BREAST DISEASES

By

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- **Breast is a modified sweat gland derived from ectoderm, as branching epithelial cords which form lactiferous ducts.**
- The paired mammary glands embryologically develop along the milk line that extends between the limbs buds from the axilla to the inguinal region.
- **About 15- 20 lobes develop during puberty , each of which drains into a single lactiferous duct.**
- True secretory alveoli develop during pregnancy and lactation under the influence of estrogen , progesterone and prolactin

Surgical Anatomy of The Breast

- **The breast is partitioned into 4 quadrants by vertical and horizontal lines across the nipple**

➢ **Upper outer quadrant**

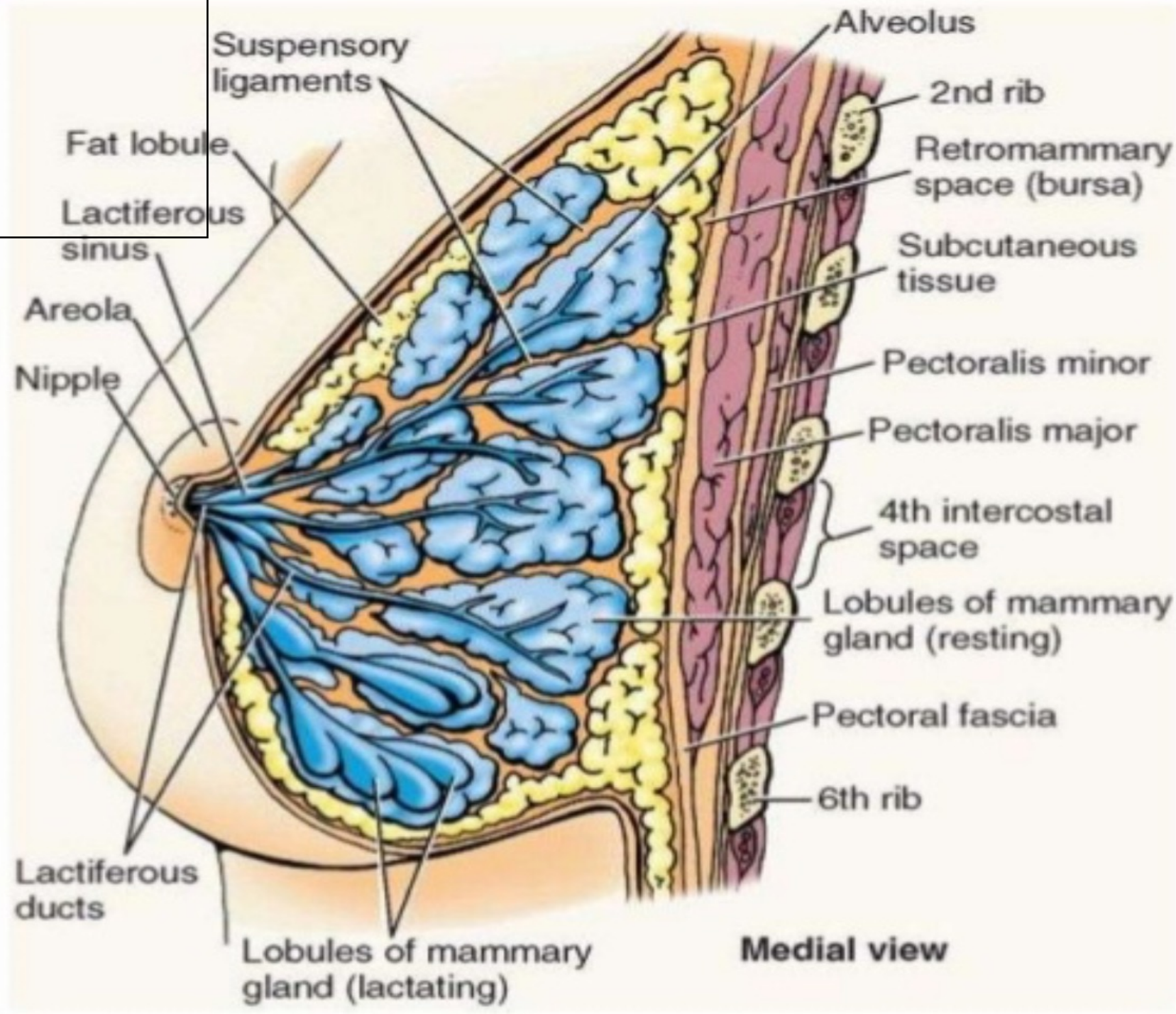
➢ **Upper inner quadrant**

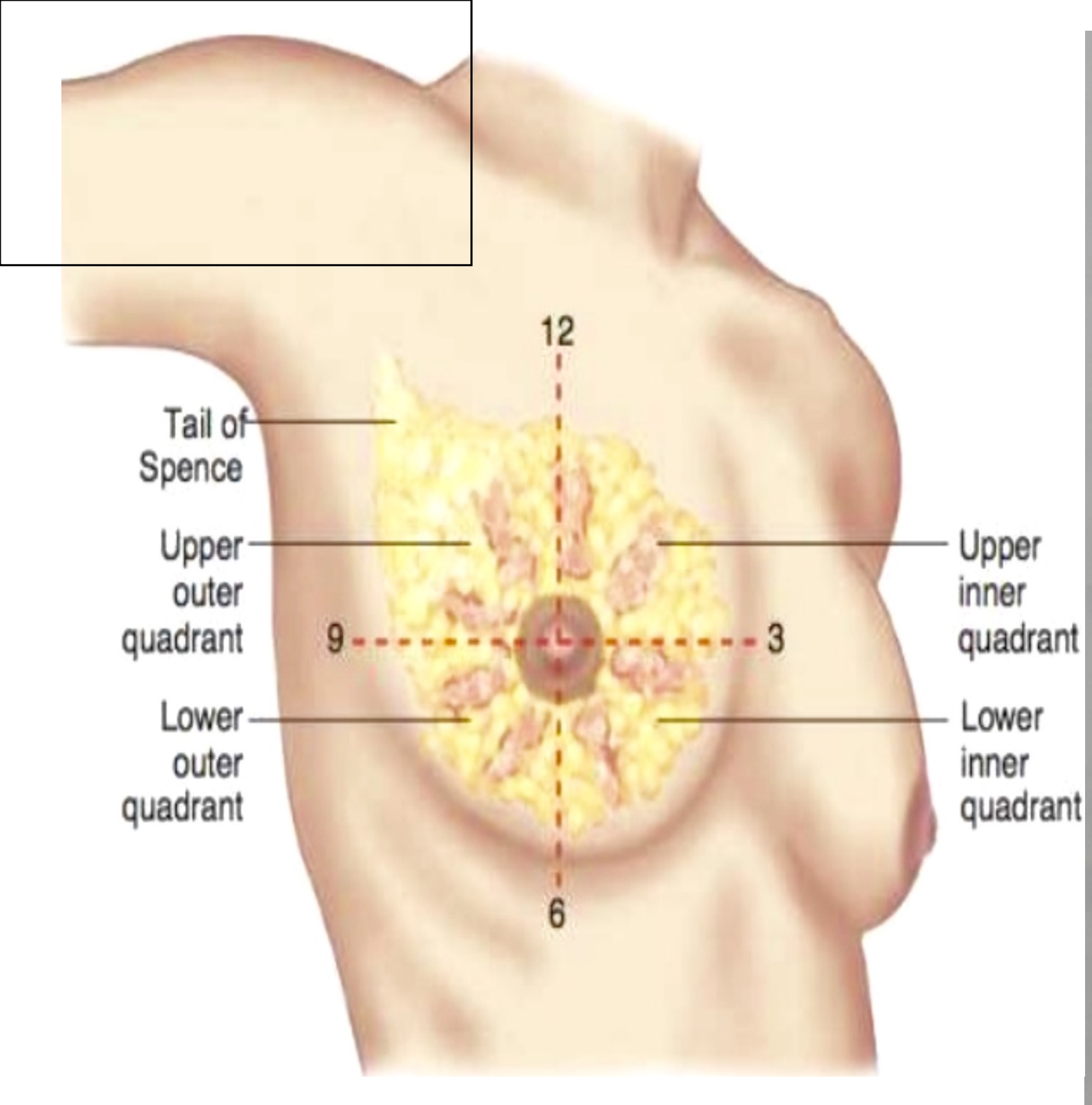
➢ **Lower outer quadrant**

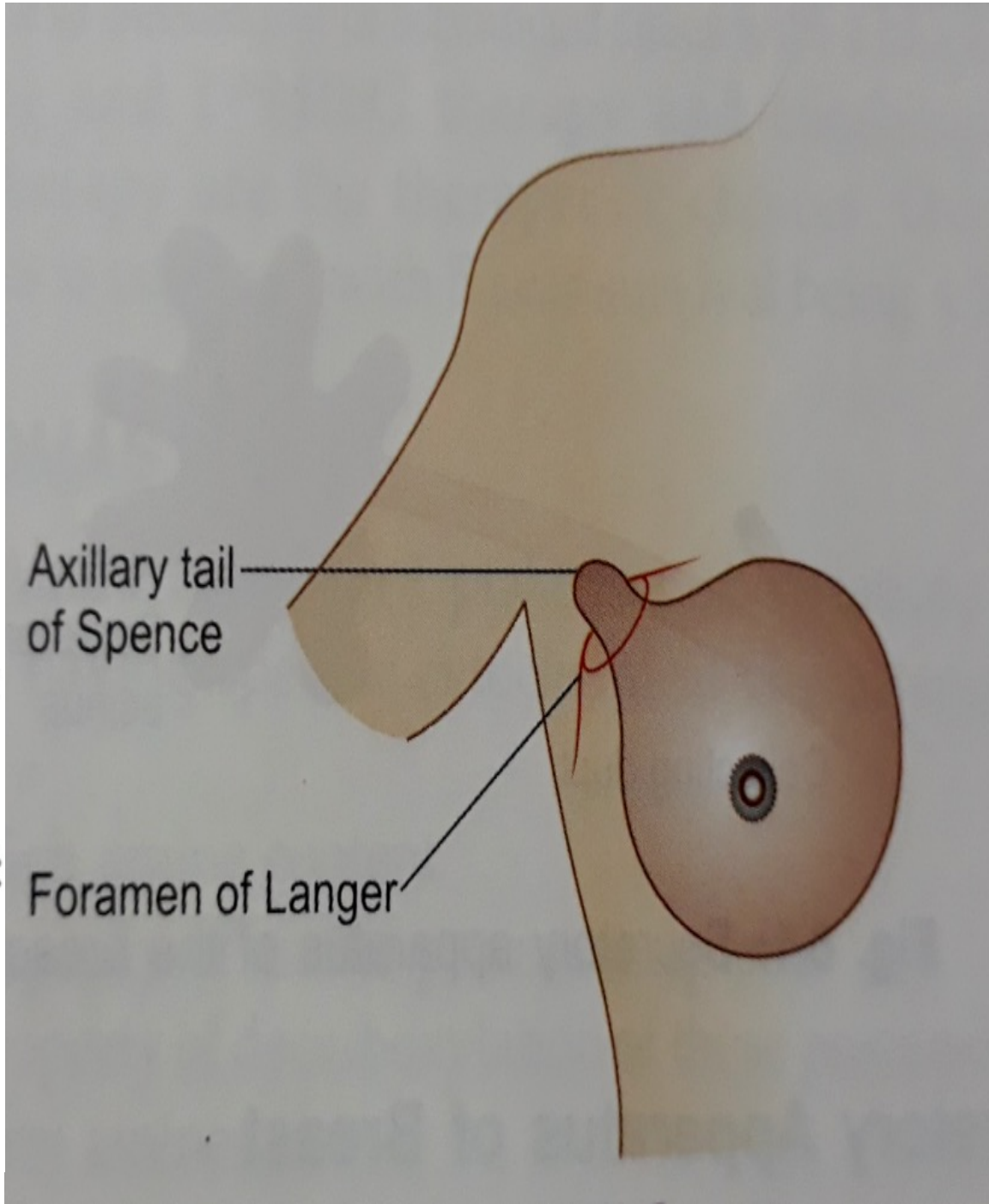
➢ **Lower inner quadrant**

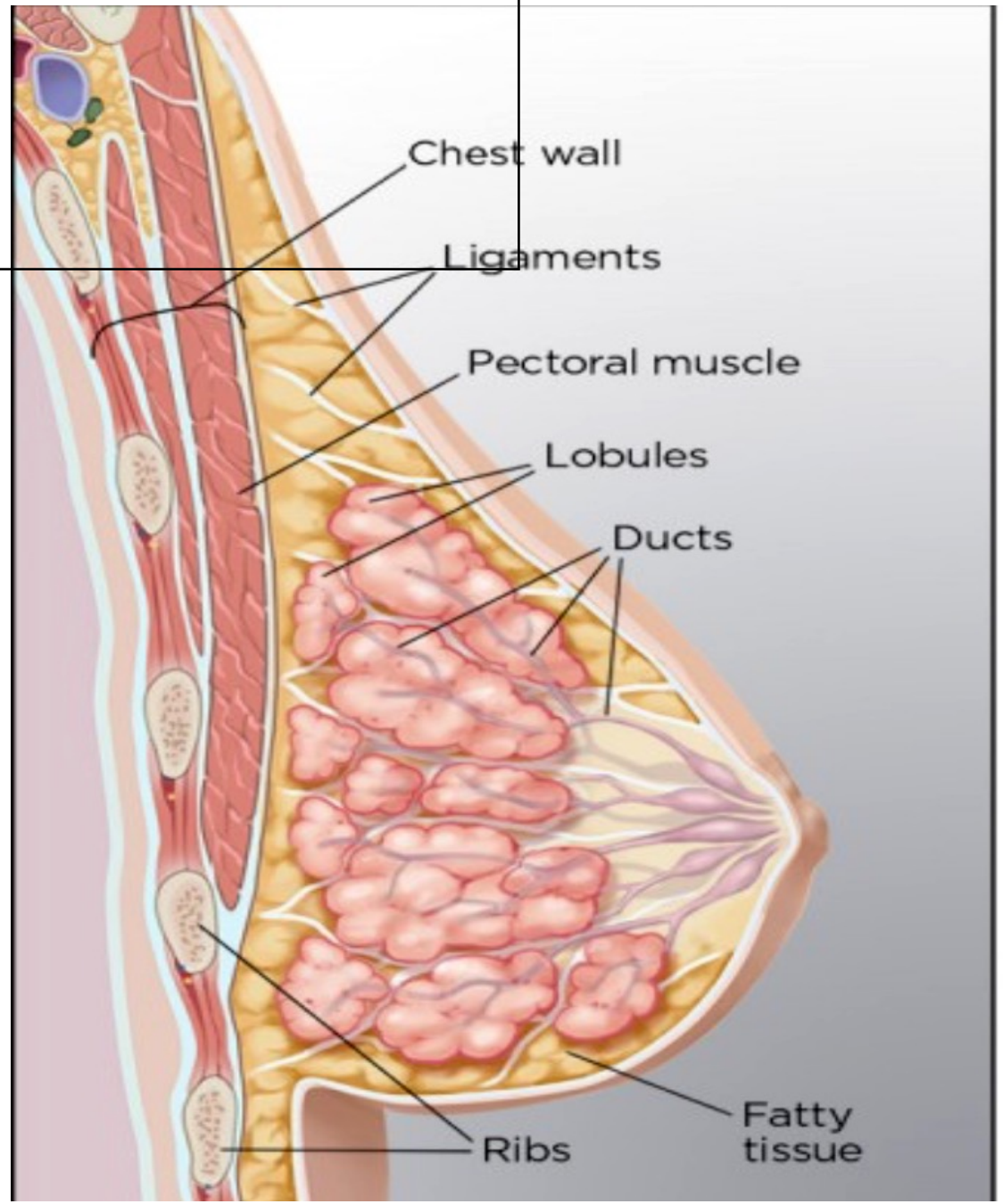
- **The upper outer quadrant has axillary extension called axillary tail of Spence**
- **Majority of benign and malignant tumors in the upper outer quadrant.**

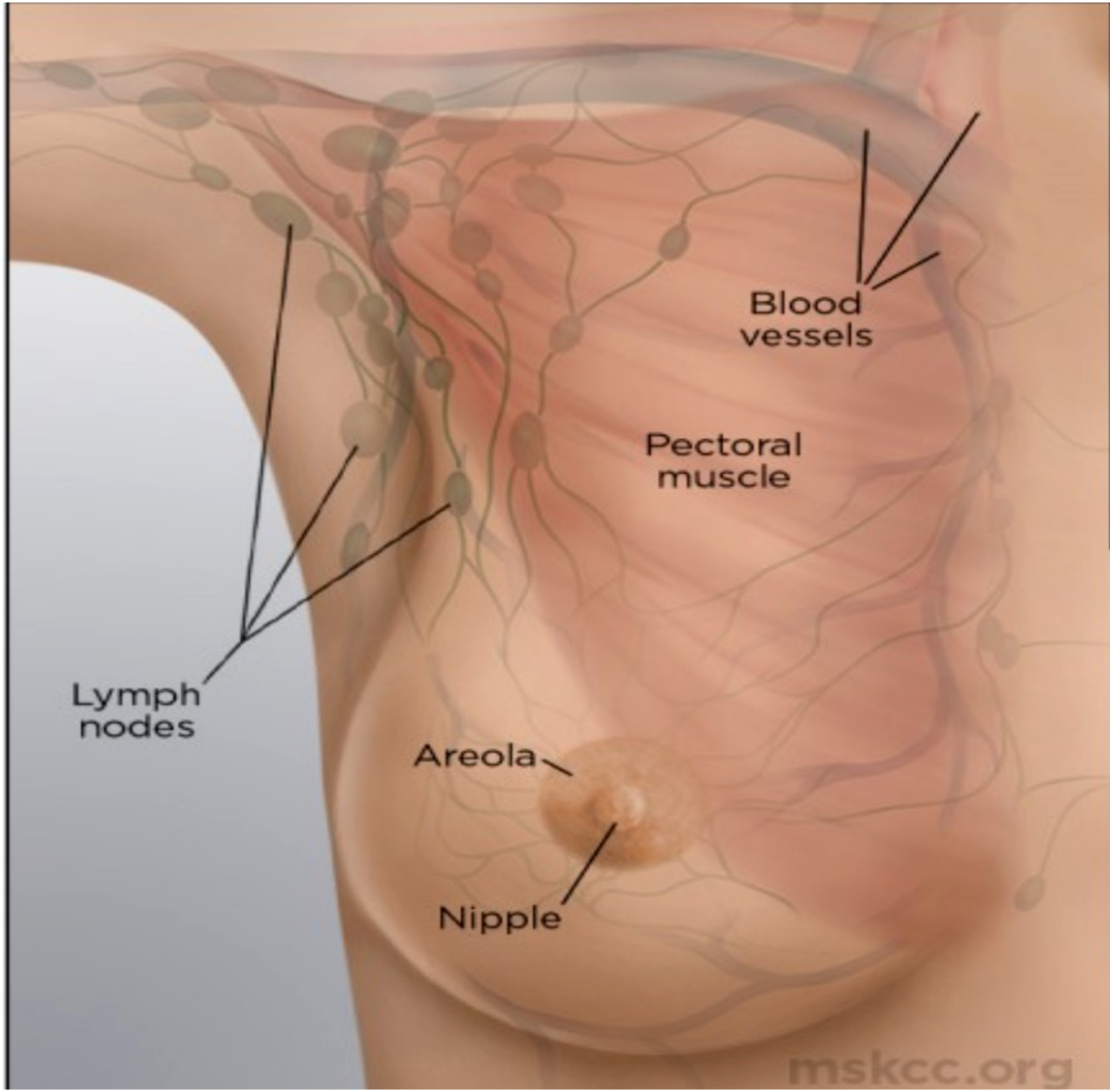
- The mature female breast extends superiorly from the level of second rib to infra mammary fold inferiorly at the level of six rib.
- Medially , the breast extends from the lateral border of sternum to the anterior or mid-axillary line laterally.
- The upper half of breast , particularly the outer quadrant contains the greater volume of glandular tissue than the remainder of the breast


Alveolus
Suspensory ligaments
2nd rib
Fat lobule
Retromammary space (bursa)
Lactiferous sinus
Subcutaneous tissue
Areola
Pectoralis minor
Nipple
Pectoralis major
4th intercostal space
Lobules of mammary gland (resting)
Pectoral fascia
6th rib
Lactiferous ducts
Lobules of mammary gland (lactating)
Medial view


12
Tail of Spence
Upper outer quadrant
Upper inner quadrant
9
3
Lower outer quadrant
Lower inner quadrant
6


Axillary tail of Spence
Foramen of Langer


Chest wall
Ligaments
Pectoral muscle
Lobules
Ducts
Ribs
Fatty tissue


Blood vessels
Pectoral muscle
Lymph nodes
Areola
Nipple
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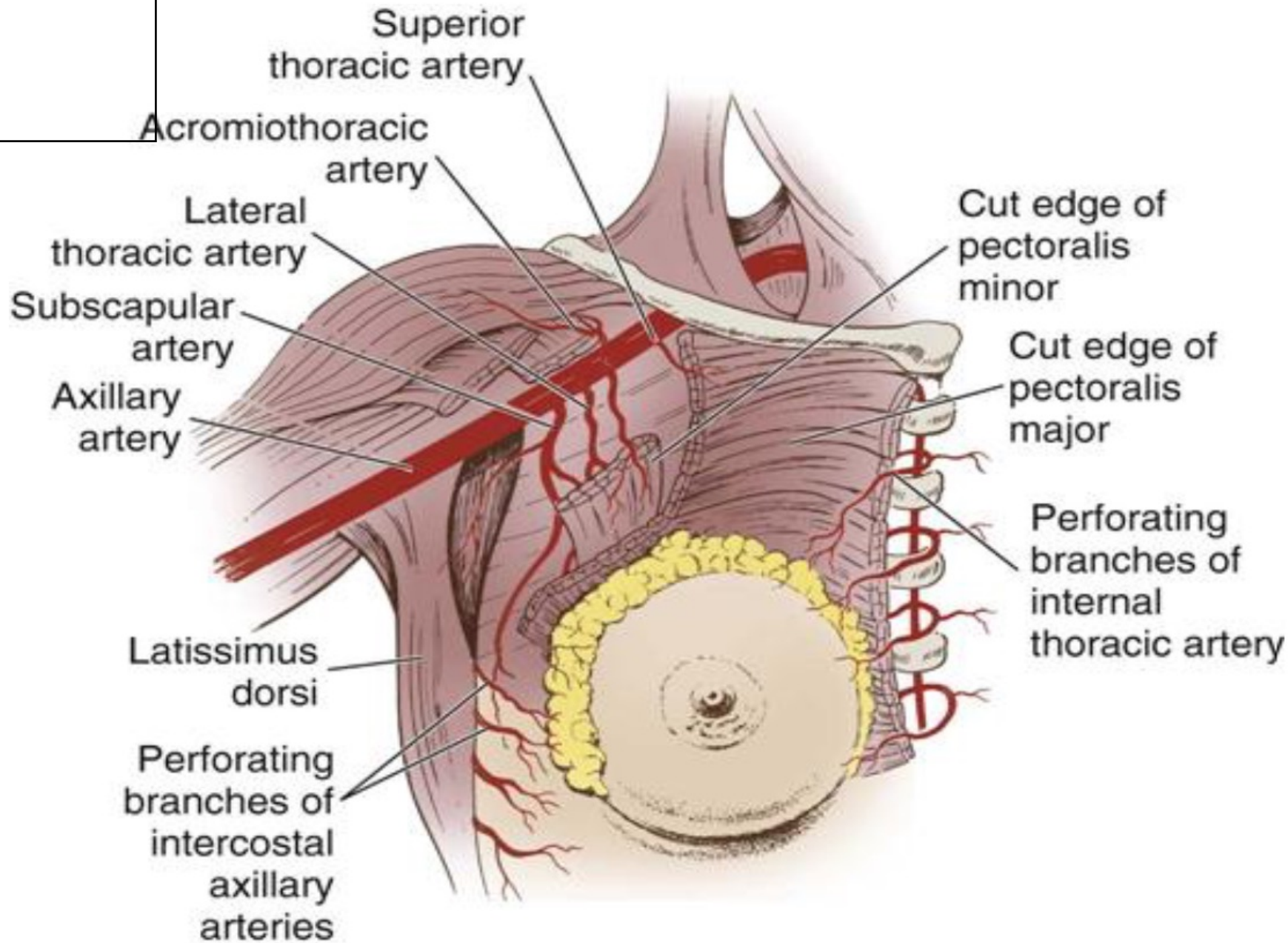
Blood supply of breast

