Breast

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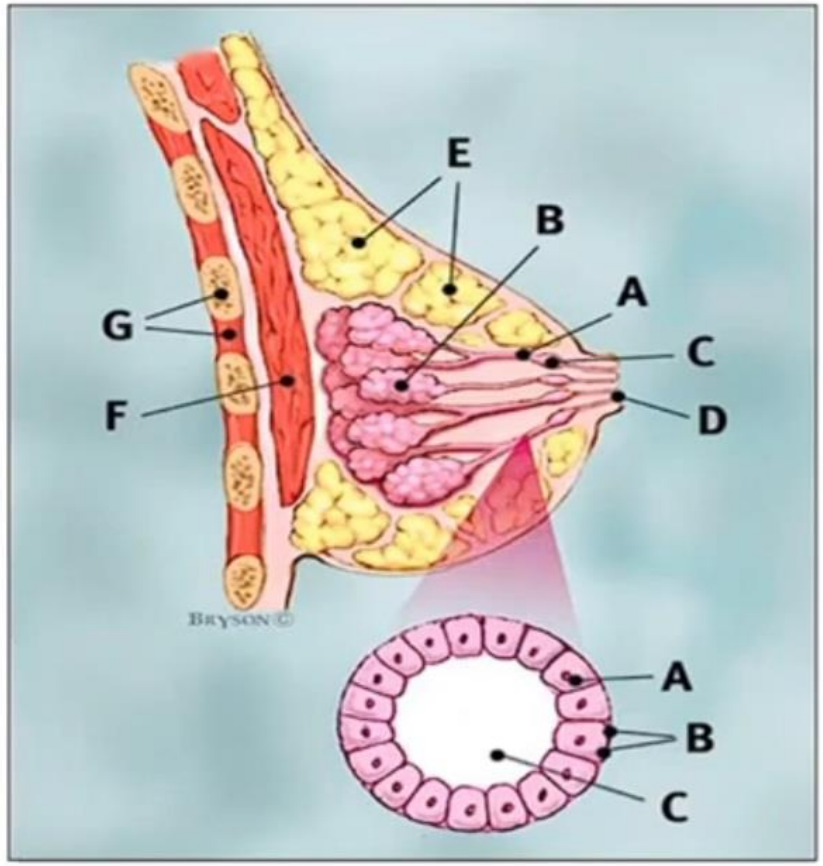
What we need to know?

- Anatomy and physiology
- Clinical approach to breast problems
- Imaging techniques
- Benign breast abnormalities
- Breast cancer

Anatomy and physiology

modified sweat gland (breast consists of)
- glands
  - lobules
  - duct
- fat
- connective tissue



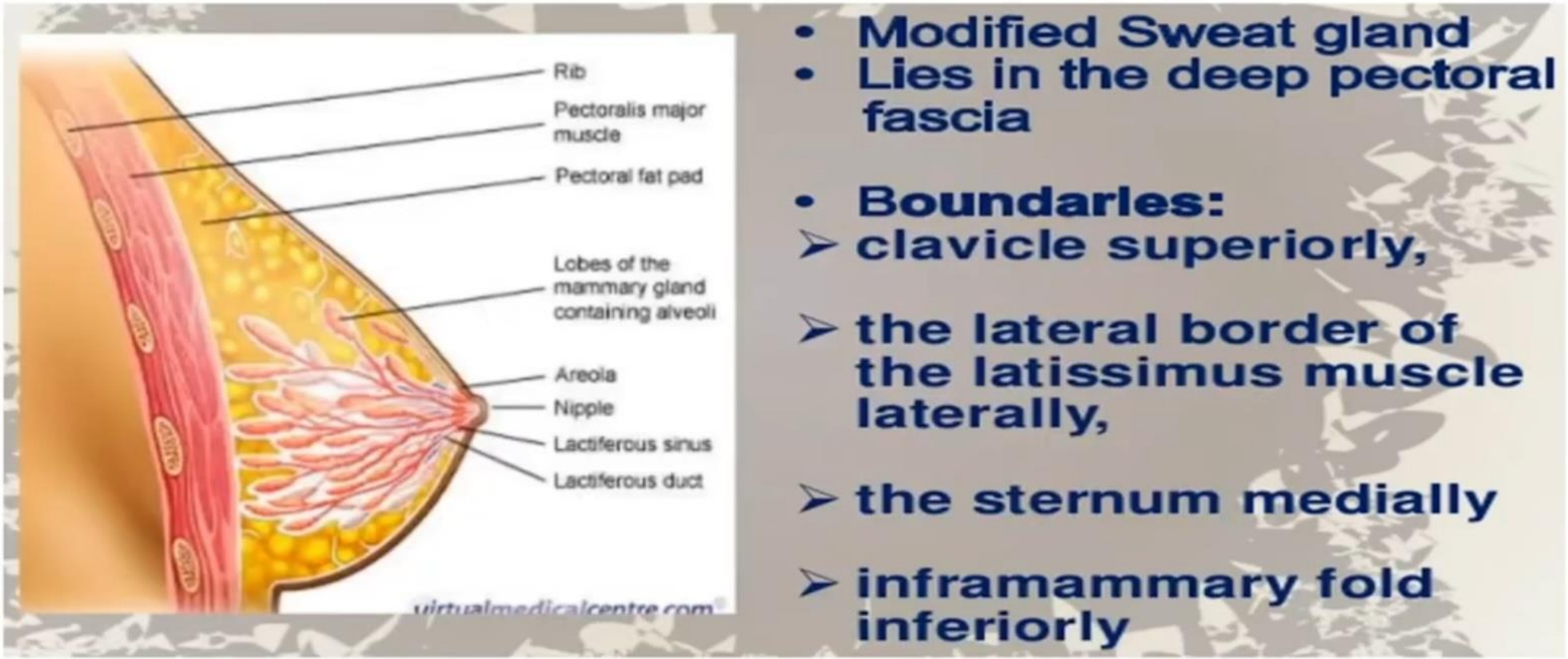
Breast profile:
- **A** ducts
- **B** lobules
- **C** dilated section of duct to hold milk
- **D** nipple
- **E** fat
- **F** pectoralis major muscle
- **G** chest wall/rib cage

CA starts here!

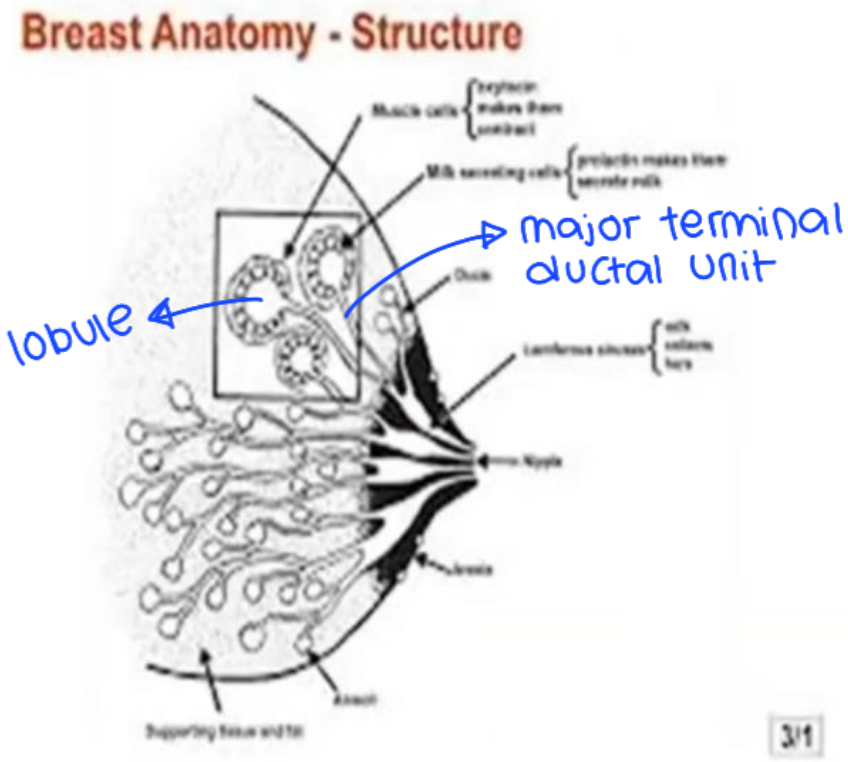
Enlargement:
- **A** normal duct cells (columnar epith.)
- **B** basement membrane
- **C** lumen (center of duct)

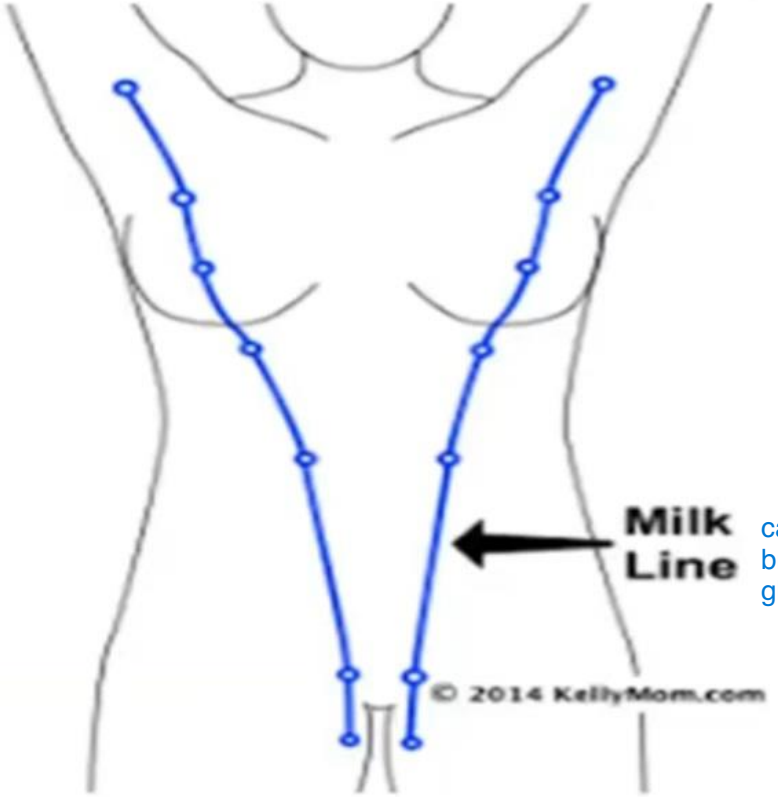
diseases can affect fat, glands, connective tissue, but the most serious diseases affect glands

