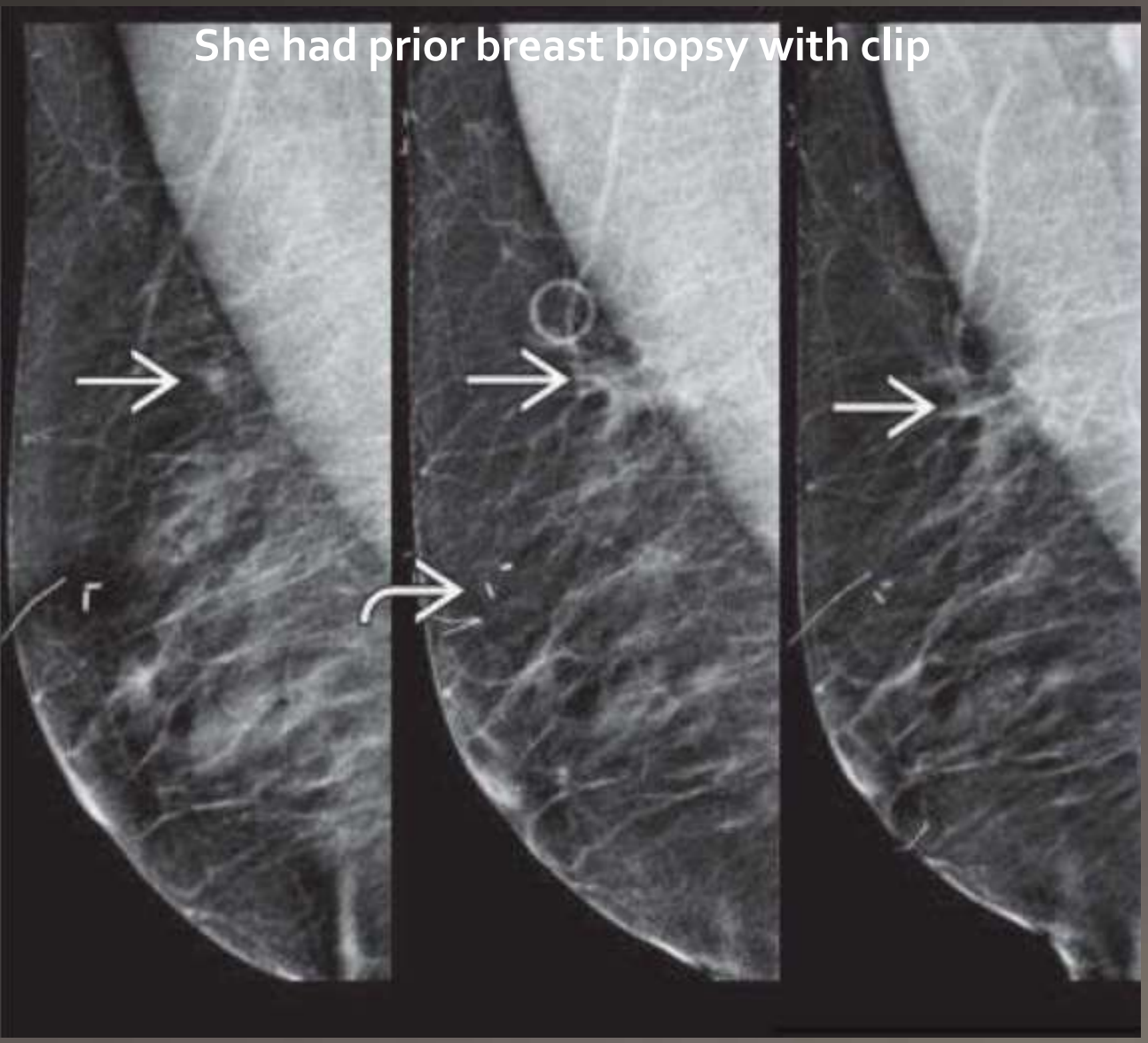
Mammogram from 4 years ago

Bilateral decreased breast density

DDX of bilateral decreased breast density (note : with normal skin thickness)

- **Obesity (weight gain)→ increase breast size and fat**
- **Normal fatty involution with age.**
- **Reduction mammoplasty → may decrease density with postop features**

screening mammogram of 62 yrs old female obtained over 5 years period



Targeted US at the posterior upper part

Irregular hypoechoic mass with indistinct margin with echogenic rim

US guided biopsy ….invasive lobular cancer

THANK YOU