1. **Lateral thoracic artery** from 2nd part of axillary artery.
2. Perforating branches of **internal mammary artery**.
3. Lateral branches of second, third and fourth **intercostal artery.**
4. Pectoral branches of **acromiothoracic** artery

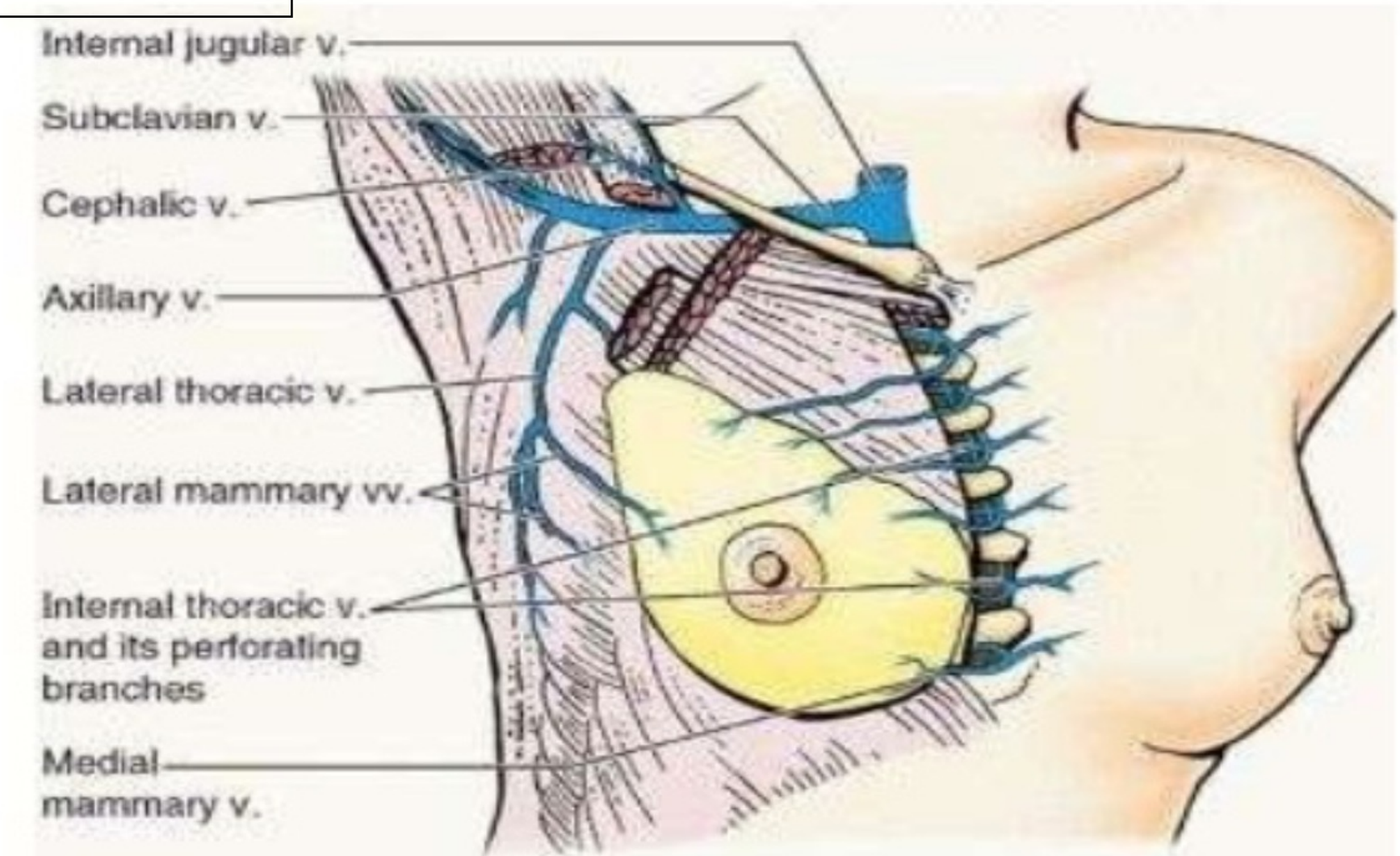

Superior thoracic artery
Acromiothoracic artery
Lateral thoracic artery
Subscapular artery
Axillary artery
Latissimus dorsi
Perforating branches of intercostal axillary arteries
Cut edge of pectoralis minor
Cut edge of pectoralis major
Perforating branches of internal thoracic artery

Venous drainage of breast

- Superficial veins from the breast drains to axillary , internal mammary and intercostal veins

- Phlebitis of one of these superficial veins feels like a cord immediately beneath the skin … Mondor's disease.
- Through posterior intercostal veins, venous drainage communicate with para vertebral venous plexus " Batson plexus", so secondaries in vertebrae is common in breast cancer.

Venous drainage



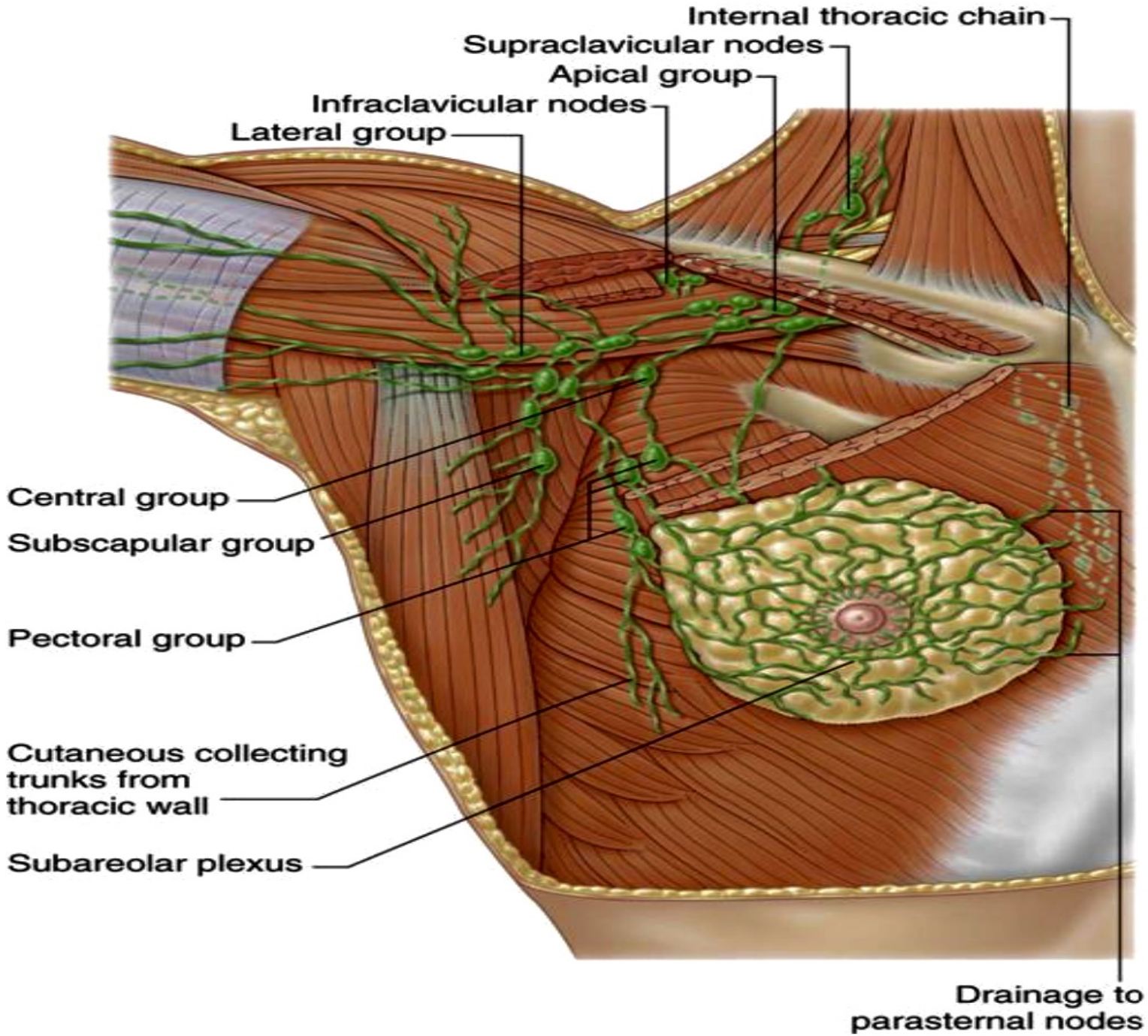
Lymphatic drainage of the breast

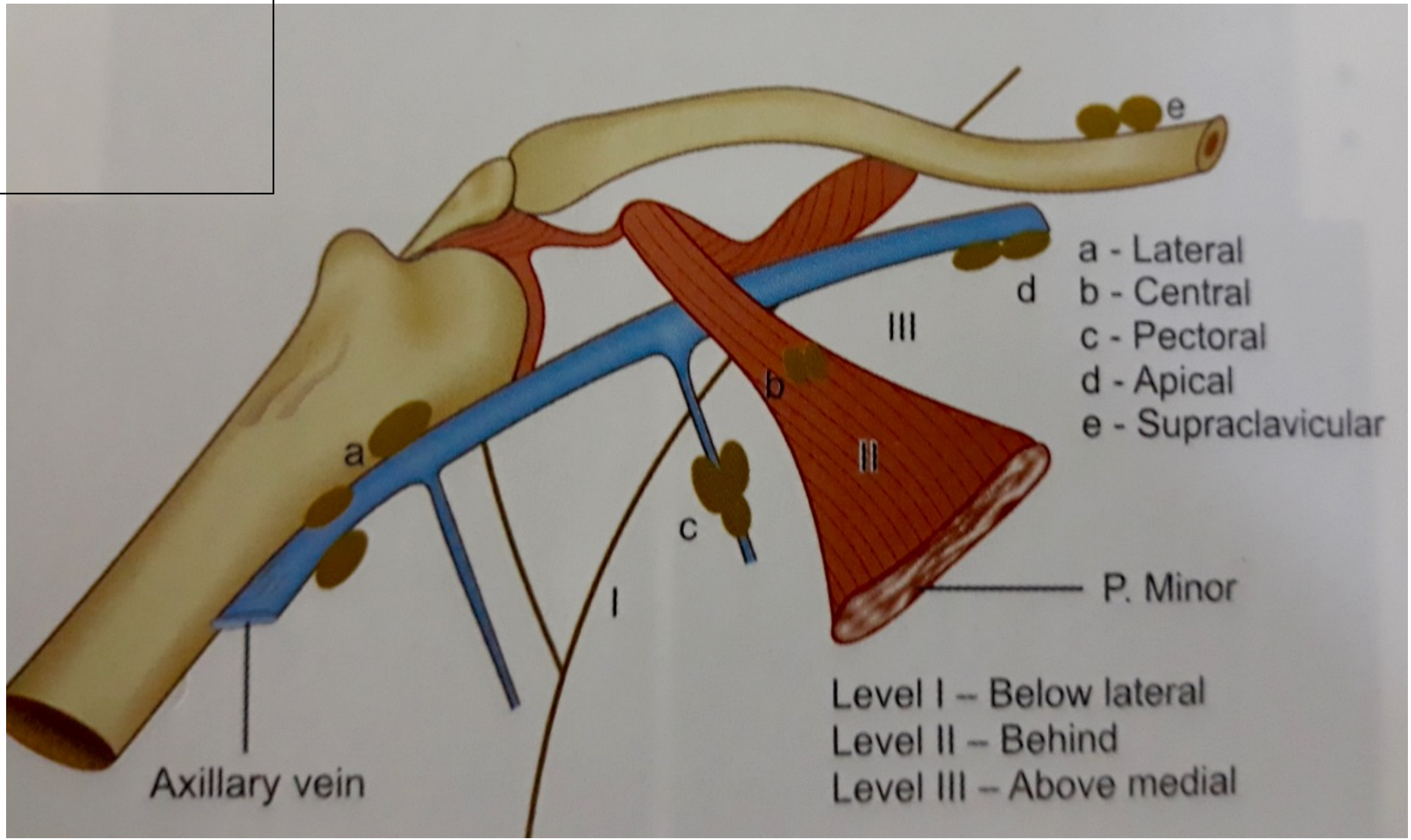
- **Commonly into the axillary lymph nodes**

1. **Anterior group (pectoral)– along the lateral thoracic vessels . Main drainage nodes.**
2. **Medial group (central) : next most common.**
3. **Posterior group (subscapular) : rarely to involve in carcinoma.**
4. **Lateral group : along the axillary vein , rare to involve in breast cancer.**
5. **Interpectoral group (Rotter's node): lies between pectoralis major and minor.**
6. **Apical.**

❖ **These lymph nodes drain later into supra and infra-clavicular lymph node**

- **25% drains mainly from medial half of the breast into 2nd, 3rd and 4th intercostal space internal mammary lymph nodes.**


Internal thoracic chain
Supraclavicular nodes
Apical group
Infraclavicular nodes
Lateral group
Central group
Subscapular group
Pectoral group
Cutaneous collecting trunks from thoracic wall
Subareolar plexus
Drainage to parasternal nodes


e
a - Lateral
b - Central
c - Pectoral
d - Apical
e - Supraclavicular
d
III
b
II
a
c
I
P. Minor
Axillary vein
Level I – Below lateral
Level II – Behind
Level III – Above medial

Presentations of breast diseases

- **Lumps**
- **Pain (Mastalgia)**
- **Swelling or changes in size or shape of the breast**
- **Nipple (discharge , retraction, displacement , ulceration)**
- **Skin Changes**
- **Abnormal mammographic findings**

Diagnosis of breast diseases

- **History and physical examination are essential for diagnostic evaluation of breast abnormalities**
- **The history includes details about**
  - **Presenting symptom whether it be a mass, pain, nipple discharge, palpable adenopathy or abnormal imaging.**
  - **History of previous breast diseases.**
  - **Risk factors for breast cancer**
  - **Menstrual history.**

Physical examination

- The physical examination should be performed with respect for patient privacy, and comfort, without compromising the complete evaluation.
- Examination begins with inspection
- The both breasts are inspected and compared for any obvious masses , asymmetries and skin changes.
- The nipples are inspected for the presence of retraction , inversion or excoriation

Palpation

- The breast is palpated with patient in upright sitting position with arms relaxed and supine with ipsilateral arm raised above the head.
- The regional lymph nodes should be examined and followed which include axillary , infraclavicular, supraclavicular and cervical nodes.
- If mass is detected , it should be measured and its location, mobility, and consistency must be documented
- True masses will persist throughout the menstrual cycle.
- Diagnosis should not be delayed.

- In patient who presented with nipple discharge, the nipple discharge is often elicited during palpation of the breast
  - The character , color , and location of discharging duct or ducts should be identified.
  - If the discharge is not grossly bloody, a Hem occult test may be used to detect occult blood.
  - Pathological discharge characterized by:
    - Unilateral
    - Uniduct
    - Spontaneous and / or bloody discharge should be evaluated with surgical duct excision

Investigations

- Mammography
- Ultrasound
- MRI
- Computed tomography , CT scan
- Fine needle aspiration cytology and biopsy.

Mammography

- Soft tissues X- ray of the breast taken by placing the breast in direct contact with ultra-sensitive film
- The dose of radiation is approximately 0.1 cGy and so, mammography is very safe investigation.
- Mammography is the most sensitive and specific imaging test currently available. The sensitivity of this investigation increases with age as the breast becomes less dense.
- In total , 5% of breast cancers are missed by mammographic screening programs.
- Digital mammography is being introduced which allows manipulation of images and computer-aided diagnosis

Types of mammography

- **Screening mammography** : is used to detect cancer in asymptomatic women when cancer is not suspected.

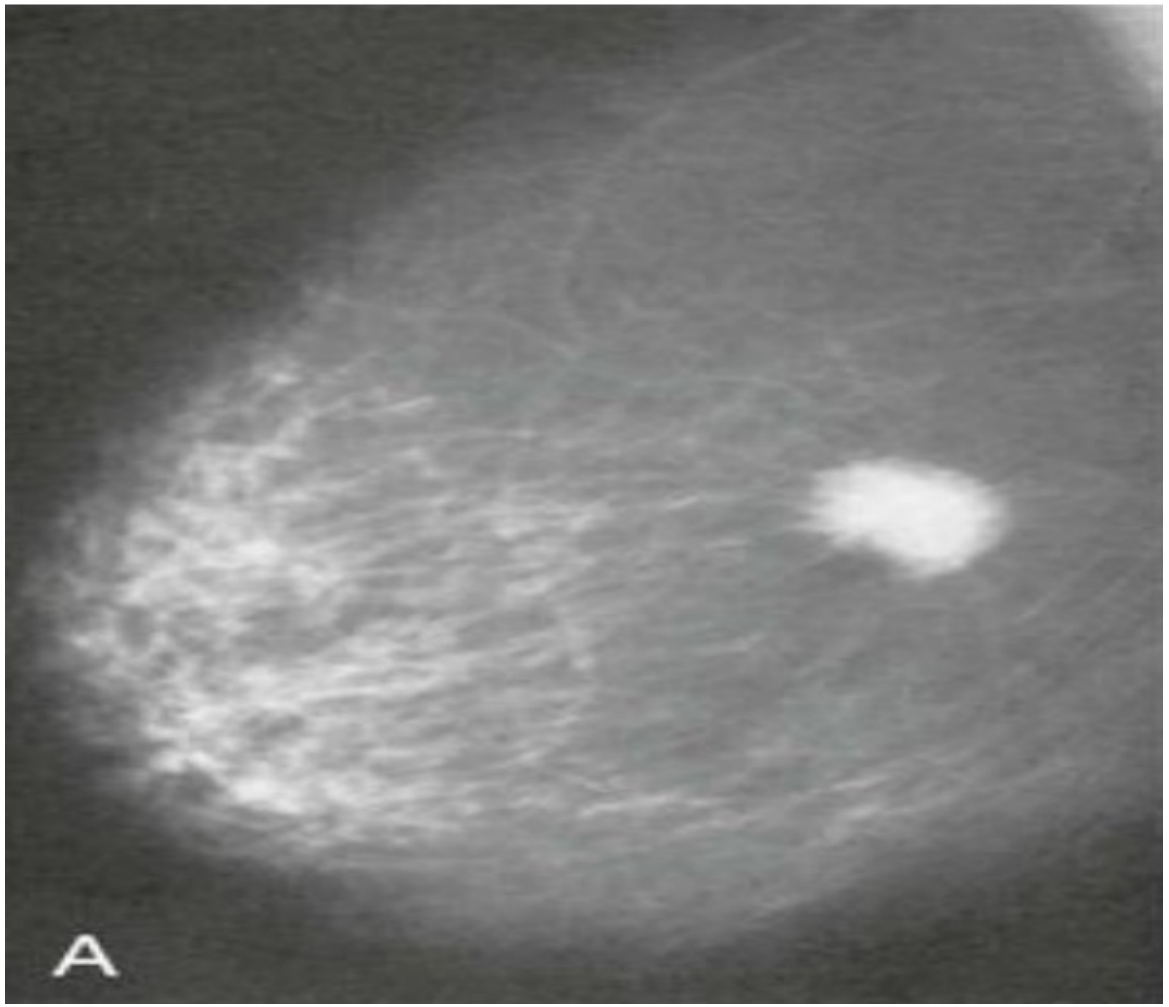
- **Diagnostic mammography**: is used to evaluate the breasts of patients with symptoms or complaints, such as nipple discharge or palpable mass or patients who have had breast cancer treated with breast conservation therapy.

Findings in mammography

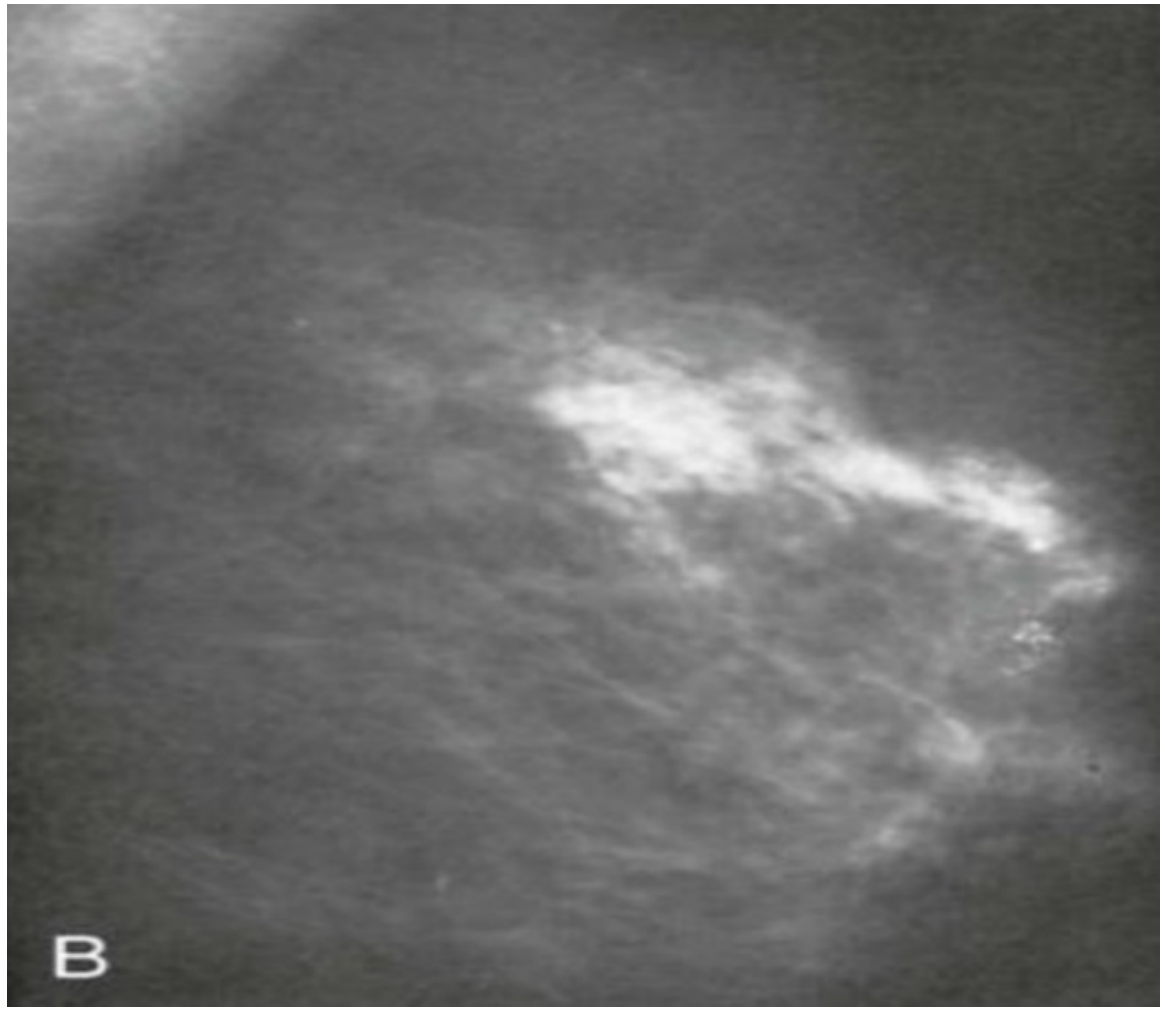
- Microcalcifications signify malignancy.
- Soft tissue shadow may be smooth and regular in benign conditions or irregular in carcinomas.
- Size and location of mass lesion.
- Spiculations, duct distortion.