* Physiologic part of glandular component acts in response to menstrual cycle (estrogen & progesterone receptors)
* variations in estrogen & progesterone levels affects ducts & lobules to prepare breast for future pregnancy (enlargement & ↑ blood)



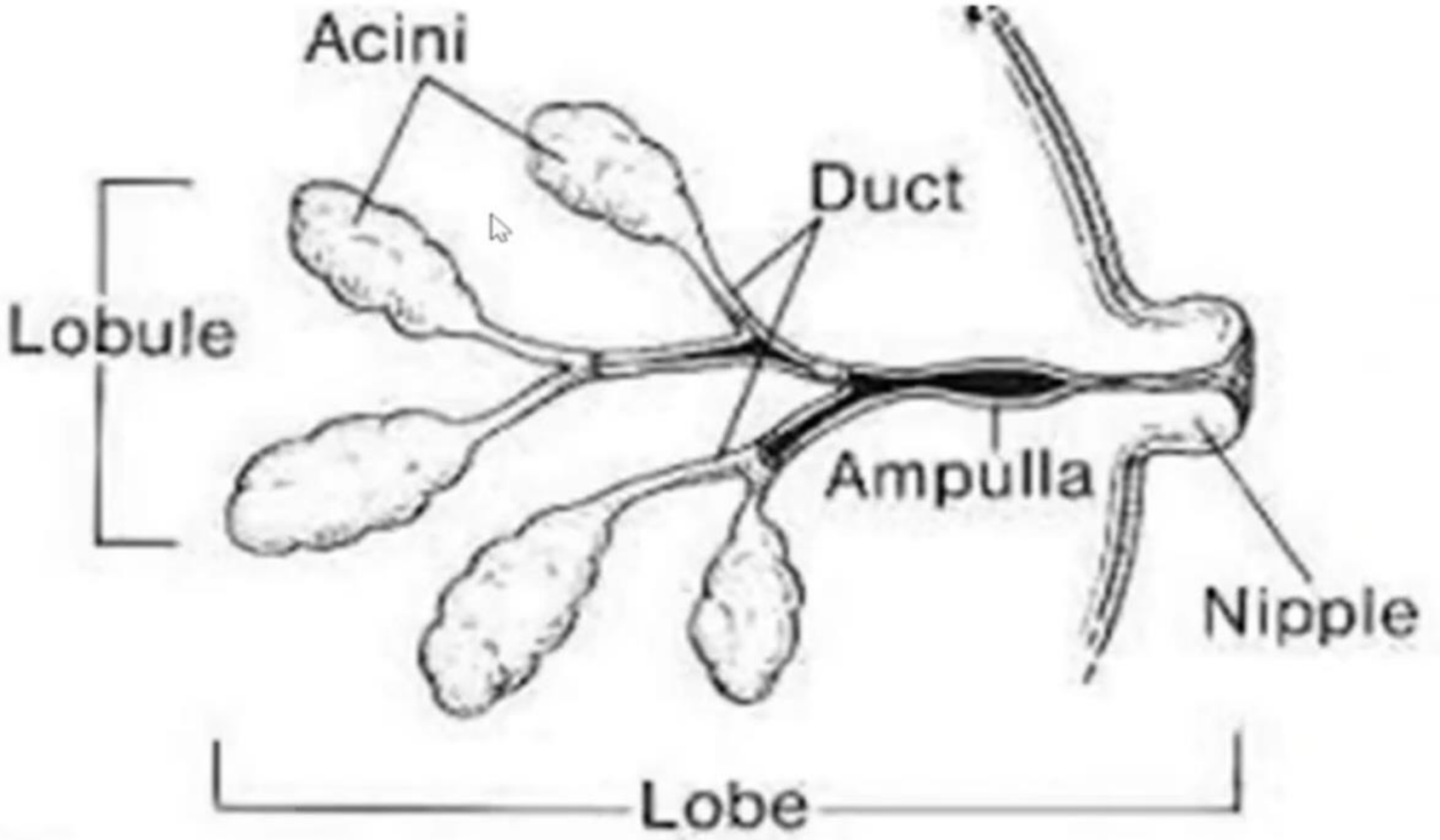
milk line: ectodermal thickening from axilla to inguinal region (may persist & be connected to extramammary breast tissue & extra nipples)





can have any accessory breast or mammary gland along this line

glandular tissue --> site of diseases (benign or malignant / affect by estrogen (during menstruation) and progesterone(after menstruation)

