

Mammogram

It's a subspeciality of radiology.

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most masses are located in the upper outer quadrant of the breast → because the bulk of the breast tissue is there.

Breast initial screening test after Hx and PE.

Mammogram.

- + detect microcalcifications
- + for women >35 y.o

U/S

- * distinguish solid from cystic lesions
- * precise site.

But Cannot detect microcalcifications

Mammogram is x ray of Brest

Is less effective in young ages (more dense breast)

Cyst seen on ultra sound

Ultrasound show the exact location of mass

Mammogram show you calcification

Craniocdal = from above the breast

Pper part of cianiocodal is the upper part

Mediolateral = from lateral part of breast and shows pect major and lymph node as white shadow (information : upper or lower part of breast)

Cause



→ with aging, ladies become having less fibrous

tissue and more fatty tissue.

↓
Black on mammogram.

↑
white on mammogram

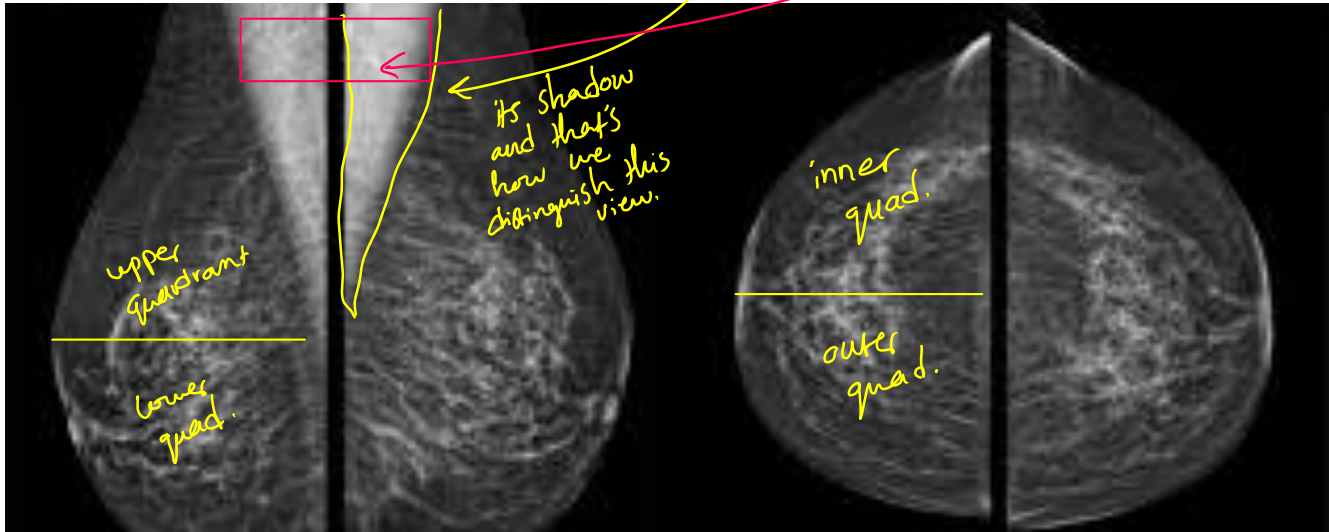
→ Standard views of mammogram which are complement to each other :

① Craniocaudal = from above the breast

Upper part of craniocaudal is the upper part

② Mediolateral = from lateral part of breast and shows pect major and lymph node as white shadow (information : upper or lower part of breast)

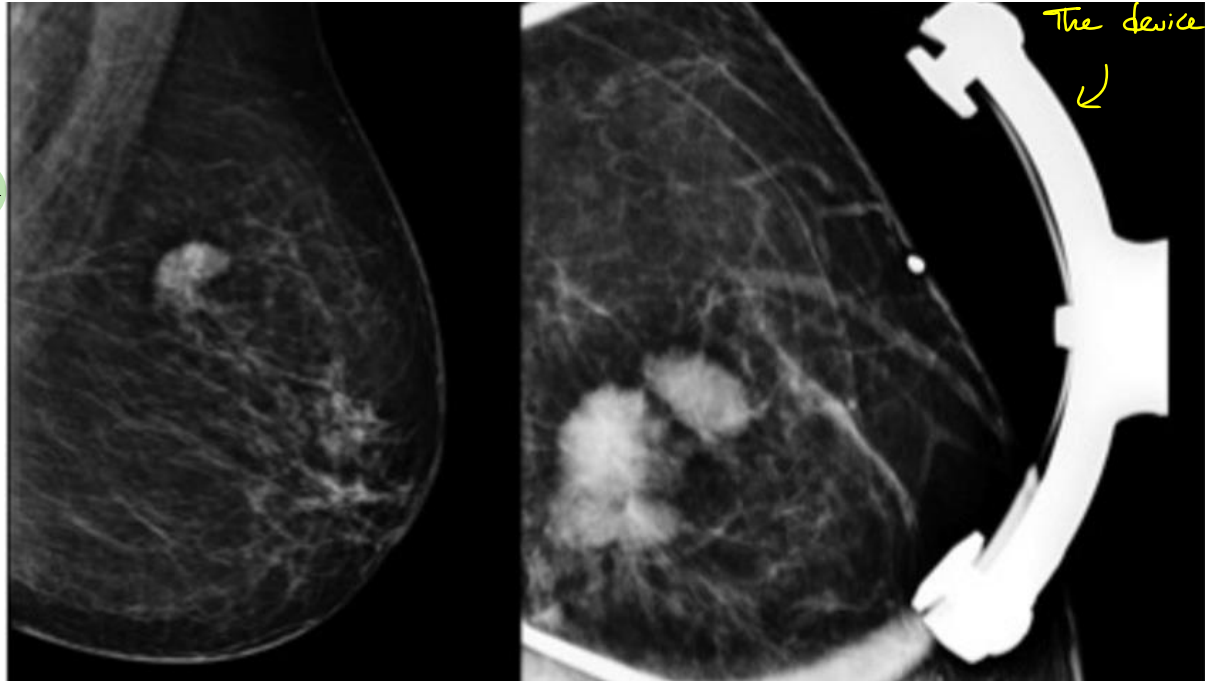
axillary



-This device is
"compression spot" used
when an area is
suspicious

-If disappeared after
compression it is normal
tissue, if not it is mass

→ when there is an architectural distortion (abnormal configuration of breast tissue which might be normal sometimes).