Mammographics findings of cancer

A- stellate mass



B-clustered microcalcifications



Breast Imaging Reporting and Database System (BI-RADS)		
category	Assessment	Follow-up
0	Need additional imaging evaluation	Additional imaging needed before a category can be assigned
1	Negative	Continue regular screening mammograms (for women over age 40)
2	Benign (noncancerous) finding	Continue regular screening mammograms (for women over age 40)
3	Probably benign	Receive a 6-month follow-up mammogram
4	Suspicious abnormality	May require biopsy
5	Highly suggestive of malignancy (cancer)	Requires biopsy
6	Known biopsy-proven malignancy (cancer)	Biopsy confirms presence of cancer before treatment begins

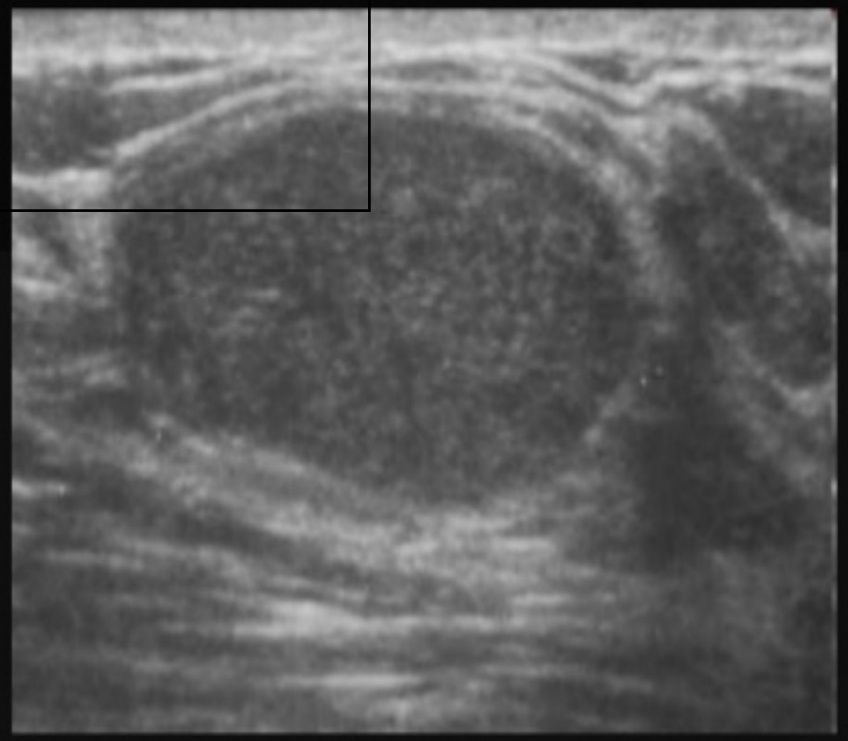
Ultrasound

- Ultrasound initially used to differentiate solid masses from cystic masses, margin of the lesion , internal echoes, retro-tumor acoustic shadowing , compressibility, dimension. It has become an important adjunct to mammography and is an excellent method for guiding some interventional procedures.
- Ultrasound is not a breast screening tool and remains an operator dependent.

- Irregular margin, irregular internal echoes, hypoechogenecity, posterior shadowing, non –compressibility, taller than wide dimensions are features of malignancy.

- Benign lesion are smooth, rounded with well defined margins with weak internal echoes and compressibility.
- FNAC can be done under Ultrasound guidance .

- It is cheaper , easily available and there is no risk of radiation
- Disadvantage is lesion less than 1 cm may not be identified.



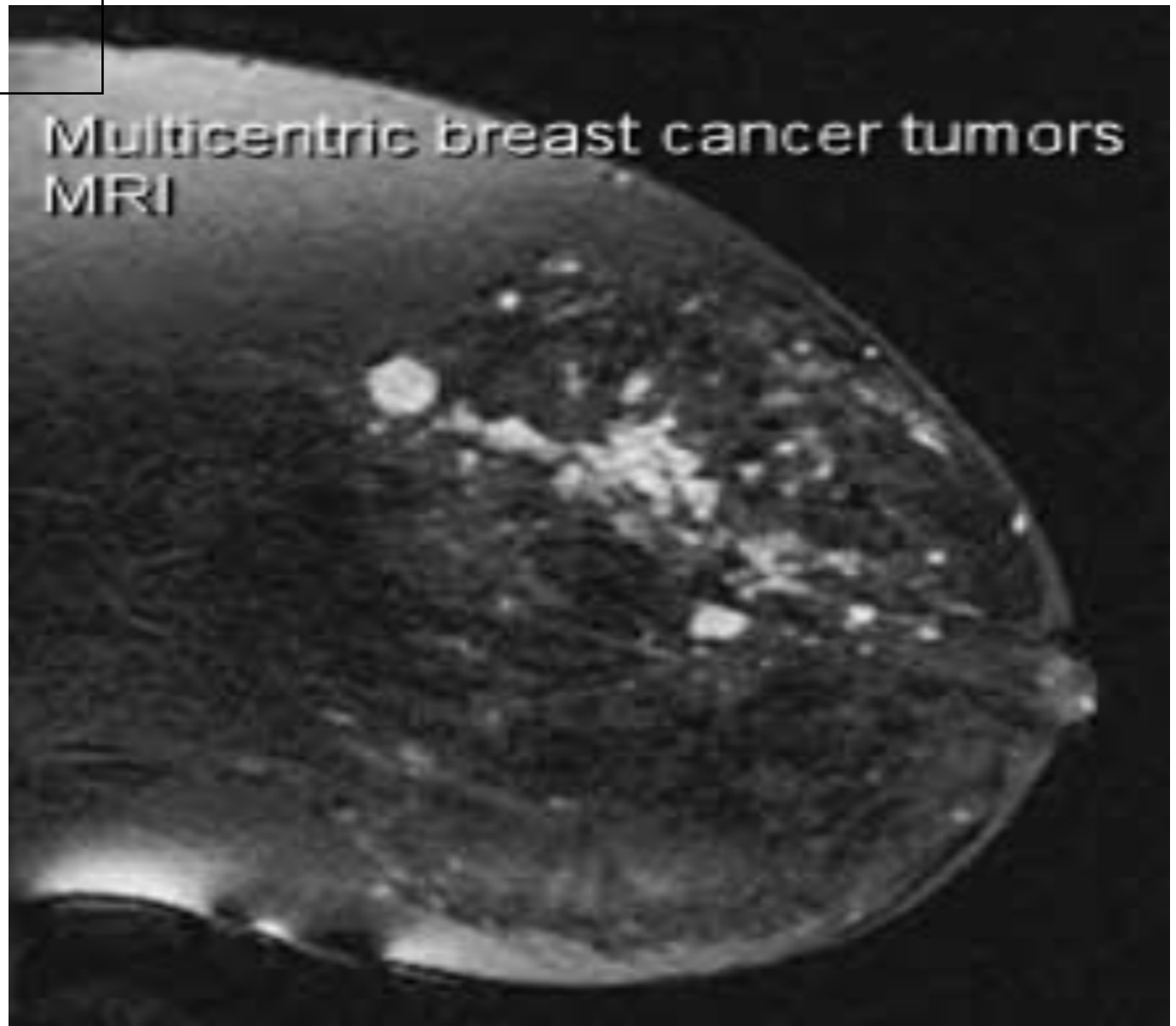
A typical fibroadenoma with homogeneous internal echoes with an ovoid shape and circumscribed margins -- **benign.**
There is posterior acoustic enhancement..

A typical **'tall' irregular spiculated hypoechoic** attenuating mass in keeping with a malignant breast tumour.

MRI Breast

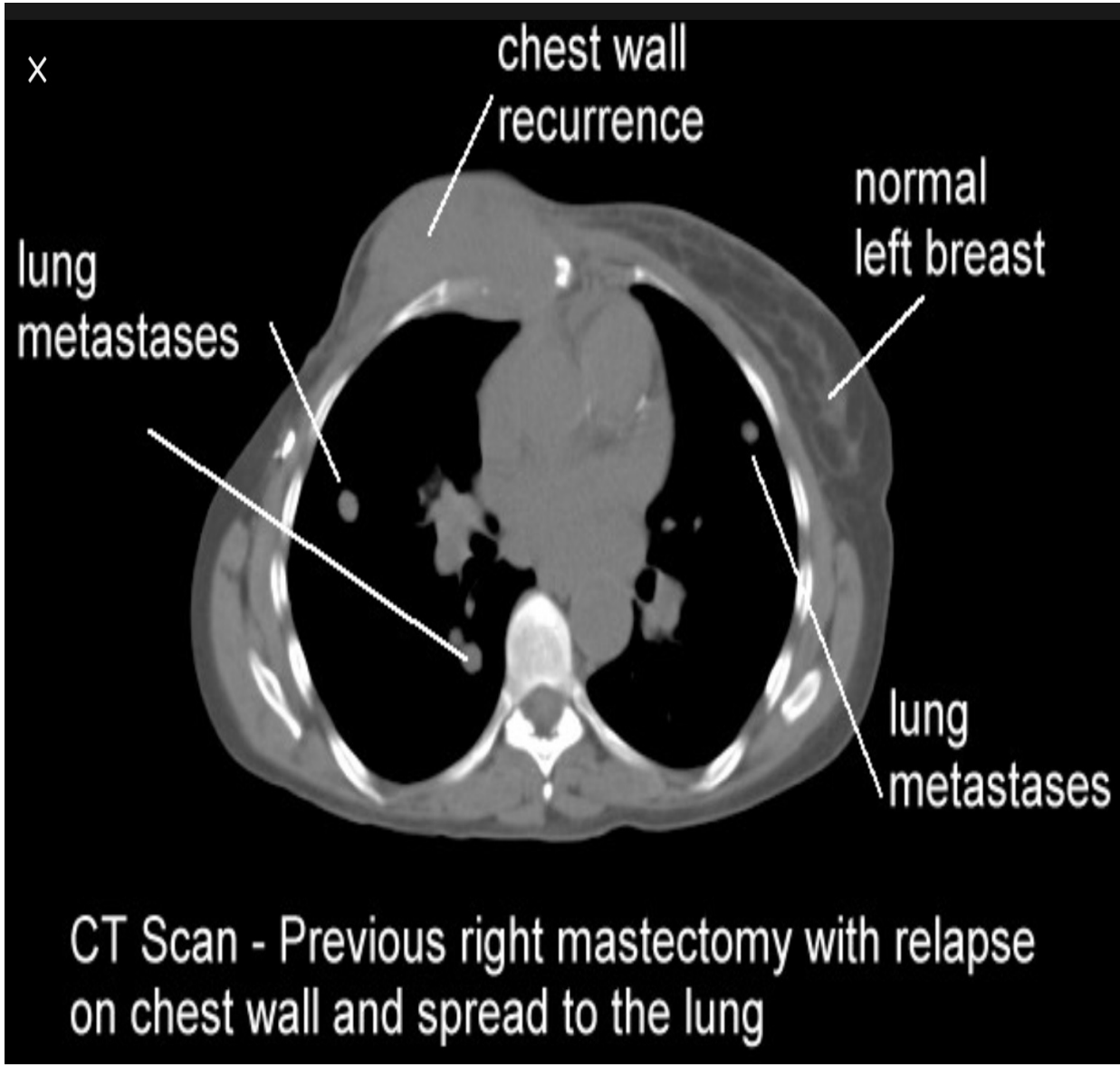
- MRI is being used with increasing frequency for screening and diagnosis of breast cancer.
- While the mammography remains the gold standard , MRI is emerging as an important modality for evaluating breast diseases.
- MRI has several advantages . There is no ionizing radiation to the patient with MRI.
- MRI is not limited by breast density and is an excellent tool for the screening of young woman with increased risk for inherited breast cancer.
- Disadvantages of MRI are cost , limited availability.

Breast MRI , Breast Cancer



Computed Tomography, CT scan of breast:

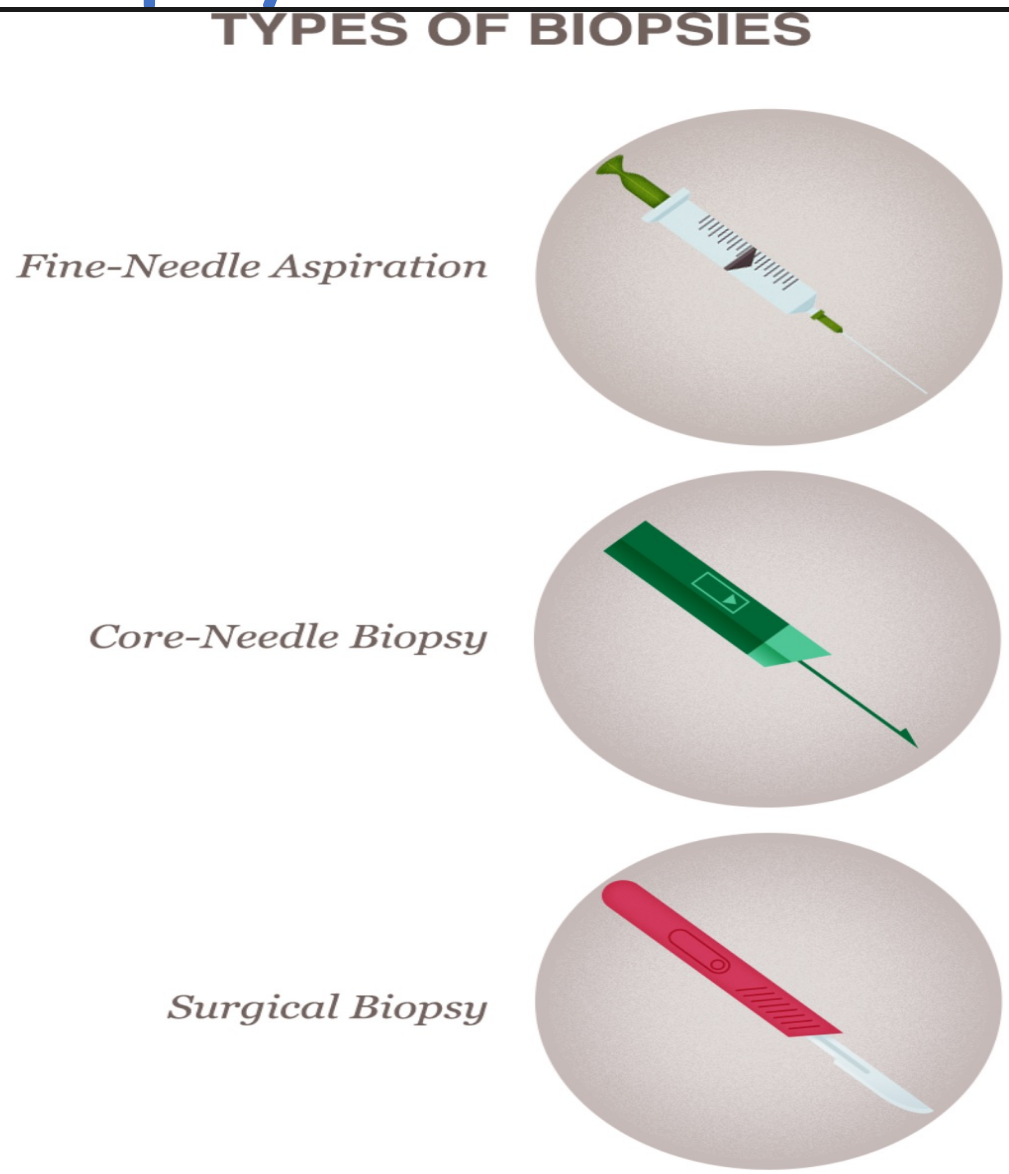
- Appears to be the best way to image internal mammary nodes and to evaluate the chest and axilla after mastectomy



Needle cytology and biopsy

- Fine - Needle Aspiration Cytology (FNAC)
- Core – Needle (Cutting – Needle) Biopsy

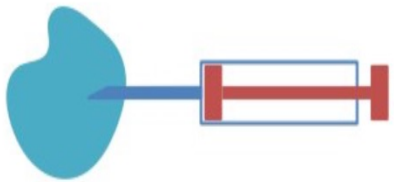
- Image –Guided
  - ➢ Stereotactic
  - ➢ Ultrasound-Guided



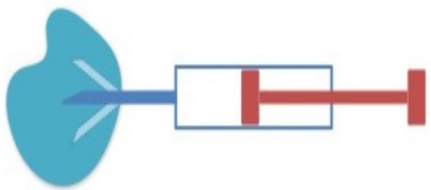
Core – needle biopsy of the breast under Ultrasound guidance

- Fine-needle aspiration cytology(FNAC) is the least invasive technique of obtaining a cell diagnosis and is rapid and very accurate if both the operator and the cytologist are well expert.
- The diagnostic accuracy of FNAC of breast masses is approximately range
- False –negative results occur in approximately 15% of cases and the False –positive result is rare.
- Core needle biopsy is considered more sensitive and more specific than FNAC.

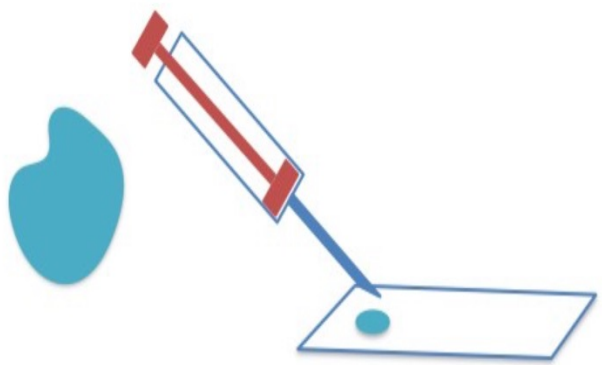
FNAC



The lesion is pierced with a thin (gauge 21-25) needle

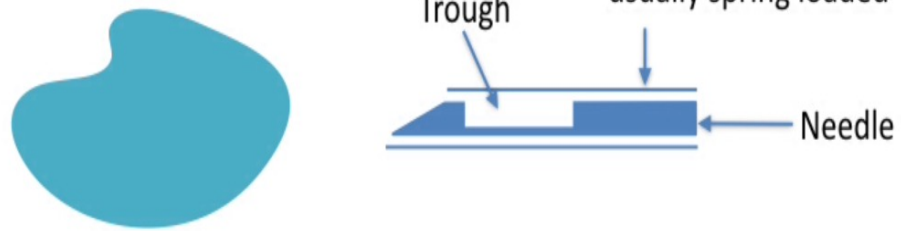


The plunger is withdrawn. Without exiting the lesion and without releasing the plunger the needle in moved in an out in different directions

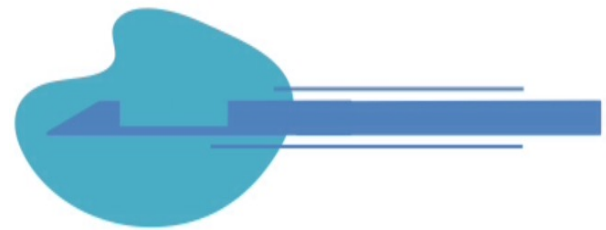


The needle is withdrawn and the material aspirated smeared on to a slide, stained and examined

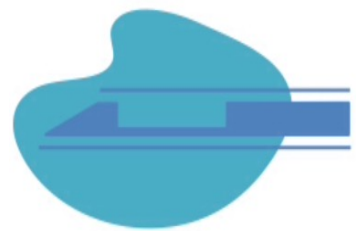
Core Needle Biopsy



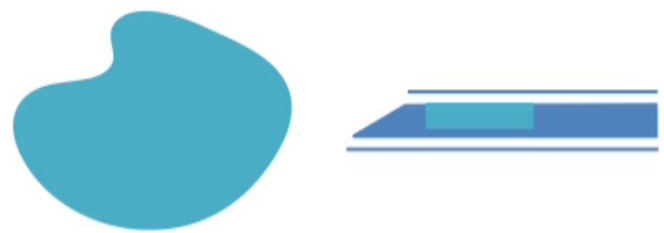
Core Biopsy needle



The needle in inserted into the mass



Outer sheath is fired



Needle is withdrawn with a core of tissue this is processed as any other biopsy would

Triple assessment

- Any patient who present with a breast lump or other symptoms suspicious of carcinoma
- The diagnosis should be made by a combination of :

➢ **Clinical assessment : detailed history and thorough physical exam.**

➢ **Radiological imaging : mammogram , ultrasound , MRI and CT scan**

➢ **Cytology and biopsy.**

- The diagnosis by triple assessment should exceed 99%

Diseases of Nipple

- Nipple retraction
- Cracked nipple
- Papilloma of the nipple
- Retention cyst of a gland of Montgomery
- Eczema
- Paget‘s diseases
- Nipple discharge

Nipple retraction

- Occurs at puberty or later in life.

➢ **pubertal retraction**, known as simple inversion,is of unknown etiology.

➢ In 25% of cases it is bilateral.

➢ It may cause problems with breast feeding and infection can occur, especially during lactation because of retention of secretions.

➢ Recent retraction of the nipple may be of considerable pathological significance .

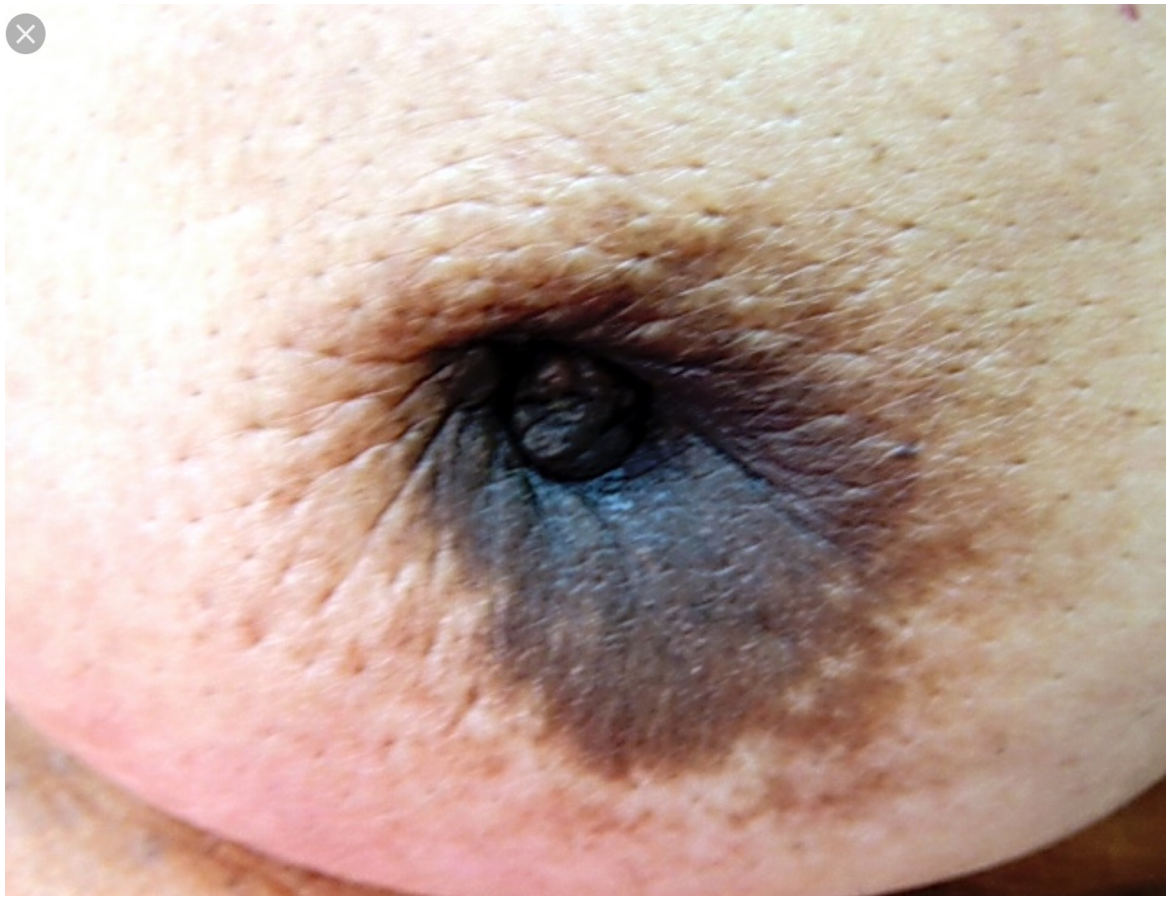
➢ A **slit-like retraction** of the nipple may be caused by ductectasia and chronic periductal mastitis.