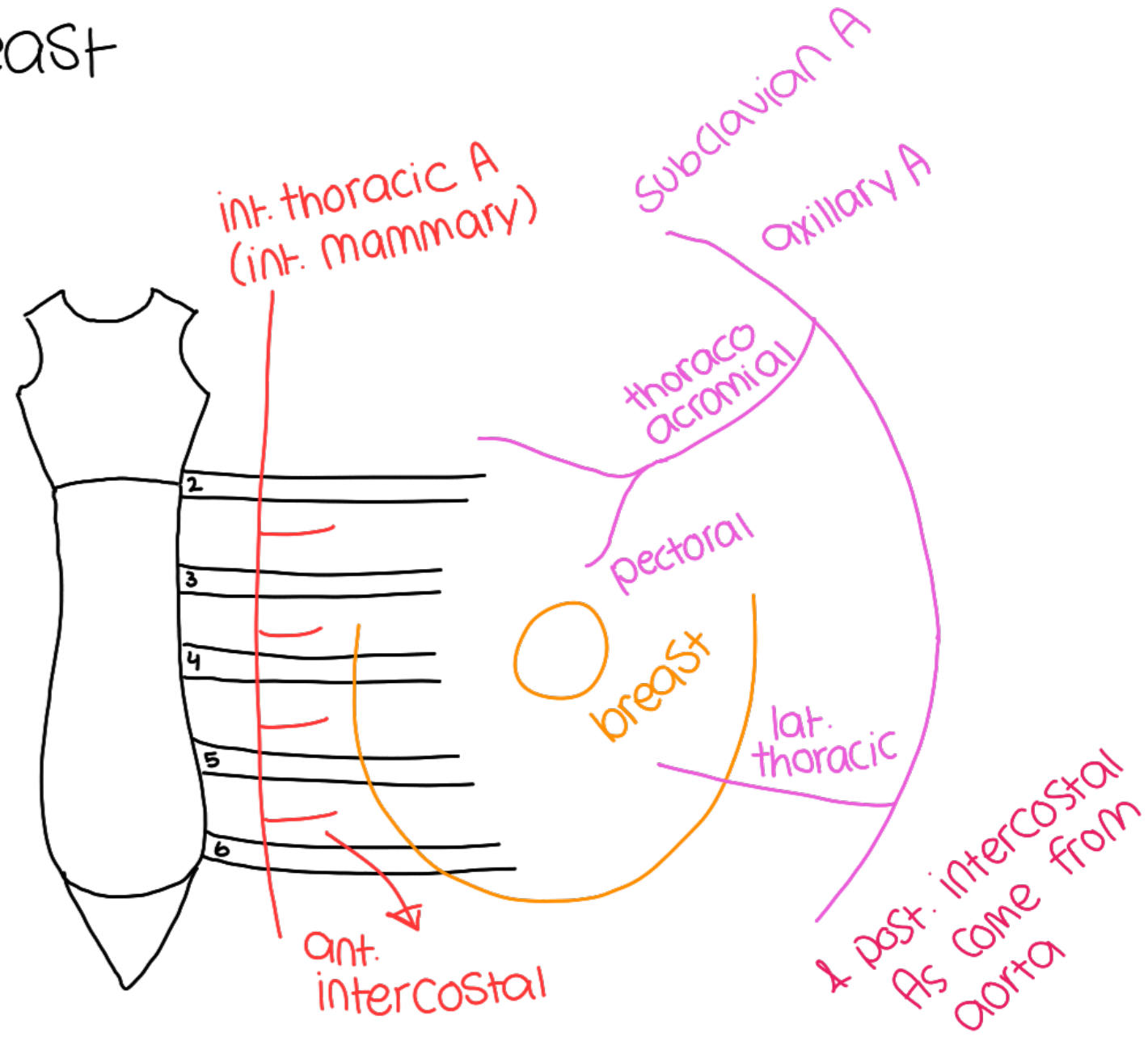


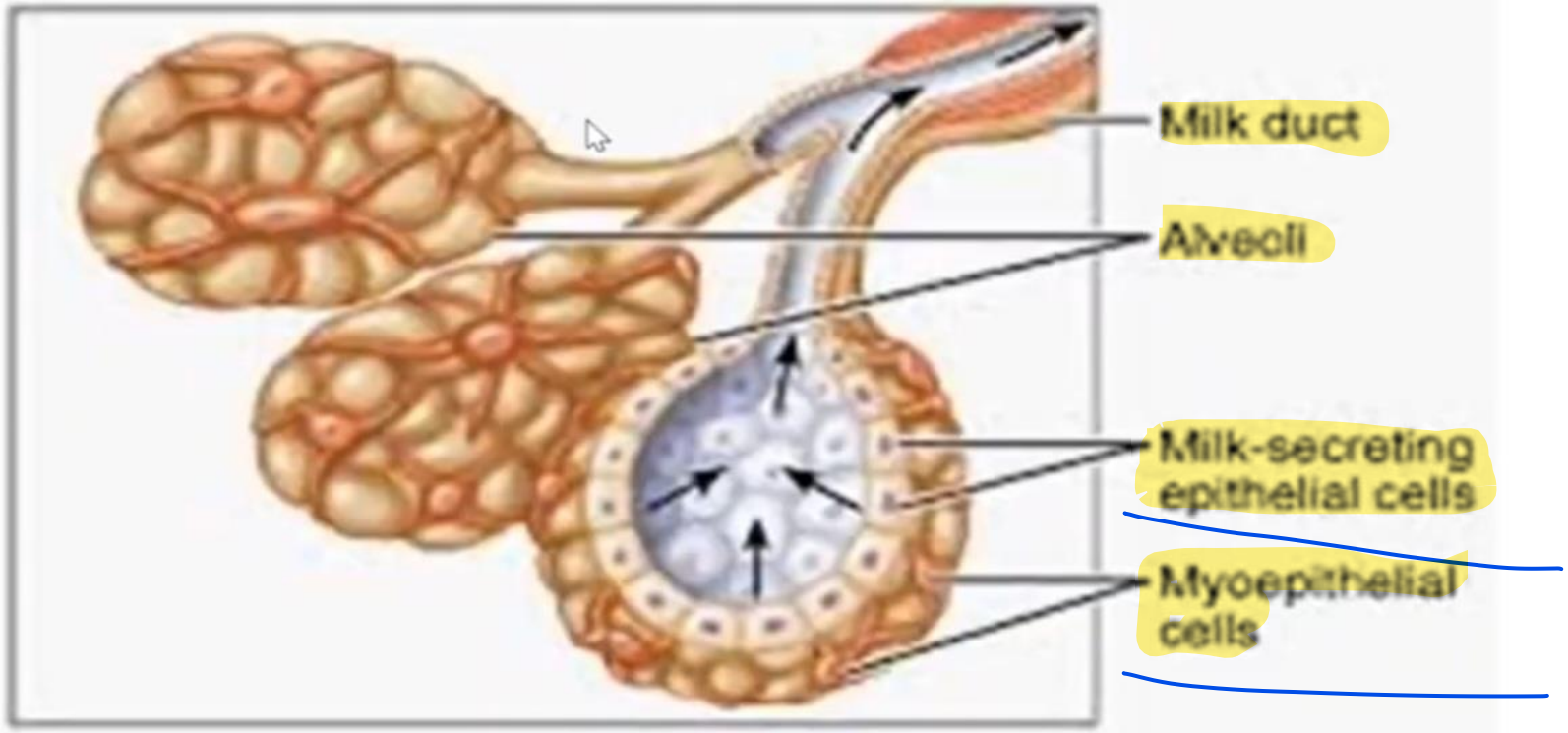
Duct structure (11)

- Perforating branches of the internal mammary arteries
- the lateral thoracic arteries
- thoracoacromial arteries
- posterior intercostal arteries

* blood Supply to breast

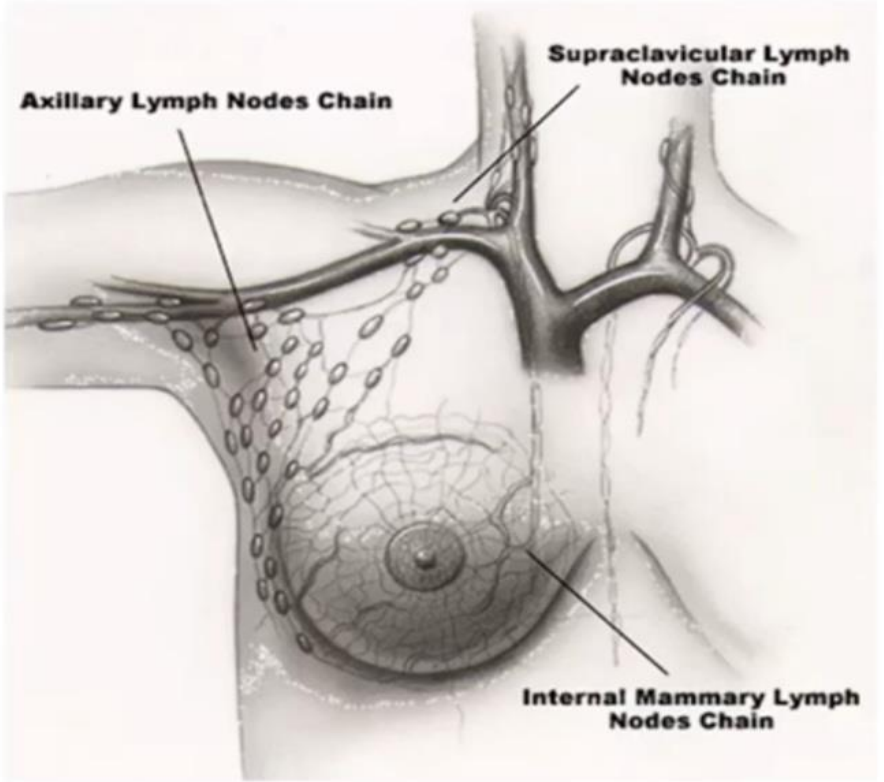
- Medial Side Of breast
- lateral Side Of breast




Milk duct
Alveoli
Milk-secreting epithelial cells
Myoepithelial cells

* lymph nodes are the most important thing to be checked when pt is diagnosed w/ breast CA

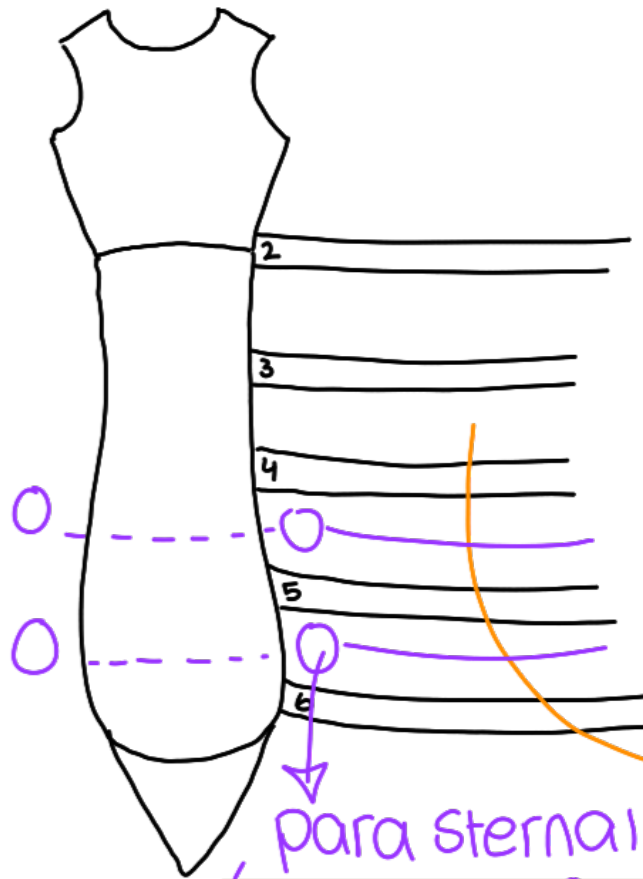
99% of LNs of beast drain in axillary LNs



most breast drainage goes to axillary lymph nodes (sentinell LNs)