• Before analyzing any mammogram, check:

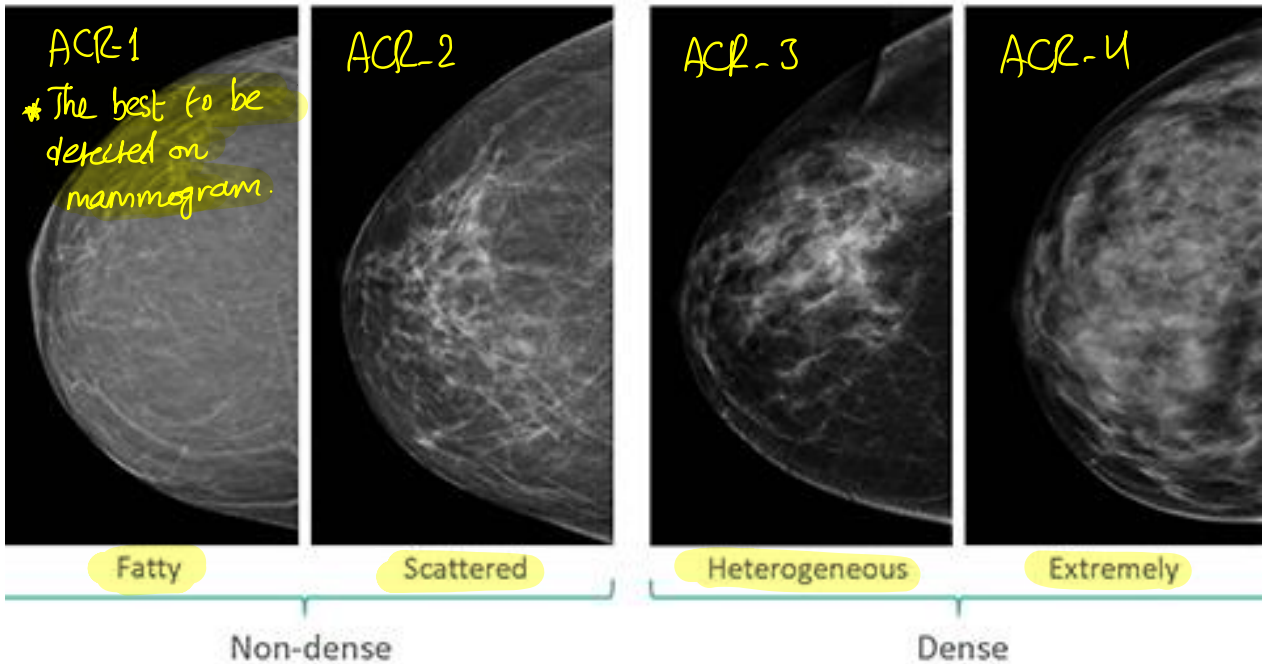
- ① • Name, date, view
- ② • Breast density.
- ③ • Mass
- ④ • Calcification
- ⑤ • Nipple and skin changes
- ⑥ • Axillary lymph node enlargement.

→ we need the most recent images, but sometimes we need to see old ones to compare - for example if there was an image done in 2010 with calcifications and the 2020 image still has them, normal mostly. But any new findings in 2020 image not in 2010s so mostly it's abnormal.

Breast density should be addressed at first according to classification since it affects sensitivity

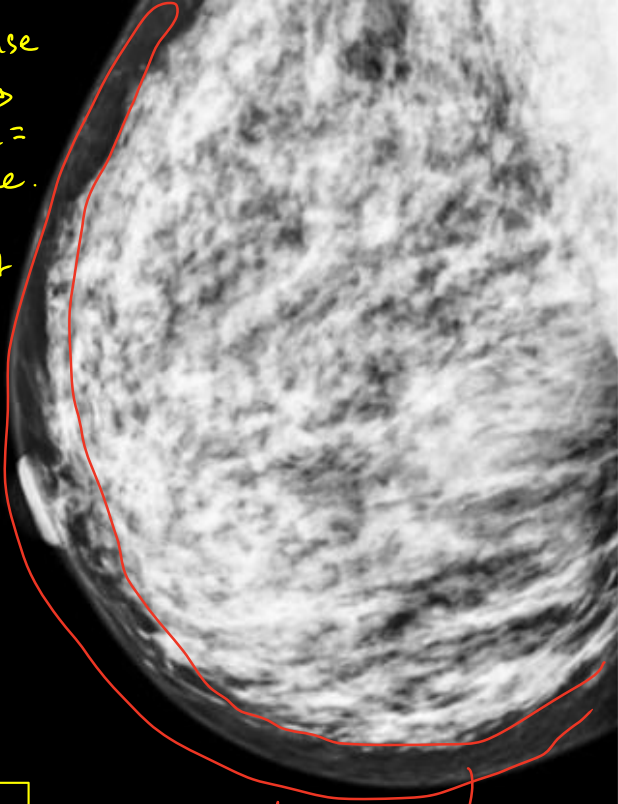
- ACR 1 0 - 25 breast tissue (mostly fat) best sensitivity *to detect any masses or calcifications.*
- ACR 2 25 - 50
- ACR 3 50-75
- ACR 4 more than 75 granular tissue (less fat)

* **Dense** breast means that it has breast tissue (which is white) >>> fat.
∴ less sensitive on mammogram.



⊕ Highly dense breast → white tissue = breast tissue.

⊕ masses cannot be detected easily



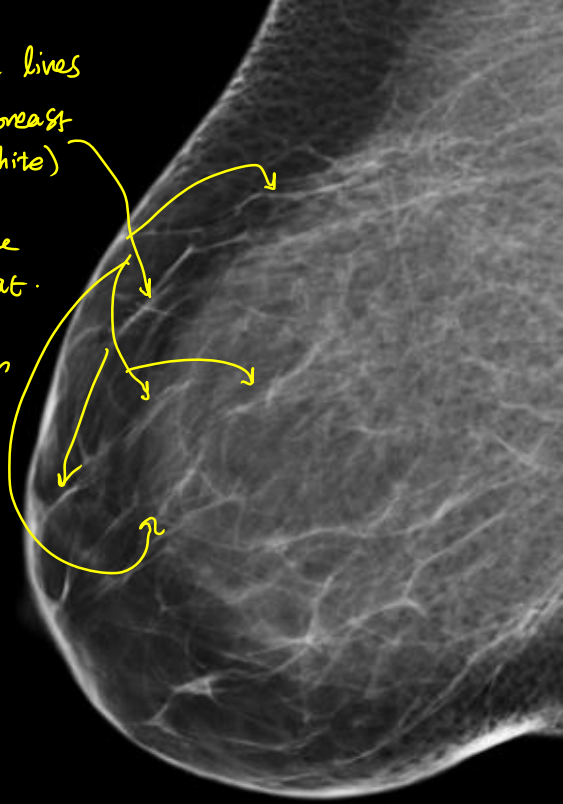
ACR-4

This black tissue is fat.

⊕ The white lines are the breast tissue (white)

⊕ most of the breast is fat.

⊕ masses can be detected easily.



ACR-1

Your goal is to check for malignant signs

= mass or calcification

Architectural distortion : normal tissue arranged in upnormal what need biopsy and further investigation

Spiculated mass : mostly malignant

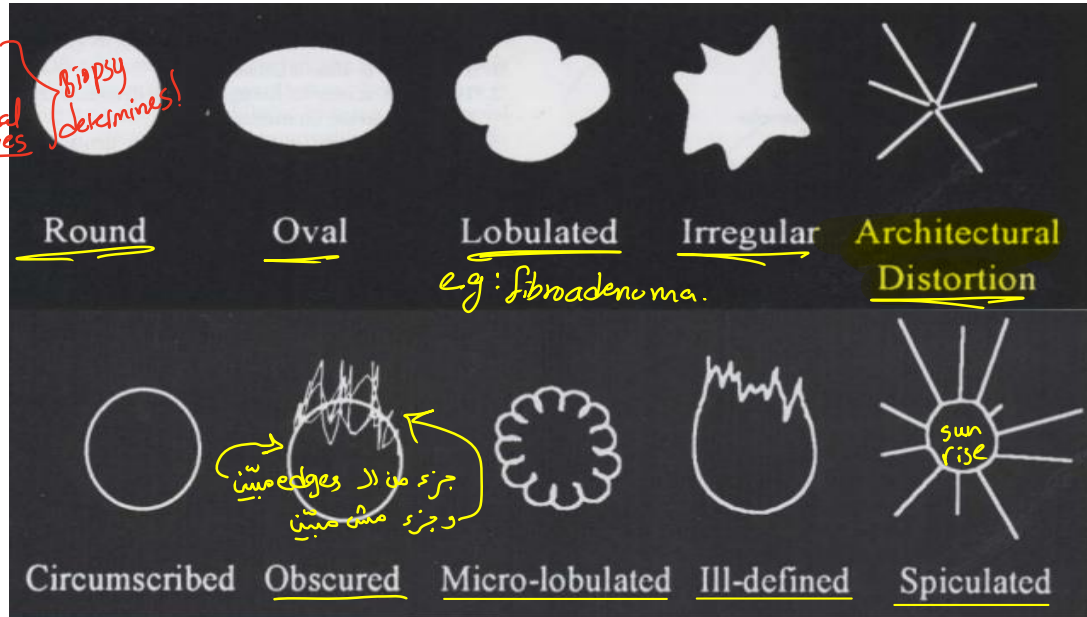
exception : abscess or necrosis or fat or post surgical changes