➢ **Circumferential retraction** , with or without an underlying lump may indicate an underlying carcinoma.

Nipple retraction

Slit-like nipple retraction

Circumferential nipple retraction



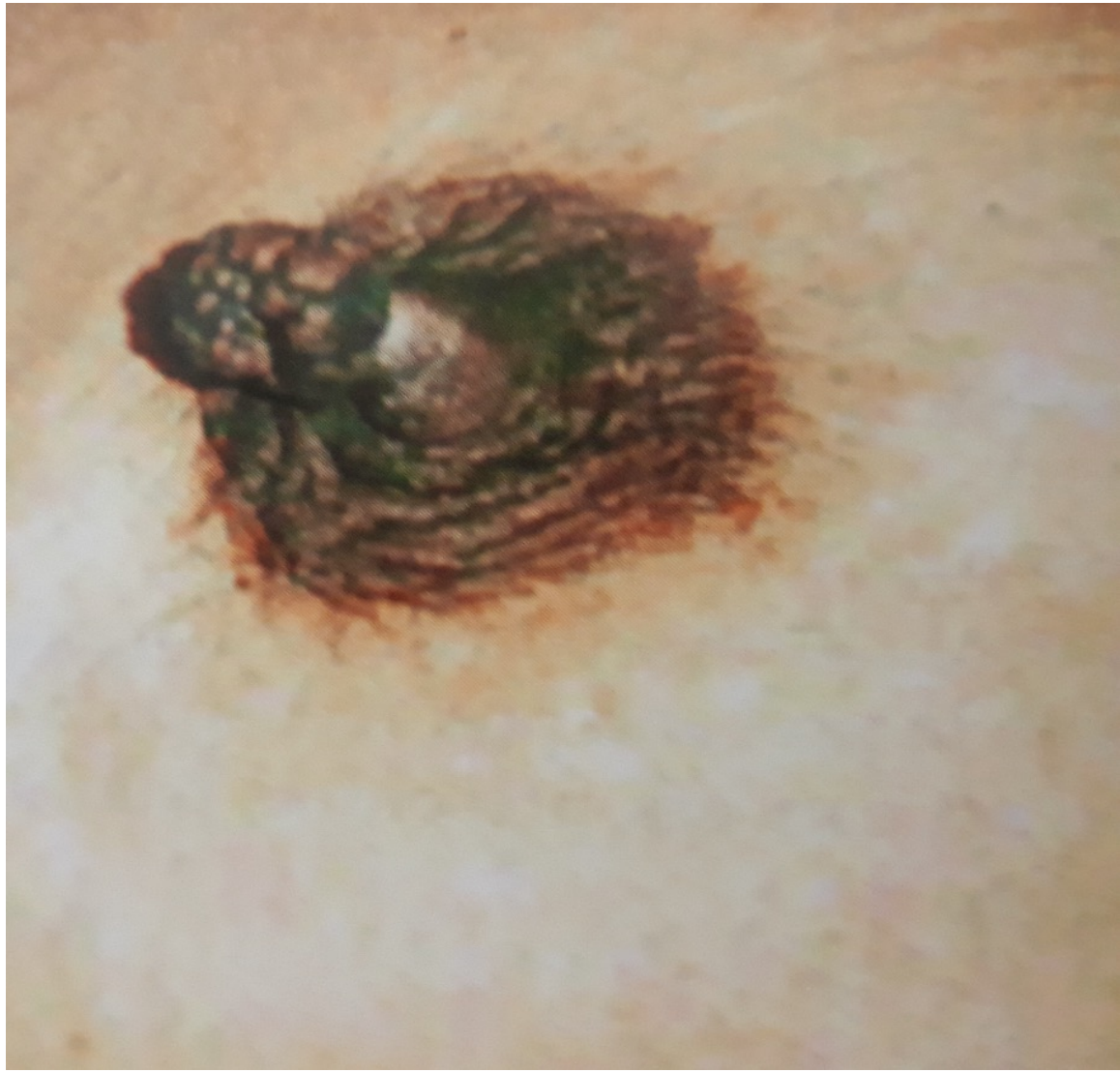
Cracked Nipple

- This occur during lactation and it's the cause of acute mastitis
- If the nipple becomes cracked during lactation, it should be rested for 24 -48 hours and the breast should be emptied with a breast pump.
- Feeding should be resumed as soon as possible.

Papilloma of the nipple

- Papilloma of the nipple has the same features as any cutaneous papilloma and should be excised with a tiny disk of skin.

- Alternatively, the base may be tied with a ligature and the papilloma will spontaneously fall off.



Retention cyst of a gland of Montgomery

- These gland situated in the areola, secrete sebum and if they become blocked , sebaceous cyst forms.

- Gland of Montgomery
  - ➢ Sebaceous glands within the areola
  - ➢ Lubricate nipple during lactation

Paget's disease of the nipple

- It must be distinguished from eczema
- Paget's disease is caused by malignant cells in subdermal layer.
- Eczema tends to occur in younger people who have eczema elsewhere.

Differences between Paget's disease and eczema of nipple

	Paget's disease		*Eczema*
1.	Unilateral	1.	Bilateral
2.	Edges are distinct	2.	Edges are indistinct
3.	Itching absent	3.	Itching present
4.	Seen in menopausal women	4.	Occurs during the time of lactation
5.	Vesicles absent	5.	Vesicles present
6.	Nipple is usually destroyed	6.	Nipple is usually intact
7.	Underlying lump is usually present	7.	No underlying lump

Nipple discharges

Blood

- Papilloma : commonest
- Carcinoma
- Ectasia

Serous

- Ectasia : common
- Fibrocystic disease : rare.

Purulent

- Infection
- Occasionally malignancy

Milk

- Lactation (physiological)
- Galactrrhoe :pitutary tumor,hypothyroidism)

Serosanguinous

- Carcinoma
- Infection

Brown- greenish

- Firocystadenosis
- Ductectasia

Galactorrhea

- Bilateral , milky discharge .

- Prolactin level should be checked, if high , suspicion of pitutary adenoma as one of the causes.

Bloody nipple discharge

- Most common cause is intraductal papilloma
- Cancer present 10% of cases.
- Management depend on:

➢ The presence of a lump which should always be given priority in diagnosis and treatment.

➢ The presence of blood in the discharge from multiple ducts or discharge from a single duct.

➢ Mammography is useful to exclude an underlying impalpable mass

Bloody nipple discharge : management

- Treatment must firstly be to exclude a carcinoma by cytology.
- If malignancy is excluded , simple reassurance is important.
- If the discharge is proving intolerable , an operation to remove the affected duct or ducts can be performed.

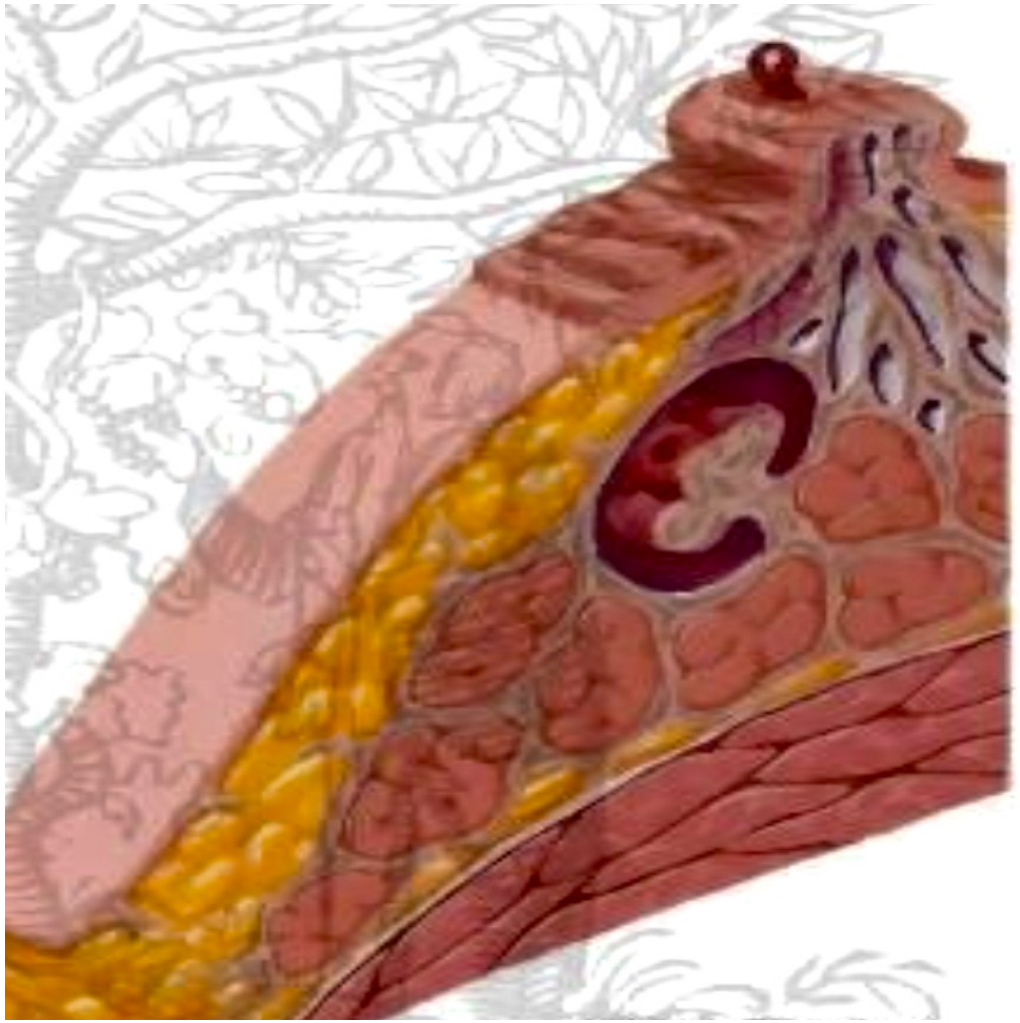
Changes that can occur in nipple

- **Destructions**
- **Depression – retraction**
- **Discoloration**
- **Displacement .**
- **Deviation .**
- **Discharge .**
- **Duplication**

Intraductal papilloma

- **Benign epithelial tumor arising in the lactiferous duct of the breast.**
- **Main cause of bloody nipple discharge.**
- **Affect women age 40 – 45 years.**
- **Size ranges 2 – 5 mm , usually not palpable**
- **Nearly always situated within 4 - 5 cm of the nipple orifice .**
- **Present with spontaneous bloody , serous or cloudy nipple discharge.**
- **Treatment by excision biopsy**

Intraductal papilloma



Benign Breast Diseases

Benign breast diseases.

- The most common cause of breast problems.
- About 30% of women will suffer from a benign breast disorders.
- The most common symptoms are pain , lumpiness or a lump.
- The aim of treatment is to exclude malignancy and once cancer excluded , to treat any remaining symptoms.

Benign Breast Diseases.

- **Congenital disorders.**
- **Infectious and inflammatory disorders.**
- **Fibrocystic diseases .**
- **Mastalgia**
- **Benign masses**
- **Trauma and injury.**

Congenital abnormalities

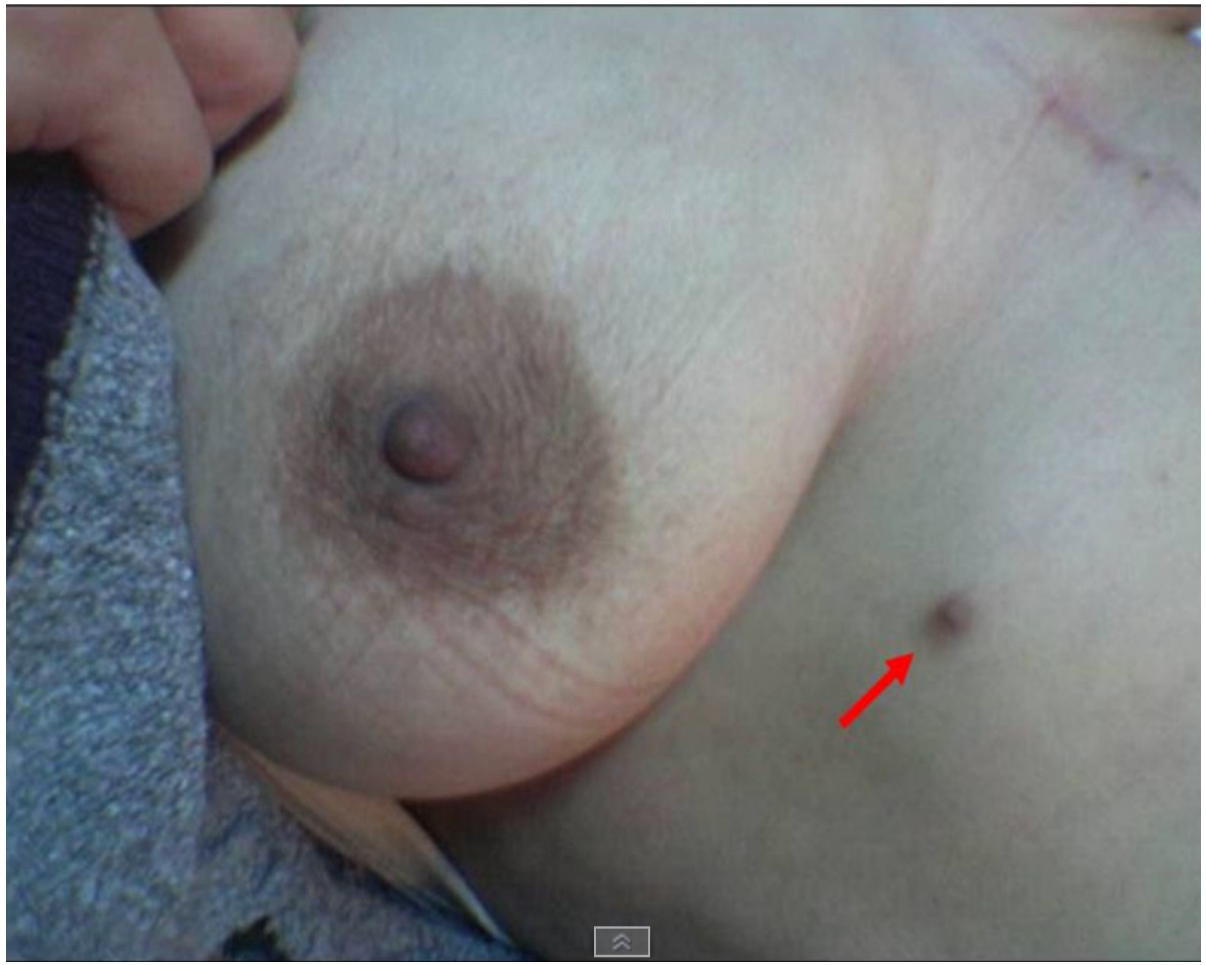
- **Amazia (Amastia) :** congenital absence of the breast may occur on one or both sides. It may associated with absence of the sternal of the sternal portion of the pectoralis major (Poland ‘s syndrome). Amazia is more common in males.
- **Polymazia (polymastia):** accessary breast reported in the axilla (most common frequent site) , groin, buttock and thigh. They have been found to function during lactation.
- **Athelia**: absence of the nipple.
- **Polythelia** : supernumery nipples.

Amastia

Polymastia

Athelia

Polythelia



Diffuse Hypertrophy of the breast

- Occurs in girls at the puberty (benign virginal hypertrophy) and less often , during the first pregnancy.
- The breasts enlarges and may reach the knees when the patient is sitting. The condition is rarely unilateral.
- This is caused by an alteration in the normal sensitivity of the breast to estrogenic hormones and some success in the treating it with anti estrogen have been reported.
- Treatment with reduction mammoplasty.

Virginal hypertrophy, age 13.

Aberration of Normal Development and Involution (ANDI) of the Breast.

- ANDI includes variety of benign breast disorders occurring at different periods of reproductive age in females-- early, matured and involution phase .
- All conditions under ANDI should be carefully examined and often mammography and FNAC /core cut biopsy should be done to rule out malignancy.
- ANDI includes different aberrations and diseases

- 1/In early reproductive age (15 – 25 years)

Normal lobule formation may cause aberration as ~~fibroadenoma~~

Normal stroma may develop juvenile hypertrophy and multiple fibroadenomas

- 2/ Immature reproductive age group(25 - 40 years)

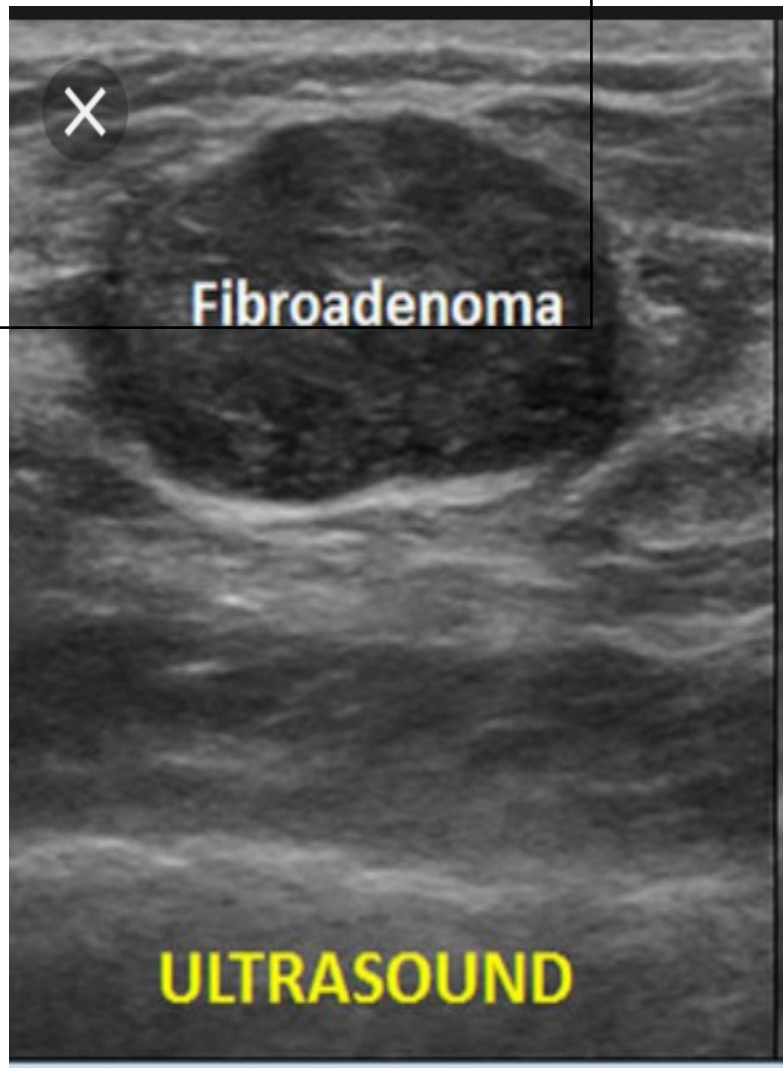
➢ Aberration and exaggeration of normal cyclical hormonal effects on glands and stroma causing generalized enlargement . Its disease status is mastalgia and nodularity which is also called fibrocystadenosis.

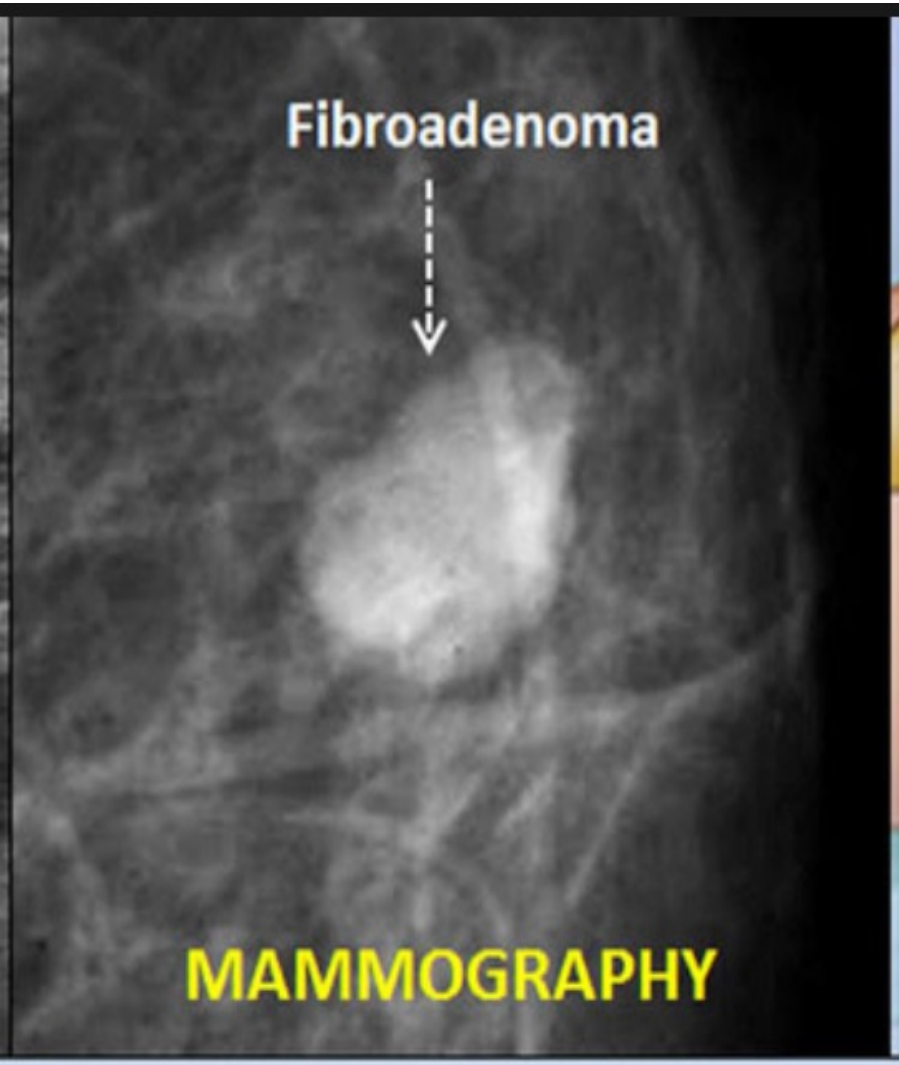
•3/ Involution age group (40 – 55 years)

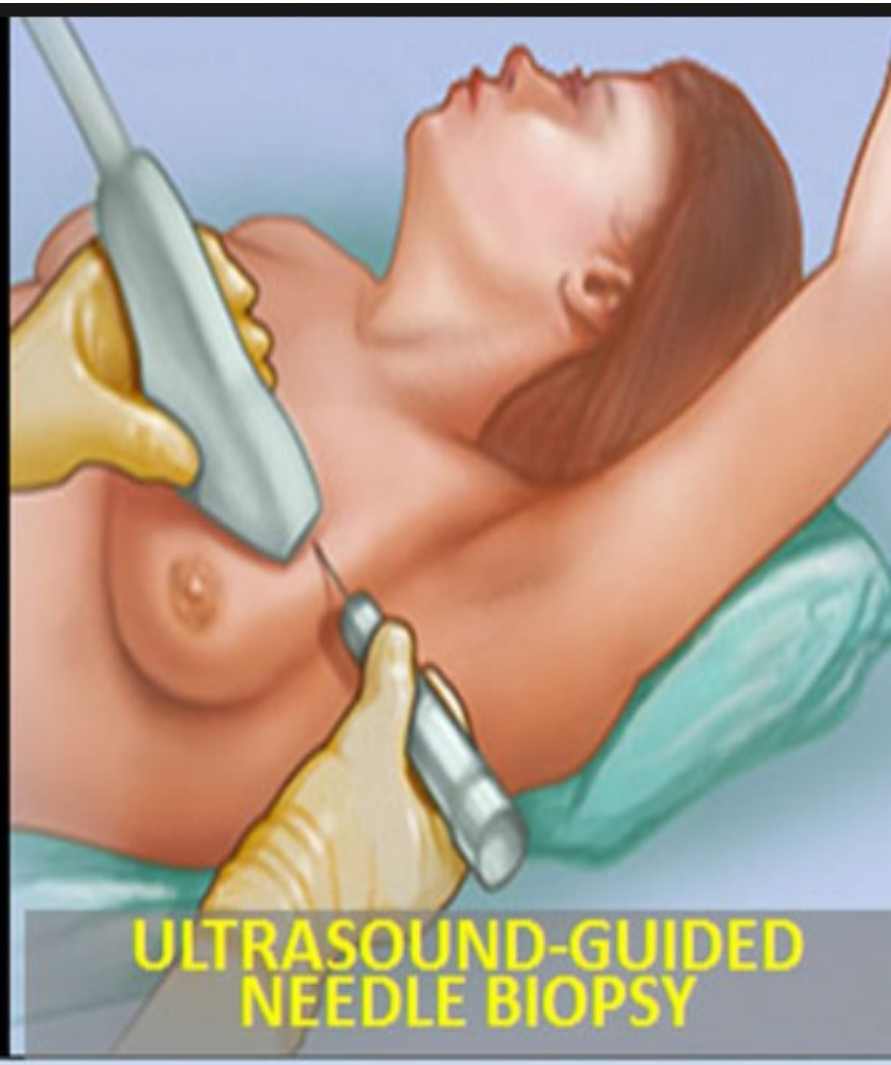
- Lobular involution with microcysts, fibrosis, adenosis , apocrine metaplasia and eventual macrocyst.
- Ductal involution may cause ductal dilatation and nipple discharge as aberration. Later diseases status develop with periductal mastitis , bacterial infection , non-lactational breast abscess and mammary duct fistula.
- Epithelial changes leads into epithelial hyperplasia and atypia.