* lymphatic drainage of breast

- lateral & central Side of breast
- upper Side
- medial Side
- lower Side



apical axillary LN

ant. axillary (pectoral) LN

breast

tumor can metastasize to other breast

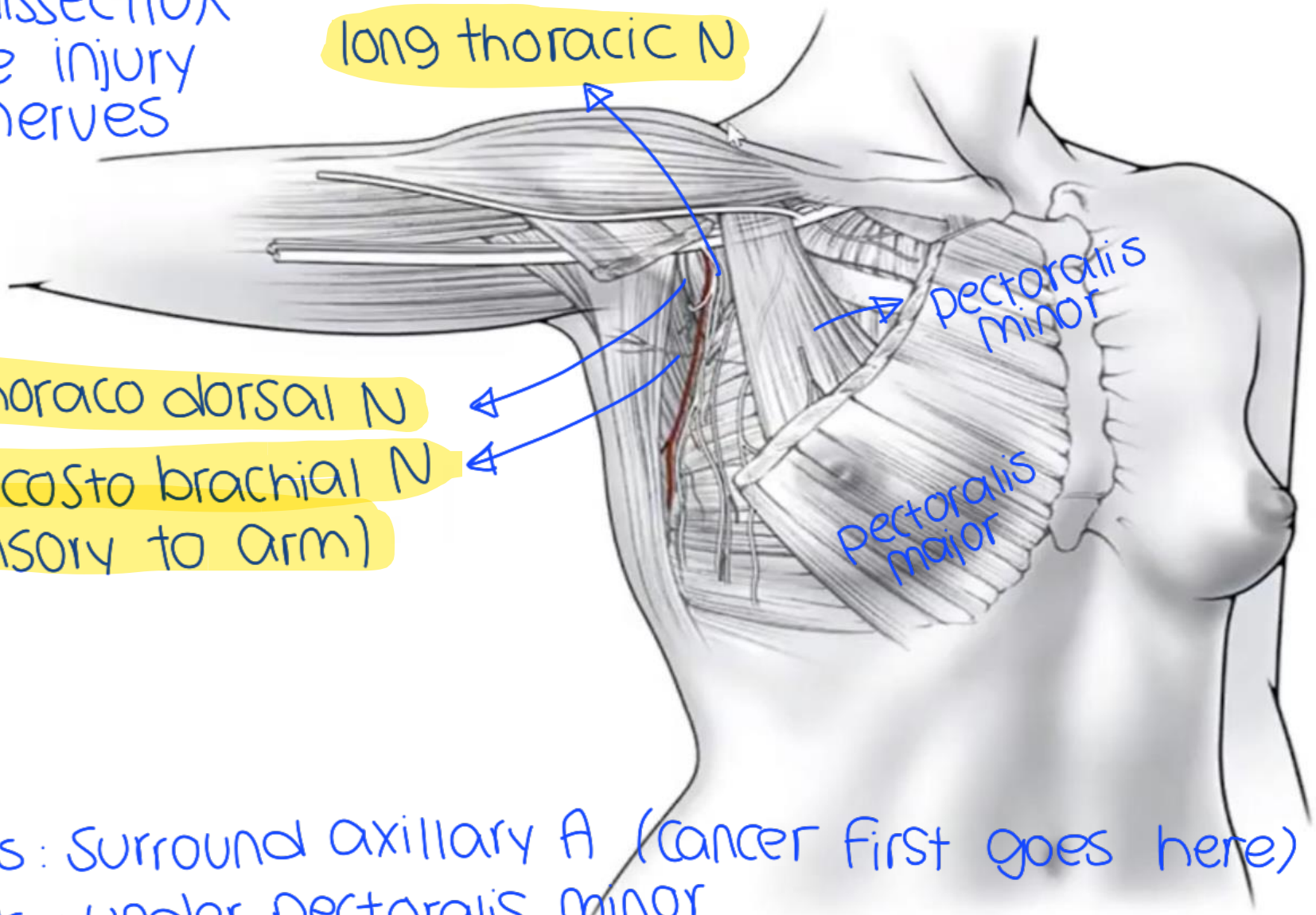
para sternal (int. mammary) LN

sub diaphragmatic

rectus sheath

linea alba

axillary dissection may cause injury to these nerves



level 1 LNs: Surround axillary A (cancer first goes here) important in management

2 LNs: under pectoralis minor

3 LNs: medially

Triple Assessment

- History and examination
- Imaging by mammography and/or ultrasound scanning
- Cytology or histology

PRESENTATION OF BREAST DISEASE

Painless lump

- Carcinoma.
- Cyst. sac (lobules / duct filled of secretion (serous fluid)
- Fibroadenoma. benign from fibrous and glandular component
- An area of fibroadenosis.

more diffuse than fibroadenoma (more than one lump)

Painful lump

- An area of fibroadenosis.
- Cyst.
- Periductal mastitis. inflammation / infection of the ducts
- Abscess (usually postpartum or lactational).
- Occasionally a carcinoma

don't exclude malignancy even if it is painful

most common presentation: breast lump

physiological developement & involution of breast tissue is caused by engorgement (gland enlargment & ↑ blood supply) & this may cause pain (hormone related)

Pain and tenderness but no lump

- Cyclical breast pain. during menstruation
- Non-cyclical breast pain.
- Very rarely, a carcinoma.

may be associated w/ drugs, smoking caffeine, alcohol

Nipple discharge

unilateral/ bilateral or spontaneous / provoked colour / amount

- Duct ectasia. abnormal dilation (enlargement) of the ducts
- Intraduct papilloma. tumor inside the duct from bloody discharge
- Ductal carcinoma-in-situ (DCIS).

malignancy involve the duct without invasion of the basement membrane
unilateral / spontaneous / serous secretions

Changes in the nipple and/or areola

- Duct ectasia.
- Carcinoma. invasion nipple areola
- Paget's disease. ductal carcinoma in situ (destruction of nipple without invasion) can transform to malignant
- Eczema. like Paget disease (don't transform to malignant) we have to differentiate between them

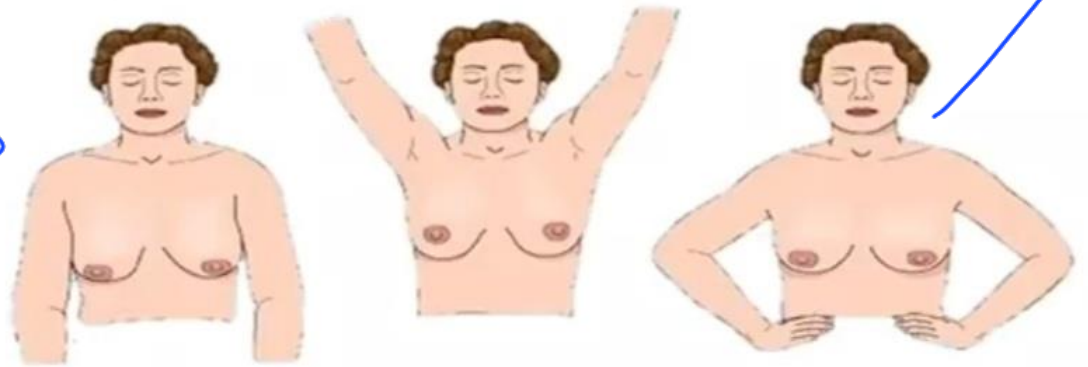
Changes in breast size and shape

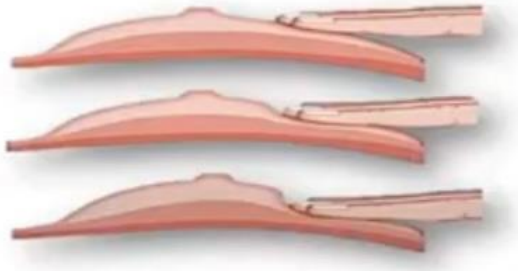
- Pregnancy.
- Carcinoma.
- Benign hypertrophy.
- Rare large tumours

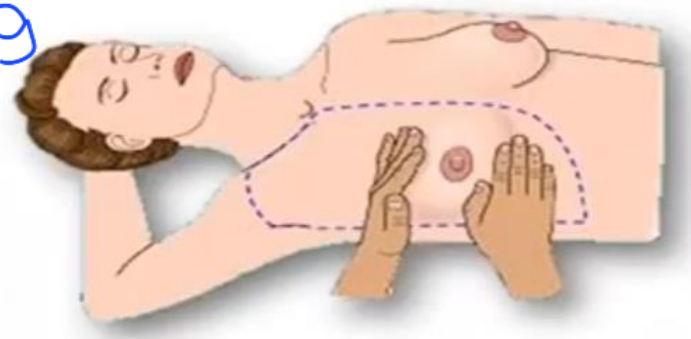
Physical examination

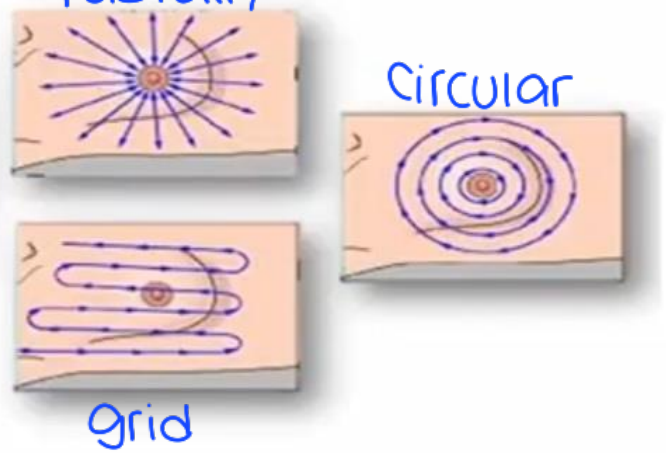
- inspection (Sitting position)
  1. biiat., symmetry
  2. skin & nipple changes
  3. discharge
- palpation of the whole breast
  3 fingers (rolling & dipping)

to contract pectoralis major which applies pressure on Cooper's ligament (masses can be clearer)

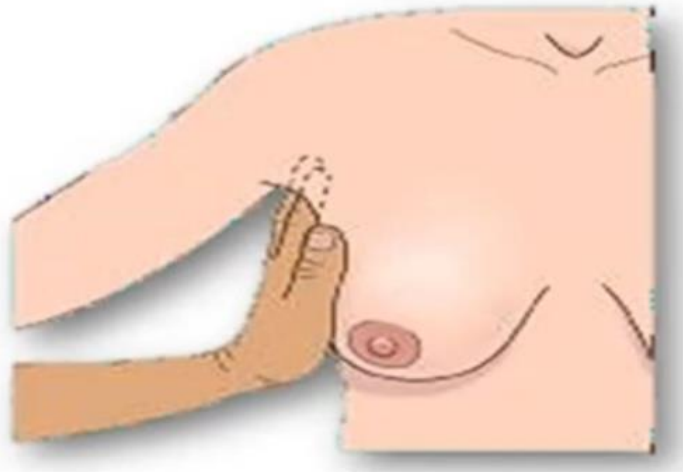








axillary examination



Supraclavicular LN examination

Breast imaging

- The breast can be imaged with mammography, ultrasound or MRI.
- Mammography is the most sensitive of breast imaging modalities.
- Sensitivity is reduced in young women due to the presence of increased glandular tissue.
- For symptomatic patients, imaging always be performed as part of triple assessment

