Breast

BI-RADS CATEGORIES

BI-RADS 0 (incomplete): Recommend additional imaging -- mammogram or targeted ultrasound

BI-RADS 1 (negative): Routine breast MR screening if cumulative lifetime risk ≥ 20%

BI-RADS 2 (benign): Routine breast MR screening if cumulative lifetime risk ≥ 20%

BI-RADS 3 (probably benign): Short-interval (6-month) follow-up

BI-RADS 4 (suspicious): Tissue diagnosis

BI-RADS 5 (highly suggestive of malignancy): Tissue diagnosis

BI-RADS 6 (known biopsy-proven malignancy): Surgical excision when clinically appropriate

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

FNAC (Breast)

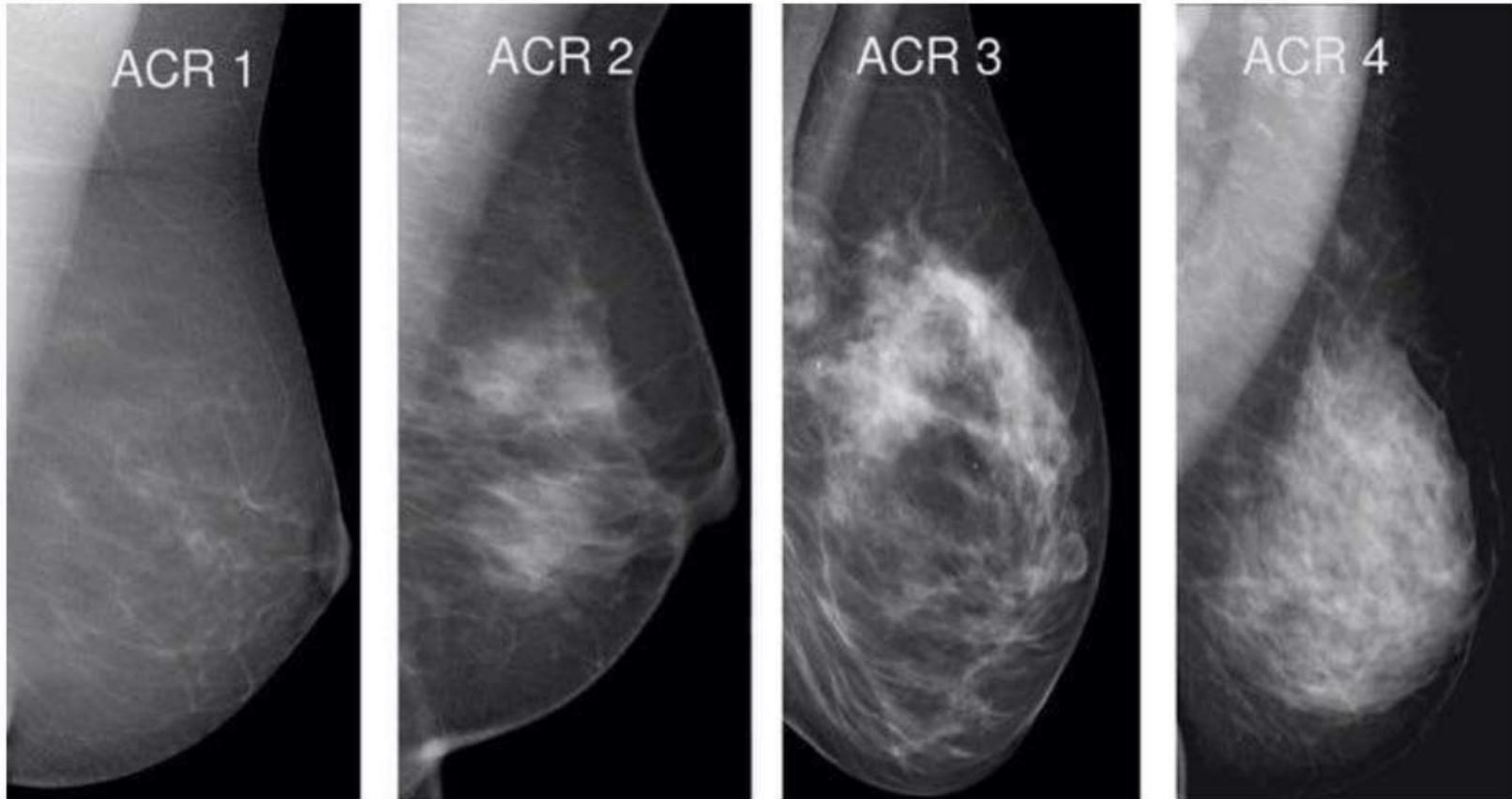| C1: Unsatisfactory |
| C2: Benign |
| C3: Atypical cells |
| C4: Suspicious cells |
| C5: Malignant |

ACR classification of breast density
ACR = American College of Radiology

old age ————————————————→ young age

There are four categories of mammographic density :

ACR 1 : almost entirely fatty. 0 – 25 %

ACR 2 : scattered areas of fibroglandular density. 25 – 50 %

ACR 3 : heterogeneously dense. 50 – 75 %

ACR 4 : extremely dense. > 75 %

Metrics	Results	ACR type	Density percentage value (%)	Sensitivity (%)	Specificity (%)	Accuracy (%)
TP	97	1 (fatty breast)	<10	90.65	73.59	85.00
FP	14					
TN	39					
FN	10					
TP	66	2 (Fibro-glandular dense)	25-50	61.68	90.57	71.25
FP	5					
TN	48					
FN	41					
TP	22	3 (Heterogeneous dense)	50-75	20.56	96.23	45.63
FP	2					
TN	51					
FN	85					
TP	6	4 (Extremely dense)	75>	5.61	98.11	36.25
FP	1					
TN	52					
FN	101					

TNM Class	Criteria
T0	No evidence of primary tumor
T1a	Carcinoma in situ
T1	< or = 2 cm
T1m1c	microinvasion .1 cm or less
T1a	>.1 to .5 cm
T1b	>.5 to 1 cm
T1c	>1 to 2 cm
T2	>2 to 5 cm
T3	>5cm
T4	Any size tumor with direct extension to : a) Chest wall or b) skin
T4a	Chest wall, not including pectoralis muscle
T4b	Skin edema, ulceration, satellite skin nodule
T4c	4a and 4b
T4d	Inflammatory carcinoma

TNM Class	Criteria
Nx	Regional lymph nodes cannot be removed
N0	No regional lymph node metastasis
N1	❑ Metastasis to movable ipsilateral axillary lymph nodes ❑ 1–3 ALN
N2	❑ Metastases in ipsilateral axillary lymph nodes fixed of matted (N2a) or met. only in clinically apparent ipsilateral mammary nodes without clinically evident axillary lymph nodes. (N2b) ❑ 4–9 ALN
N3	❑ Metastases in ipsilateral axillary or infraclavicular lymph nodes (N3a) or clinically apparent ipsilateral internal mammary lymph nodes (N3b) or ipsilateral supraclavicular lymph nodes (N3c) ❑ 10 or more ALN
MX	Distant metastasis cannot be assessed
M0	No distant metastasis
M1	Distant metastasis

Q1: What is the finding? Male breast nipple changes

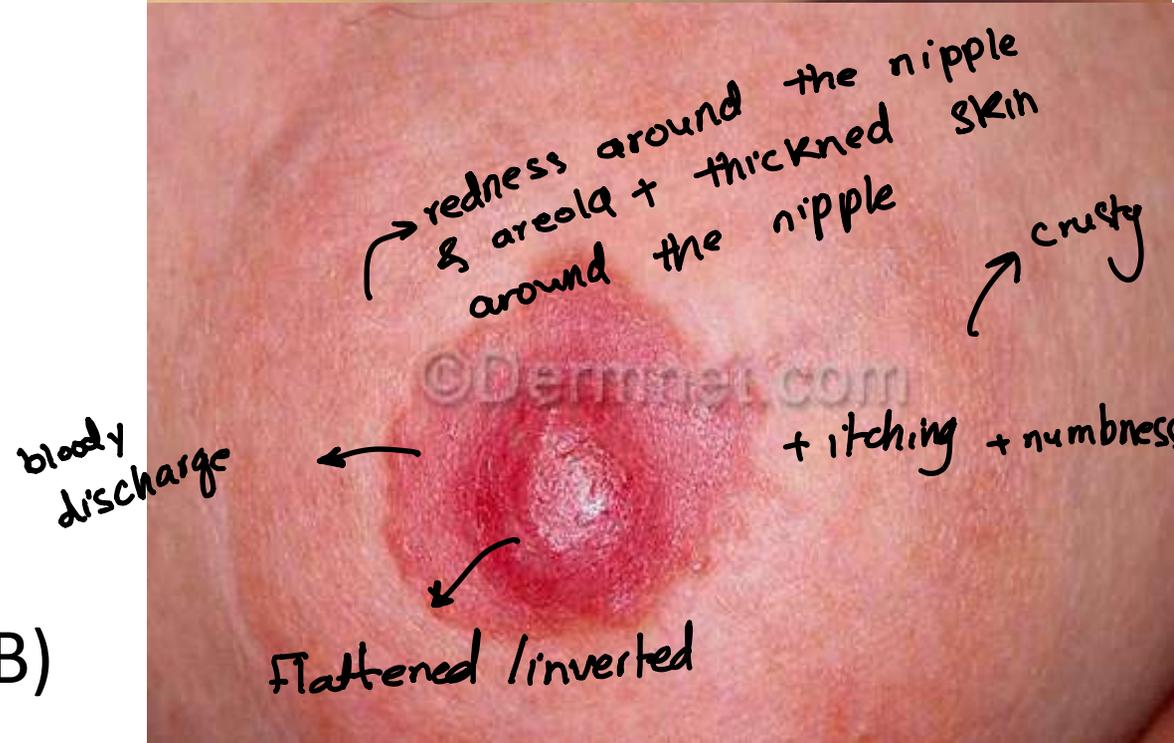**Q2: Most common gene mutation associated with male breast cancer?** BRCA 2

Q: A nipple biopsy for a female patient shows large cells with a clear cytoplasm, high grade nuclei and prominent nucleoli:

Q1: What is your Dx?
- Paget disease of the breast/nipple (PDB)

Q2: Mention 2 immuno-histochemical tests to differentiate it from melanoma?
1) CEA (pos. in PDB)
2) Protein S100 (neg. in PDB)

erythematous, eczematous
d2 of nipple & areola

redness around the nipple & areola + thickned skin around the nipple

crusty

+ itching + numbness

bloody discharge

©Dermnet.com

Flattened/inverted

① acute masaitis ➝ ① 1st 3 months postpartum from lactating
② improper nursing
③ stress & sleep deprviation   ③ FB

② granulomatous ➝ ① ideopathic   ④ Recurring subareolar abscess
② FB   (zuska d2)
③ wegner d2
④ sarcodoisis

Q1: What is the Dx?
- Breast mastitis, Abscess

Q2: MCC? as organism
- S. Aureus

Q3: Mx?
- Abx
- Incision & Drainage

① Continous breast feeding, manual pomp between feeding, start with uneffected one
then to affected + ↑ frequancy
② analgesic
③ ↑ Fluid & nutrition
④ warm breast compresseor

① Breast swelling
② Breast lump
③ redness

in hx:
① pain/burning while breast feeding

in exam:
① tenderness
② warmth

Q: 50 yo female has breast pain, breast only shows skin redness?

+ itching

Q1: What is the Dx?

- Inflammatory breast cancer

Q2: Diagnostic procedure?

- Tissue biopsy CNP

alone X

Q3: Mx? → alone X

- Mastectomy + Radiotherapy

الازم مع بعض

Q4: What is the modality of Dx?

- Triple assessment → Hx, PE, imaging
- Mammogram + US

+ Biopsy

Q5: According to TNM stage system the T stage is?

- T4d

by inspection ÷
① swelling
② erythema

by examination
① LN involvement
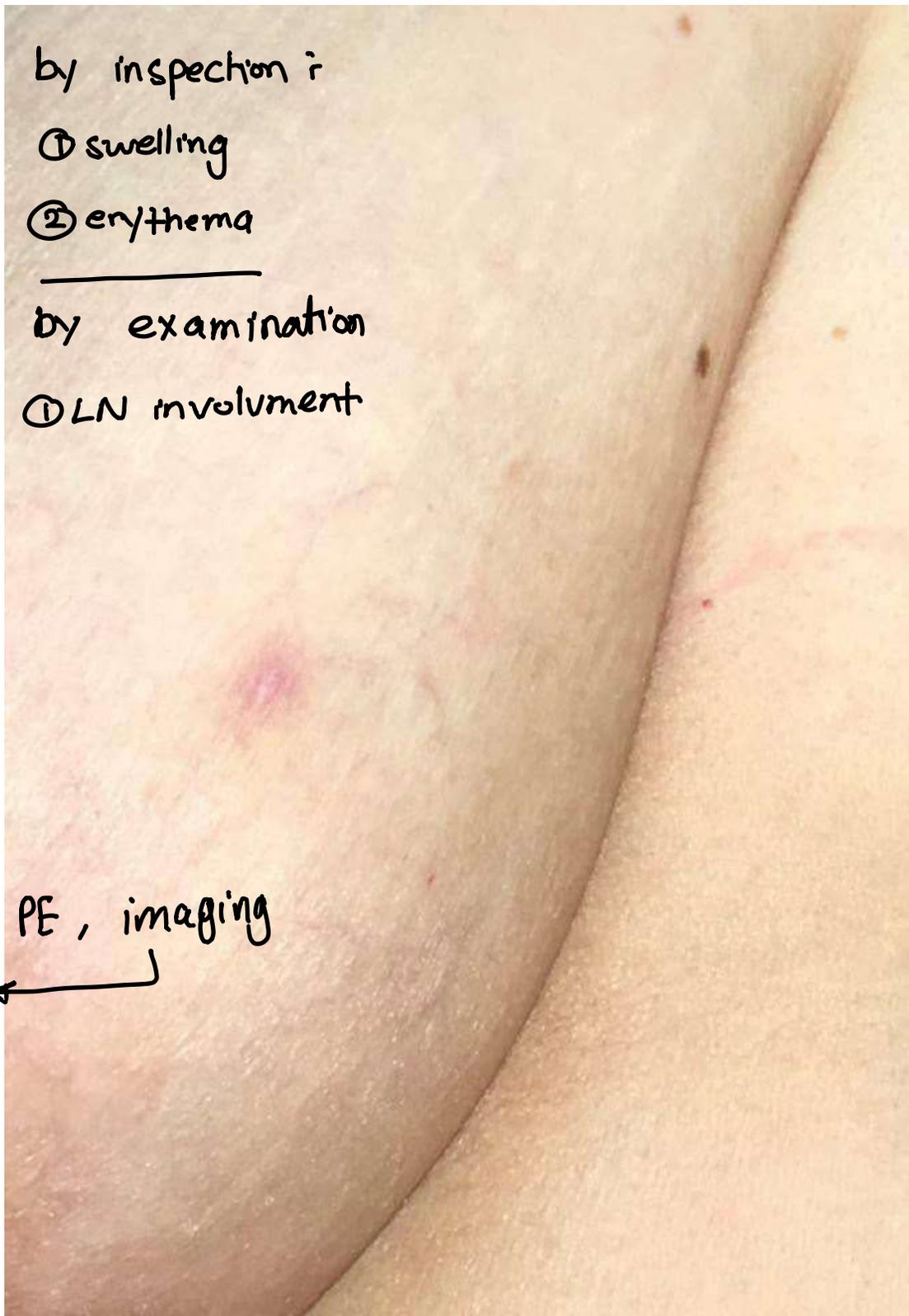
Sign of Ca

Nipple retraction (inversion).