Fibroadenoma

- It is benign encapsulated tumor occurring commonly in young females of 15 - 25 years age group.
- It is considered as hyperplasia of a single lobule of breast (classified under ANDI)
- It is the most common benign tumor of the breast.
- It is usually less than 2 cm in size. (> 5 cm in size called giant fibroadenoma).
- Classified grossly into soft and hard types.
- Classified microscopically into the : intracanalicular (large and soft) and pericanalicular (small and hard)

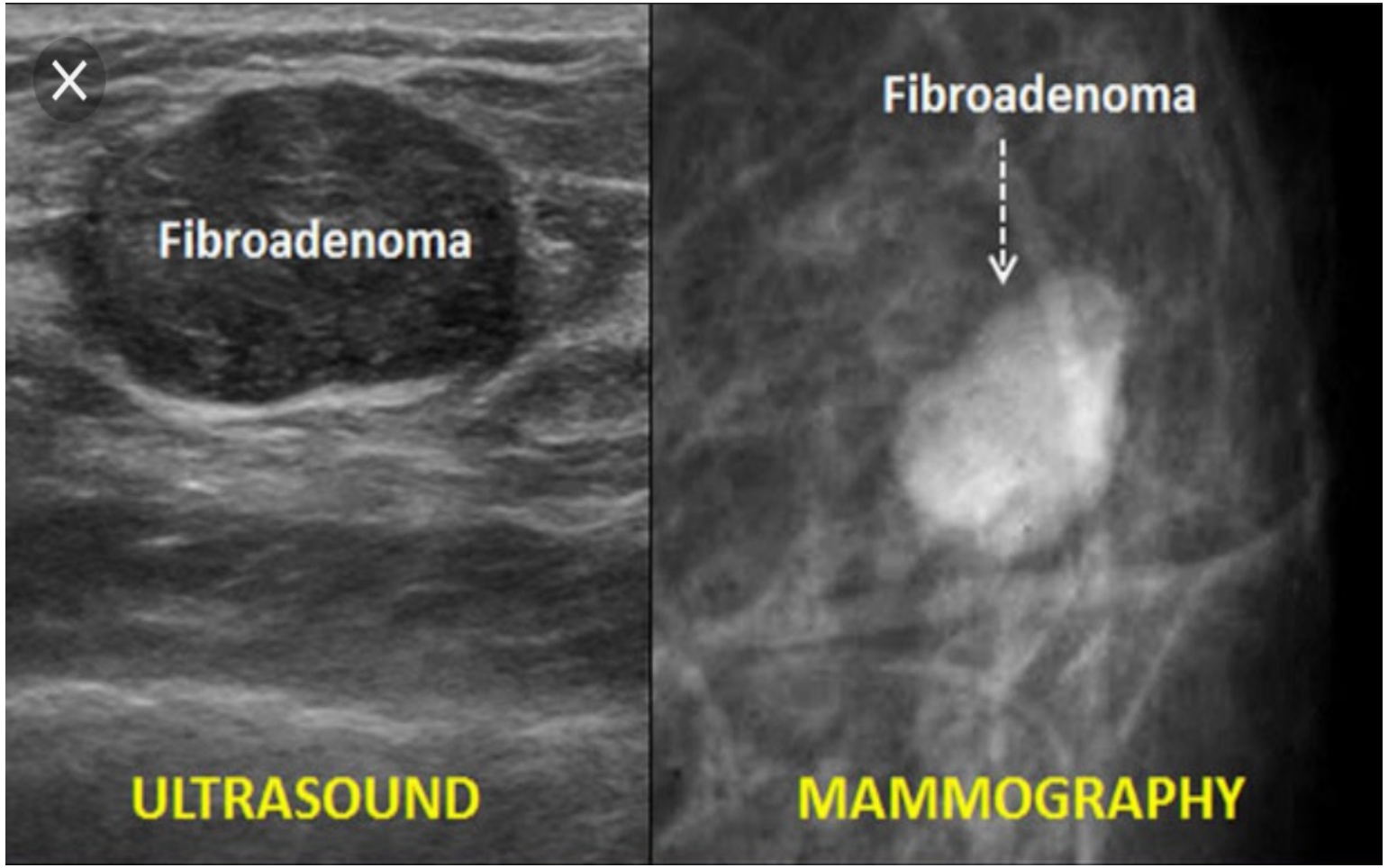






Fibroadenomas are seen as well-defined and ovoid masses on ultrasound and mammography. Definitive diagnosis is established with ultrasound-guided needle biopsy

Fibroadenoma



Clinical features, investigations and treatment of fibroadenoma

- **It is present as a painless swelling in one of the quadrant , which is smooth , firm , non tender, well localized and moves freely within the breast tissues (mouse of the breast)**
- **Axillary lymph nodes are not enlarged.**
- **Investigations by mammography , ultrasound and FNAC.**
- **Treatment by excision.**

Phylloides Tumor (Cystosarcoma Phylloides/Serocytic disease of Brodie

- They are not simply giant fibroadenoma.
- They show a wide spectrum of activity , from almost a benign condition (85%) to locally aggressive and sometimes metastatic tumor (15%)
- When malignant, (sarcoma) spreads to lung or bone.
- Grossly, it is large capsulated area with cystic spaces and cut surface shows soft , brownish cystic areas.
- Microscopically, it contains cystic spaces with leaf like projections, hence the name (phylloides– Greek—leaf-like)

Clinical features of Phylloides tumor.

- They occur in premenopausal women (30-50 years.)
- It is usually unilateral, grows rapidly to attain a large size with bosselated surface.
- Swelling is smooth, non tender, soft, fluctuant with necrosis of the skin
- Skin of the breast is stretched , red, and with dilated veins over it.
- Tumor is warmer, not fixed to skin or chest wall, nipple retraction is absent.
- Lymph nodes are usually not involved. Recurrences is common.

Investigations and treatment of phylloides tumor

- Investigations include :

➢ ultrasounds, FNAC, Mammography, Chest X ray, CT scan of the chest to look for secondaries.

- Treatment include:

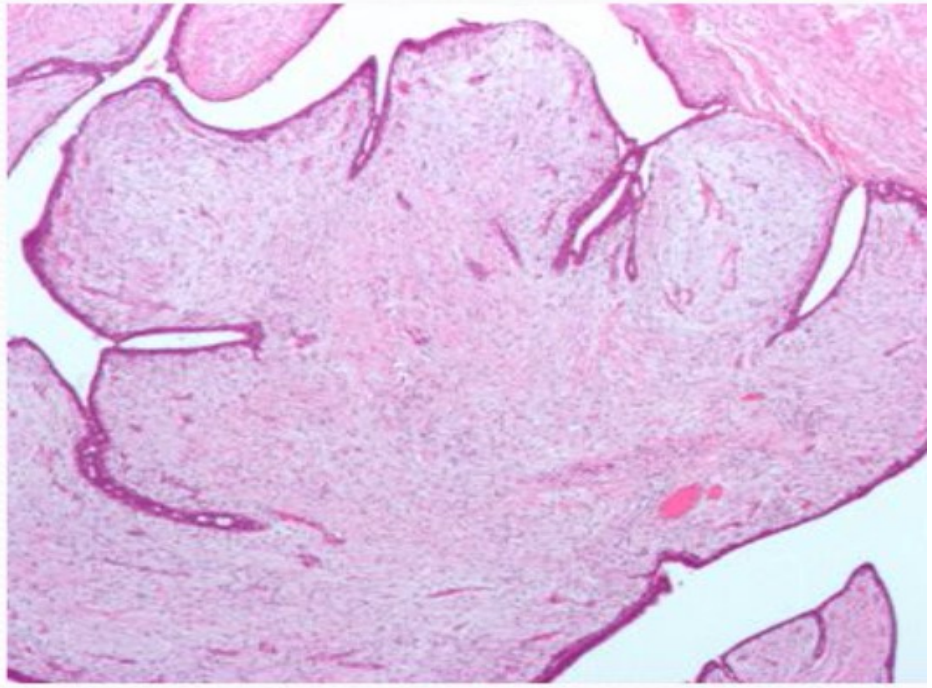
➢ Excision or subcutaneous masrectomy

➢ If malignant (sarcoma), total mastectomy is indicated.

Phylloides tumor

CLINICAL APPEARANCE

HISTOPATHOLOGY



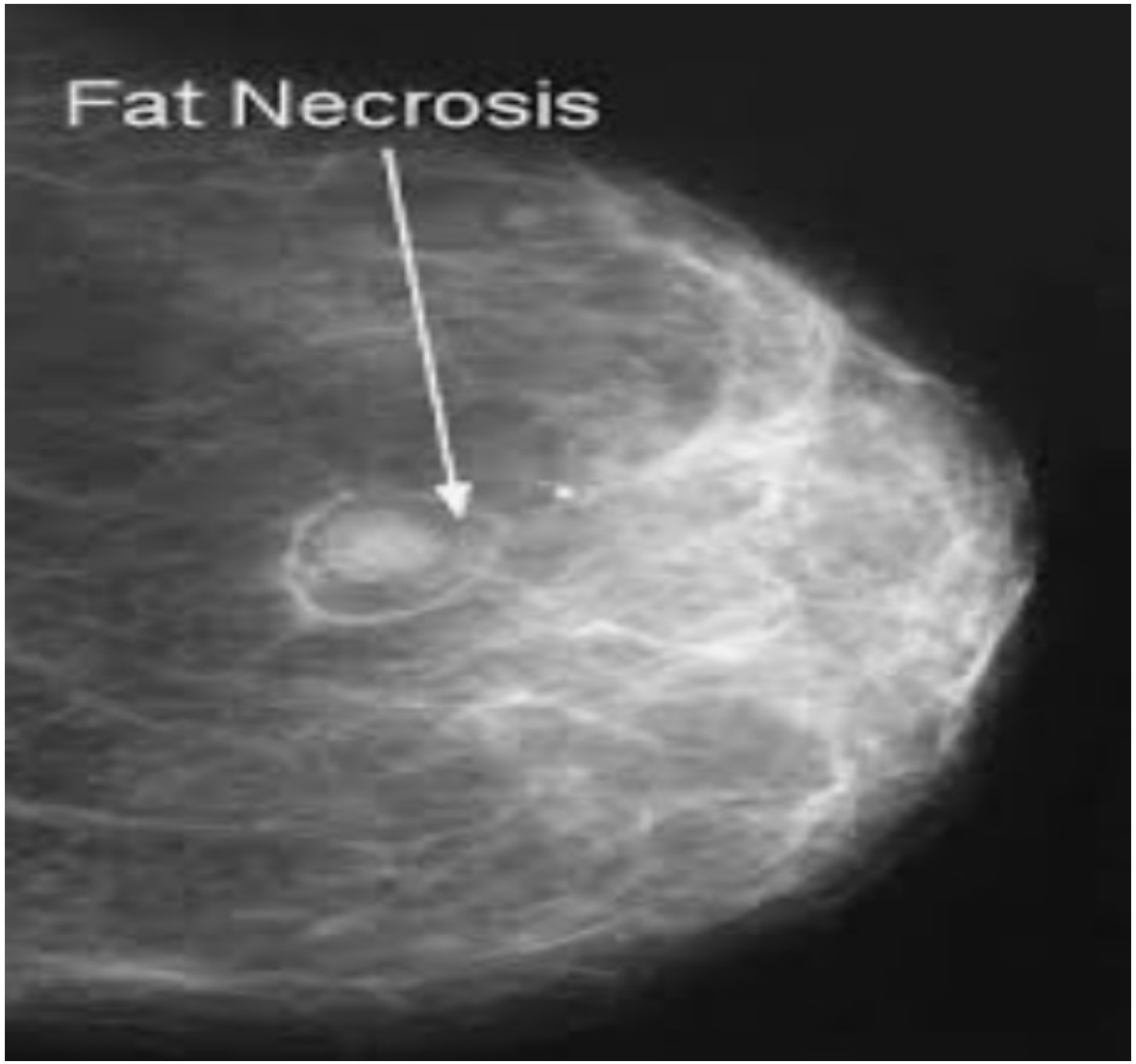
Phylloides vs Fibroadenoma

	Phyllodes	Fibroadenoma
❖Age	Older(40-50y)	Younger
❖Duration	Rapid growth	Slower progression
❖Recurrence	Common	Less common
❖Size	Large ,bosselated	Smaller
❖Mammogram	Round density with smooth borders	Same
❖Ultrasound	Cystic spaces +/-	Same
❖Cytology	More cellular, malignant type	Same as low grade phyllodes

Fat Necrosis

- **Traumatic fat necrosis may be acute or chronic and usually occurs in middle -aged woman**
- **Following a blow a lump, often painless appears.**
- **This may mimic a carcinoma, displaying skin tethering and nipple retraction, and biopsy is required for diagnosis.**
- **A history of trauma is not diagnostic as this may merely have drawn the patient attention to a pre -existing lump.**
- **Treatment by excision**

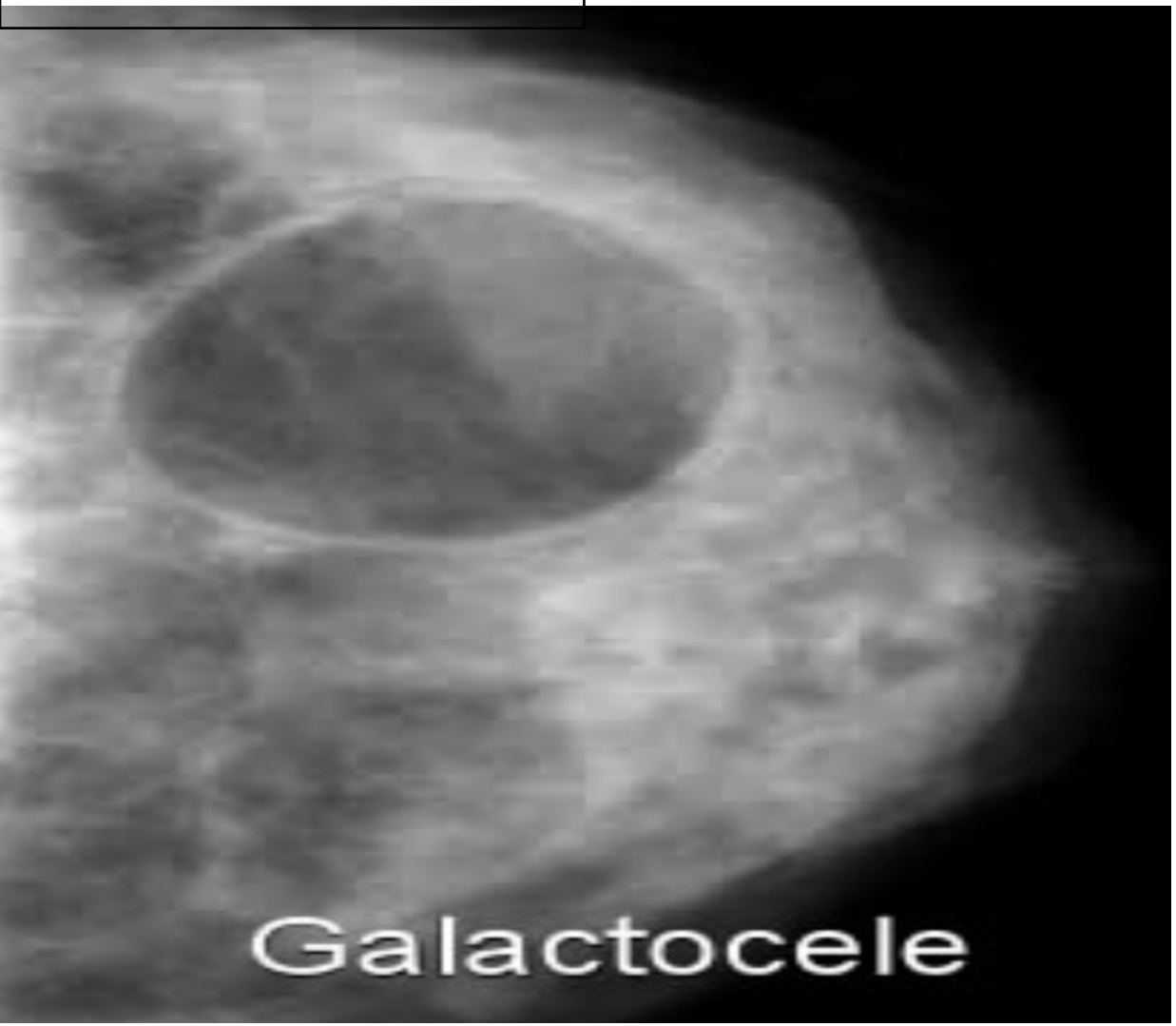
Fat necrosis



Galactocele

- Seen in lactating women .
- It is due to the blockage of lactiferous duct resulting in enormous dilatation of lactiferous sinus.
- It contains milk within
- It is a retention in subareolar cyst region attaining large size.
- Presented as lump in the lower quadrant of breast which is usually unilateral large non tender soft , fluctuant with smooth surface .
- Investigations include ultrasound and FNAC.
- Treatment : excision

Galactocele

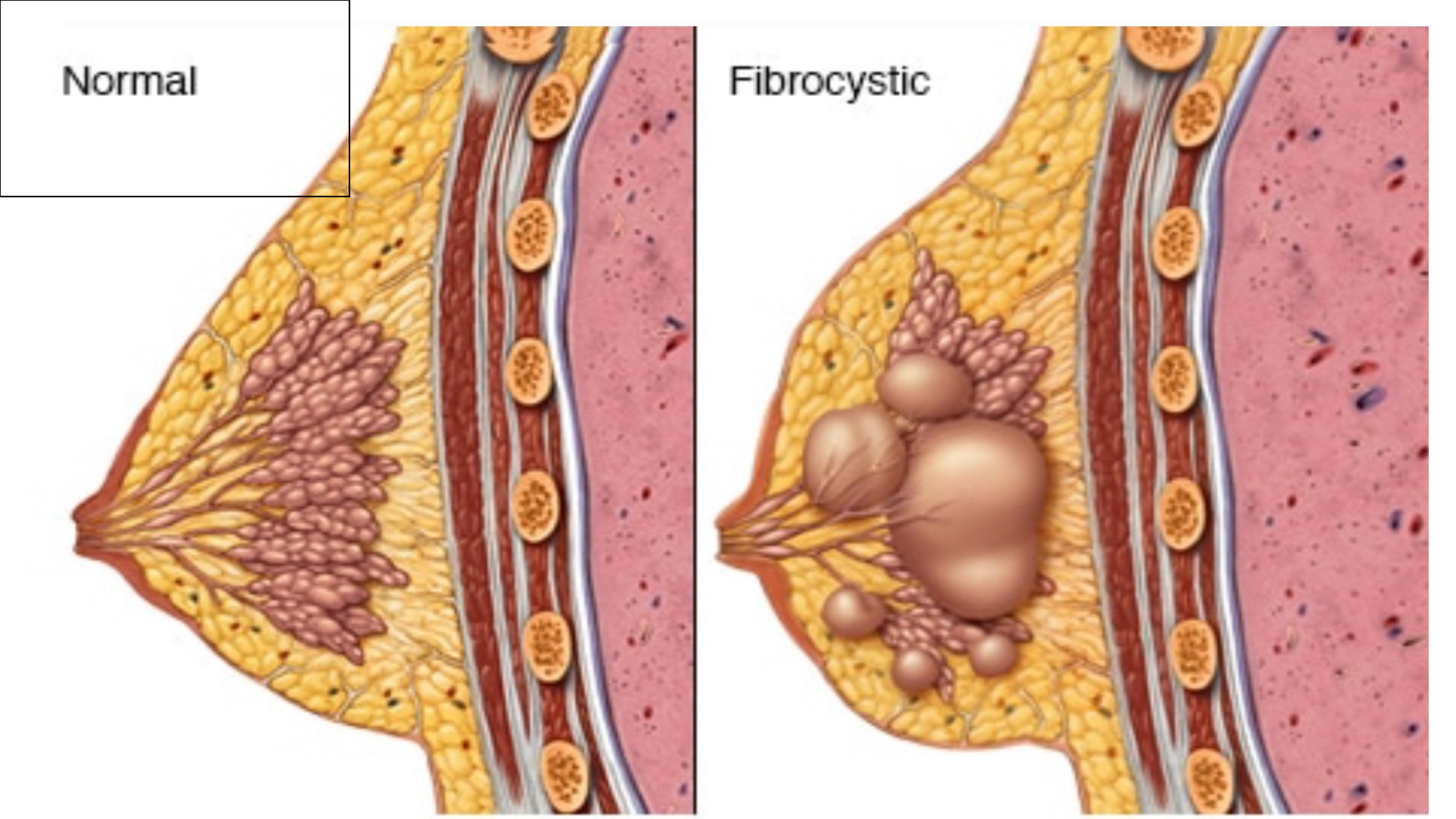


Fibrocystic Disease of the Breast (Fibrocystadenosis)

- It is due to(ANDI) of breast.It is estrogen dependent condition
- One of the cysts may get enlarged to become a clinically palpable, well localized swelling_blue-dome cyst of Bloodgood.
- It is fluctuant , transilluminant , non tender , often tensely cystic swelling(Macrocyst) with thin bluish capsule.
- It should be aspirated initially. Surgical excision is done if it persist or recurs after two aspiration
- When diffuse small, multiple cysts are the main component, it is called Schimmelbusch‘s disease. It is quite common .