mammogram

RCC

Right Craniocaudal

rt craniocaudal

LCC

Left Craniocaudal

lt craniocaudal

RMLO

Right Mediolateral Oblique

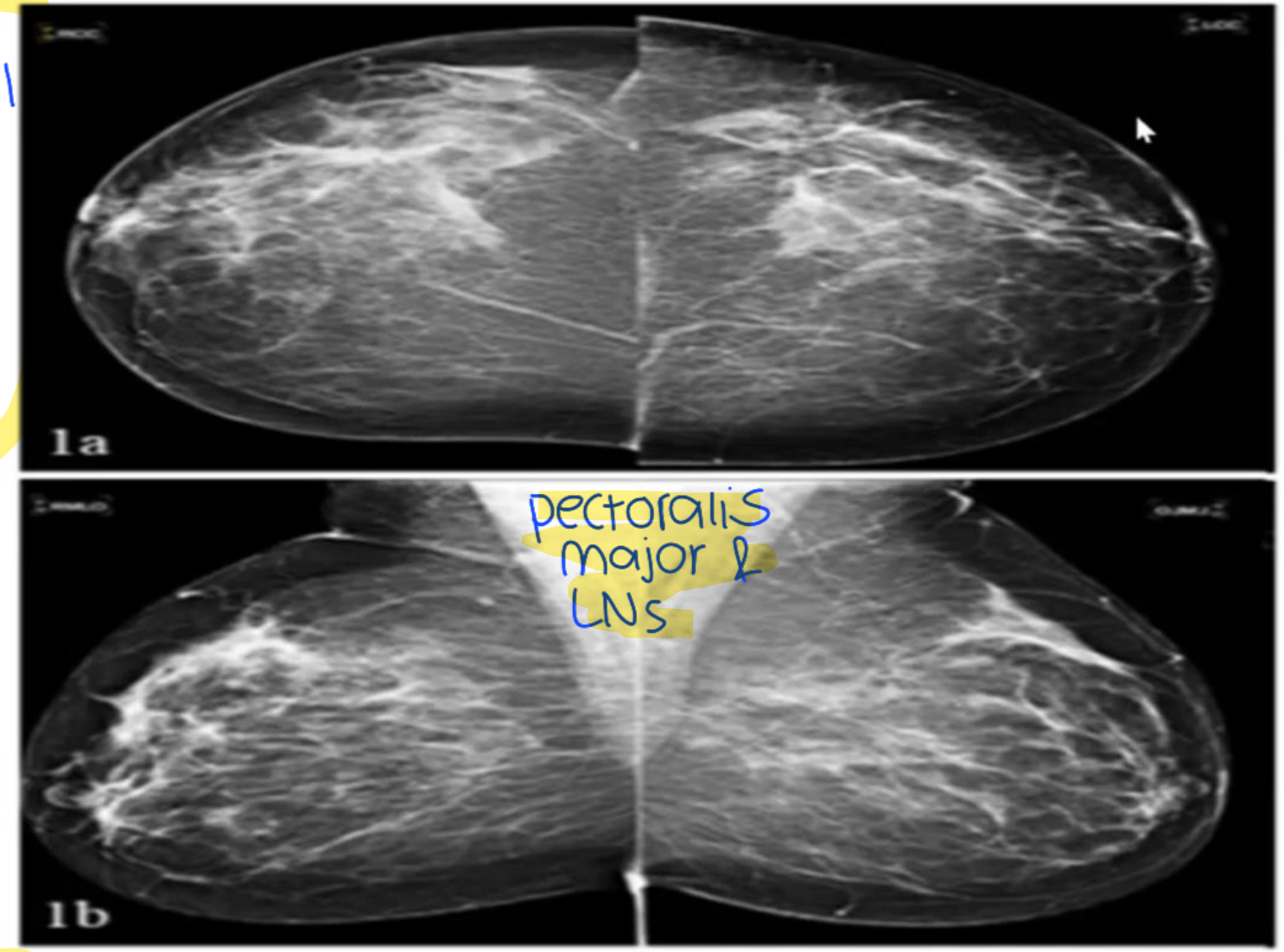
rt mediolat. Oblique

LMLO

Left Mediolateral Oblique

lt mediolat. Oblique

Cranio caudal view
↳ locates mass (medial vs. lateral)



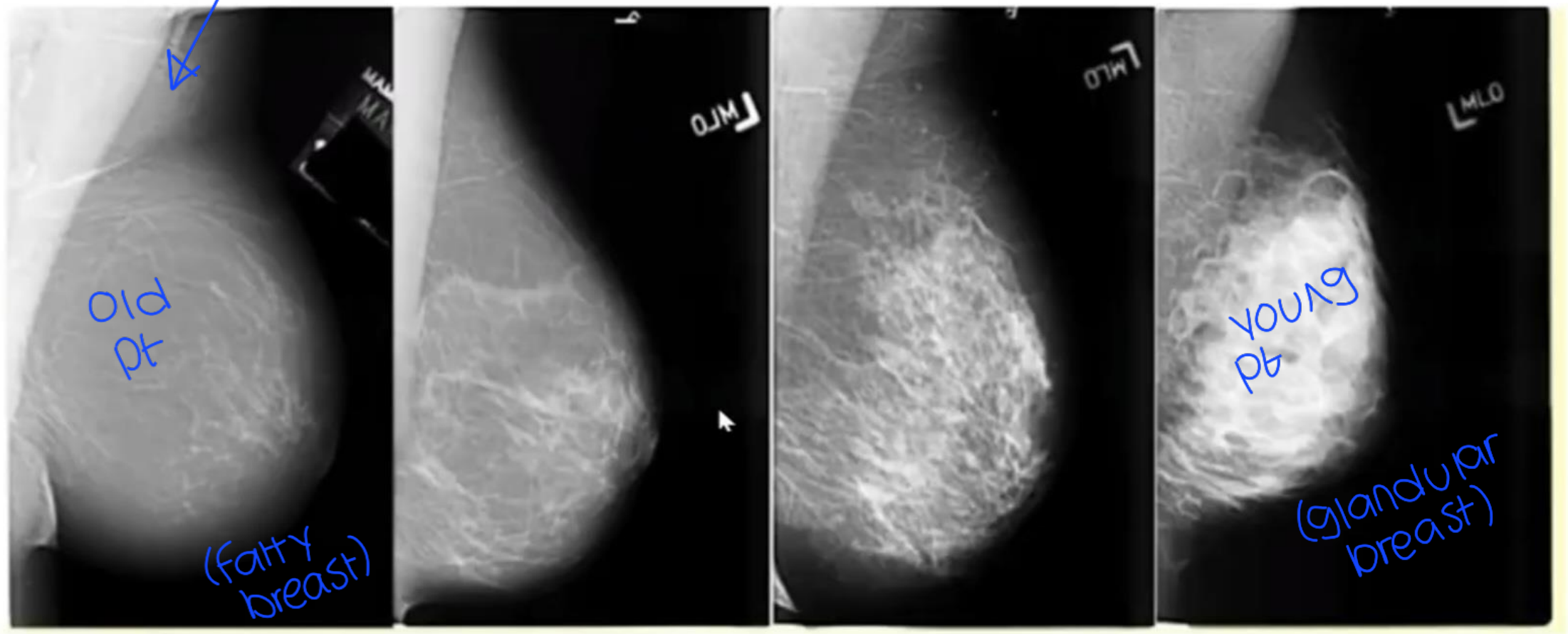
pectoralis major & LNs

Medio lat. oblique view
↳ locates mass (superior vs. inferior)

hyper dense: glandular & vascular & connective tissue (masses appear hyperdense)
hyperdense
lighter or whiter

hypo dense: Fat
dark

masses appear better in fatty breast



in old age patient --> high fat --> hypodense (dark) --> masses appear better
in young female patient --> high glandular tissue --> hyperdense (lighter / white) --> difficult to see masses

↗ classification depends on factors like: mass shape (defined vs. irregular), presence of microcalcification, ...

BI-RADS mammographic assessment categories

Assessment category	Recommendation	Probability of malignancy
0: Incomplete	Need for further evaluation	Not applicable
1: Normal	Normal interval follow-up	0 percent
2: Benign (well defined)	Normal interval follow-up	0 percent
3: Probably benign	A short interval follow-up is recommended	<2 percent
4: Suspicious abnormality imaging is not clear	A biopsy should be considered	≥2 to <95 percent
		(a) Low-risk
		(b) Intermediate-risk
		(c) Moderate to high-risk
5: Highly suggestive of malignancy	Biopsy or surgery should be performed	≥95 percent
6: Biopsy-proven carcinoma	Appropriate action should be taken	

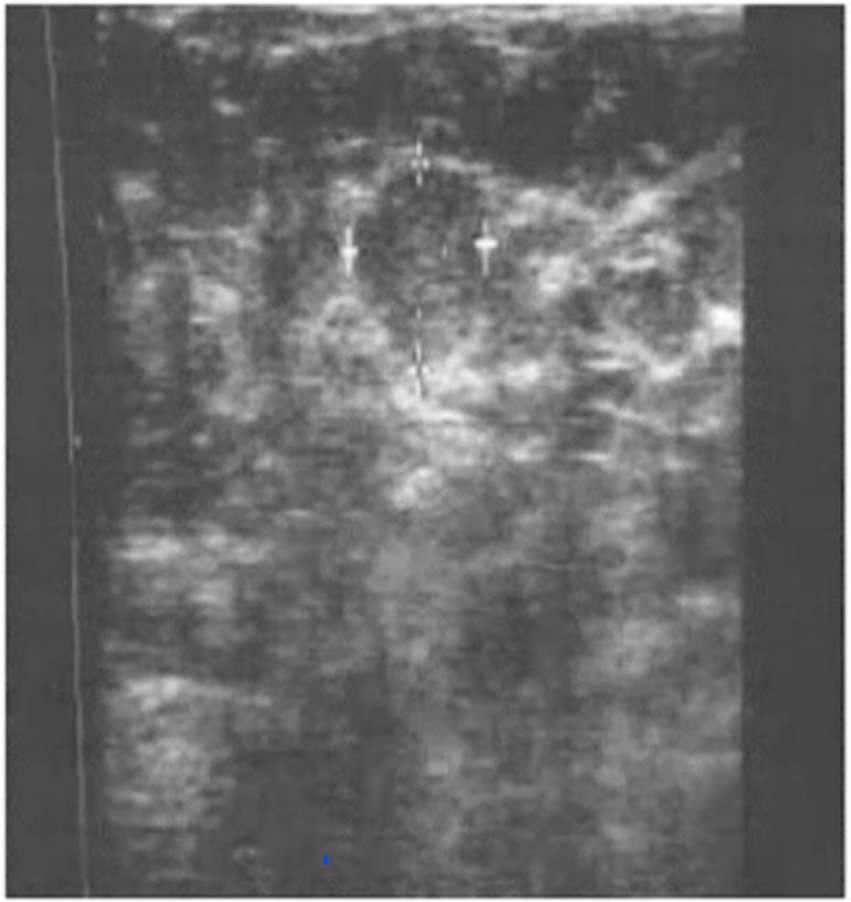
BI-RADS: Breast Imaging Reporting and Data System.