Peau d' orange (orange peel).
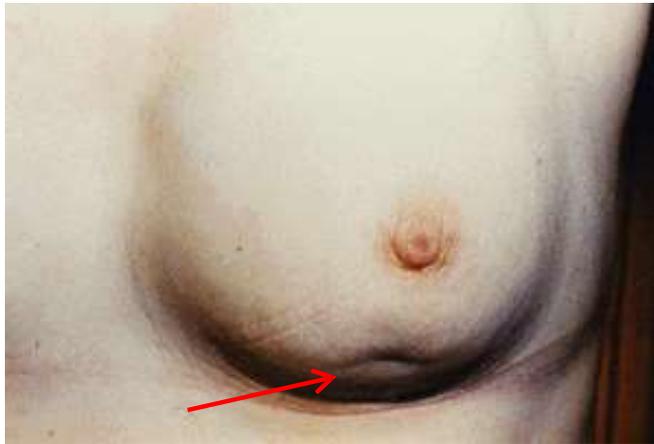
Sign of Ca

Skin dimpling

Paget disease of the nipple (eczema around the nipple)

Duct ectasia

duct ectasia :bilateral inversion and displaying transverse slit pattern

-AKA Plasma cell mastitis./ *Periductal mastitis*

-Condition Mimics cancer (nipple ① retraction ②, inversion ③, pain, Nipple discharge ④). + *sub areolar palpable mass*

↓*Bloody or greenish in color*

-disorder of <mark>peri- or post-menopausal age</mark>.

-Self-limiting condition. *conservative or surgical exision of main duct*

Normal duct

Dilated and clogged duct

Lobe

Normal milk duct

Clogged milk duct

Fine needle aspiration (FNA)

** **Advantages** :
- done in office
- minimal discomfort.

** **Disadvantage** :
- may not always rule out cancer when it's negative.
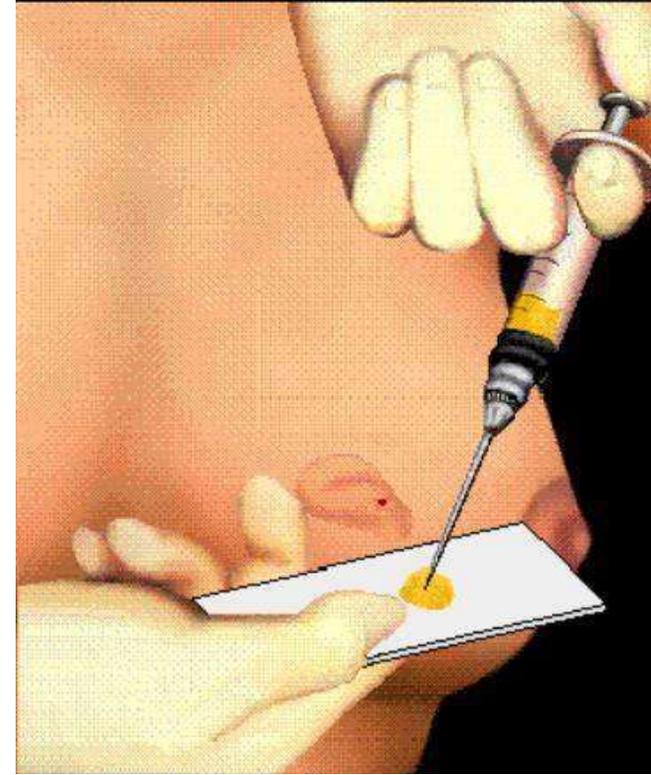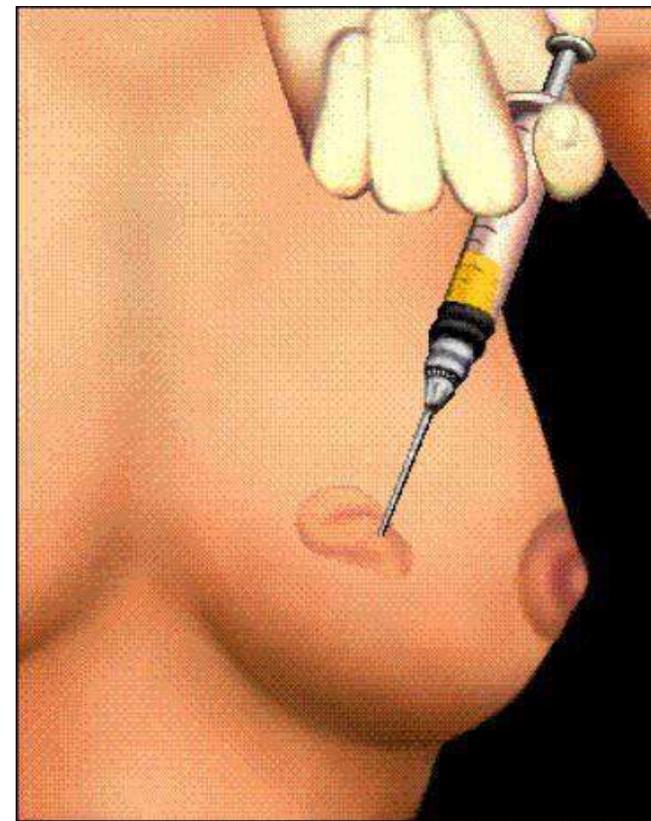
Incisional biopsy

- Local anesthesia, often with mild sedation.
- Only part of the tumor is removed for Dx.
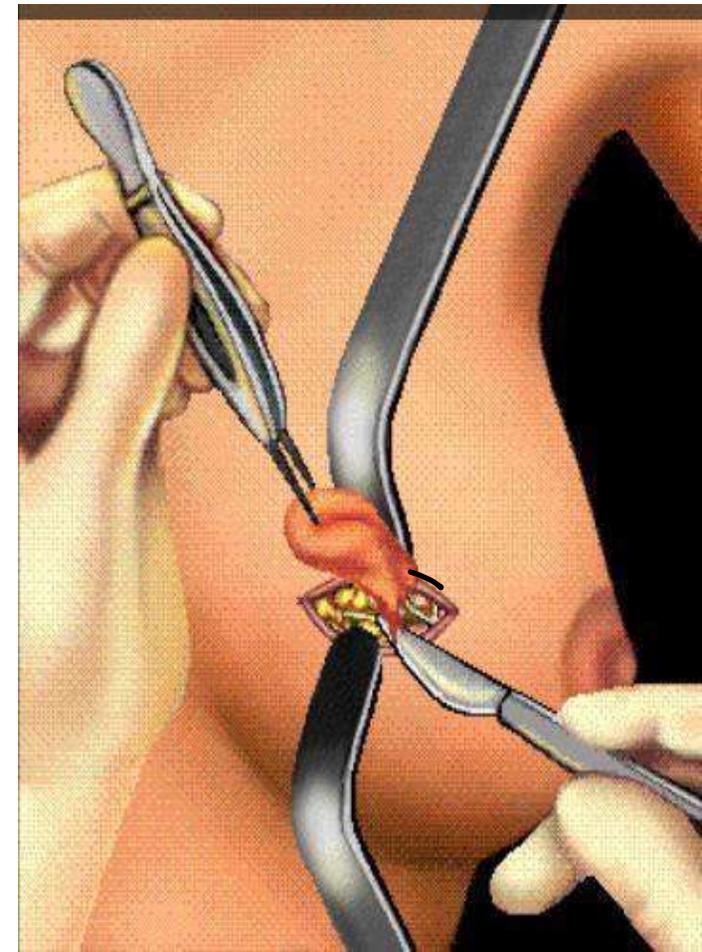- Outpatient procedure.
- Done when the tumor is large.
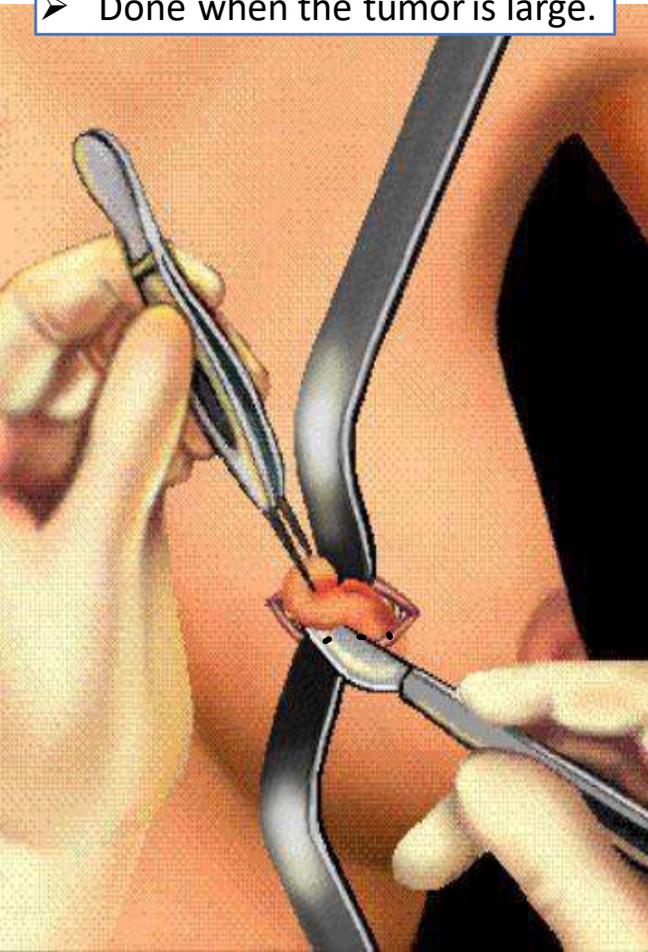
Excisional biopsy

- **The mc biopsy procedure**.
- Outpatient procedure.
- The entire lump is taken out using a small incision.
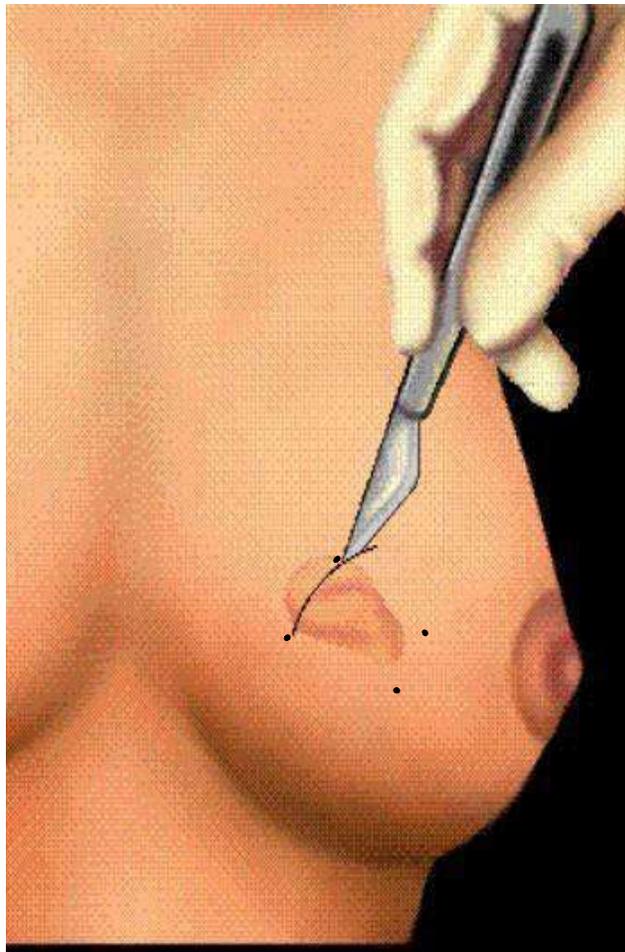
Lumpectomy

- Excisional biopsy may be sufficient for the lumpectomy, if the margins were negative.
- With radiation therapy, it is as effective as modified radical mastectomy.

Radiotherapy

Side effects (self limited)

① skin reddening & irritation/ ② darkening of the skin/ ③ blistering/ ④ minimal ↓ in blood counts/ mild fatigue/ ⑤ lymphedema in the arm (arm sleeves are used to control the swelling).

swelling

Chemotherapy

Side effects

Common SE for any chemo

① hair loss/ ② ↓ blood counts/ ③ nausea & vomiting/ ④ ↓ platelet count when high dose is used/ ⑤ mouth sores/ ⑥ diarrhea/ loss of appetite/ wt gain/ menopause.
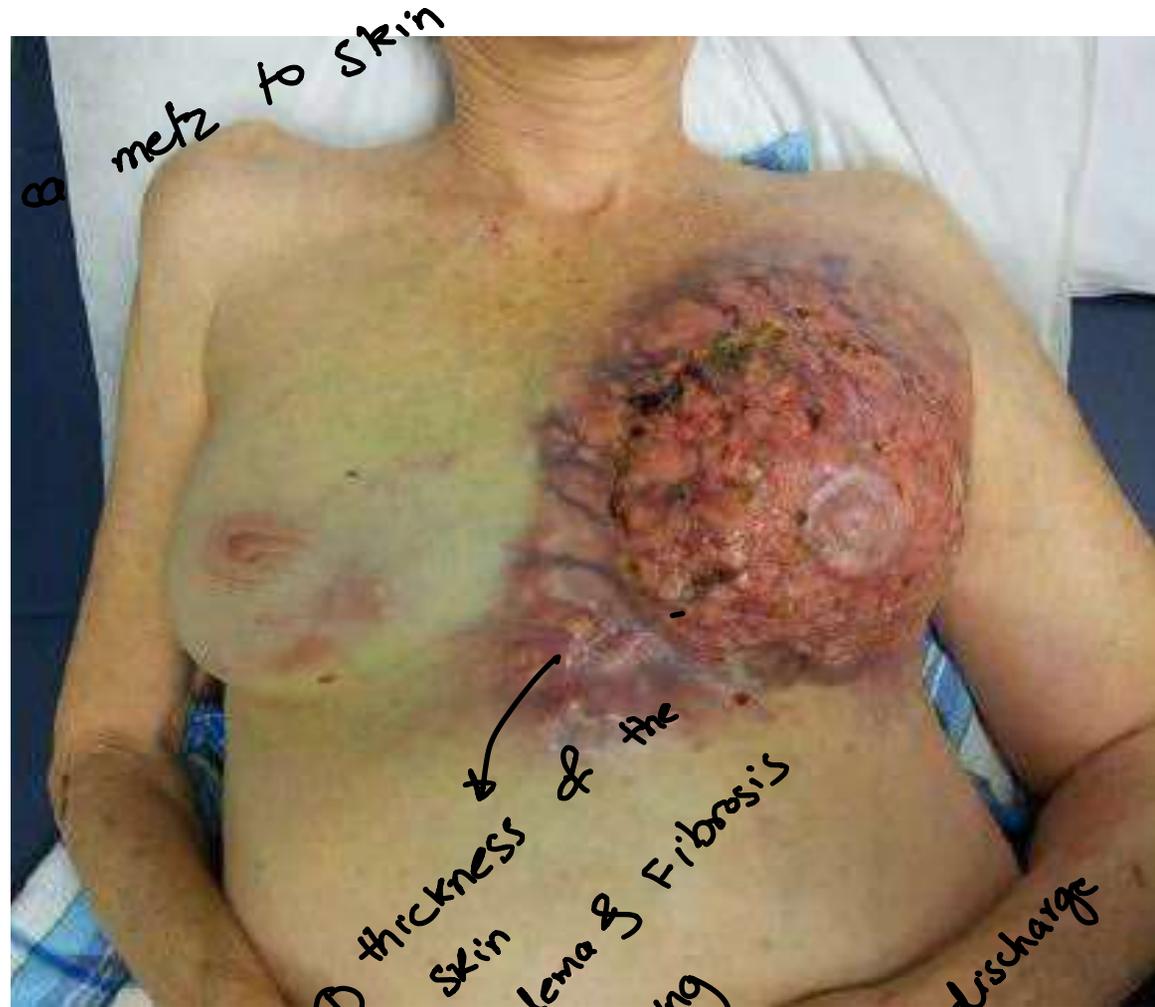
↓ immunization

Q1: What is the pathology?