First one is most benign g last one is most malignant .

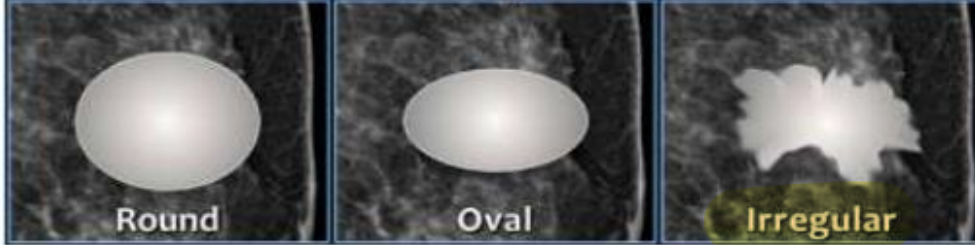
Mass



Describe site shape size and margin and density

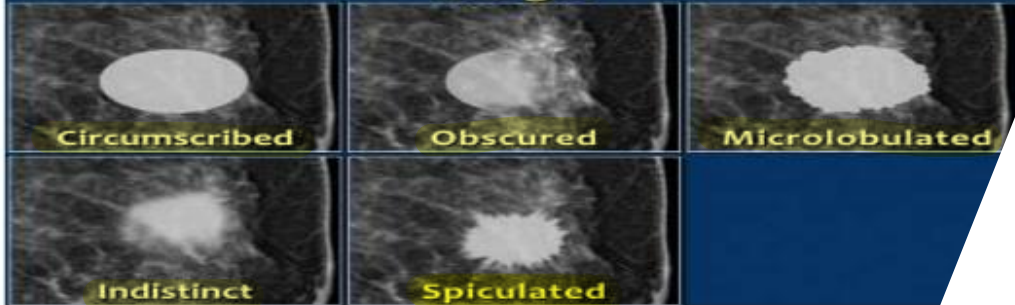


Shape



mostly it's malignant.

Margin



- * Hard to define. (needs radiologist)
- * incidental finding on mammogram.
- * Un-palpable.

Micro

Calcification :

When bilateral = mostly benign

Localisation is suspicious to malignant

- Diffuse distribution: *mostly Benign.*
Formerly called "scattered", these are calcifications randomly distributed within the breast

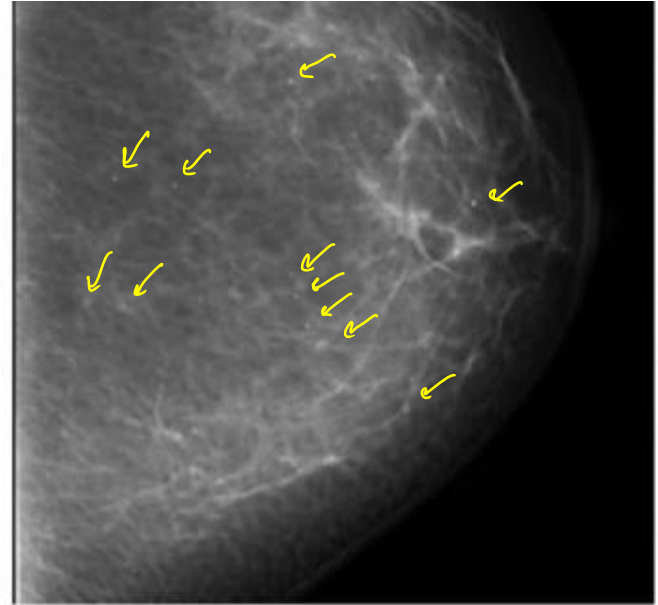
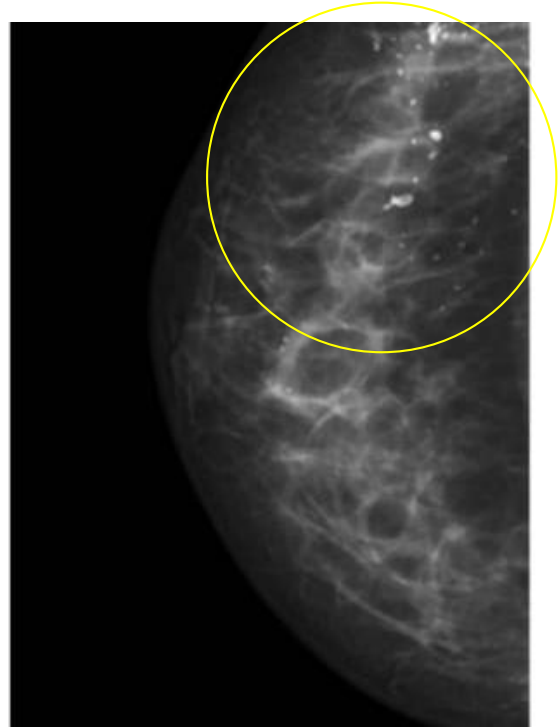


Figure 2. Diffuse distribution. Round microcalcifications diffusely distributed within the breast, **benign aspect.**

- Regional distribution: *mostly Benign.*
- This pattern describes calcifications in an extensive area, greater than 2 cm in their largest dimension.



كل ما صاروا المصطلح calcifications بنوعهوا بمساحات
أصغر كل ما صار الرشح يفتوح أكثر.

Group distribution : malignant

- Grouped/clustered distribution:
- This term is used when a few calcifications are found in a small area of tissue. The lower limit for this descriptor are 5 calcifications in 1 cm or when there is a definable pattern.

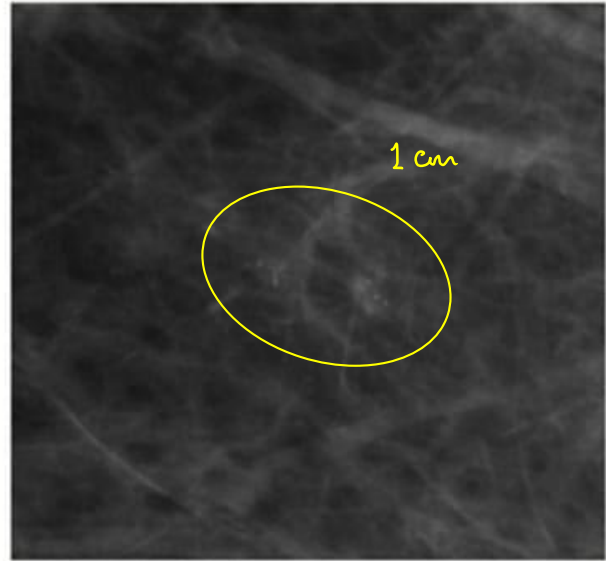


Figure 4. Grouped Distribution. Pleomorphic and linear microcalcifications distributed in a small area. Stereotactic biopsy: atypical ductal hyperplasia.