Source: Breast Imaging Reporting and Data System (BI-RADS) Atlas. 4th Edition. American College of Radiology, Reston, VA, 2003.

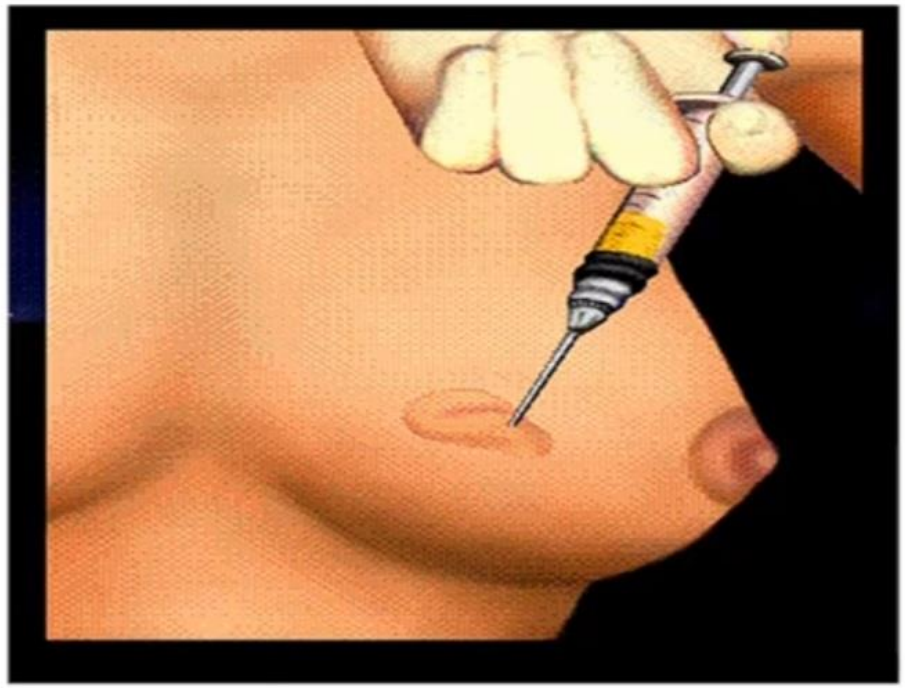
differentiate the cyst from solid lesions

Breast Ultrasound (useful for ♀ glandular tissue & young pt)

- Ultrasound is useful in the assessment of breast lumps
- Complements mammography and is able to differentiate solid and cystic lesions
- Also able to guide fine needle aspiration and core biopsies
- Can be used to assess tumour size and response to therapy
- In the diagnosis of malignancy it has a sensitivity and specificity of 75% and 97% respectively
- Cysts and solid lesions have typical appearances



Fine Needle Aspiration Cytology

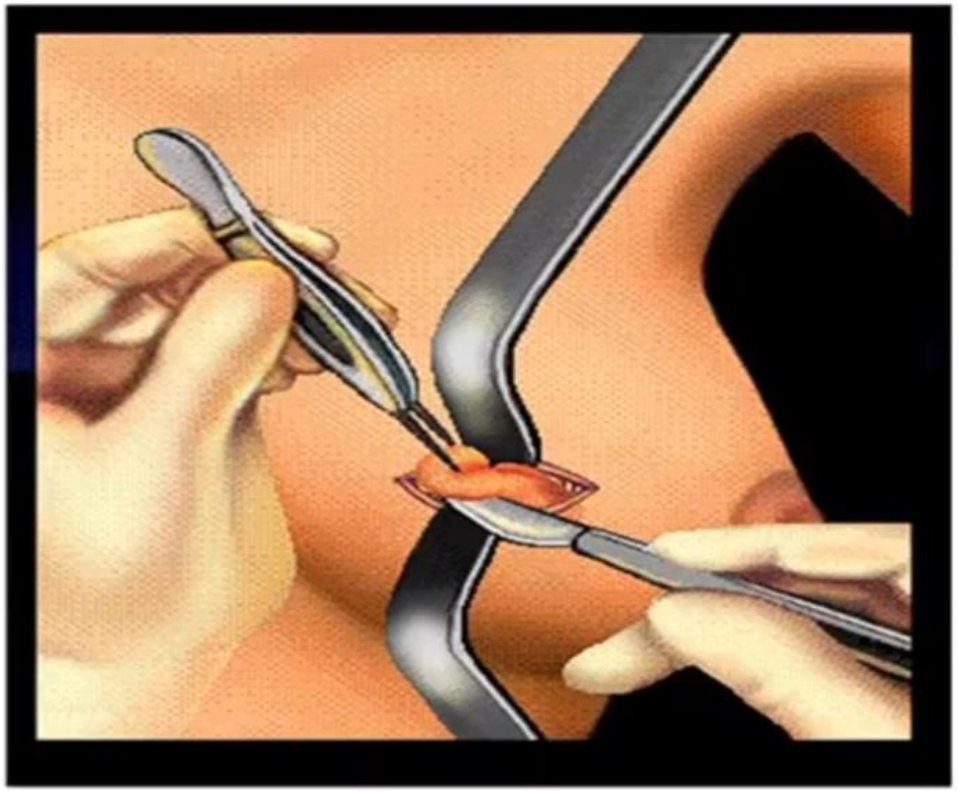


↑mitotic activity
hyperchromasia
prominant nucleoli
↑ nuclear : cytoplasmic ratio

Tissue Biopsy (shows invasion of basement membrane)

remove part of mass ← Incisional or Excisional biopsy → remove whole mass

Core needle biopsy
2 cut needle



Fibroadenoma

benign

rarely transform to malignant

- **Position** It may be anywhere in the breast.
- **Shape and size** Fibroadenomas are usually spherical or ovoid but sometimes lobulated and may be any size.
- **Surface** smooth, the edge definite and the consistency like firm rubber.
- **Mobility** the most mobile of all breast lesions 'breast mouse'.

fibrous & glandular tissue / affects young females

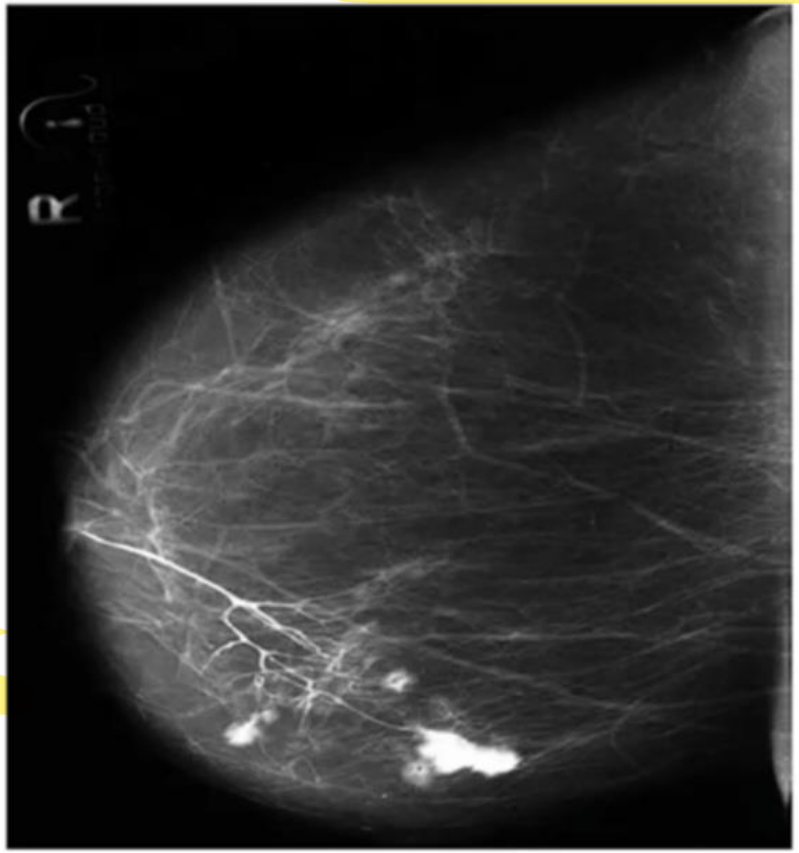
how to remove fibroadenoma?
Circumareolar incision → move mass & remove it for cosmetic reasons

Intraductal papilloma

benign but can transform to malignant

↳ Overgrowth of columnar cells → bleeds → bloody discharge

- This uncommon condition is a papillary benign neoplasm arising from the duct epithelium and enlarging into the duct system.
- It usually presents with a bloodstained discharge → usually from a single duct / from the nipple, although there may be a soft swelling near the areola.



inflam. process affecting major ducts → dilatation → secretions → infection (bacterial) → greenish discharge (bilat. / multi duct)