Breast ca metz to skin
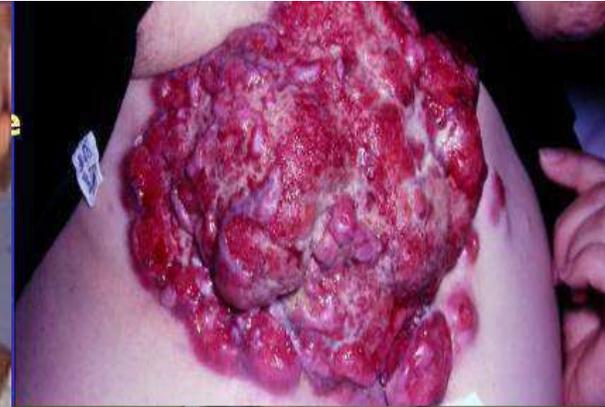
- Carcinoma en cuirasse

Q2: What is its TMN?

- <u>Stage 4</u>

4A → chest wall

4B → skin

4C → A+B

4D → inflammatory breast ca

① thickness & the skin

② edema & Fibrosis
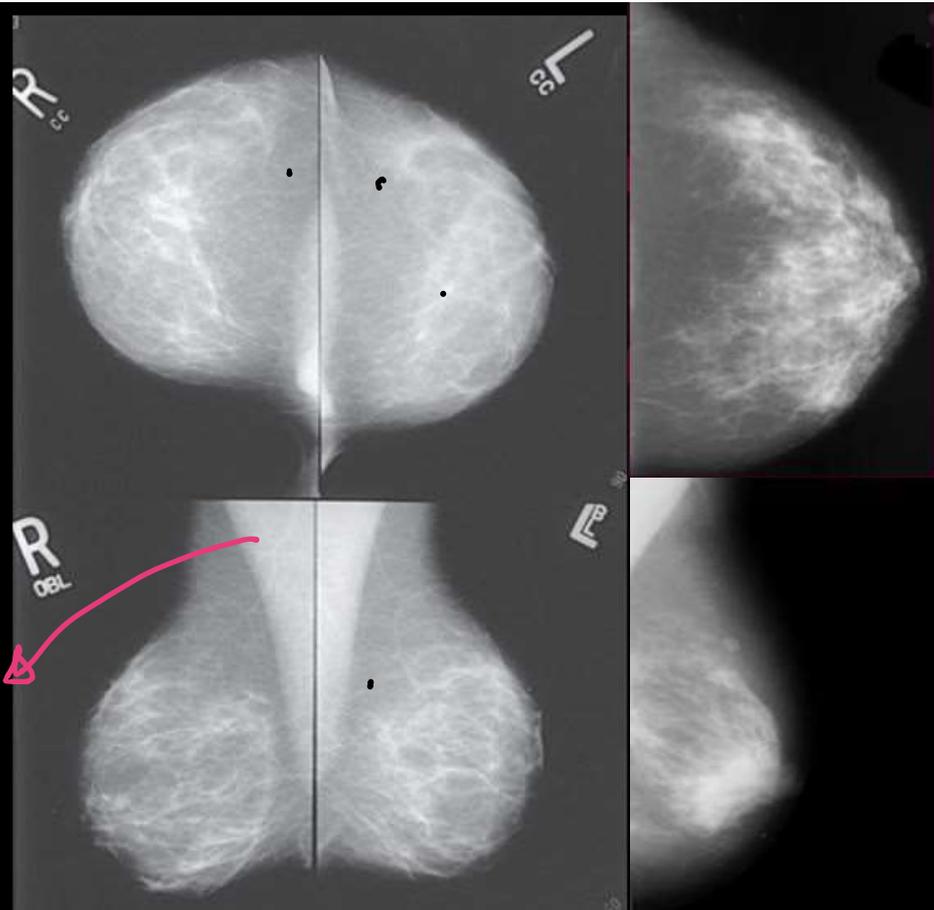
③ bleeding

④ pruritus

⑤ Foul smelling discharge

Q: Name the following views for mammogram:
- Craniocaudal (CC)
- Mediolateral Oblique (MLO)

Craniocaudal (CC)

Mediolateral oblique (MLO)

Pectoralis major

Q1: Name the study?

- Mammogram

Q2: Mention 2 abnormalities?

- Mass with irregular border and calcification

Q3: What is the Dx?

- Breast Ca

Q4: How to confirm your Dx?

- Biopsy
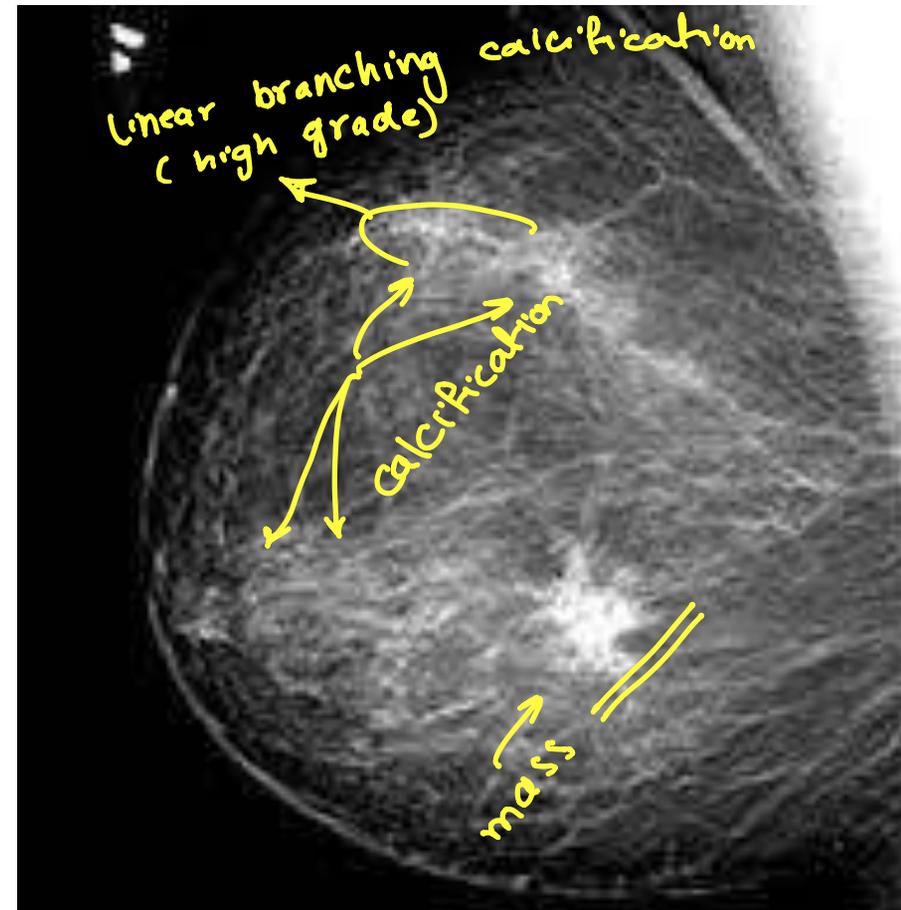
Q1: What is this view?

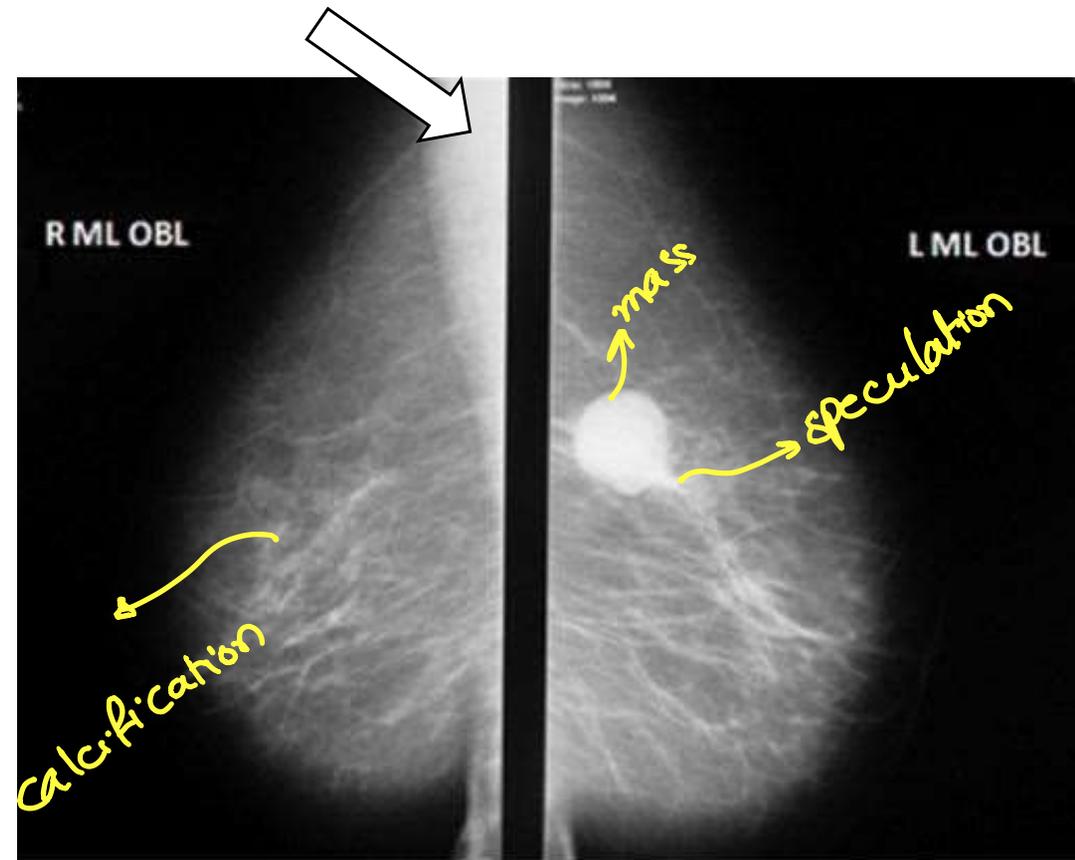- Mediolateral oblique

Q2: What is this structure (arrow)?

- Pectolaris major muscle

Q3: What are the malignant changes seen on mammograms? Mention 3?

1) Calcifications
2) Speculations
3) Mass with greater density than normal tissue

Q: A 23-year-old single female presented to the clinic with rapidly growing (9cm) left breast mass over the last 6 months. The mass was irregular, hard and fixed at the time of examination: + painless

Q1: Your Dx?
- Phyllodes tumor

Q2: What is this structure (arrow)?
- Pectolaris major muscle

Q3: if it is malignant, what is the common route of METS?
- Hematogenous

Q4: The mc site of METS?
- Lungs

① well defined oval mass

② coarse calcification

هنا

Q: Female with ACR of 4 and BIRAD 0:

Q1: What is the % of breast density?
- >75%

Q2: What to do next?
- Birads score: requires further investigations

Q: Breast with Birad 2:
Q1: What is the next step in Mx?
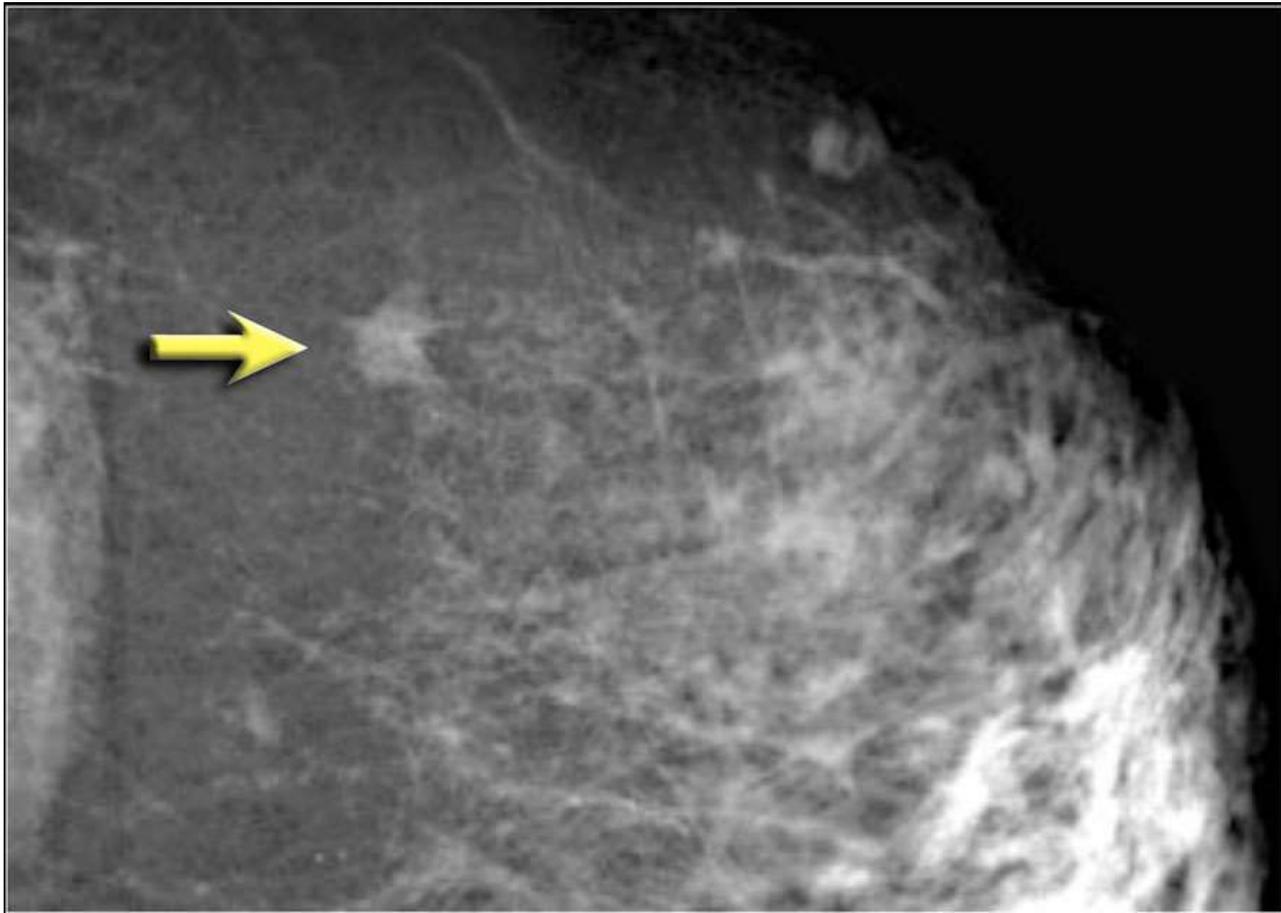- Routine screening
Q2: What is the view in B?
- Mediolateral oblique view
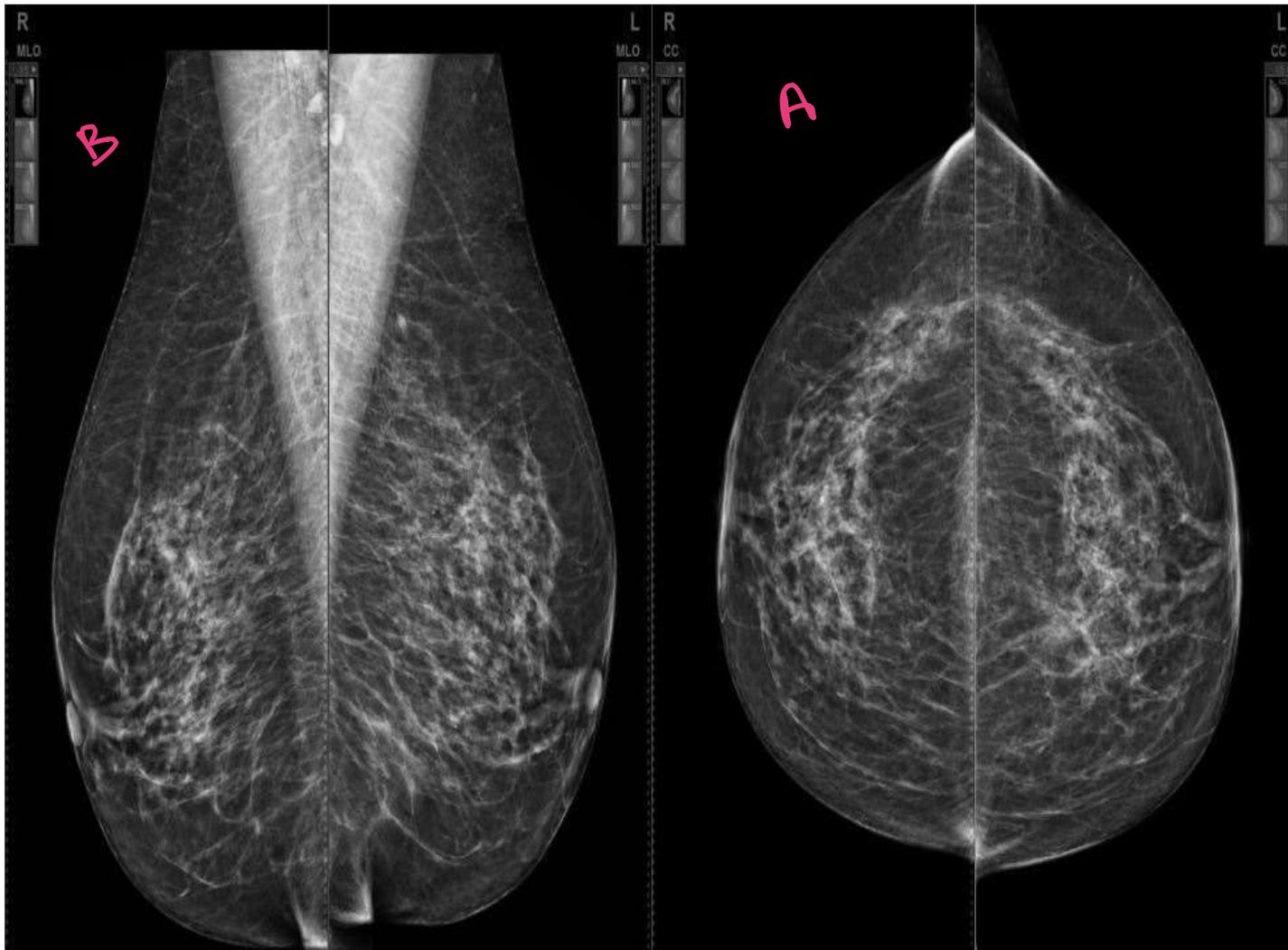
Q: A 37-year-old female presented with right <mark>breast pain</mark> for the last 3 months. A breast ultrasound showed these findings consistent with BIRAD 4c. >50 & <95%.

Q1: The likelihood of malignancy is: ~~50-90%~~

Q2: The clinical T stage "if a diagnosis of invasive carcinoma is proved" is: (T4)

Q: A 40-years old married female presented with a right breast mass for 1-year duration. The patient had a history of a right breast mass excision 3 years ago. Physical exam showed a 4cm hard right breast mass which is fixed to the chest wall & the skin. Mammogram and ultrasound were consistent with BIRADS 5.

1. Based on the TNM, the clinical T stage for this patient is? T4c

2. The likelihood of malignancy based on imaging findings is? >95%
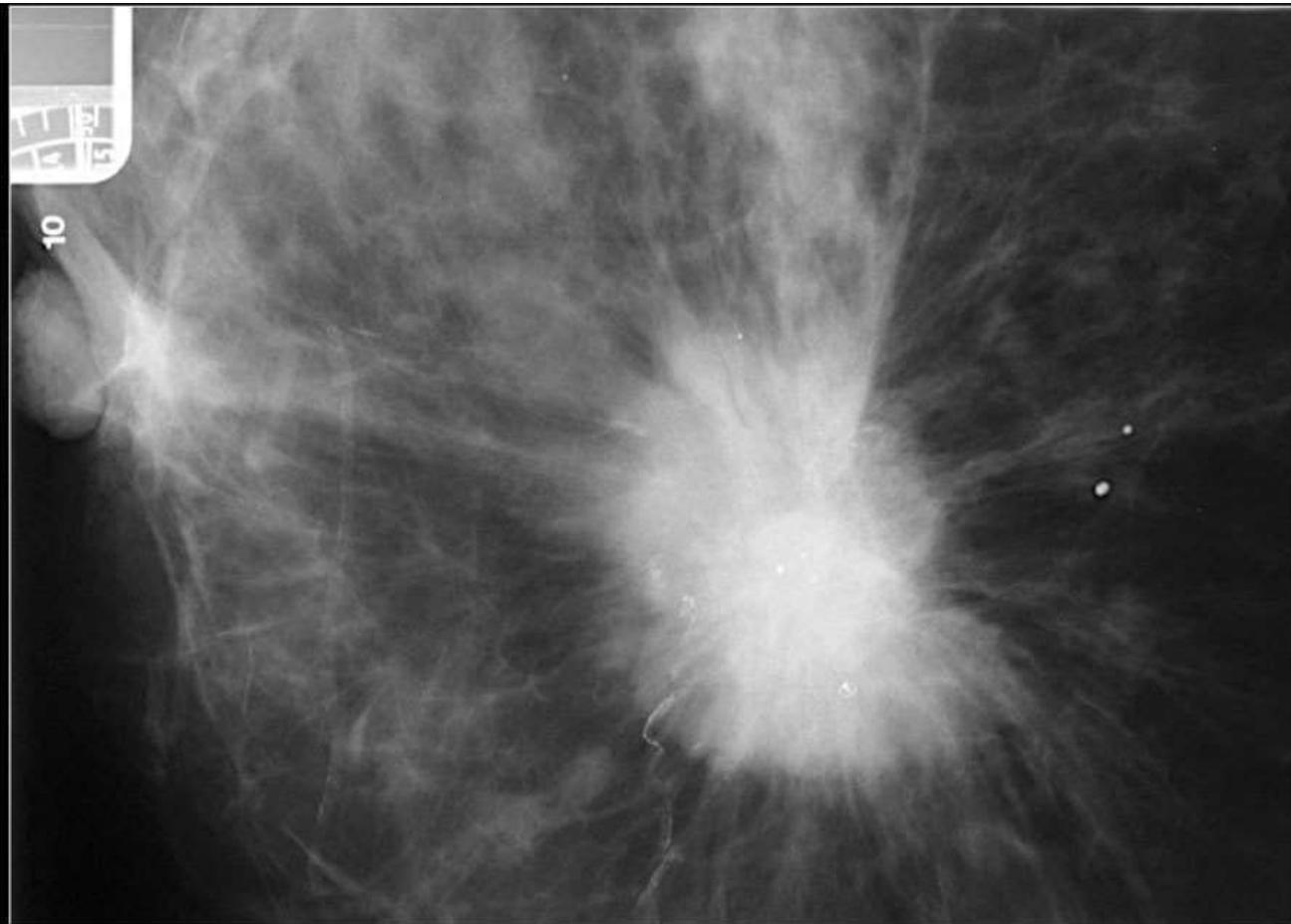
T4a : to chest wall only
T4b : to skin only
T4c : to both
T4d: Inflammatory breast cancer

if this picture is inflammatory breast ca then it's T4d

Q1: What is the pathology?
- Infiltrative ductal carcinoma

Q2: What is its TMN?
- Stage T3

Q3: What is the sign?
- Peau'd orange and nipple retraction, skin dimpling

Q4: Give 2 DDx?
1) Invasive ductal carcinoma
2) Inflammatory breast cancer

Q5: What is the cause of this?
- Invasion of lymphatics, causing lymph nodes obstruction

Q: A pt came complaining of a tender cord like subcutaneous structure, pain, swelling and redness of the left breast:

Q1: Dx? Mondor's Disease (Superficial Thrombophlebitis)

Q2: What is the Mx?

- NSAIDS

- Usually benign and self-limiting condition

in inferior outer quaderant

Q1: What is the name of this study?

- Mammogram

Q2: Mention 2 signs you see.

1) Speculated mass
2) Microcalcifications

Q3: What is the Dx?

- Infiltrative Ductal Carcinoma
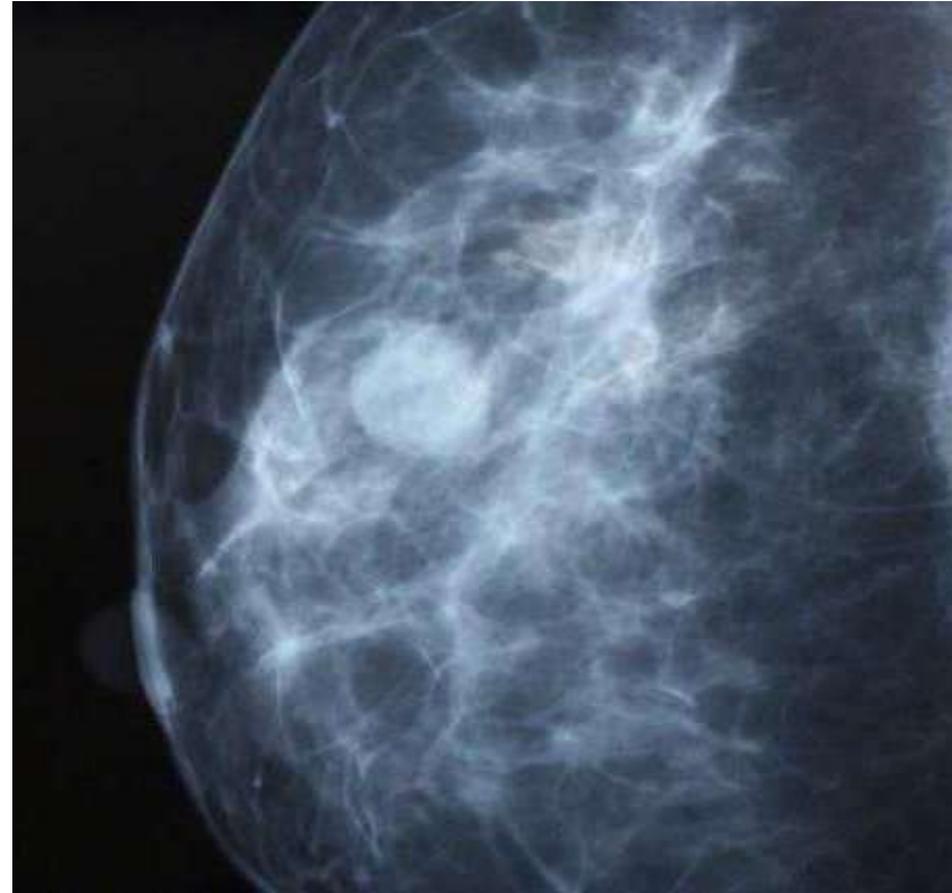
Q1: What is the pathology?
- Phyllodes tumor (Brodie's)

Q2: What is the Mx?
- Wide local excision

1cm free marign ± chemo or Radio

Q3: What is the like hood (%) of this tumor to be benign?
- 90% benign
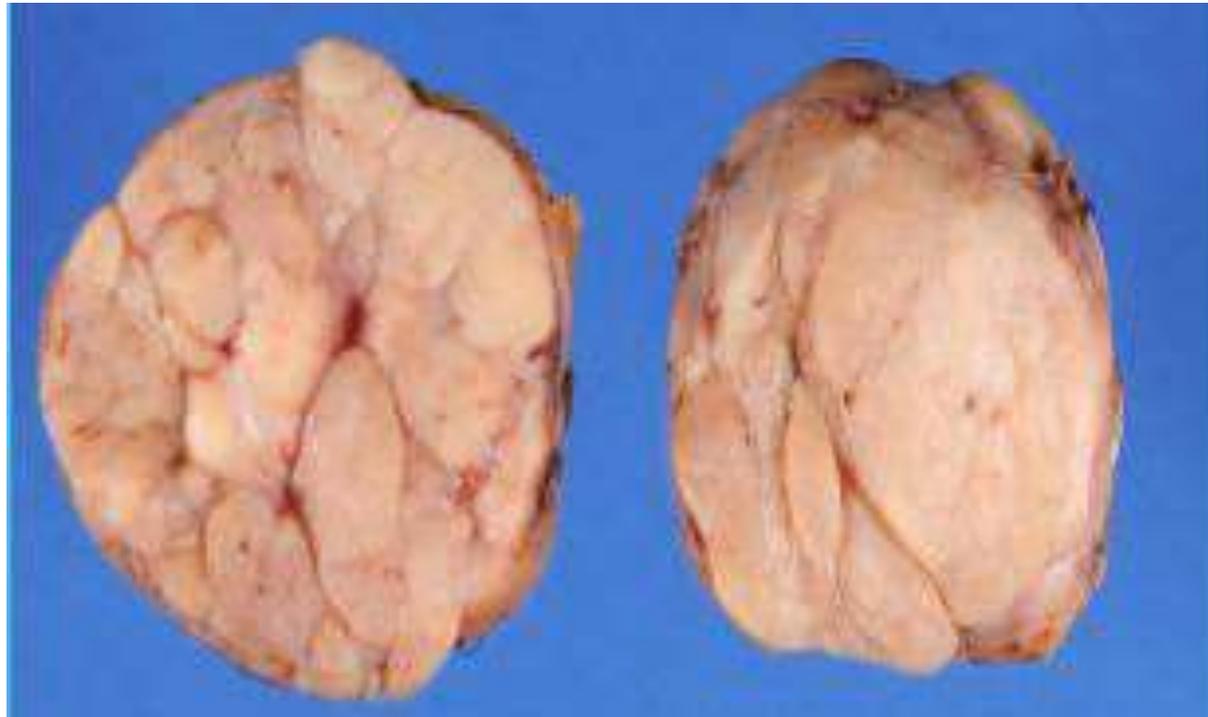
Q: Female with mobile, mouse like lump in one breast:

Q1: What is the Dx?
- Fibroadenoma

Q2: What is the stage according to FNA?
- C2

C1 = unsatisfactory.
C2 = cells present all benign; no suspicious features.
C3 = cells suspicious but probably benign.
C4 = cells suspicious but probably malignant.
C5 = Definitely malignant.