Linear (calcification of duct)
= highest risk of Mal

- ✧ Linear Distribution: Calcifications are arranged in a linear path that can branch, suggesting calcium deposits within a duct. A probability of malignancy is described as about 60%

∴ Biopsy is mandatory

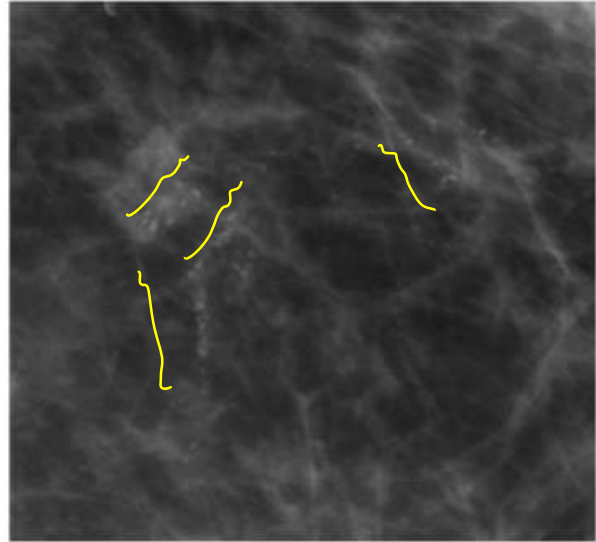
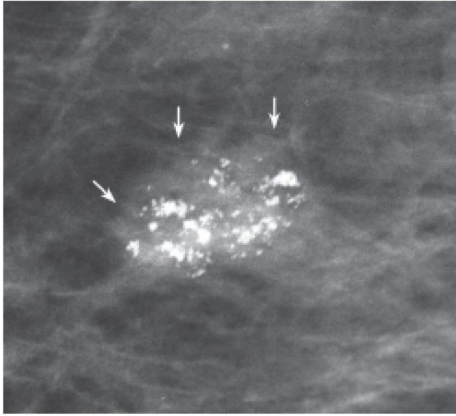


Figure 5. Linear distribution. Pleomorphic microcalcifications following the distribution of a duct. Stereotactic biopsy showed intracystic papillary carcinoma associated with high grade DCIS.



Till round are benign
 Fine linear or branching and pleomorphic are malignant
 Upper left Pic = dystrophic mostly benign

Vascular calcifications	
Skin calcifications	
Milk of calcium calcifications	
Thick linear calcifications	
Popcorn calcifications	BI-RADS 2
Dystrophic calcifications	
Round, scattered or isolated calcifications	
Ring calcifications	
Suture calcifications	
Round grouped calcifications	BI-RADS 3
Coarse, rough, heterogeneous calcifications	B
Amorphous calcifications	BI-RADS 4 B
Fine pleomorphic calcifications	B
Linear or branched linear calcifications	C
Linear and new branching linear and segmental distribution calcifications	BI-RADS 5

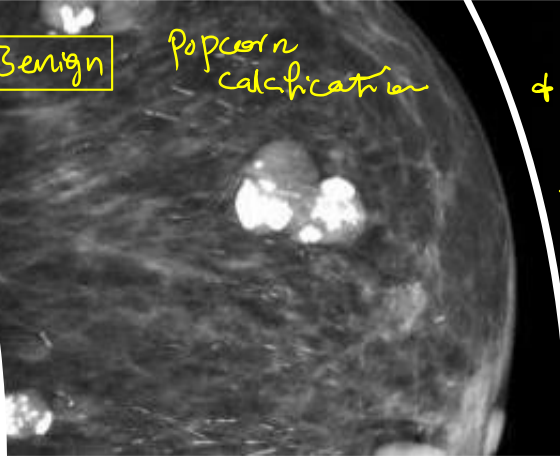
Types of microcalcifications and risk of malignancy.

Benign

- Ex. Ring calcification
- Popcorn calcification
- Vascular calcification
- Vascular larger than linear
- Popcorn calcification = benign (involving fibroadenoma)
- Ring = Cyst with marginal calcification
- Skin calcification : is benign too

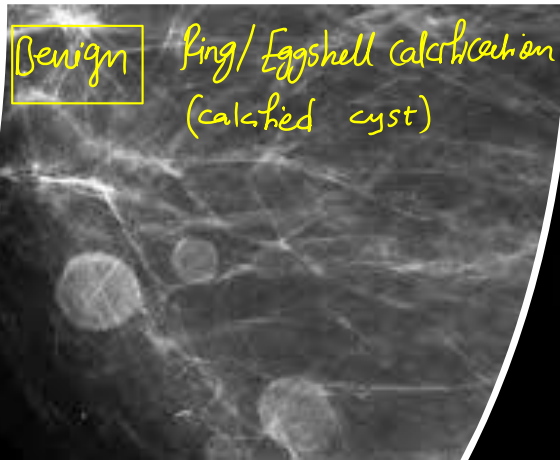
Benign

Popcorn
calcification



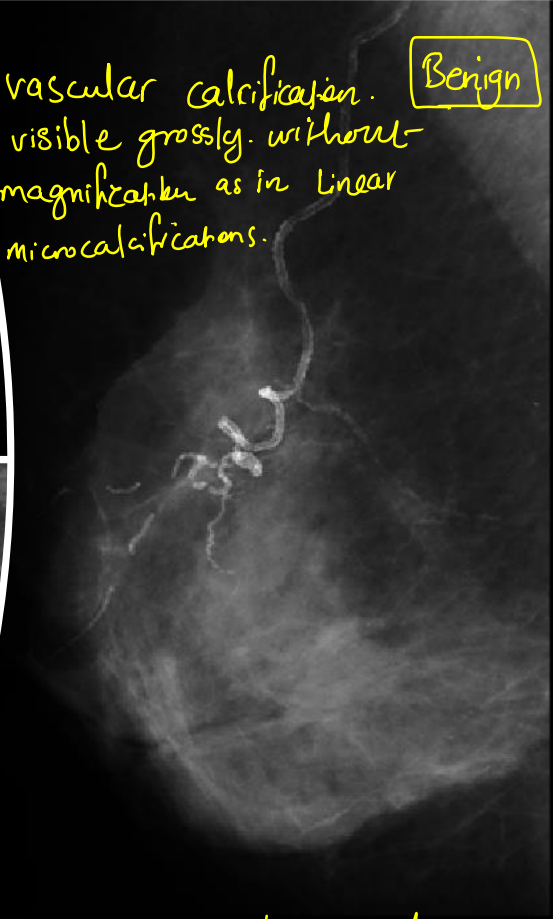
Benign

Ring/Eggshell calcification
(calcified cyst)



+ vascular calcification.
visible grossly. without
magnification as in linear
microcalcifications.