Periductal mastitis or ductectasia

inflammation / infection of the duct

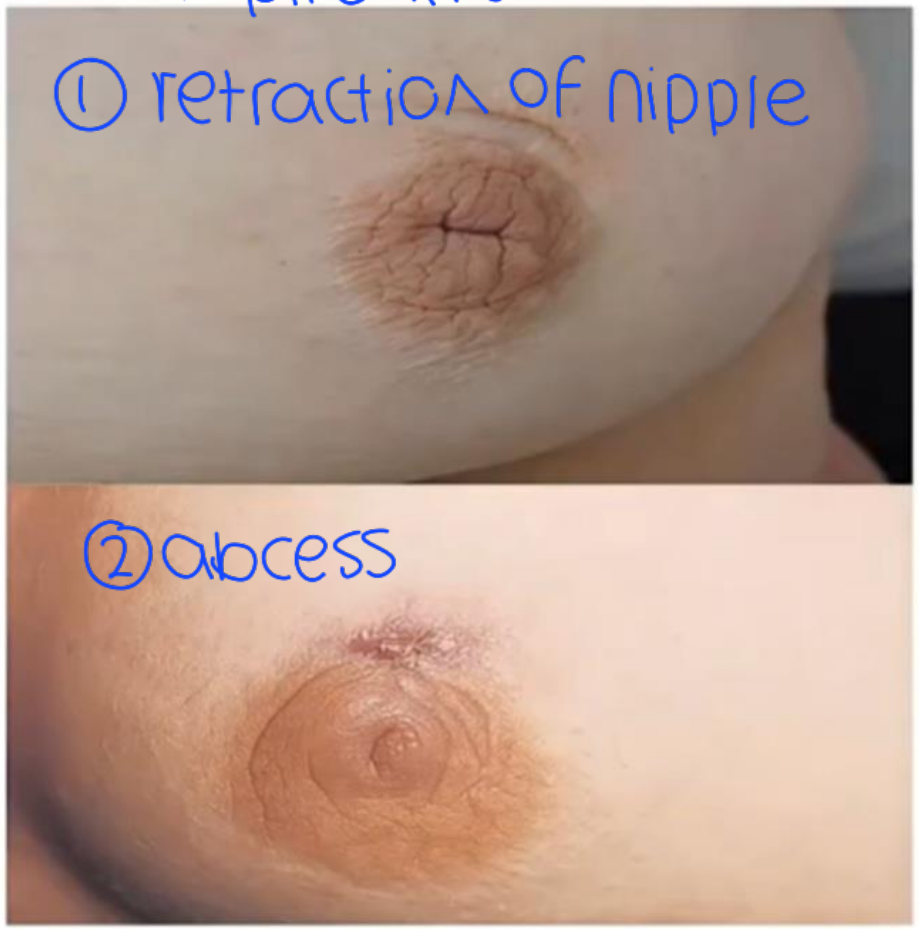
benign but need treatment (antibiotic)

may be Smoking, caffiene

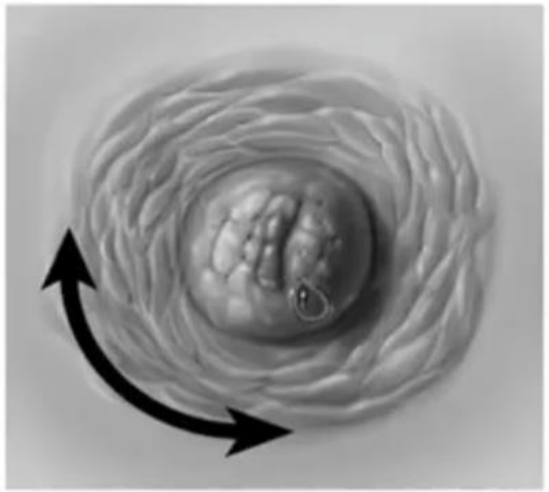
- This is a common condition of unknown aetiology.
- Dilatation of the mammary ducts,which are full of inspissated material containing macrophages and chronic inflammatory debris..
- Nipple inversion
- Nipple discharge
- Chronic low-grade infection of the peri areolar area, with tender thickening around the nipple known as periductal mastitis
- Abscess formation,.
- Periductal abscess may rupture (or be drained) externally and remain in communication with the duct system.
- Mammillary fistula

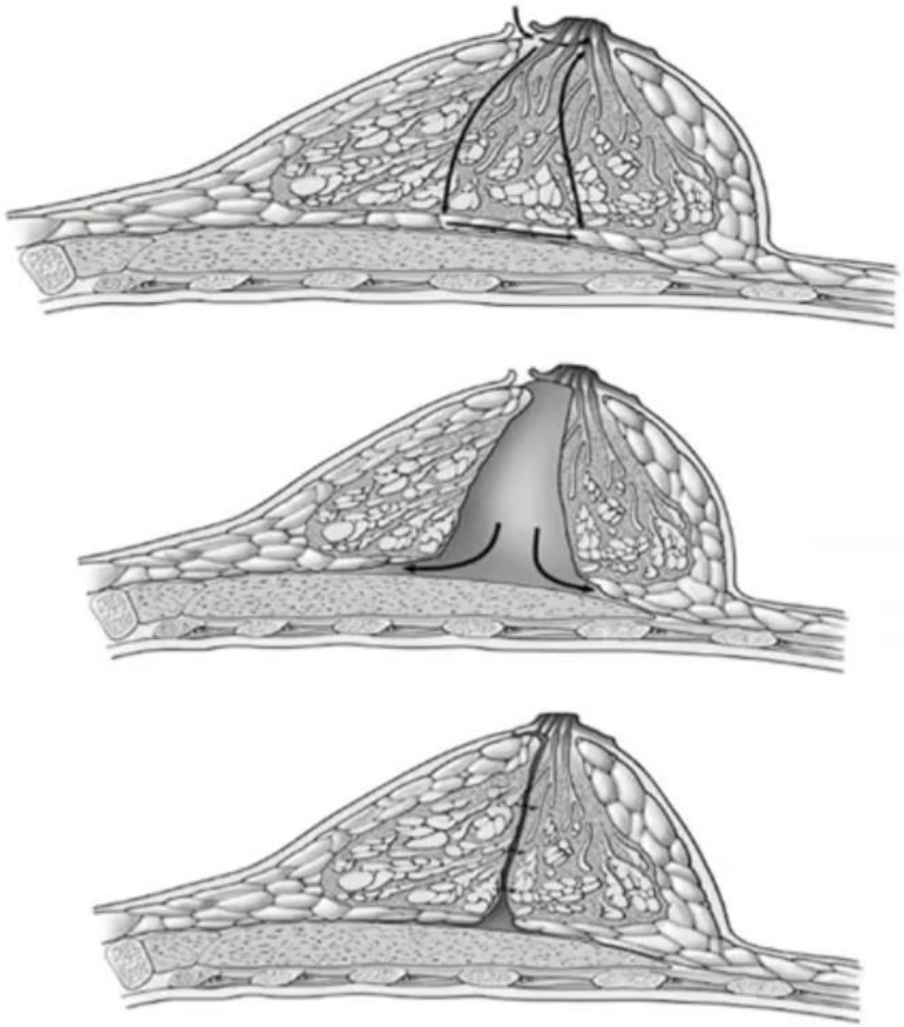
③

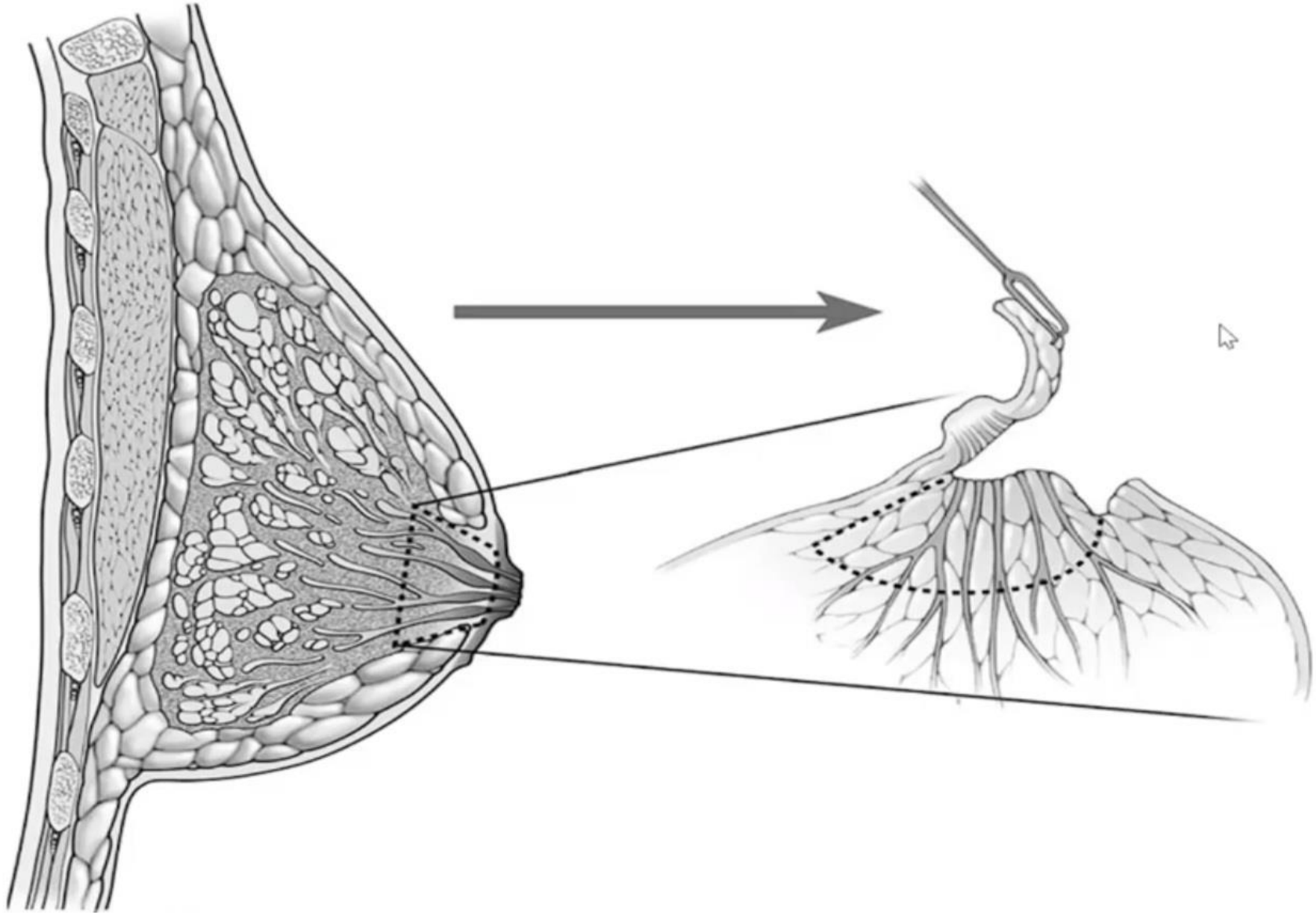
Complications :