Q: a 35 yo female patient:

Q1: What is the Dx?

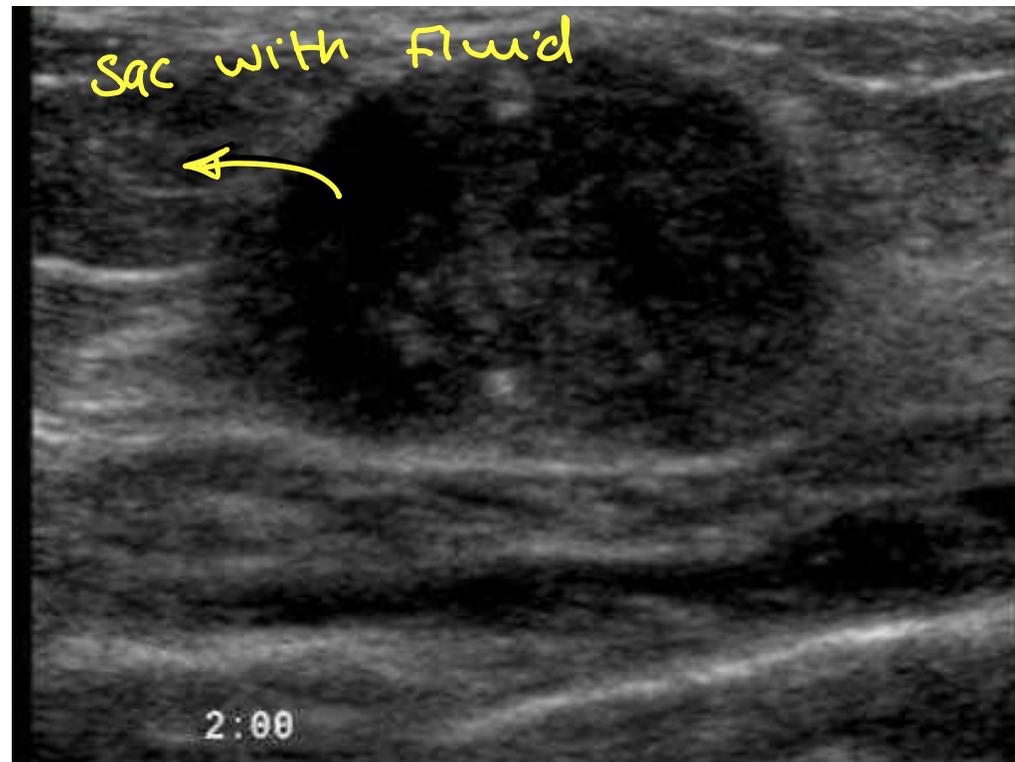- Breast Cyst

Q2: Name the sign (black arrow)?

- Acoustic enhancement

Q3: What are the indications for a biopsy in this female?

1) Bloody aspiration
2) Failure to completely resolve
3) Recurrence after 2nd aspiration
4) Atypical cells
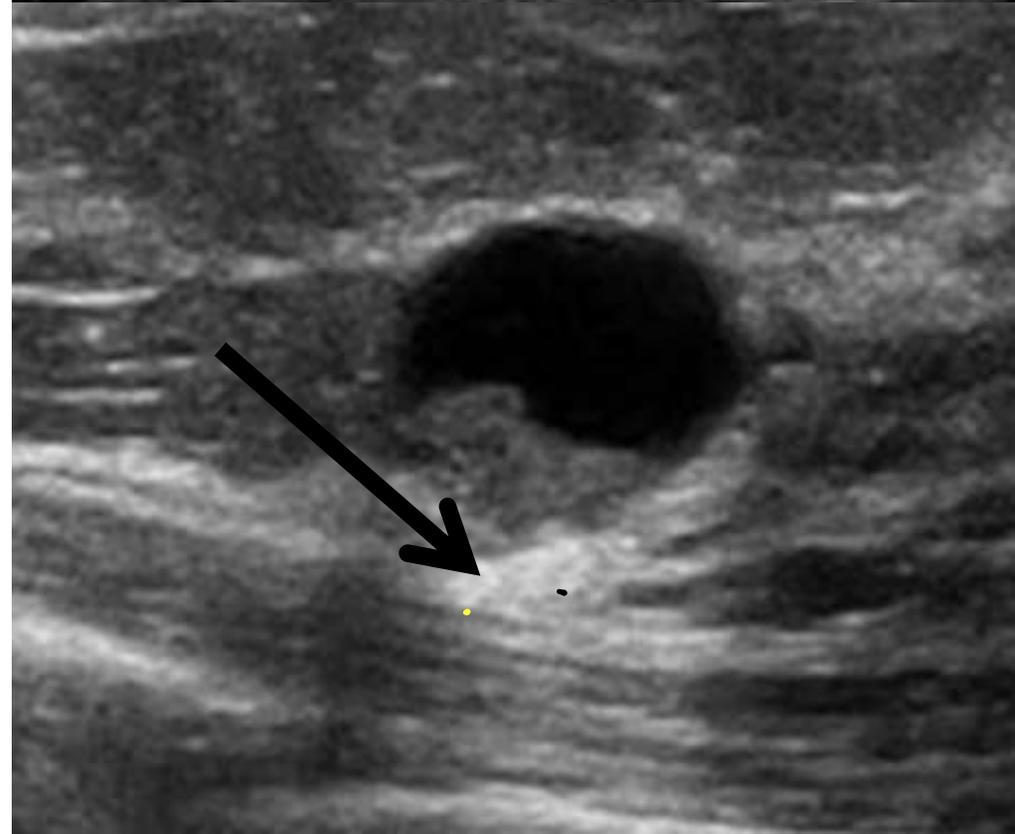
Q1: Describe the discharge?

- Uniductal Bloody Discharge

Q2: What is the pathology?

- Intraductal papilloma

Q3: Give a DDx?

- Intraductal papilloma
- Duct Ectasia
- Ductal invasive carcinoma

Q3: 2 imaging studies?

1) Ductogram, Ductoscope
2) Mammogram, US

Q4: What is the risk of malignancy of this lesion?

- 15%

**Q1: What is the mechanism that the breast cancer causes hypercalcemia?**

- Parathyroid hormone - related protein
(not due to osteoclastic METS)

** Note: The main pathogenesis of hypercalcemia in malignancy is increased osteoclastic bone resorption, which can occur with or without bone metastases. The enhanced bone resorption is mainly secondary to PTH-related protein
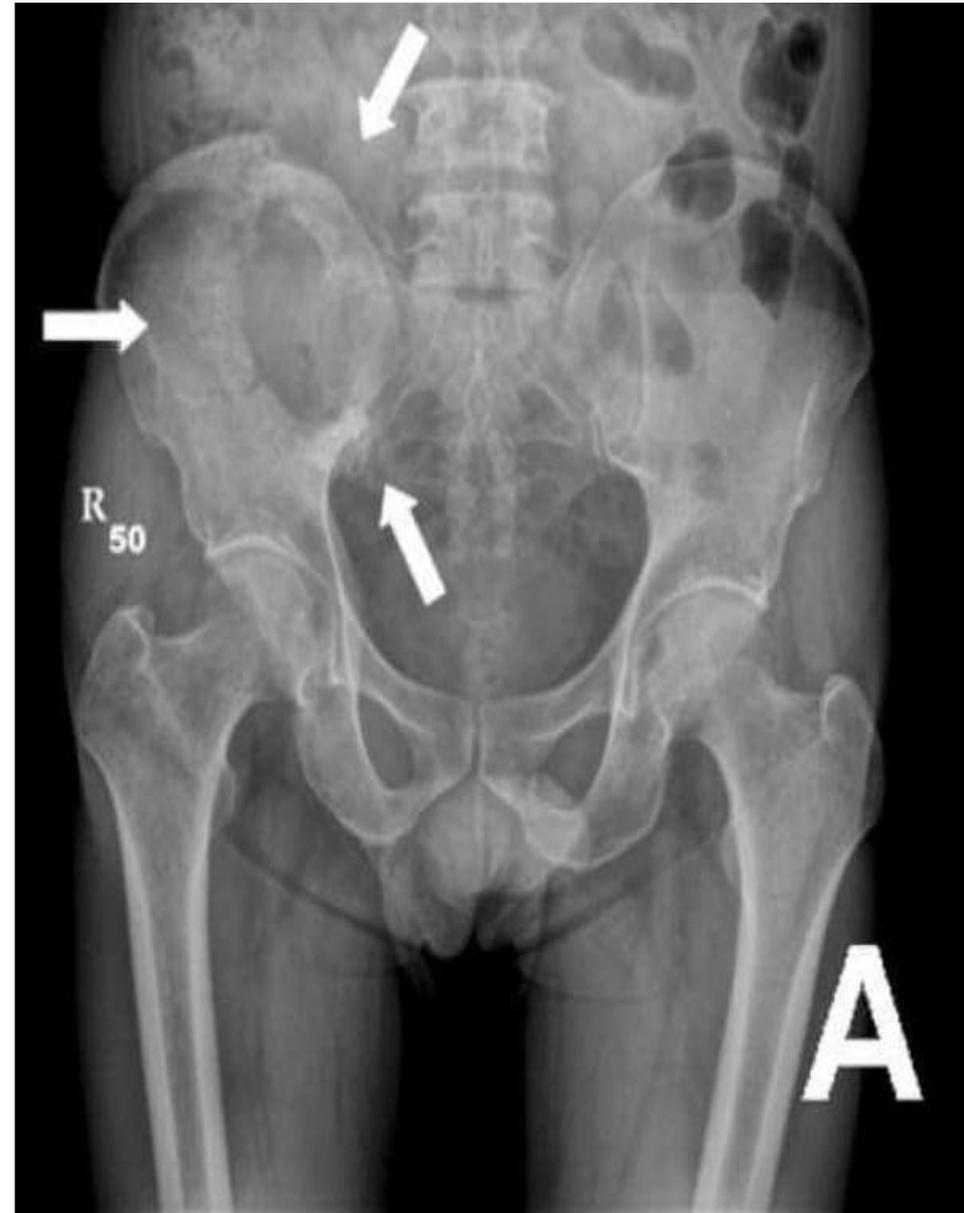
Breast Cyst
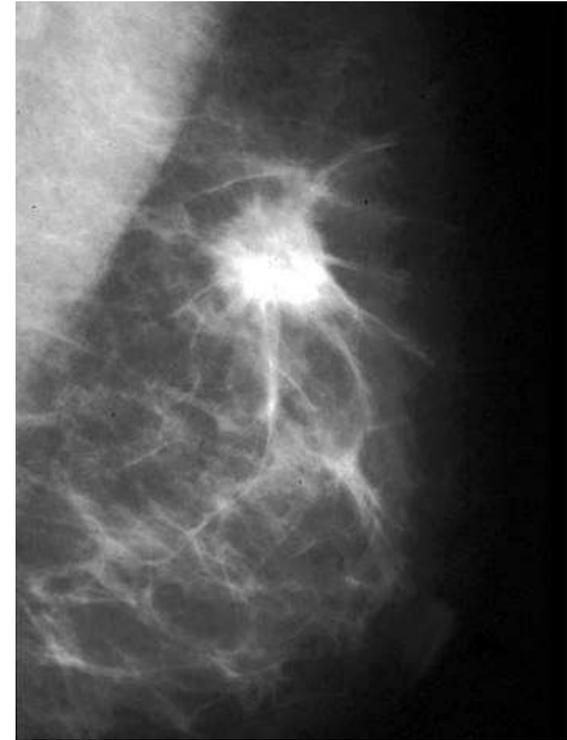
**breast cancer:** dense mass with a spiculated margin.

clustered microcalcification: five or more calcifications, each measuring less 1mm in one cubic cm, the possibility of malignancy increases as a size of individual calcification decreases and the total number of calcification per limit area increases.

↓ calcification size ⟶ ↑ malignancy

↑ numbers ⟶ ↑ malignancy
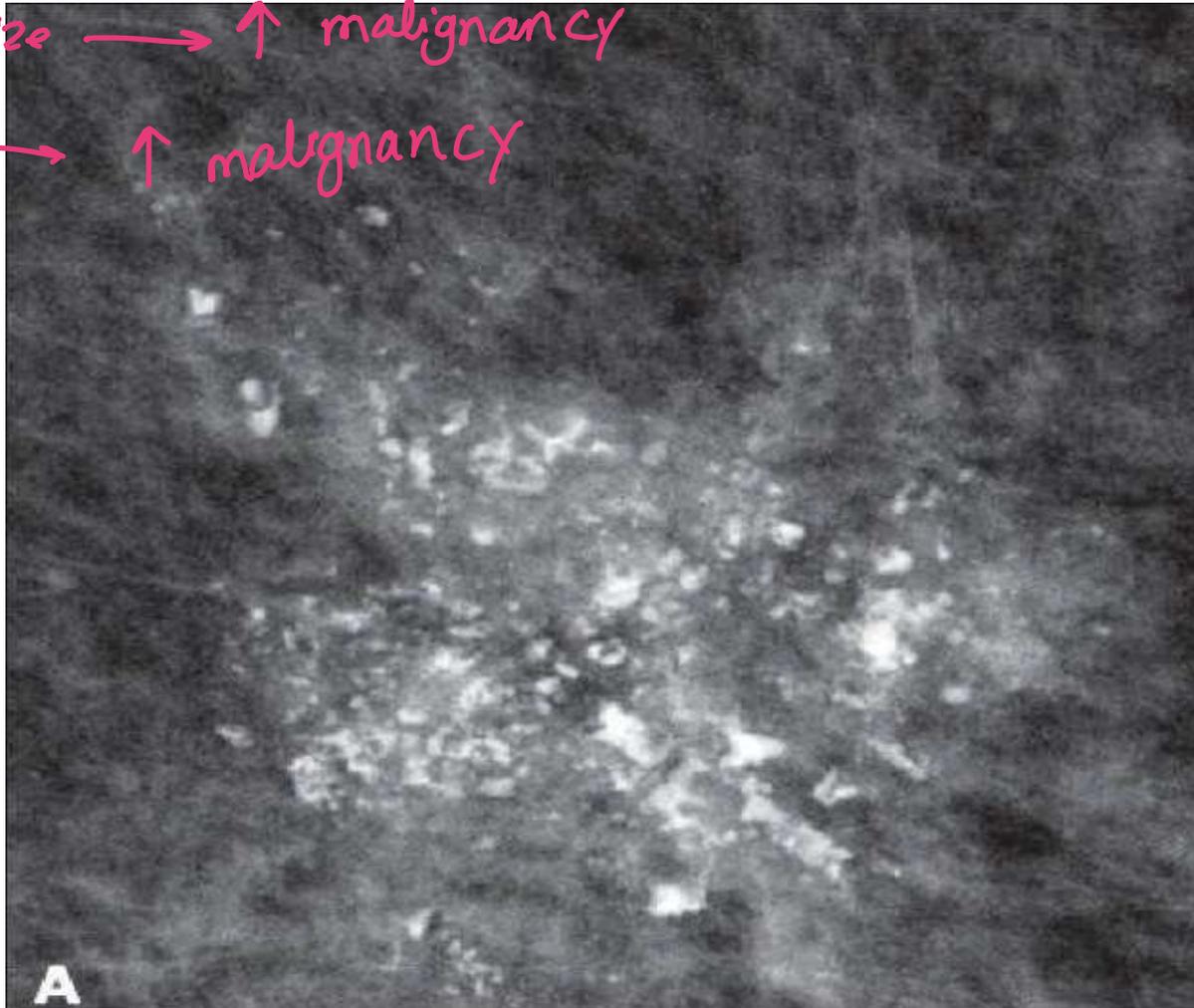
The 2 major signs of malignancy in mammography:

1. Mass with spiculated margins or stellate appearance (the single arrow).

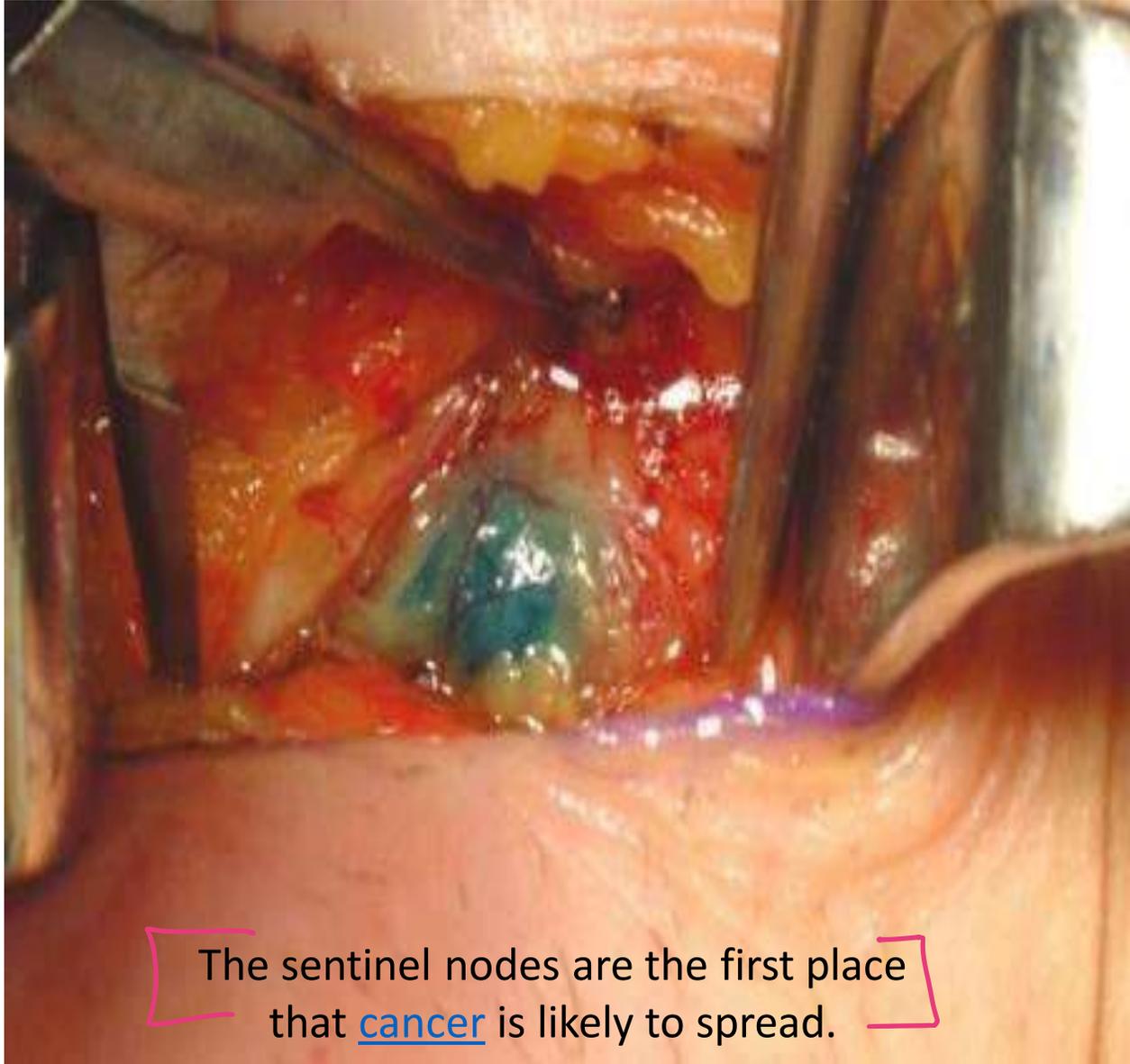2. Microcalcifications (the double arrows).
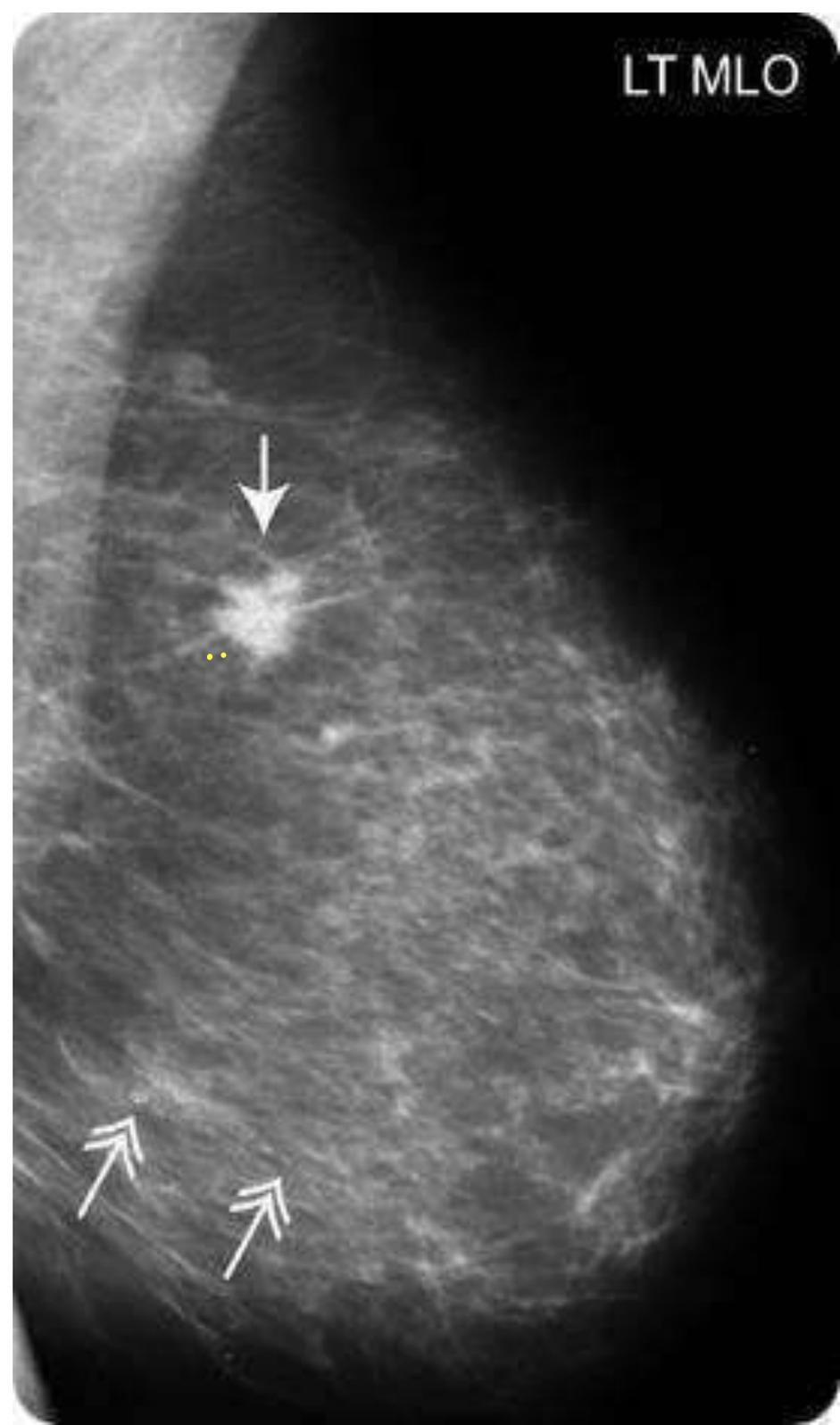
Breast Infiltrating ductal cancer ultrasound.

This shows an irregular ductal tumor with nodules infiltrating the area around it.

Sentinel Lymph Node

The sentinel nodes are the first place that [cancer](#) is likely to spread.

Q1: What are the skin changes indicative of breast cancer in this image?
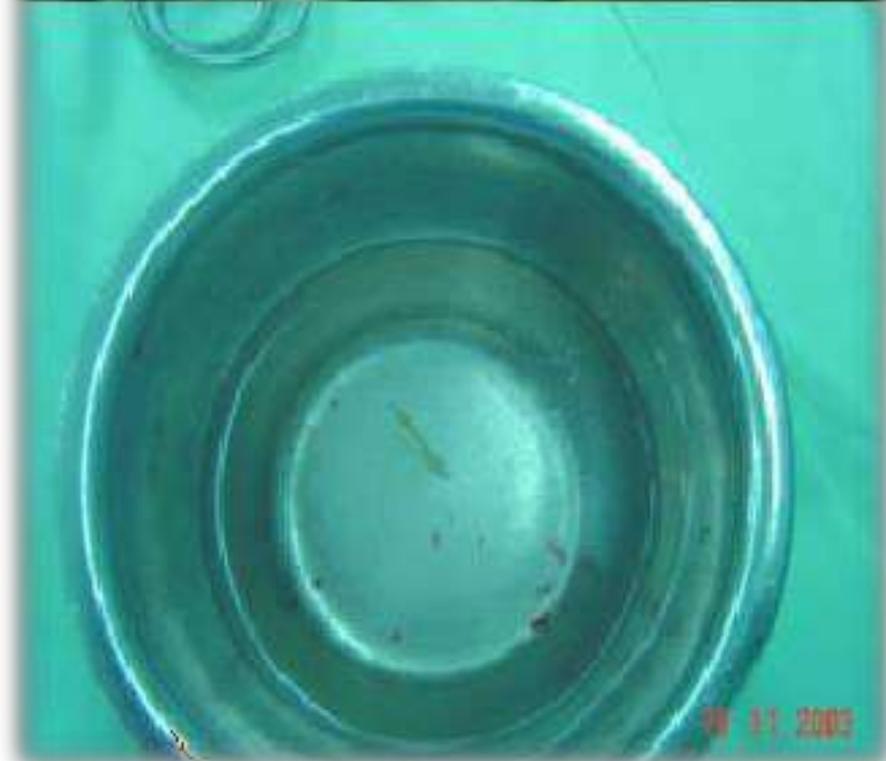
Nipple retraction

Peau dé orange

Q2: What is this procedure?
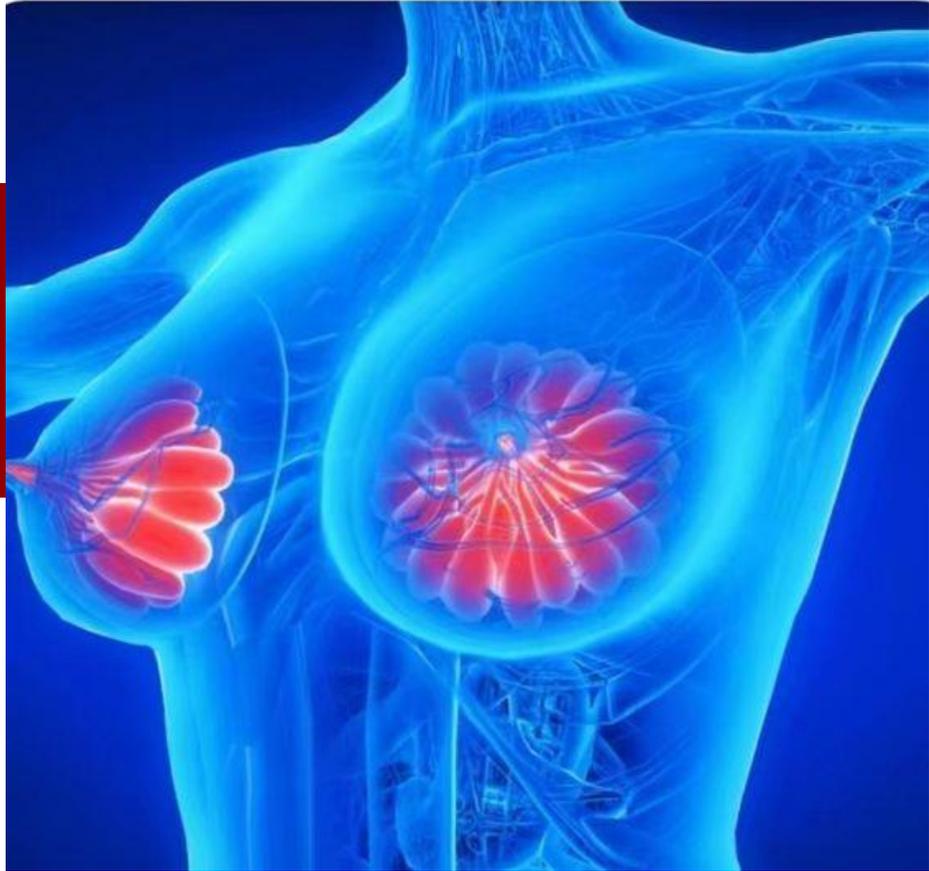
Core needle biopsy

(true-cut biopsy)

Lymphangiosarcoma

-As a complication of long- standing lymphedema , usually in the edematous arm of post radical mastectomy patient.

-to prevent it : use elastic compression stockings.

mastectomy

BREAST

A male patient with a heart disease:

A. what is the abnormality in the picture ?

B.what drugs our patient takes that can cause this finding ?

ANSWER

A. Gynecomastia.

B. spironolactone ,digoxin

A female with a diagnosis of a breast cancer ,

1. what is the underlying cause for this skin pathology

2. What is the pathology?

3. What is its TMN?

4. What is the sign?

5. Give 2 differentials?

ANSWER

1.skin pathology caused by Invasion of the malignant cells into the subdermal lymphatics

2.Infiltrative ductal carcinoma

3. Not~~sure~~ *T4*

3.Peau'd orange and nipple retraction, skin dimpling

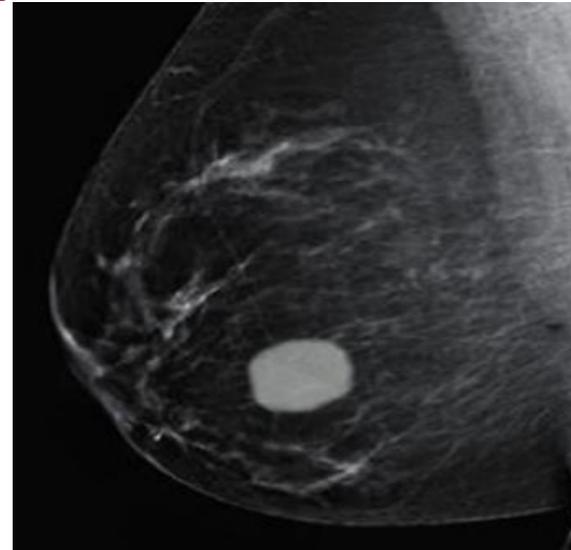4.1)Invasive ductal carcinoma 2) Inflammatory breast cancer

. QUESTION

A 40 year old lady presented with 3 cm painful mass in the left breast for 6 weeks duration. Breast ultrasound and mammogram as in this figure?