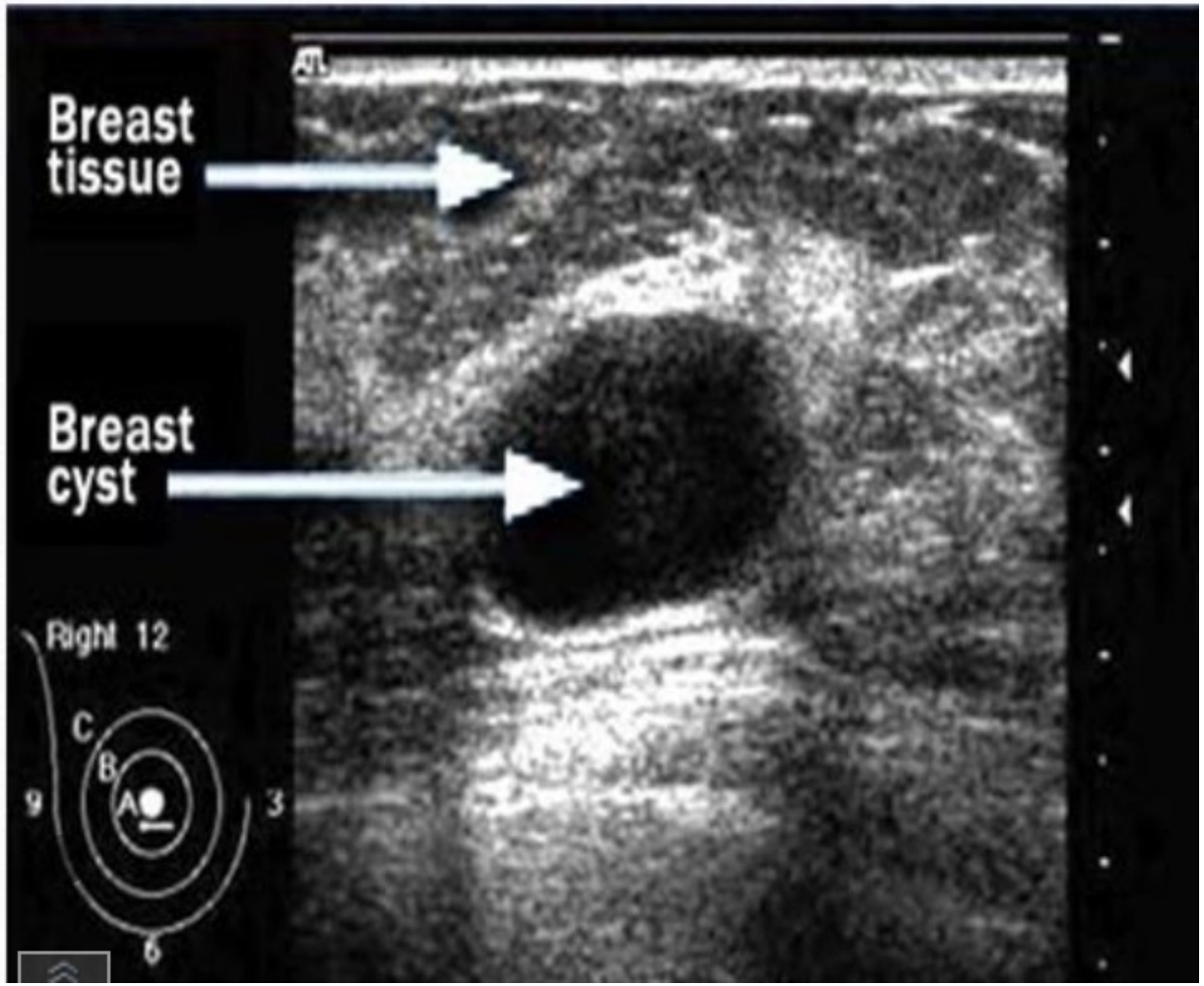
Clinical features and investigations of Fibrocystic diseases.

- Presentation is during menstruating age group as bilateral, painful, diffuse granular, tender,swelling .
- Pain and tenderness are more just prior to menstruation (cyclical mastalgia)
- It subsides during pregnancy, lactation and after menopause .
- Discharge from nipple when present will be serous or occasionally greenish.
- Occasionally shotty enlargement of axillary lymph nodes.
- Investigations include FNAC,ultrasound and mammography.

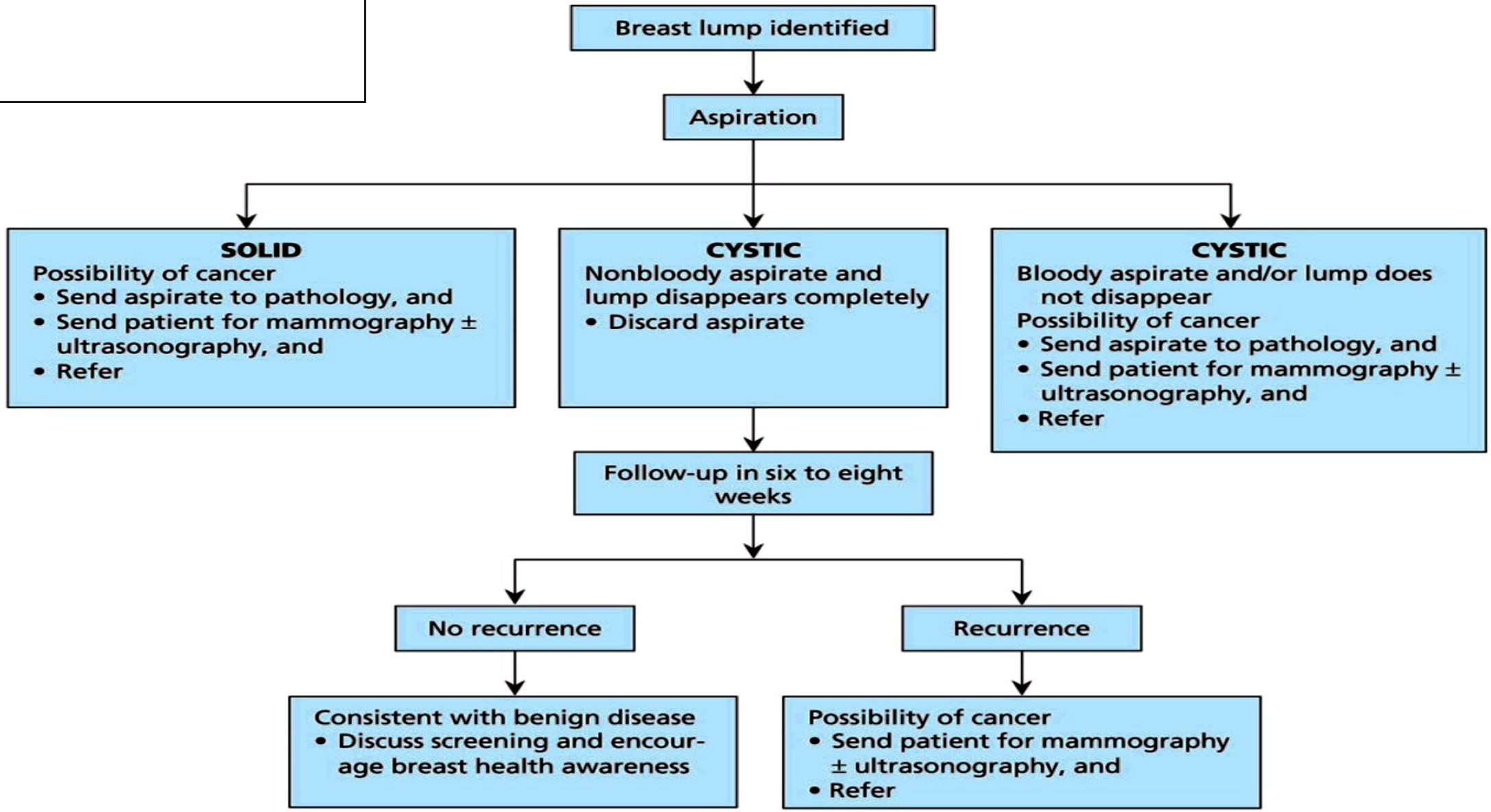

Normal
Fibrocystic

Breast cyst

- Definition – non integrated involution of breast tissue
- Age group – 30-50
- Multiple and bilateral
- Can mimic malignancy
- Confirmed by USG and aspiration



Management of breast cyst.



Mastalgia

- Breast pain is the most common breast symptom
- Classified as

I. Cyclical mastalgia

II. Non- cyclical mastalgia

III. Extra mammary (non breast) pain

- Mastalgia can be sever enough to interfere with usual daily activity.

Cyclical mastalgia

- Two-thirds of women with mastalgia have cyclical mastalgia.
- The mean age of presentation is in the third and fourth decades.
- It is linked to the menstrual cycle, increasing in severity in the days preceding menstruation and then decreasing a er the onset of menses.
- It is usually described as a bilateral aching pain or heaviness affecting the upper outer quadrants of the breast.
- **Mastalgia affects up to 75% of women during their lifetime and is the reason for 50% of all referrals to breast clinics**
- The exact cause of cyclical mastalgia is poorly understood but the link to the menstrual cycle makes a hormonal connection likely.

Non cyclical mastalgia

- Non-cyclical mastalgia accounts for one-third of mastalgia. is type of mastalgia is more common in older and postmenopausal women
- It o en presents as a unilateral, sharp, burning or localized pain in one quadrant of the breast.
- non-cyclical mastalgia may be caused by localized breast pathology such as large cysts in fibrocystic disease, periductal mastitis, engorgement during lactation or a breast abscess.These potential underlying causes should be looked for and managed appropriately.

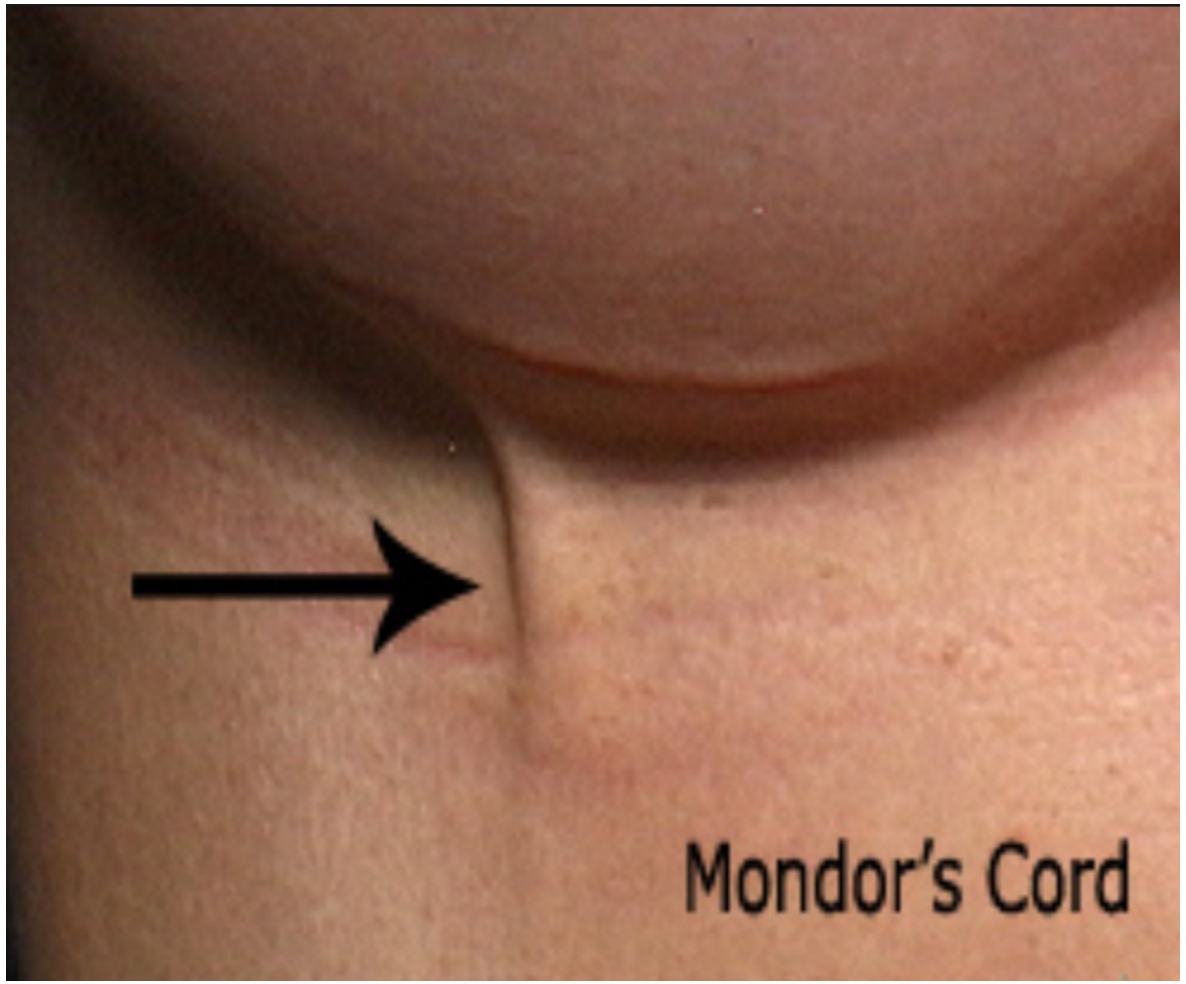
Management of mastalgia

- **Reassurance after thorough clinical examination and appropriate investigation is the mainstay of management.** 85% of patients will be satisfied and relieved once mastalgia is explained and breast cancer is excluded.
- **Daily breast pain chart and lifestyle modification:** A prospective daily diary to record the presence and severity of breast pain may be valuable.
- **Mechanical support** in the form of a well-fitting, supportive brassiere is simple and effective for many women.
- Other **lifestyle advice** is to reduce caffein, increase exercise, and reduce fat intake and body weight.

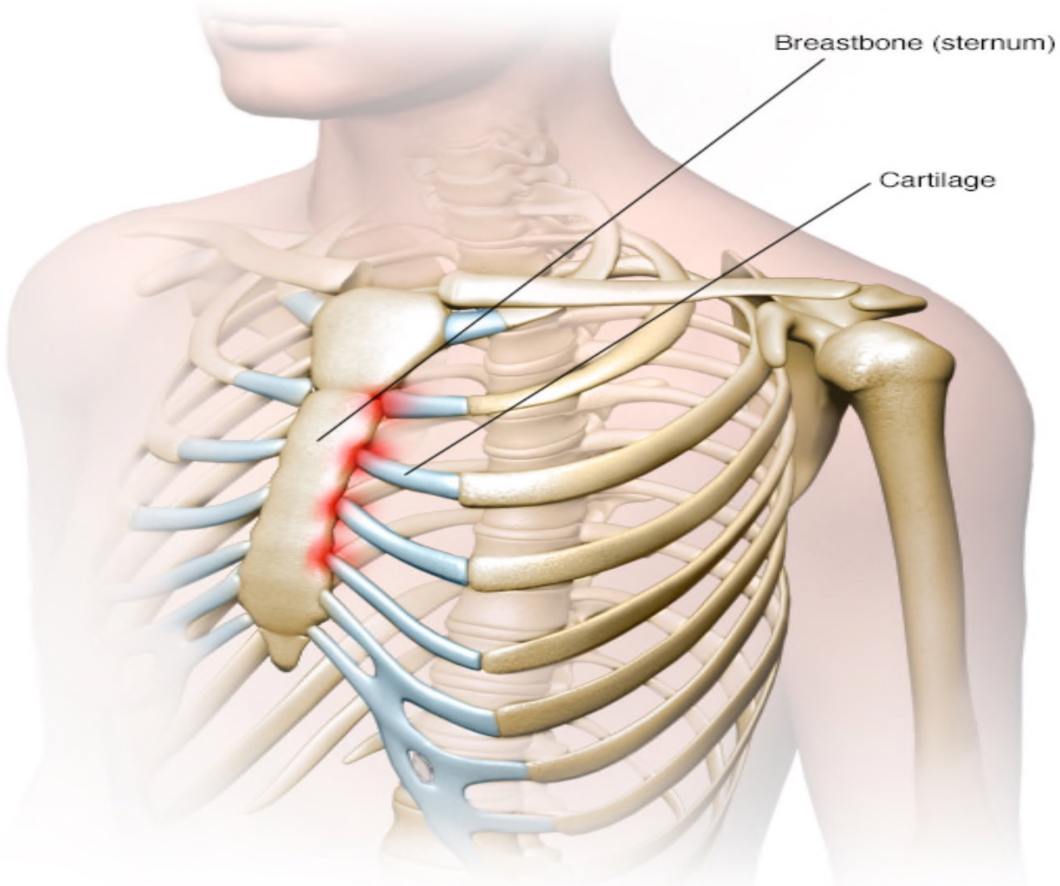
- **evening primrose oil** used for mastalgia and other premenstrual tension symptoms. It contains gamma linolenic acid, which is low in some women with cyclical mastalgia
- **tamoxifen** is an estrogen receptor blocker. Low-dose tamoxifen is very effective in treating mastalgia, with a 90% success rate after 6 months of treatment.
- **Danazol** is a synthetic testosterone which binds to progesterone and androgen receptors. It reduce mastalgia by up to 70% and non cyclical mastalgia by 30%.
- **Bromocriptine** : inhibit the release of prolactin from pitutary.
- **Non-steroidal anti-inflammatory gel.**
- **Surgery**: there is no evidence that surgery benefits patient with sever mastalgia

Extramammary pain : arises from the chest wall or other sources and its interpreted as a cause within the breast like Mondors disease and Tietz syndrome.

Mondor disease



Teitz syndrome (costochondritis)



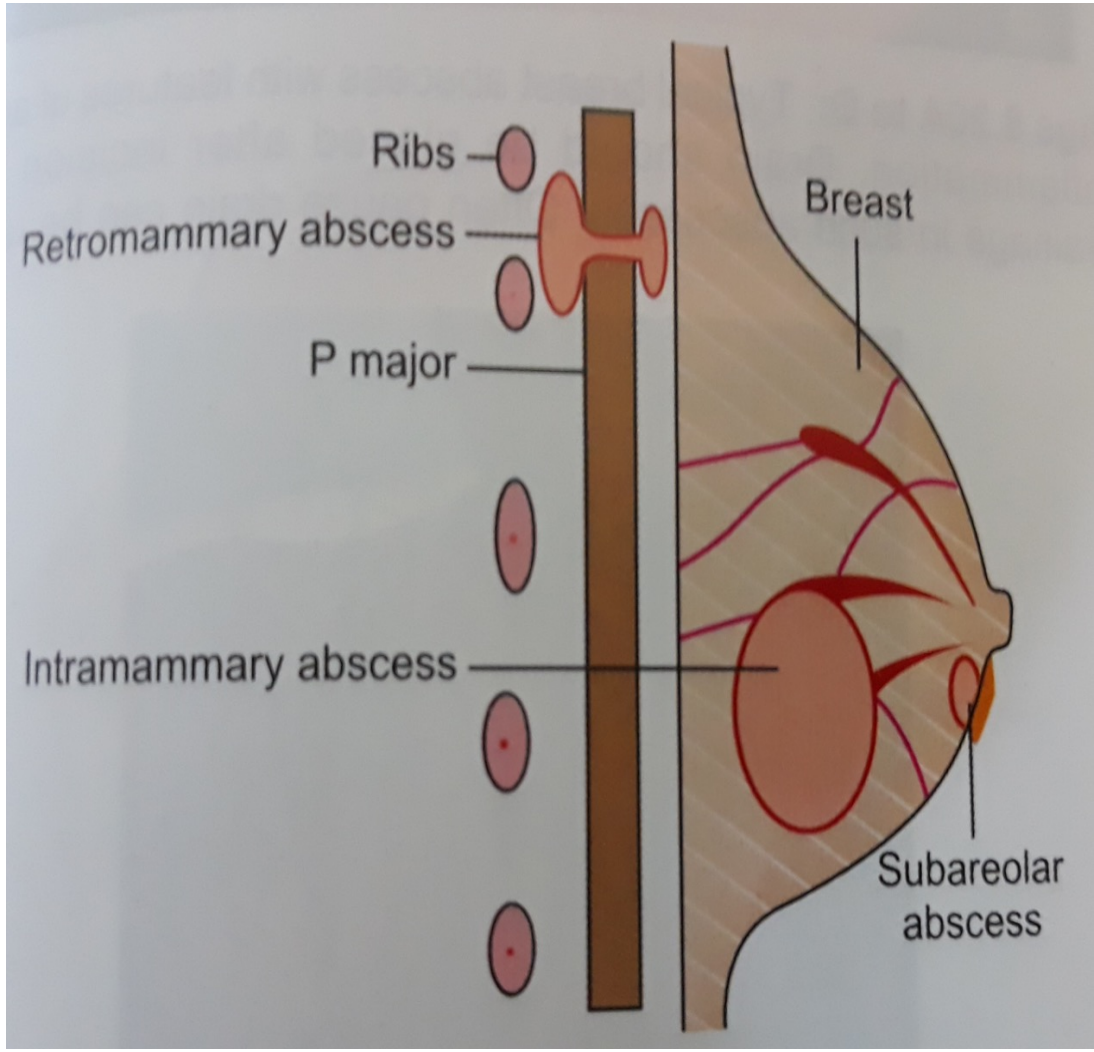
Mastitis : inflammation of breast tissues.

- **Types :**

I. **Subareolar.**

II. **Intramammary.**

III. **Retromammary (Submammary)**



I. Subareolar mastitis

- It is the infection under the areola due to cracks in the nipple or the areola.
- It results from an infected gland of Montgomery or a furuncle of the areola.
- Often it is associated with duct ectasia- causing formation of abscess, sinus and fistula.
- Clinical features include red , inflamed , edematous areola with a tender swelling underneath.
- Treatment consists of drainage of pus by making a subareolar incision under cover of antibiotics.

II. Intramammary mastitis : lactational and non lactational.

1. Lactational mastitis : commonly seen in lactating women.

- **Precipitating factors include: cracked or retracted nipple, improper cleaning of the nipple, inadequate milk expression causing stasis, infection from the mouth of the baby and rarely from hematoma get infected.**
- **Staph aureus bacteria (commonest) enters the breast during sucking through the cracked nipple.**
- **Staph aureus causes clotting of milk in the blocked duct and multiply.**
- **Infection initially begins in one quadrant but later involves entire breast.**

Clinical features of lactational mastitis.

- Continuous throbbing pain in the breast and fever.
- Diffuse redness , tenderness, and brawny induration .
- Purulent discharge from the nipple.
- Entire breast may get involved eventually.
- It is difficult to differentiate initial stage of mastitis (stage of cellulitis) from stage of breast abscess formation.
- When it is treated by antibiotics without incision and drainage , it may get organized to form a non tender hard breast lump with sterile pus inside – stage of antibioma formation
- Main differential diagnosis is inflammatory breast carcinoma

Treatment of lactational mastitis

- Antibiotics : Cephalosporins, flucloxacillin and amoxicillin.
- Repeated US guided aspiration can be tried.
- Drainage under general anesthesia, a counter incision may be needed.
- It is not advisable to wait till the formation of abscess.

2. Non- lactational mastitis

- It is commonly occurs in duct ectasia and periareolar infection.
- Common organism are bacteroids, anaerobic streptococci, enterococci and gram negative organism.
- It is commonly recurrent with tender swelling under the areola
- Treatment include antibiotics, repeated aspiration and drainage .
- Later, cone excision of the duct is done. (Hadfeild- Adair operation)

Lactational breast abscess

Nonlactational breast abscess

Drainage of lactational abscess

Central duct excision for duct ectasia (Hadfeild – Adair operation)

III. Retromammary mastitis.

- **It is mainly due to tuberculosis of the intercostal lymph nodes or ribs beneath or suppuration of intercostal lymph nodes.**
- **Other rare causes include empyma necessitans and infected hematoma.**
- **Breast is normal.**
- **Investigations include chest x ray, FNAC, ESR, peripheral smear, US of breast and chest wall. CT scan of chest may be needed.**
- **Treatment consists of treatment of the cause and drainage through submammary / retromammary incision.**

Duct Ectasia

- It is dilatation of lactiferous ducts due to muscular relaxation of chest wall with periductal mastitis.
- It is also called “ plasma cell mastitis” as periductal inflammation contains plasma cells.
- Commonly many ducts are involved.