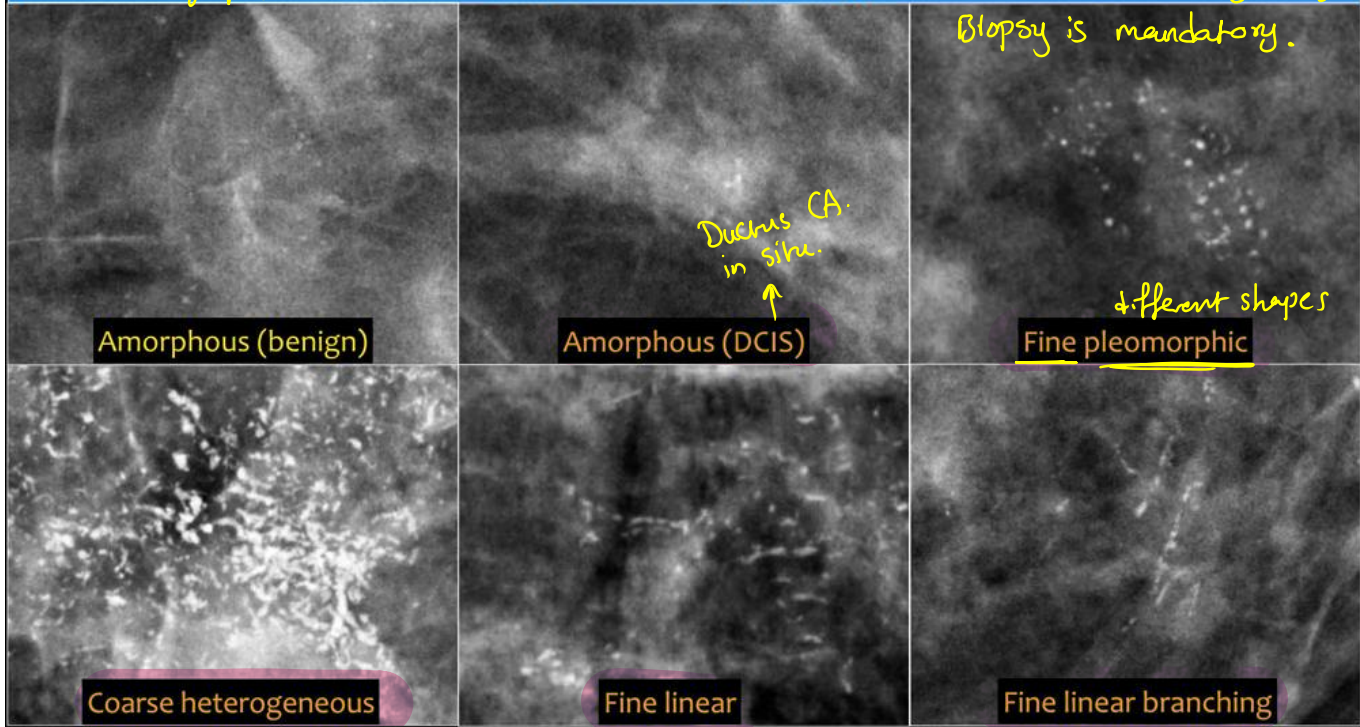
Benign



• all are magnified:

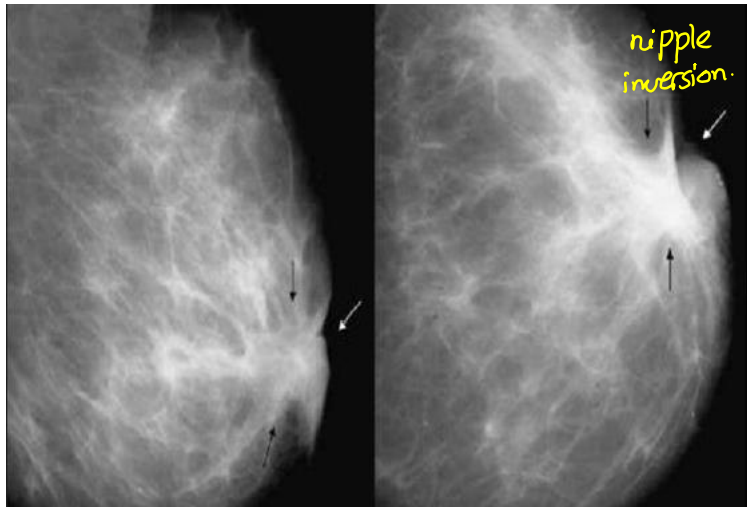
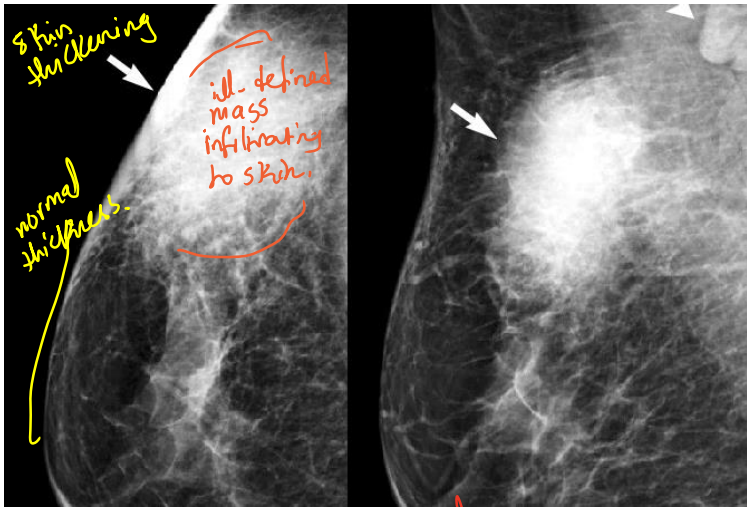
Suspicious morphology

→ associated with malignancy:



Coarse = كل وحدة شكل و بتختلف عن الثانيه زي الحجر المطحون and larger calc. than fine pleomorphic.

Mamogram guided biopsy to take biopsy from calcification because they are small and can't be seen on other techniques



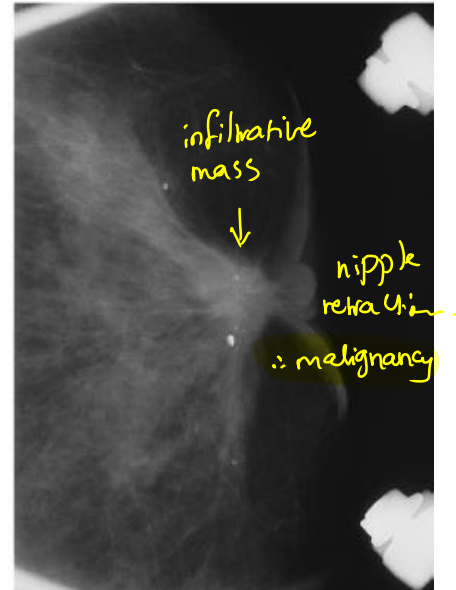
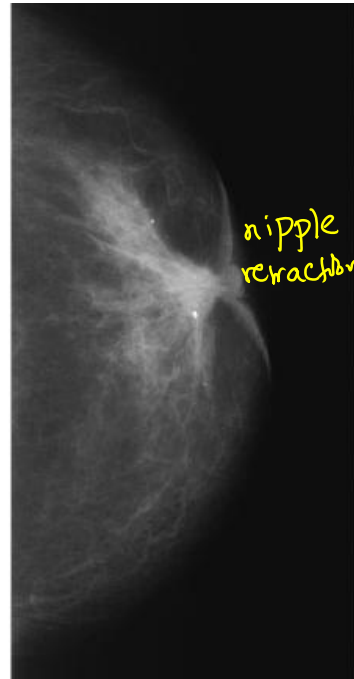
might be from normal if from both and bilateral.