A. What is the most likely diagnosis?

B. What is the best next step in management?

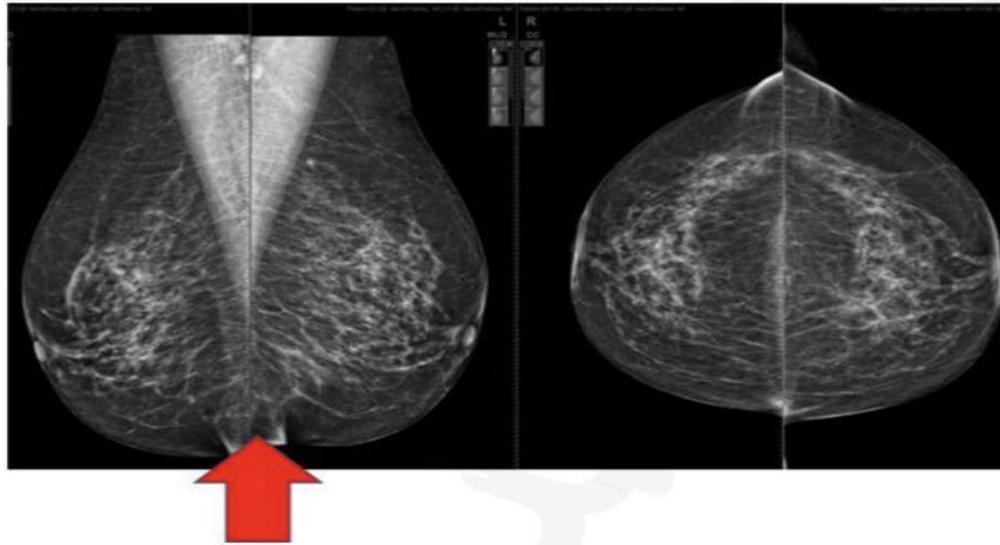# . ANSWER

A. Breast cyst

B. Cyst aspiration - Follow up

Regarding this mammogram for A 45 year old.

A. Name the view labeled by the red arrow?

B.If the radiologist report labelled the result as BIRAD 0, the next step in management is?

. ANSWER

A. Medio-lateral oblique

B. Ultrasound + breast MRI

3 years following treatment of breast cancer, this lady presented to the clinic for regular check up. During examination you identified these changes.

A. Name this complication?

B. What possible complication could this patient develop secondary to it?

. ANSWER

A. Lymphoedema

B. Axillary dissection
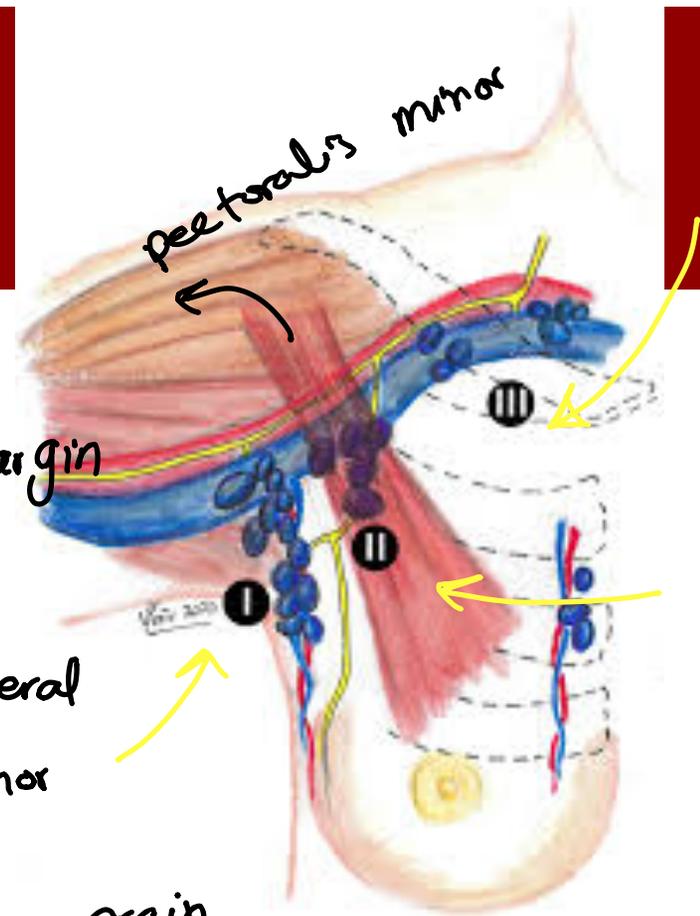
a) Name the muscle

b) the green color zone number

ANSWER

a) Pectoralis Major

b) Zone 1 → LN lateral to lateral margin of pectoralis minor

2 → LN between medial & lateral margin of pectoralis minor

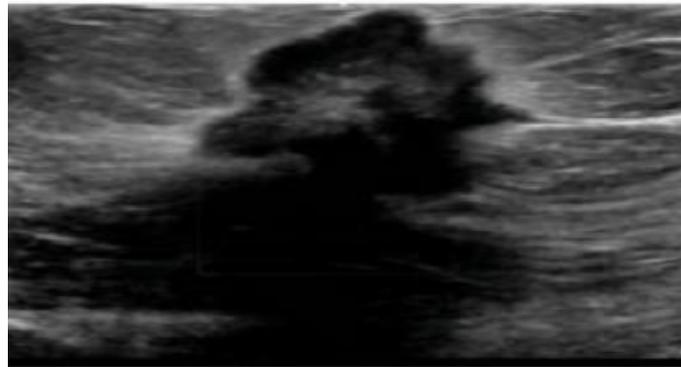3 → LN medial to medial margin of pectoralis minor

18. 50 y old female , presented to breast clinic with breast pain and nipple thickening with eczema like appearance , breast US DONE ,What is the most likely tumor ?

a. Invasive ductal carcinoma
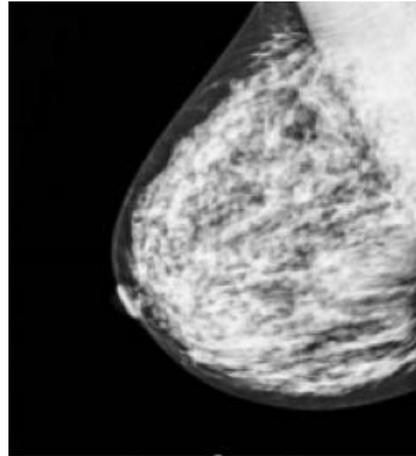
 b. LCIS

c. DCIS

 d. Squamous cell carcinoma

Answer: C

22. This is a 43 year old lady mammogram, according to BIRAD classification what class breast density is this:

a. Class D

b. Class A

c. Class B

 d. Class C

Answer: D

26. This a mammogram with BIRAD-3 , the next step in management is:

a. Breast MRI

b. Follow up in 6 months

c. Breast FNA

d. Core needle biopsy

Answer: B

Image not found

Female with ACR of 4 and BIRAD 0 :

 A. what is the percentage of breast density?

B.what to do next?

(No picture found)

ANSWER

A. >70% ~~>70%~~ >75%

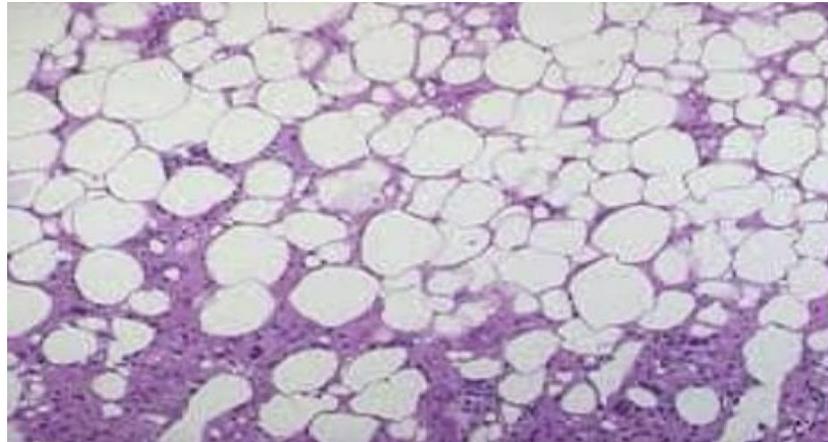B. repeat cytology [Further investigations & images → MRI /mammo /US]

Female patient with a hard fixed painful mass for 3 weeks duration:

1. What your next step?

2. What's a benign condition?

ANSWER

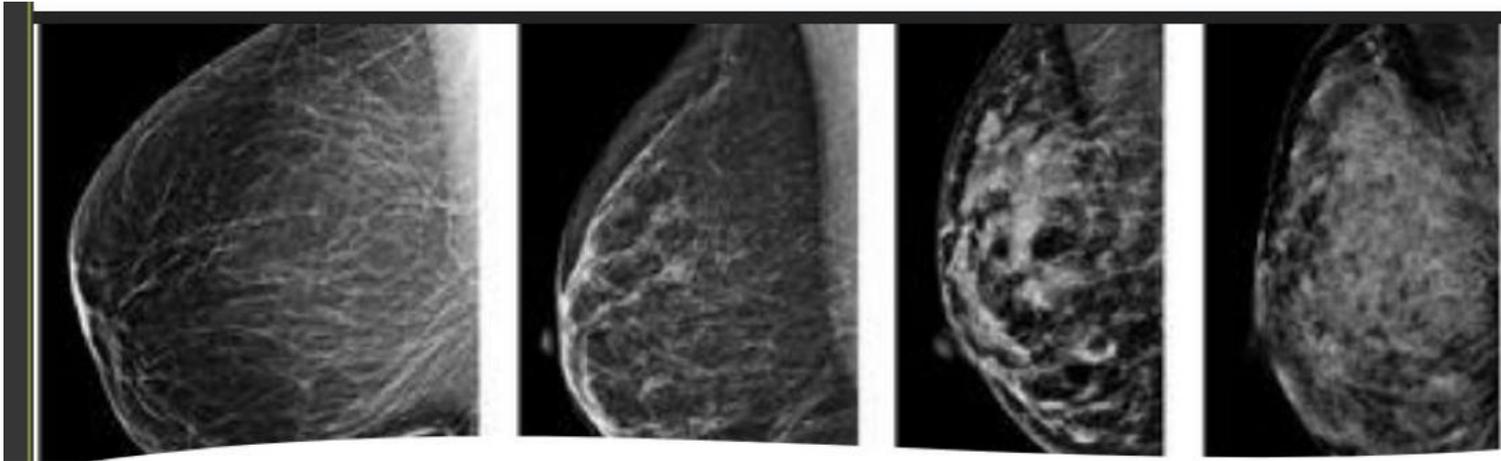1. Mammogram or US (depends on the age "not sure ")

2. Fat necrosis

1. Which one is heterogeneously dense?
2. Which one is most likely to be malignant?

(not the same picture)

ANSWER

✓ 1. Picture C

2. Picture B

mostly yes → (Not sure)

16 years old male , present with chronic beast mass ; Name the diagnosis

. ANSWER

Gynecomastia
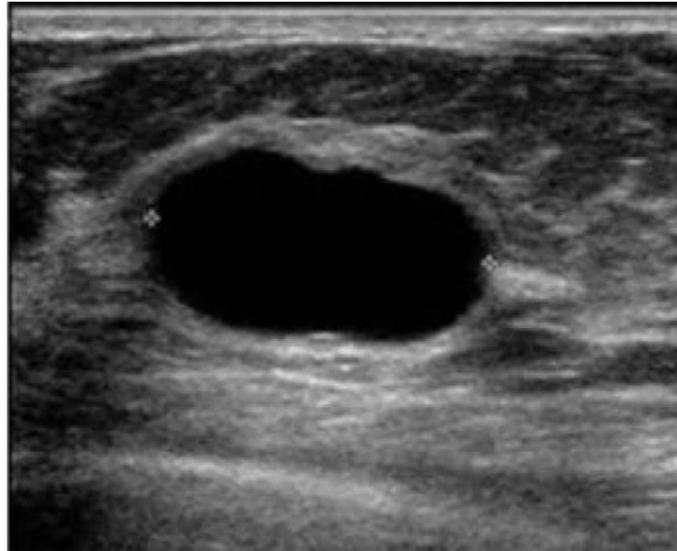
A) What is your diagnosis:

B) What is your management

• ANSWER

A. Breast cyst

B. Aspiration

A question about breast cancer, there were values of ER(+), PR(+), HER2 (-)

A) What is the luminal classification

(No picture found)

• ANSWER

A. Luminal B , Her2 negative

1. What is the finding ?

2. Most common Gene mutation associated with Male breast cancer ?

. ANSWER

1.Male breast nipple changes.

2. BRCA 2

1.Diagnosis?

2. Most common cause?

 3.Next step in management?

. ANSWER

1.Breast Mastitis/Abscess

2. S.Aureus.

.3. Abx

Incision and drainage

منكر

A 23-year-old single female presented to the clinic with rapidly growing (9cm) left breast mass over the last 6 months. The mass was at the time of examination irregular, hard and fixed ;

A•What is the most likely

diagnosis?

B. The most common site of metastasis is:

. ANSWER

A.Phyllodes tumor

B.Lungs

A 37-year-old female presented with right breast pain for the last 3 months. A breast ultrasound showed these findings consistent with BIRAD 4c.