Clinical features of duct ectasia.

- **Greenish discharge from the nipple.**
- **Indurated mass under the areola which is often tender.**
- **Retraction of the nipple which occurs at the later stage of the disease. Slit like retraction of the nipple due to fibrosis occurs. Eventually it forms an abscess and fistula.**
- **Often they are bilateral and multifocal.**
- **More common in smokers- in relation to arterial pathology.**
- **Secondary bacterial infection is common.**
- **It must be differentiated from breast carcinoma.**

Investigations and treatment of duct ectasia.

- **Investigations:**

➢ **Discharge study.**

➢ **Ultrasound examination.**

➢ **Mammography.**

- **Treatment :**

➢ **It is important to stop smoking.**

➢ **Cone excision of involved major ducts (Hadfeild – Adair operation).**

➢ **Antibiotics.**

Tuberculous mastitis.

- It is relatively rare and usually associated with active pulmonary tuberculosis.
- Present as a swelling in the breast with cold abscess, sinus and a typical bluish appearance of surrounding skin with matted lymph nodes in the ipsilateral axilla.
- It must be differentiated from breast cancer.
- Investigations include FNAC, frozen section biopsy and excision biopsy.
- Treatment include antiTB therapy (INH, Rifampicin, Ethambutol, Pyrazinamide.) and drainage of cold abscess.

Tuberculosis of the breast

Breast Cancer

- Worldwide, breast cancer is the most frequently diagnosed life-threatening cancer in women and the leading cause of cancer death among women.
- In less-developed countries, it is the leading cause of cancer death in women; in developed countries, however, breast cancer accounts for 29% of all cancers in women and is second only to lung cancer as a cause of cancer deaths.
- Many early breast carcinomas are asymptomatic; pain or discomfort is not usually a symptom of breast cancer.
- Breast cancer is often first detected as an abnormality on a mammogram before it is felt by the patient or healthcare provider.

- The general approach to evaluation of breast cancer has become formalized as triple assessment: clinical examination, imaging (usually mammography, ultrasonography, or both), and needle biopsy.

- Surgery and radiation therapy, along with adjuvant hormone or chemotherapy when indicated, are now considered primary treatment for breast cancer.

- Adjuvant breast cancer therapies are designed to treat micrometastatic disease or breast cancer cells that have escaped the breast and regional lymph nodes but do not yet have an established identifiable metastasis.

Incidences in carcinoma breast

- 30% of all female cancers
- 20% of cancer related deaths in females
- 2-4% bilateral
- 2-5% hereditary
- Lump in the breast-commonest presentation (75%)
- 10% presents with pain
- 35-45% with mutation of BRCA1 gene
- 70% blood spread occurs to bones

Risk factors for breast carcinoma

- Breast carcinoma in 1st degree relative
- Breast carcinoma in contralateral breast
- BRCA1/BRCA2 gene mutation
- Obesity and alcohol intake
- Gynaecomastia in male breast
- Nulliparity
- Early menarche and late menopause

Clinical presentation

History

- Many early breast carcinomas are **asymptomatic**, particularly if they were discovered during a breast-screening program. Larger tumors may present as a **painless mass. Pain or discomfort** is not usually a symptom of breast cancer; only 5%-10%of patients with a malignant mass present with breast pain.

- Often, the purpose of the history is not diagnosis but **risk assessment.** A **family history** of breast cancer in a first-degree relative is the most widely recognized breast cancer risk factor.

Factors Affecting Breast Cancer Risk

Major Risk Factors	Minor Risk Factors	Protective Factors
Being female	Early menarche (before age 12 yr)	Breastfeeding
Increase age	Late menopause (after 55 yr)	Exercise 3 times per week
Family history of breast cancer	Nulliparity	First childbirth before age 30 yr
Diagnosis of atypical hyperplasia or LCIS	First childbirth after age 30 yr	
BRCA1 or BRCA2 gene mutation	Estrogen replacement therapy (?)	
	Daily alcohol intake (>1 drink)	
	Dietary fat (?)	

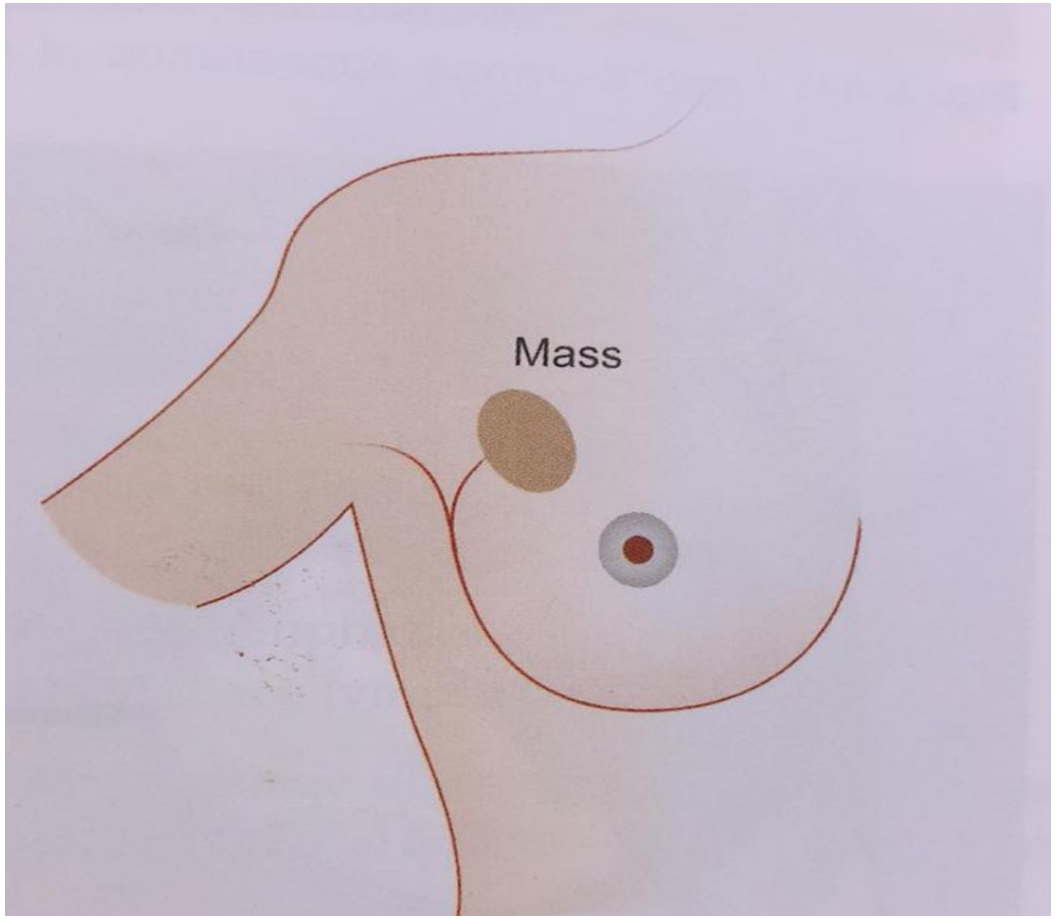
Physical Examination

- **If the patient has not noticed a lump, then signs and symptoms indicating the possible presence of breast cancer may include the following:**

- **Change in breast size or shape.**
- **Skin dimpling or skin changes (eg, thickening, swelling, or redness).**
- **Recent nipple inversion or skin change or other nipple abnormalities (eg, ulceration, retraction, or spontaneous bloody discharge)**
- **Nipple discharge, particularly if bloodstained.**
- **Axillary lump.**

➢To detect subtle changes in breast contour and skin tethering, the examination must include an assessment of the breasts with the patient upright with arms raised. The following findings should raise concern:

- **Lump or contour change**
- **Skin tethering**
- **Nipple inversion**
- **Dilated veins**
- **Ulceration**
- **Mammary Paget disease**
- **Edema or peau d'orange**



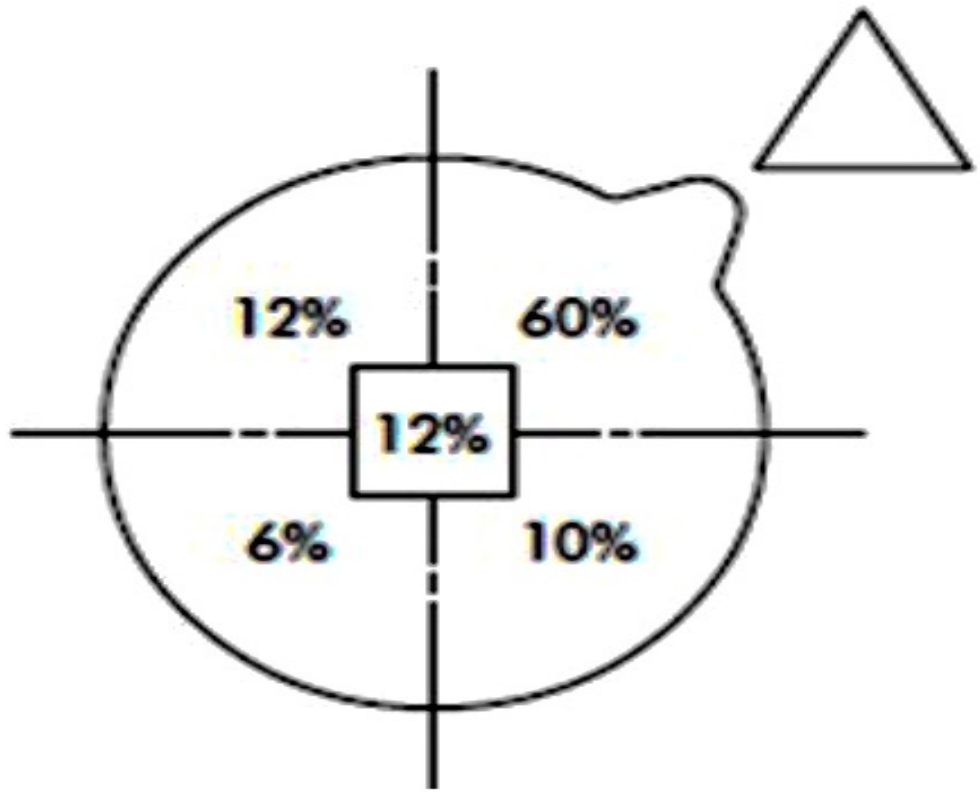
- **A complete examination includes assessment of the axillae and supraclavicular fossae, examination of the chest and sites of skeletal pain, and abdominal and neurologic examinations. The clinician should be alert to symptoms of metastatic spread, such as the following:**

  - **Breathing difficulties**
  - **Bone pain**
  - **Symptoms of hypercalcemia**
  - **Abdominal distention**
  - **Jaundice**
  - **Localizing neurologic signs**
  - **Altered cognitive function**
  - **Headache**

Presentations of breast cancer.

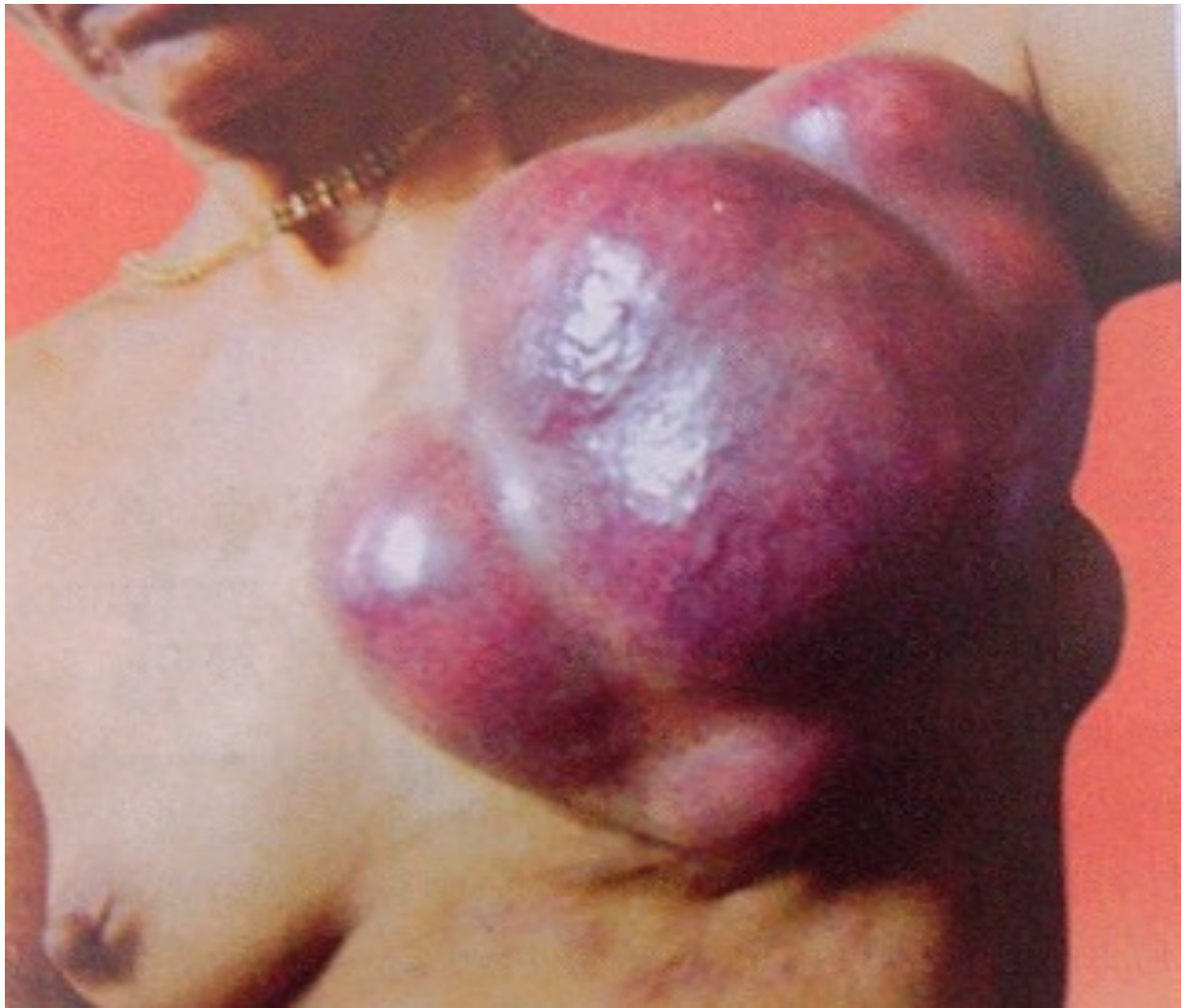
- **Hard , painless lump (commonest)**
- **Nipple discharge.**
- **Ulceration and fungation**
- **Axillary lymph node enlargement .**
- **Chest pain and haemptysis.**
- **Bone pain, tenderness and pathological fracture.**
- **Pleural effusion, ascites.**
- **Liver secondaries, secondary ovarian tumor.**
- **Painful lump.**

- Although any portion of the breast, including the axillary tail, may be involved, breast cancer is found most frequently in the upper outer quadrant .



Carcinoma of breast presenting as a lump

Advanced breast cancer involving whole breast

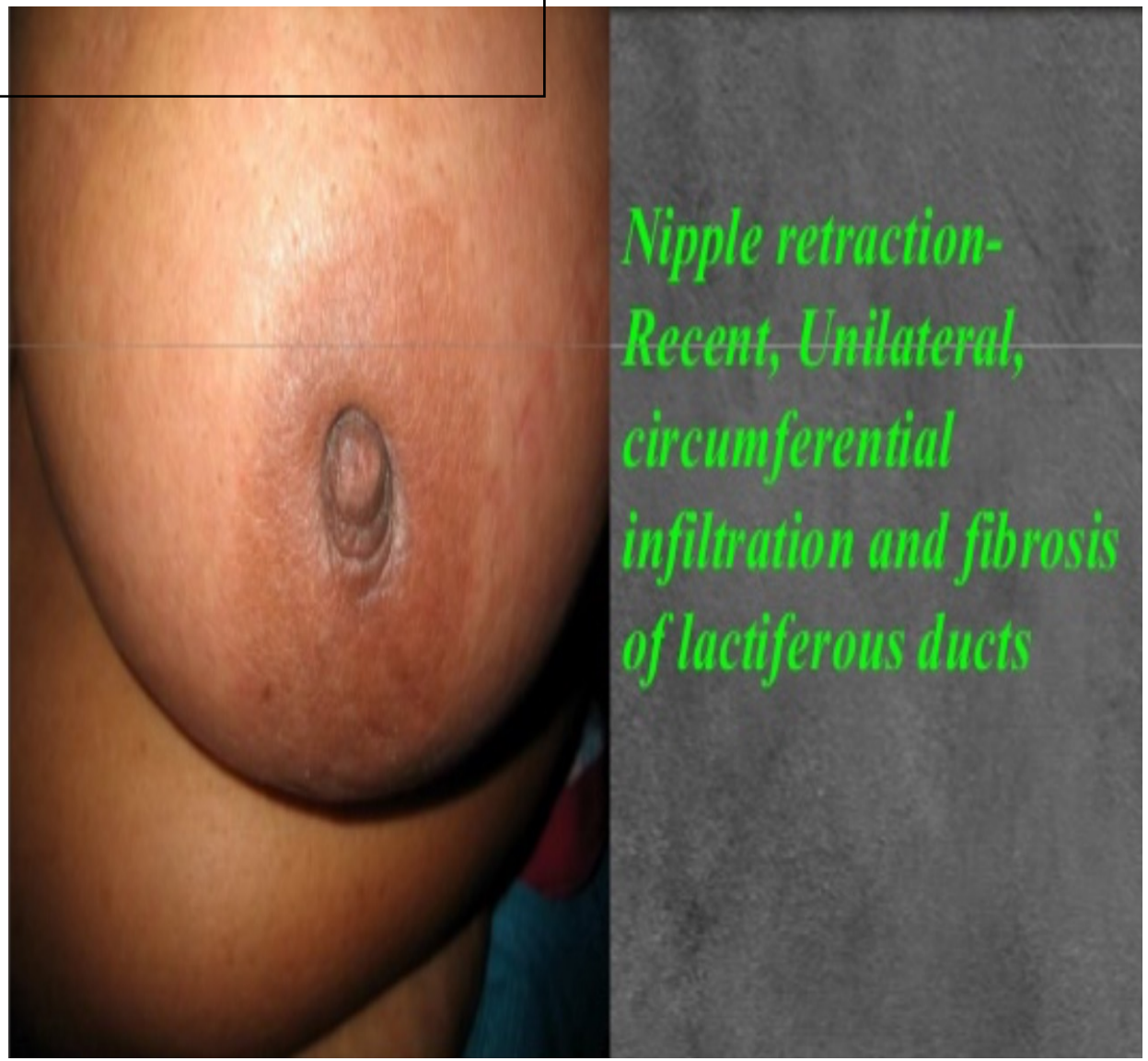


Cutaneous manifestations of breast cancer

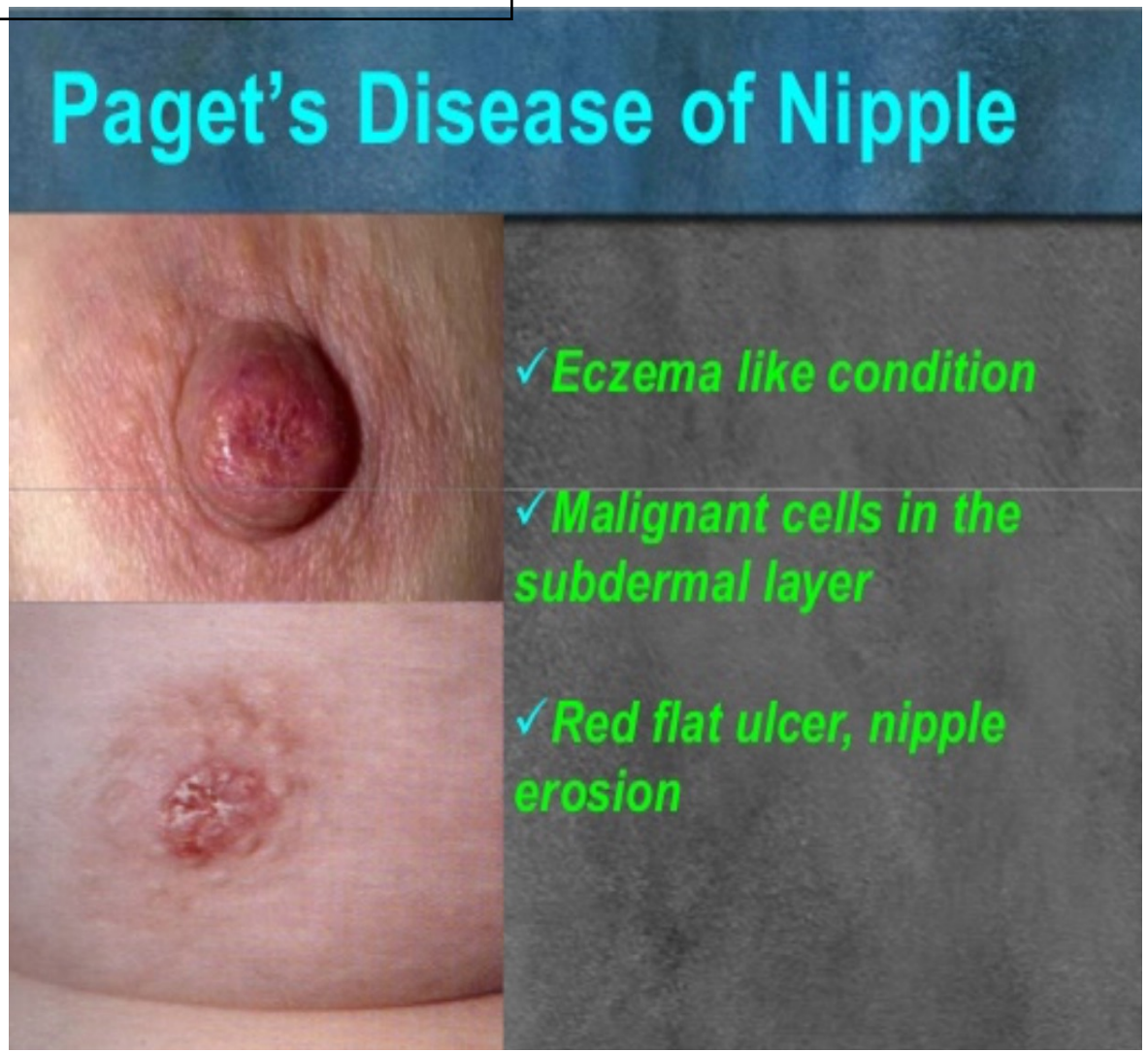
- **Peau d' orange:** due to obstruction of dermal lymphatics, opening of sebaceous gland and hair follicles get buried in the edema giving rise to orange peel appearance.
- **Dimpling of skin** due to infiltration of Cooper ligament.
- **Retraction of nipple** due to infiltration of lactiferous ducts.
- **Ulceration and discharge** from the nipple and areola.
- **Skin ulceration and fungation.**
- **Cancer-en-cuirasse:** skin over the chest wall and the breast is studded with cancer nodules appearing like an armour coat.
- **Tethering to skin.**

Breast cancer: mass in upper outer quadrant& peau d’ orange .

Breast cancer: nipple retraction, skin dimpling& tethering



Breast cancer: Paget disease and cancer-en-cuirasse



Breast cancer: skin ulceration and fungation

Pathology of Breast Cancer.