Nipple retracted and skin thickening (compared to most of skin around it) = malignant

depending on
the Hx and
PE and other

- 1- Malignant. (Dermal plexus infiltration and edema).
- 2- Inflammation.
- 3- Radiotherapy.

signs (calcifications, mass--).



Mass pulls nipple posteriorly

* Right breast ← (assumption):

* Mediolateral oblique

* ACR-2 (relatively sensitive).

* Mass
→ site: ^{upper} outer quad. of Rt. breast
→ size: 2x2 cm.
→ shape: spiculated.

! shadow of pect. major.

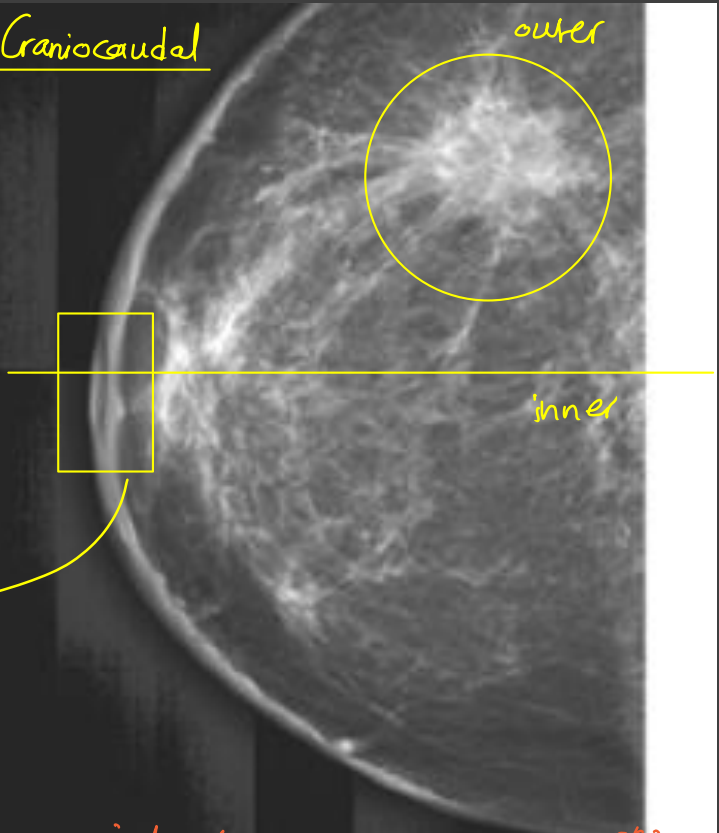
* Microcalcifications:
need further magnification to be seen.

* skin thickness: there's thickening ✓

* nipple inversion ✓

* no LNs enlargement.

Craniocaudal



• Dx :- Biopsy is needed as its spiculated mass + nipple retraction + skin thickening.

Assume this is the right breast:

- Patient's data are unavailable.

- view.

Density. ACR-1 (sensitive)

- Mass. (in upper outer quad. of Rt. breast)

ill-defined edges + obscured + microlobulated).

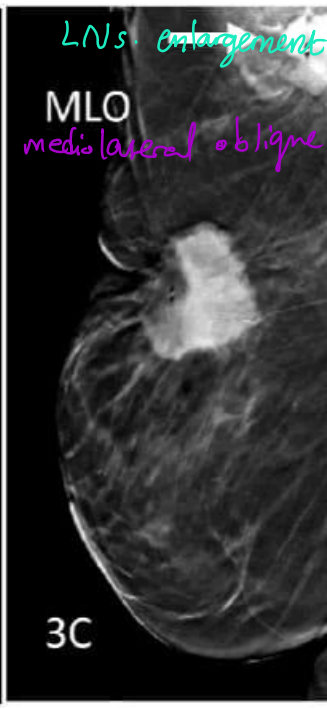
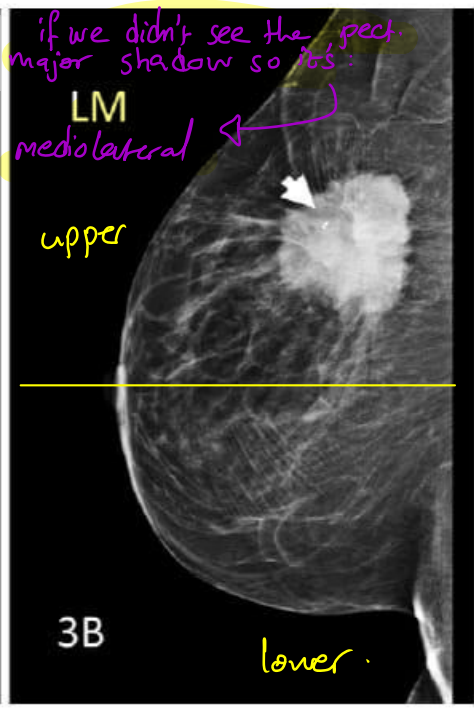
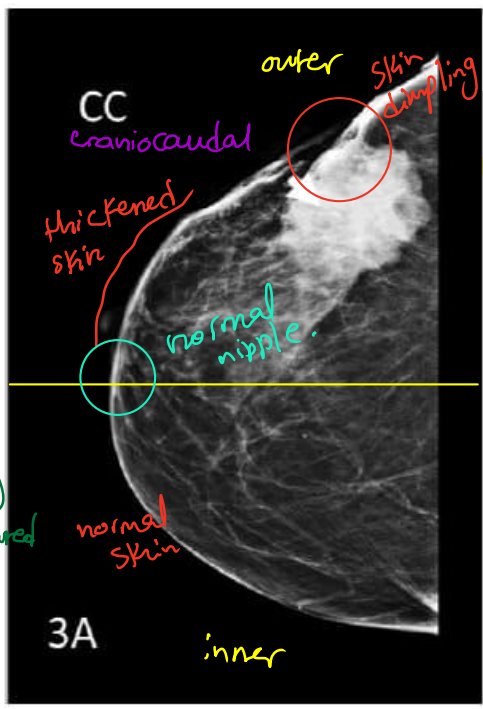
Description
Microlobulates
4cm