A. The likelihood of malignancy is:

B. The clinical T stage "if a diagnosis of invasive carcinoma is proved" is
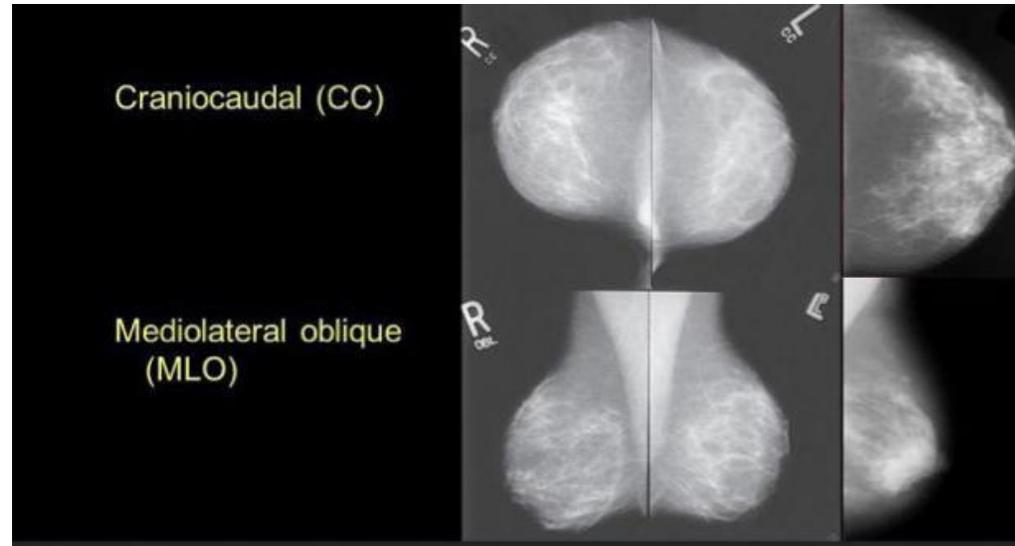
. ANSWER

A. 50-90%

$> 50 \ \text{\&} < 95$

B. T4

Name the following views for mammogram

. ANSWER

Craniocaudal (CC)

Mediolateral Oblique (MLO)

What is your next step if the patient is a BIRAD 3

ANSWER

Follow up (6 month) and further investigations

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

35 years-old female patient:

1. What is the Dx?

2. What does the arrow indicate to:

3. What are the indications for a biopsy in this female?

4. What will you do to manage this patient
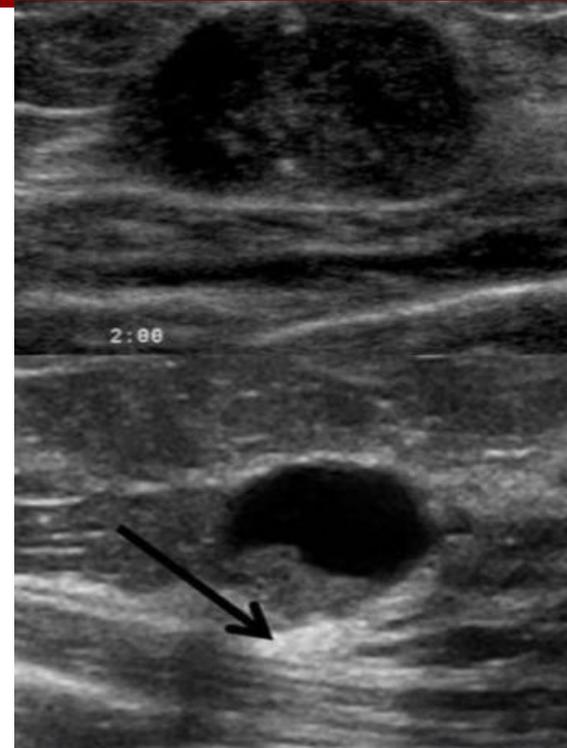
ANSWER

1. Breast Cyst

2. Acoustic Enhancement

3. 1) Bloody aspiration 2) Failure to completely resolve 3) Recurrence after 2nd aspiration 4) Atypical cells
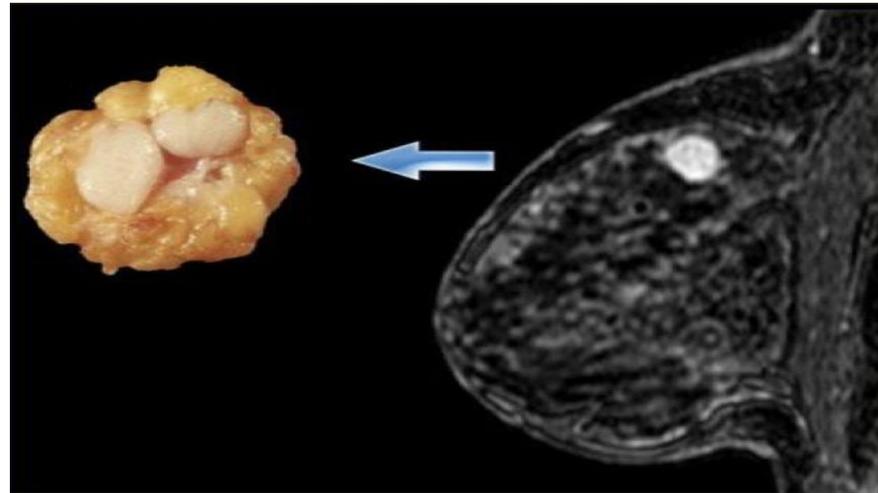
4. Aspiration

23-year-old female underwent triple assessment for an asymptomatic mobile breast lump

1. What is the most likely diagnosis?

2. What is the FNA category reported?

3. Give 2 indications for surgery:

. ANSWER

1.Fibroadenoma

2.clusters of branching papillary fronds of benign ductal epithelial cells, myoepithelial cells, and sparse stromal fragments in a fibromyxoid background

3.

1.masses that are symptomatic

2.increasing in size

A punch biopsy was taken from the nipple that revealed large cells with a clear cytoplasm, high-grade nuclei andprominent nucleoli

1. What is the diagnosis?

2. Name two markers that can differentiate it from Melanoma on immune

histochemistry :

. ANSWER

Not sure about the answers

2.Mammary Paget Disease

1. CK7+) and CD23

    — CEA +ve

    —S100 —ve

A nipple biopsy for a female patient shows large cells with a clear cytoplasm, high grade nuclei and prominent nucleoli

1. What is your Dx?

2. Mention 2 immuno- histochemical tests to differentiate it from melanoma?

. ANSWER

1.Paget disease of the breast/nipple (PDB)

2.1)CEA (pos. in PDB) 2) Protein S100 (neg. in PDB)

A 50 years-old female has breast pain, breast only shows skin redness

1. What is the diagnosis?

2. Diagnostic procedure?

2. Management

4. modality of diagnosis?

5. According to bTNM stage system the T stage is?

. ANSWER

1.Inflammatory breast cancer

2.Mammogram

3.Mastectomy

4.Triple assessment

5.T4d

1. What is the pathology?

2. What is its TMN?

• ANSWER

1. Carcinoma en cuirasse

2. Stage 3 (if there is METS – stage 4)

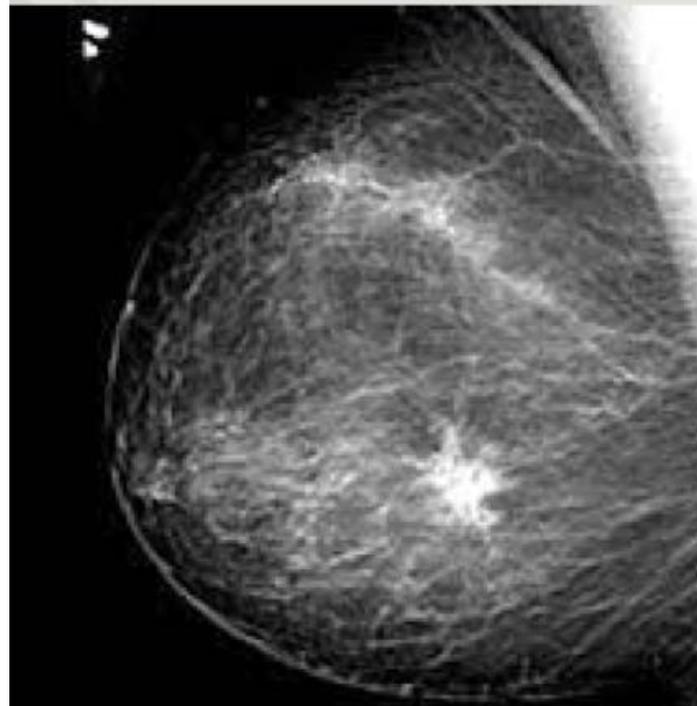*I think it's لأنه لفظ امراض مشابهة عن metz From Breast → skin*

1. Name the study?

2. Mention 2 abnormalities?

3. What is the diagnosis?

4. How to confirm your diagnosis?

ANSWER

1.Mammogram

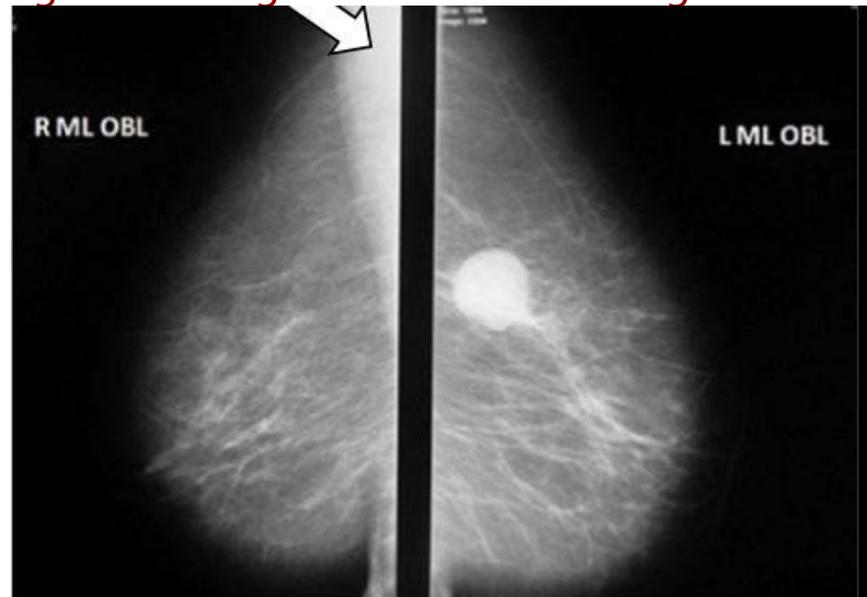2.Masswith irregular border and calcification

3.Breast Ca

4.Biopsy

1.What is this view?

2.what is this structure (arrow)?

3.what are the malignant changes seen on mammograms? Mention 3?

. ANSWER

1.Mediolateral=oblique

2.Pectolaris major muscle

3.1) Calcifications 2) Speculations 3) Mass with greater density than normal tissue

37 years-old female patient is complaining of enlarging breast mass within 6 months:

1. Your diagnosis?

2. What is this structure (arrow)?

3. if it is malignant, what is the common route of METS?

● ANSWER

1. Phyllodes tumor
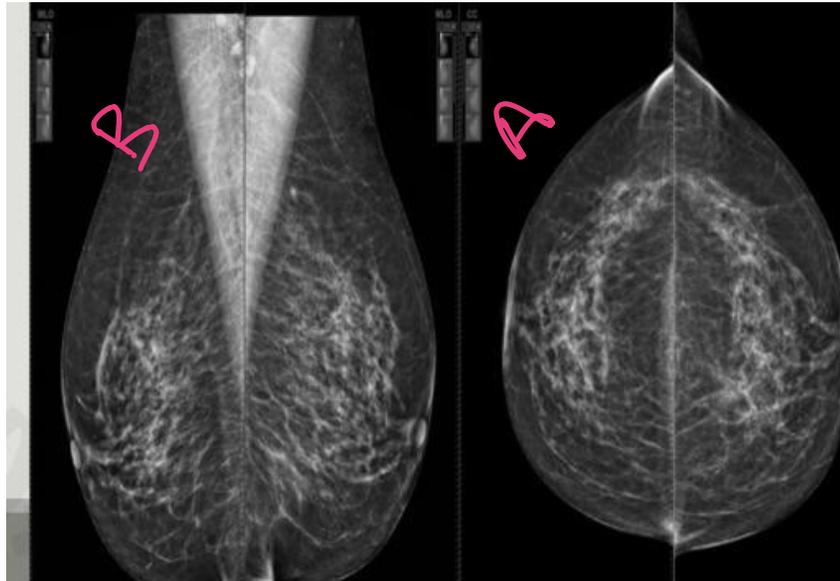
2. Pectolaris major musc

3. Hematogenous

Breast with Birad 2:

1.What is the next step in the management?

2.What is the view in B?

ANSWER

1.Routine screening

2.Mediolateral oblique view

BI-RADS CATEGORIES

BI-RADS 0 (incomplete): Recommend additional imaging -- mammogram or targeted ultrasound

BI-RADS 1 (negative): Routine breast MR screening if cumulative lifetime risk ≥ 20%

BI-RADS 2 (benign): Routine breast MR screening if cumulative lifetime risk ≥ 20%

BI-RADS 3 (probably benign): Short-interval (6-month) follow-up

BI-RADS 4 (suspicious): Tissue diagnosis

BI-RADS 5 (highly suggestive of malignancy): Tissue diagnosis

BI-RADS 6 (known biopsy-proven malignancy): Surgical excision when clinically appropriate
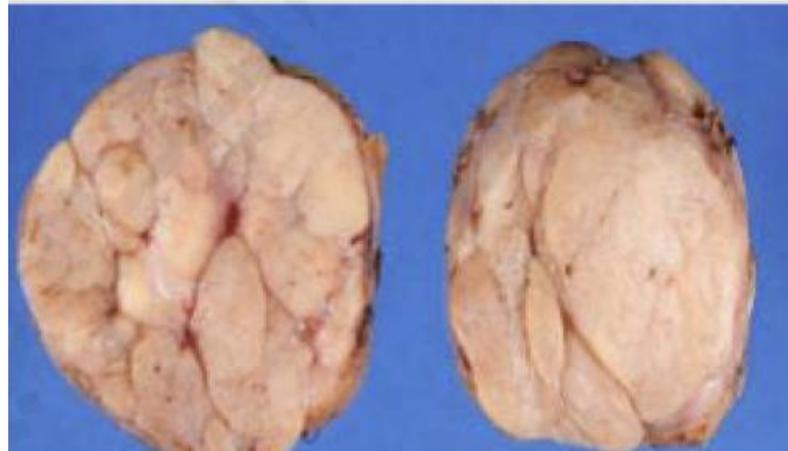
1.What is the pathology?

2.What is the management?

3.What is the like hood (%) of this tumor to be benign?

ANSWER

1. Phyllodes tumor (Brodie's)

2. Wide local excision

3. 90% benign

A female with mobile, mouse like lump in one breast:

1. What is the diagnosis?

2. What is the stage according to FNA?

. ANSWER

1.Fibroadenoma

2.C2

Cl = unsatisfactory.
C2 = cells present all benign; no suspicious features.
C3 = cells suspicious but probably benign.
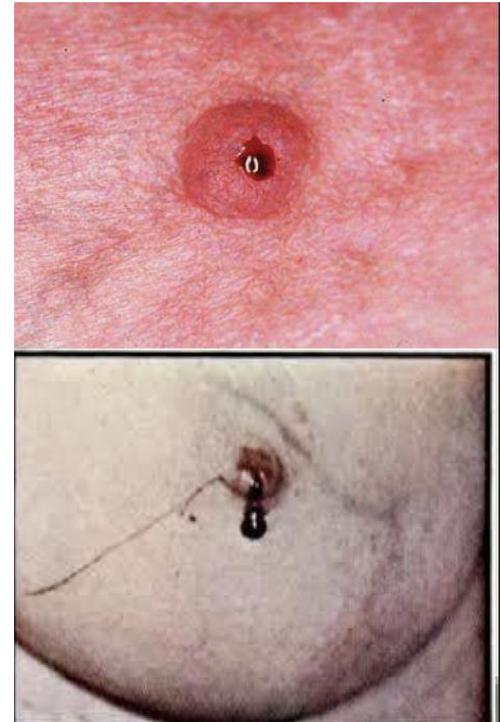C4 = cells suspicious but probably malignant.
C5 = Definitely malignant.

1. What is the pathology?

2. Mention 2 imaging studies?

3. What is the risk of malignancy of this lesion?

ANSWER

1.Intraductal papilloma

2.1) Ductogram, Ductoscope 2) Mammogram, US

3.15%

By which mechanism does breast cancer cause hypercalcemia?

. ANSWER

Parathyroid hormone - related protein (not due to osteoclastic METS)

Note: The main pathogenesis of hypercalcemia in malignancy is increased osteoclastic bone resorption, which can occur with or without bone metastases. The enhanced bone resorption is mainly secondary to PTH-related protein**