treatment : remove major duct





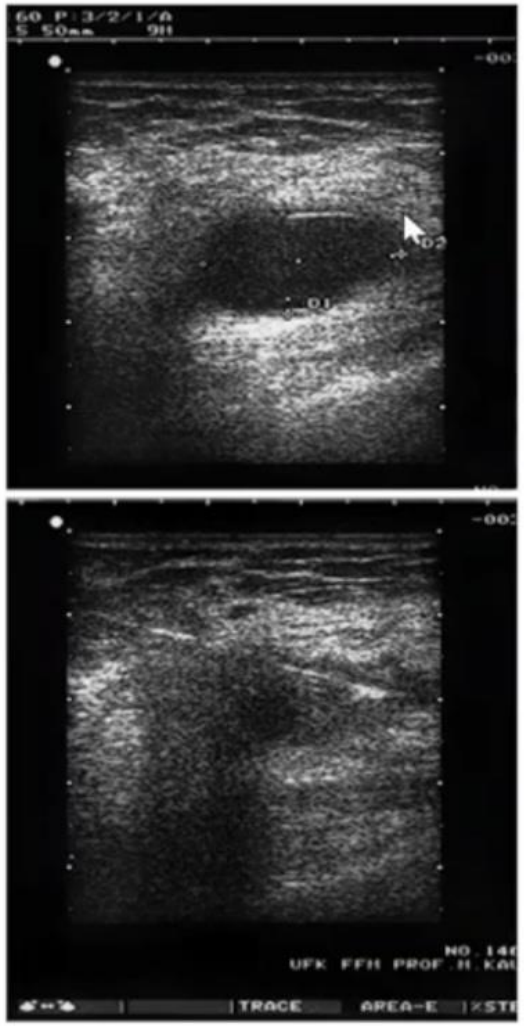


Breast Cyst

treatment : observation and follow up

doesn't transform to malignant

- **History**
- Age forties and early fifties.
- Presentation sudden onset
- discomfort and tenderness.
- Past history Many patients have multiple cysts and
- **Examination**
- Shape and surface → well defined, smooth
- consistency → firm
- Size.
- **Ultrasound**



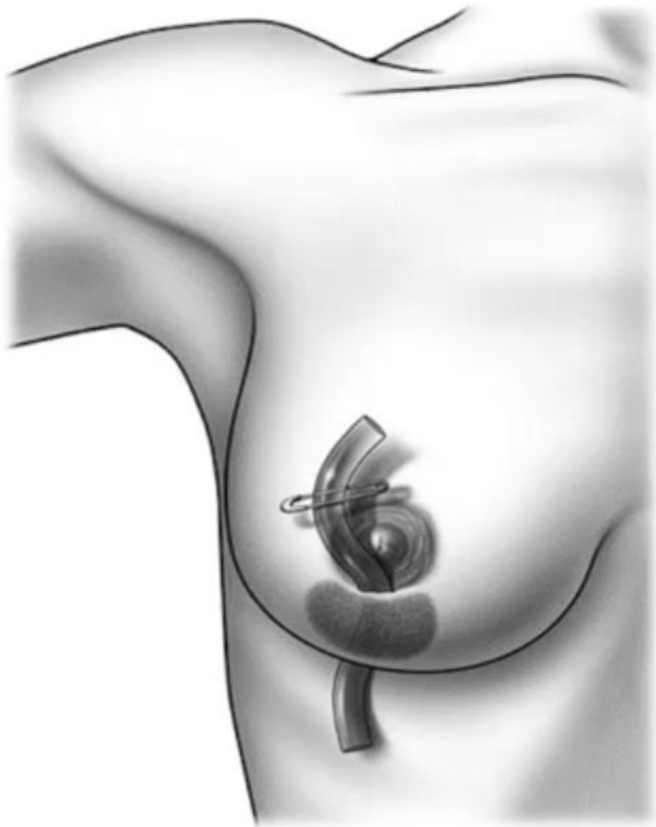
treatment: aspiration or observation

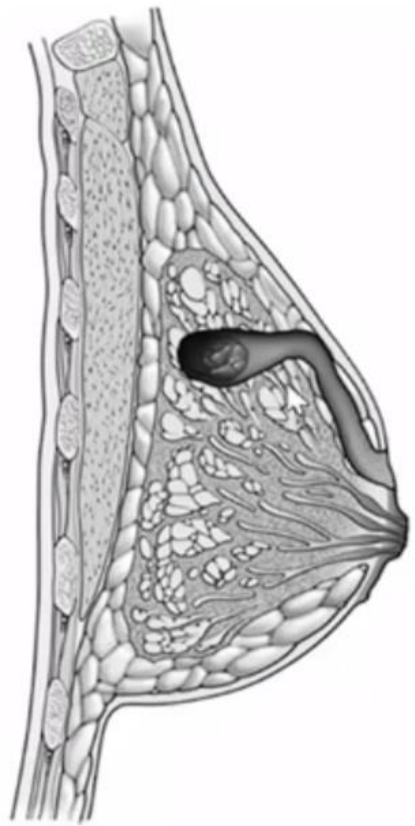
Breast Abscess

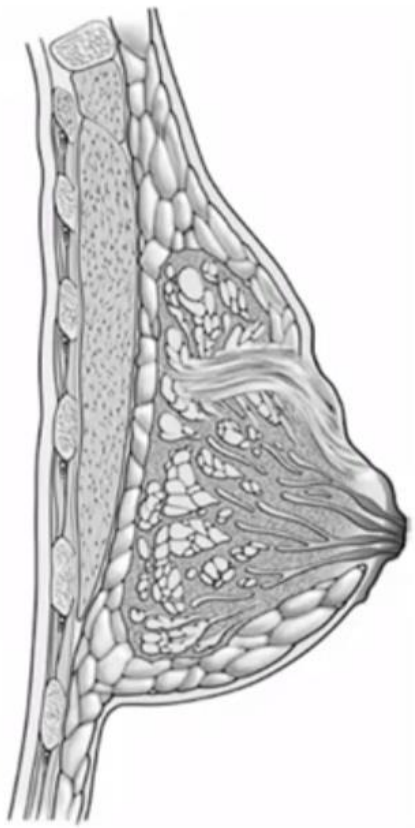
Cuz of accumulation of milk
(if mother doesn't breastfeed her baby)

treatment : open to drain the pus

treatment of breast abcess : incision & drainage

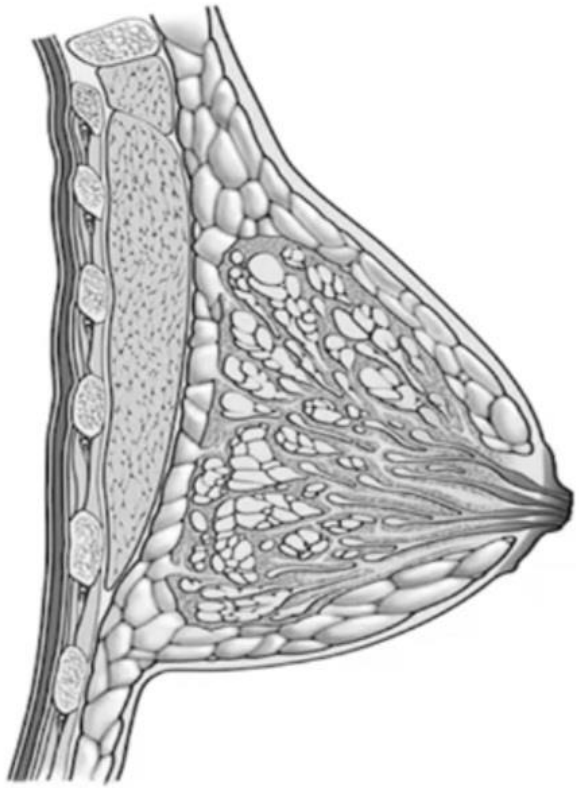






Type of lump	Age (years)	Pain	Surface	Consistency	Axilla
Solitary cyst	40–55	Occasional	Smooth	Soft to hard (high fluid pressure)	Normal
Nodularity	20–55	Often	Indistinct	Mixed	Normal
Fibroadenoma	15–55	No	Smooth and bosselated	Rubbery (or firm)	Normal
Carcinoma	35+	Uncommon	Irregular	Hard	Nodes may be palpable

Paget’s disease of the nipple Vs Eczema



Eczema	Paget's disease
Bilateral	Unilateral
Sometimes lactating	Older females
Itches	Does not itch
Vesicles	No vesicles
Nipple intact	Nipple may be destroyed
No lumps	May be an underlying lump

Onset: weeks

Onset: months

→ tumor within major duct (DCIS) → invade & Obstruct nipple → may turn into invasive ductal carcinoma