Upper outer

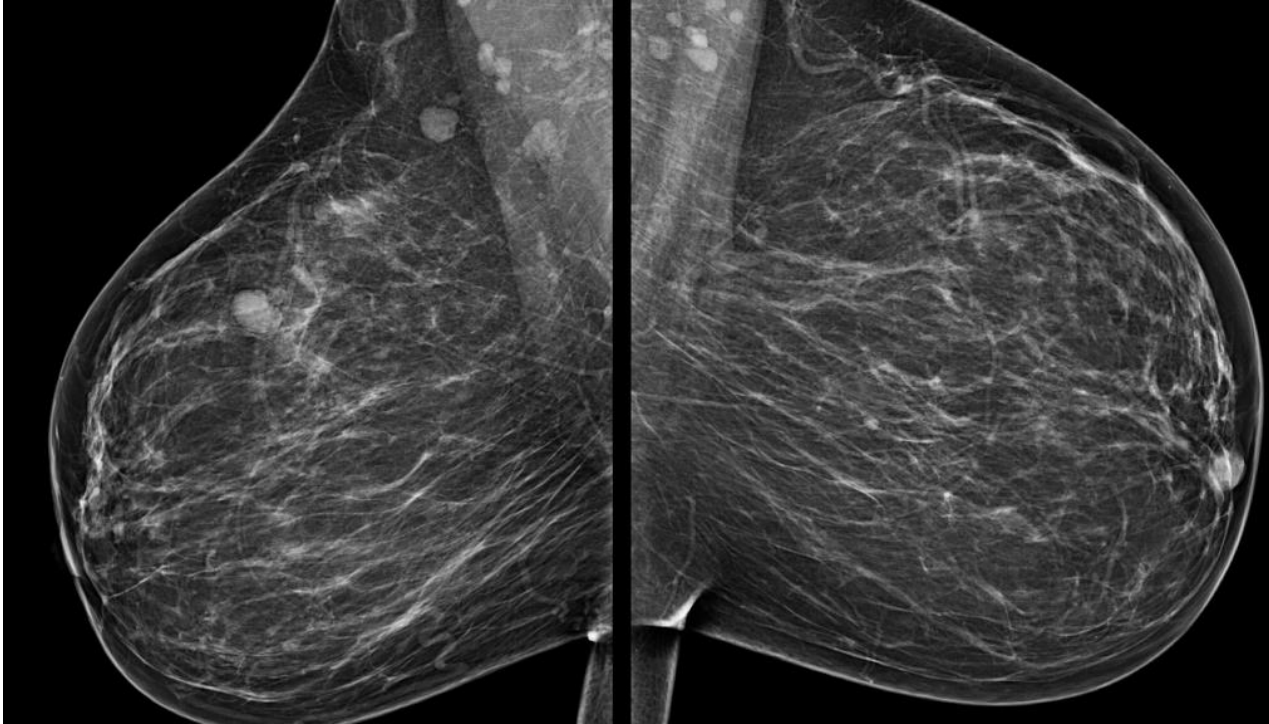
Skin thickening and retracted (dimpling)

Ln involved

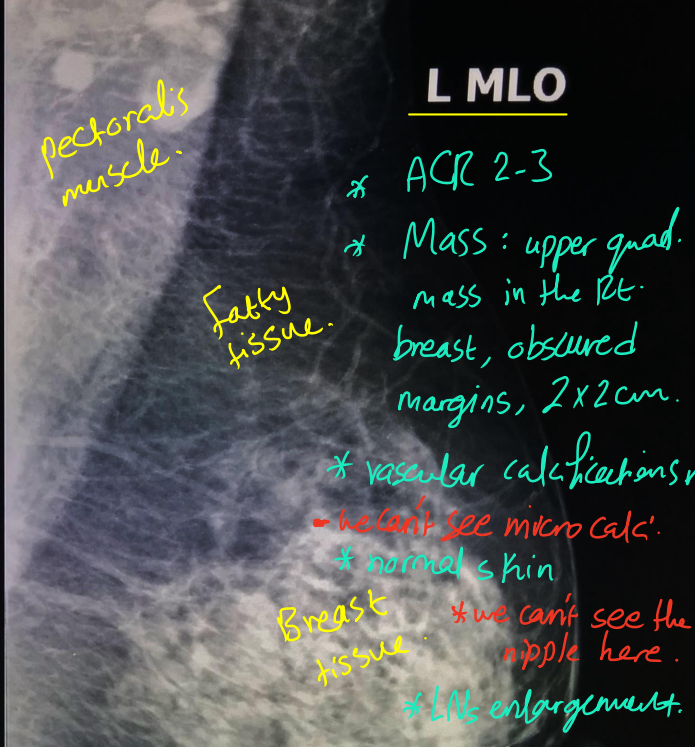
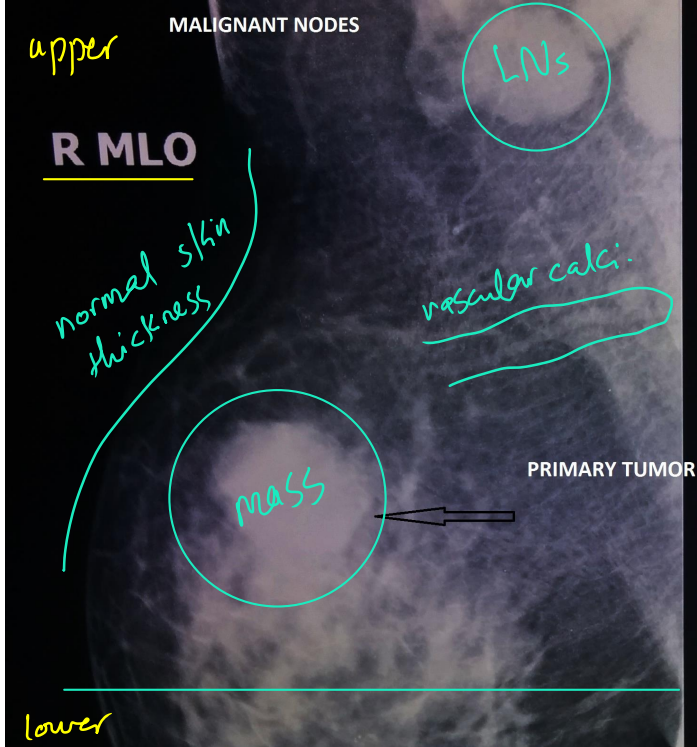
- Calcifications: needs magnification. ≠ no nipple retraction.



mostly it's a malignant mass and we need a biopsy.

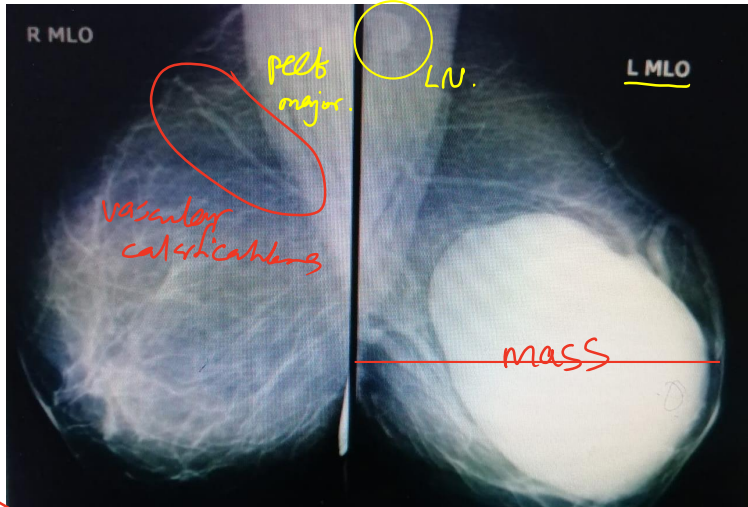
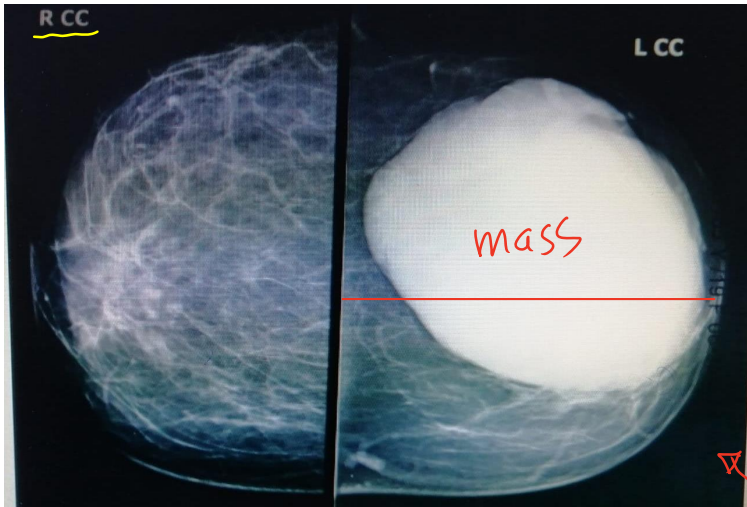


Vascular thickening and regional round masses which are lymph nodes
LNs are associated with benign condition, how : masses on muscle and



Blood vessels are not seen unless they are calcified malignant
 Ln malignant j large irregular with presence of irregular masses

} mostly malignant mass.



- * Density → acceptable (ACR-2 maybe).
- * Mass → large + well defined edges (regular), retroareolar mass.
- * Vascular calcifications
- * no skin thickening.
- * LNs. enlargement.

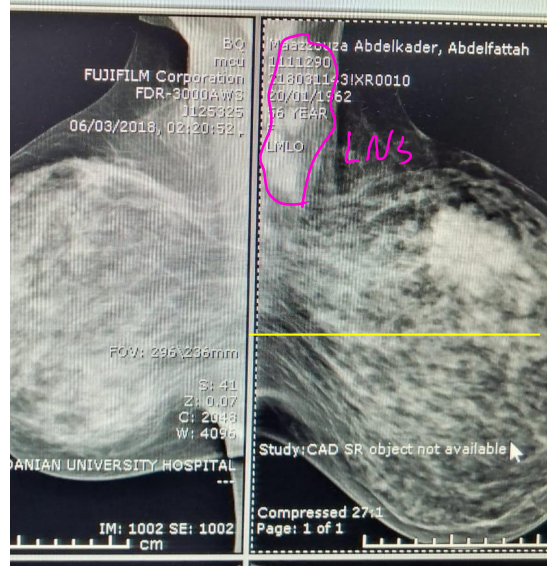
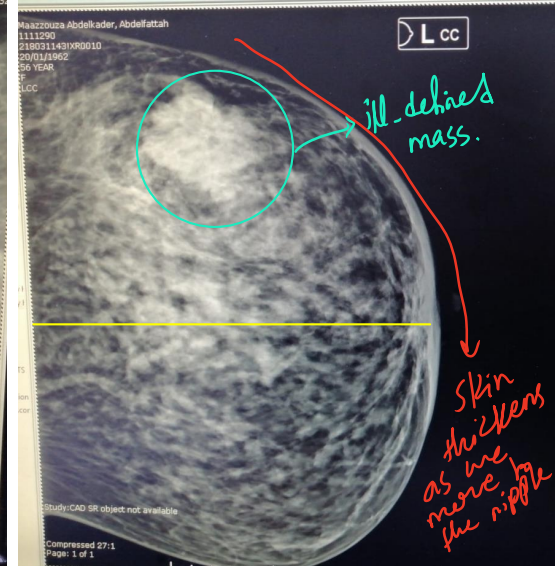
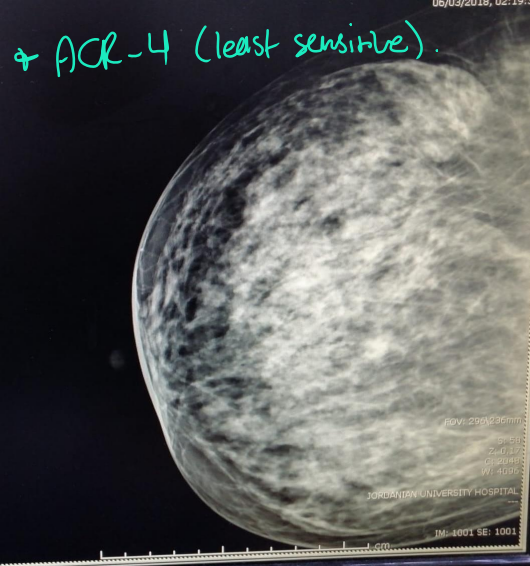
• More than 1 quadrant

• Filloidus tumor



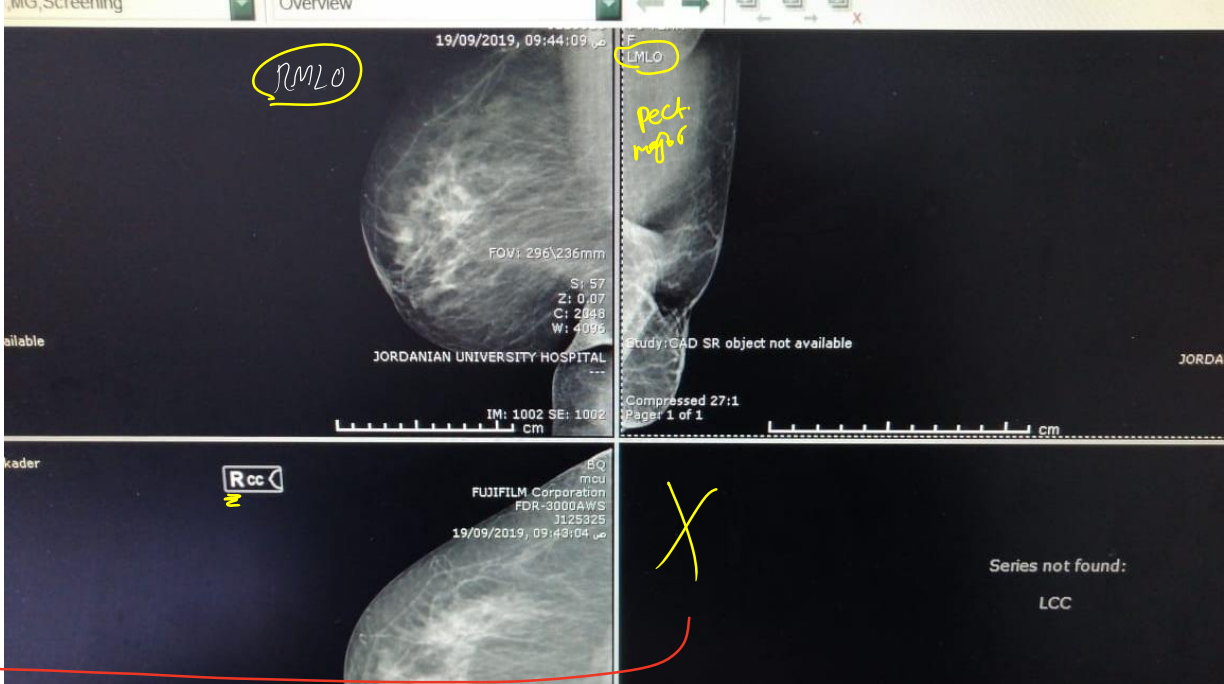
* The biopsy determines.

→ we are not able to determine if it's upper/lower or inner/outer.



All malignant features

- ♣ Mass ⇒ Upper outer quad of the left breast.
- ♣ Skin thickening in the left breast.
- ♣ normal nipple.
- ♣ LNs enlargement.



No left breast j post mastectomy

Reconstruction is done after the treatment is over to avoid infection

Dense tissue = appears as net

Diffuse calcification : dots not net