- **Breast carcinoma arising from lactiferous ducts is called as ductal carcinoma**
- **Breast carcinoma arising from lobules is called as lobular carcinoma.**
- **In-situ carcinoma is preinvasive carcinoma which has not breached the epithelial basement membrane. It may be :**
  - **Ductal carcinoma in situ.**
  - **Lobular carcinoma in situ.**
- **Invasive carcinoma can occur eventually.**

The spread of breast cancer

1- Local spread

- The tumour increases in size and invades other portions of the breast.

- It involve the skin and penetrate the pectoral muscles and chest wall if diagnosed late.

2- Lymphatic metastasis

- occurs primarily to the axillary and the internal mammary lymph nodes.

- Involvement of supraclavicular nodes and contralateral lymph nodes represents advanced disease.

3- Spread by the blood stream

- By this route bone metastases occur, In order of frequency the lumbar vertebrae, femur, thoracic vertebrae, ribs and skull and these deposits are generally osteolytic.

- Metastases to liver, lung, brain, adrenal gland and ovaries also occur.

Classification of breast cancer

I. Non-invasive breast cancers

II. Invasive breast cancers

I. Non-invasive breast cancers

- 10% of all types of breast cancer
- Good prognosis
- Ductal carcinoma in situ, lubular carcinoma in situ, and paget's disease

Ductal carcinoma in situ

- Seen as microcalcifications on mammogram
- Confined to ductal cells.
- No invasion of the underlying basement membrane.
- Chance of recurrence 25-50% in 5 years.

Treatment of ductal carcinoma insitu

- Wide excision alone suitable and the margins are clear.
- Wide local excision and radiation reduce local recurrence to 2%
- Node dissection not necessary (nodal disease < 1%)

- _ Mastectomy is an option if there is substantial risk of local and regional recurrences

Lobular Carcinoma in Situ

- Not detectable on mammography
  - Most commonly found incidentally
- Risk of invasive breast cancer in 20 years is 15-20% **bilaterally**

Treatment of lobular carcinoma in situ.

- Careful follow-up
- Bilateral masectomy may be considered if other risk factors are present such as family history or prior breast cancer, and also dependent on patient preference.

II. Invasive breast cancers

- Favorable histologic types
- Less favorable types
- Least favorable type

The various types of breast cancers are listed below by percentage of cases:

1. **Infiltrating ductal carcinoma** is the most commonly diagnosed ~~breast tumor~~ and has a tendency to metastasize via lymphatics; this lesion accounts for 75% of breast cancers
2. **Infiltrating ductal carcinoma** is the most commonly diagnosed breast tumor and has a tendency to metastasize via lymphatics; this lesion accounts for 75% of breast cancers
3. **Medullary carcinoma** accounts for about 5% of cases and generally occurs in younger women
4. **Mucinous (colloid) carcinoma** is seen in fewer than 5% of invasive breast cancer cases

- **5-Tubular carcinoma** of the breast accounts for 1-2% of all breast cancers
- **6-Papillary carcinoma** is usually seen in women older than 60 years and accounts for approximately 1-2% of all breast cancers
- **7-Metaplastic breast cancer** accounts for fewer than 1% of breast cancer cases, tends to occur in older women (average age of onset in the sixth decade), and has a higher incidence in blacks
- **8-Mammary Paget disease** accounts for 1-4% of all breast cancers and has a peak incidence in the sixth decade of life (mean age, 57 years)

Favorable histologic types

- **Tubular carcinoma**
- **Mucinous (colloid) carcinoma**
- **Papillary carcinoma**

2-3% of all invasive breast cancers .

5 and 10 year survival rates are 73 and 59 %.

Less Favorable histologic types

- **Invasive ductal carcinoma**
  - Most common and occurs in 78% of all invasive breast cancers.
  - Metastases to axillary nodes in 60%
  - 5 and 10 year survival rates are 54 and 38 %

Least favorable type

•Inflammatory carcinoma

- 1.5 - 3% of breast cancers
- Characteristic clinical features of erythema, peaud'orange, and skin ridging with or without a palpable mass.
- Commonly mistaken for cellulitis.
  - Will generally fail antibiotics before being diagnosed

Inflammatory breast cancer

Breast cancer staging (TNM)

- **Primary tumor (T)**
- Tumor size definitions are as follows:
  - Tx – Primary tumor cannot be assessed
  - T0 – No evidence of primary tumor
  - Tis – DCIS
  - Tis – LCIS
  - Tis – Paget disease of the nipple with no tumor (Paget disease associated with a tumor is classified according to the size of the tumor)
  - T1 – Tumor ≤2 cm in greatest diameter
  - T2 – Tumor >2 cm but not >5 cm in greatest diameter
  - T3 – Tumor >5 cm in greatest diameter
  - T4 – Tumor of any size, with direct extension to skin or chest wall and inflammatory breast cancer

Regional lymph nodes

- Nx – Regional lymph nodes cannot be assessed (eg, previously removed)
- N0 – No regional lymph node metastasis
- N1 – Metastasis in movable ipsilateral axillary lymph node(s)
- N2 – Metastasis in ipsilateral axillary lymph node(s) fixed or matted, or in clinically apparent ipsilateral internal mammary nodes in the absence of clinically evident axillary lymph node metastasis
- N3 – Metastasis in ipsilateral infraclavicular or supraclavicular lymph node(s) with or without axillary lymph node involvement, or clinically apparent ipsilateral internal mammary lymph node(s) and in the presence of axillary lymph node

Distant metastasis

- **Metastases are defined as follows**
  - **Mx – Distant metastasis cannot be assessed**
  - **M0 – No distant metastasis**
  - **M1 – Distant metastasis**

Stage	Tumor	Node	Metastases
Stage 0	Tis	N0	M0
Stage I	T1	N0	M0
Stage IIA	T0 T1 T2	N1 N1 N0	M0 M0 M0
Stage IIB	T2 T3	N1 N0	M0 M0
Stage IIIA	T0 T1 T2 T3	N2 N2 N2 N1-2	M0 M0 M0 M0
Stage IIIB	T4 T4 T4	N0 N1 N2	M0 M0 M0
Stage IIIC	Any T	N3	M0
Stage IV	Any T	Any N	M1

Common sites of distant spread in breast cancer

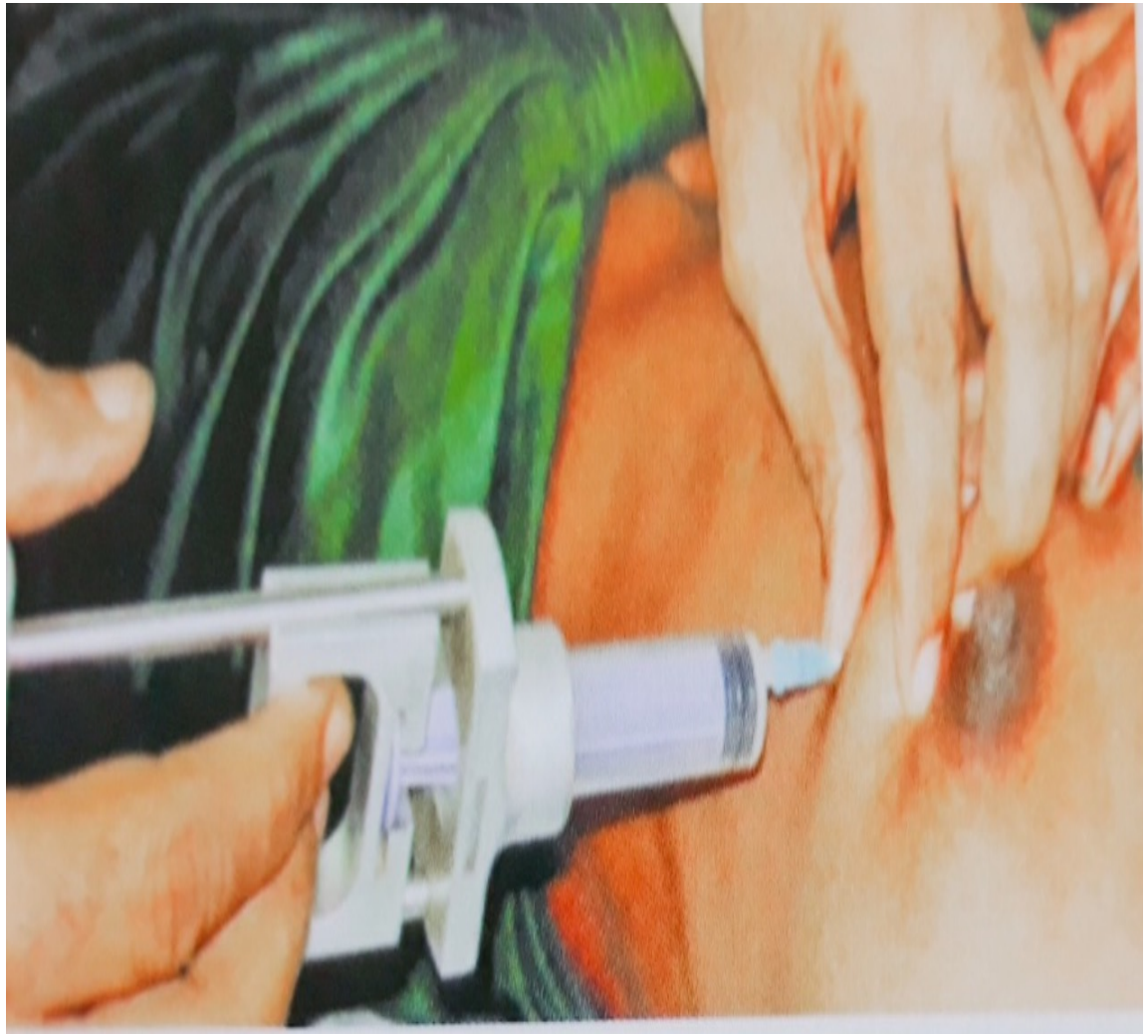
- **Bones – 70% - lumbar vertebrae, pelvis bones, long bones)**
- **Lung and pleura- 20-30%**
- **Soft tissues – 5-15%.**
- **Liver- 10-12%**
- **Brain- 2-5%**
- **Adrenals - 2-5%**

Investigations of breast cancer

- **Mammography**: both screening and diagnostic
- **Breast Ultrasound**: detects site, size, consistency , and axillary lymph nodes status , and FNAC can be done under US guidance.
- **FNAC and core needle biopsy.**
- **Excision biopsy**.
- **Chest X-ray** to look for pleural effusion and lung secondaries.
- **CT scan of the chest.**
- **Abdominal ultrasound** : to look for liver secondaries, ascites, Krukenberg tumor.

- **X-ray spine** for osteolytic secondaries
- **Estrogen, progesterone and HER 2 receptors status** by immunohistochemistry.
- **MRI breast** to differentiate scar from recurrence and to image breast with implants.and management of axilla and recurrent disease.
- **Tumor marker:** CA 15/3.
- **Sentinel lymph node biopsy (SLNB)**
- **CT scan of chest, abdomen and brain .**
- **Ductography** for intraductal carcinoma.

Fine Needle Aspiration Cytology -FNAC

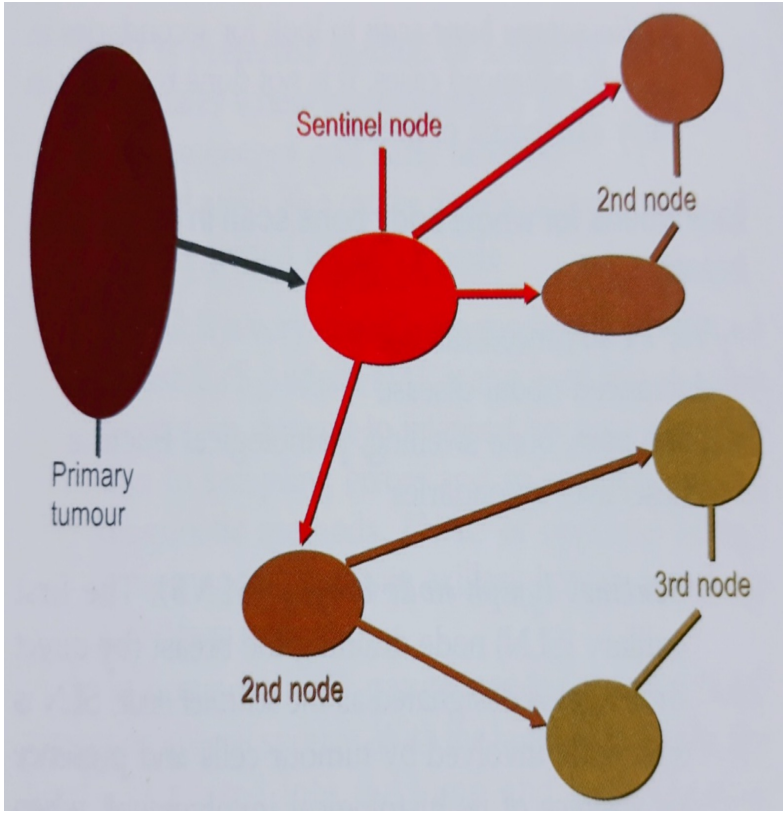


FNAC Scoring

C_0 : No epithelial cells
C_1 : Scanty epithelial cells, benign
C_2 : Benign cells
C_3 : Atypical cells
C_4 : Suspicious cells
C_5 : Malignant cells

Sentinel lymph node biopsy (SLNB) of breast

- *Sentinel lymph node biopsy (SLNB)*: The first axillary (SLN) node draining the breast (by direct drainage) is designated as the *sentinel node*. SLN is first node involved by tumour cells and presence or absence of its histological involvement, when assessed will give a predictive idea about the further spread of tumour to other nodes.



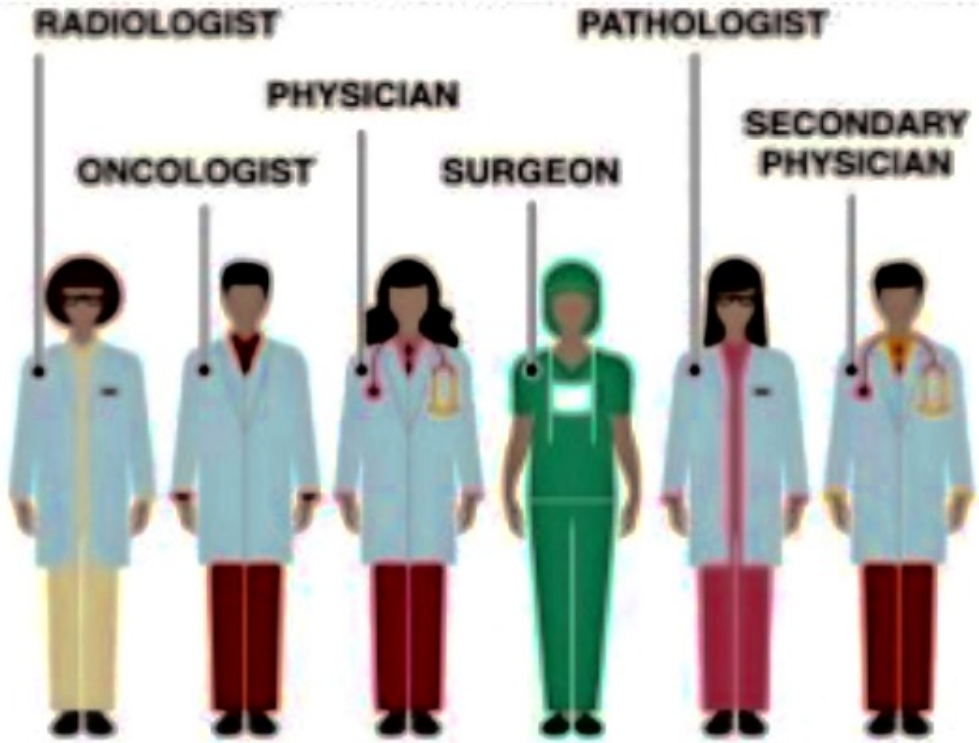
Breast cancer treatment modality

- **Surgery**
  - Local treatment
- **Radiation**
  - Local treatment
- **Chemotherapy and hormonal therapy**
  - Systemic treatment

Management of Ca Breast

Options available;

I. Surgery
II. Radiotherapy
III. Hormone Therapy
IV. Chemotherapy



I. Surgery

— Breast conservation surgery (BCS)

- Stage I, stage II, and sometime stage III carcinomas
- Lumpectomy, axillary lymphadenectomy, and postoperative radiation therapy
- Contraindications:

  tumors > 5 cm , gross multifocal disease, and diffuse malignant microcalcifications by mamography.

- Local recurrence more than mastectomy so follow up important

Breast conserving surgery

1. ***Wide Local Excision (WLE)/ Partial Mastectomy***

   Removal of unicentric tumour with 1cm clearance margin.

   Incision: Over tumour + Axillary Dissection + RT

2. ***Quadrantectomy:***

   Removal of entire quadrant with ductal system with 2-3cm normal breast tissue clearance. Part of QUART Therapy (Quadrantectomy + Axillary dissection + RT) Not advocated now.

3. ***Skin Sparing Mastectomy***

4. ***Lumpectomy (=WLE)***

Lumpectomy

Quadrantectomy

- Breast non preservative surgery (Mastectomy)

- **Simple mastectomy**
- **Modified radical mastectomy**
- **Radical mastectomy**
- **Extended radical mastectomy**

– Simple mastectomy

- All breast tissue is removed, axillary contents not removed
- Treatment for non-invasive breast cancer

– Modified radical mastectomy

(most common mastectomy procedure for invasive breast cancer)

- Entire breast and axillary contents are removed
- Pectoralis muscles remains

– Halsted radical mastectomy

- Removes breast, axillary contents, and pectoralis major muscle
- Cosmetically deforming
- Only indicated when pectoralis muscle involved

MODIFIED RADICAL MASTECTOMY

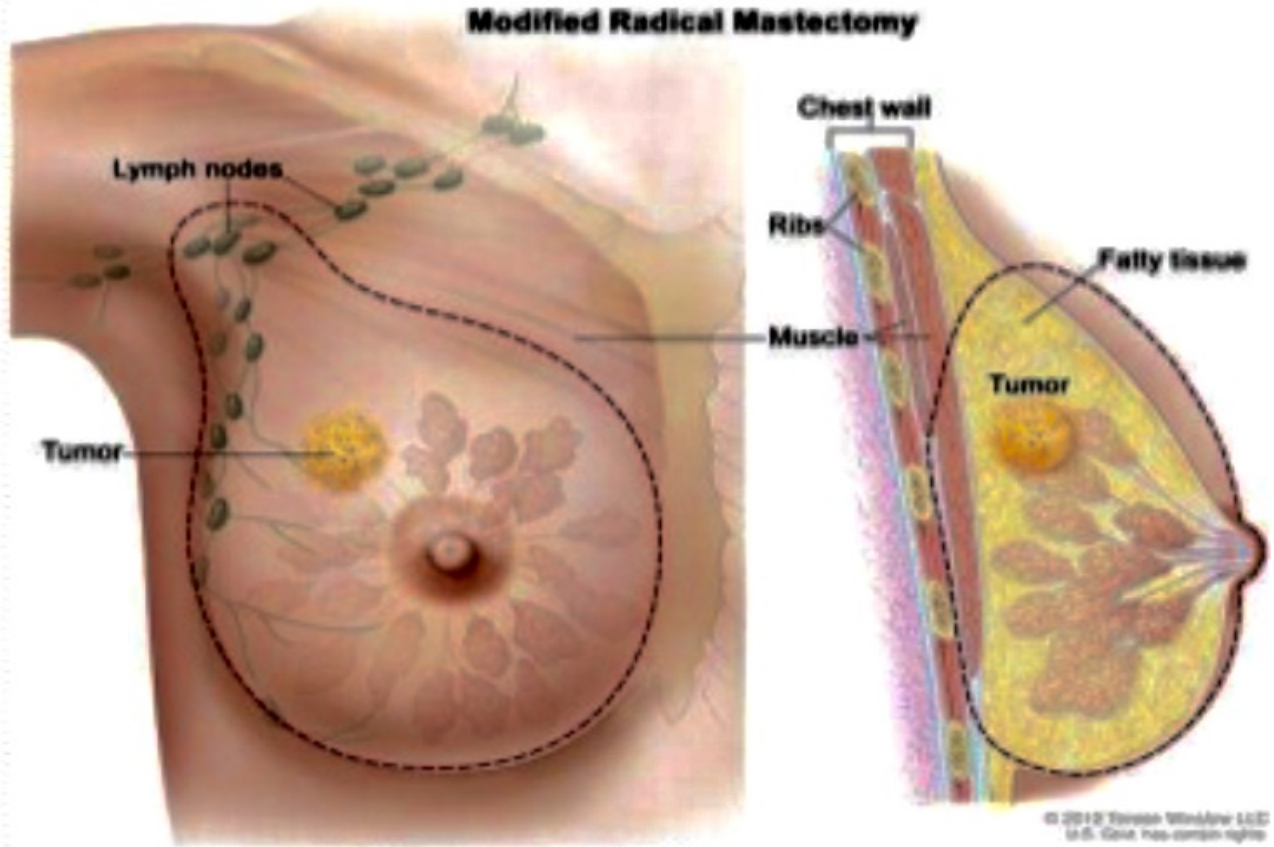
Patey's Operation

Tissues removed:

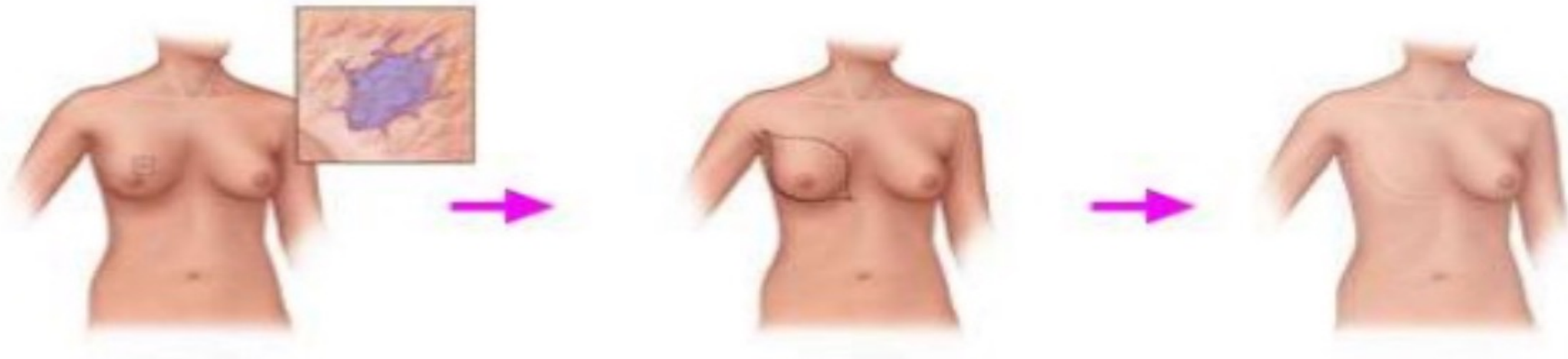
TM + Clearance of Level I, II & III Axillary LN + Pectoralis minor

Tissues preserved:

Nerve to Serratus anterior, Nerve to Latissimus dorsi, Intercostobrachial nerve, Axillary Vein, Cephalic Vein, Pectoralis major



Lumpectomy: surgical removal of the cancerous lump



Mastectomy: surgical removal of the entire breast

BCS → DCIS, stage I-II cancer; not if multicentric disease

BCS must always be followed by adjuvant RT on the residual ipsilateral breast tissue

Complications of mastectomy

- Injury/ Thrombosis of Axillary Vein
- Seroma
- Shoulder Dysfunction
- Pain and Numbness
- Flap Necrosis and infection
- Lymphoedema and its problems
- Axillary hyperaesthesia
- Winged Scapula

II. Radiotherapy

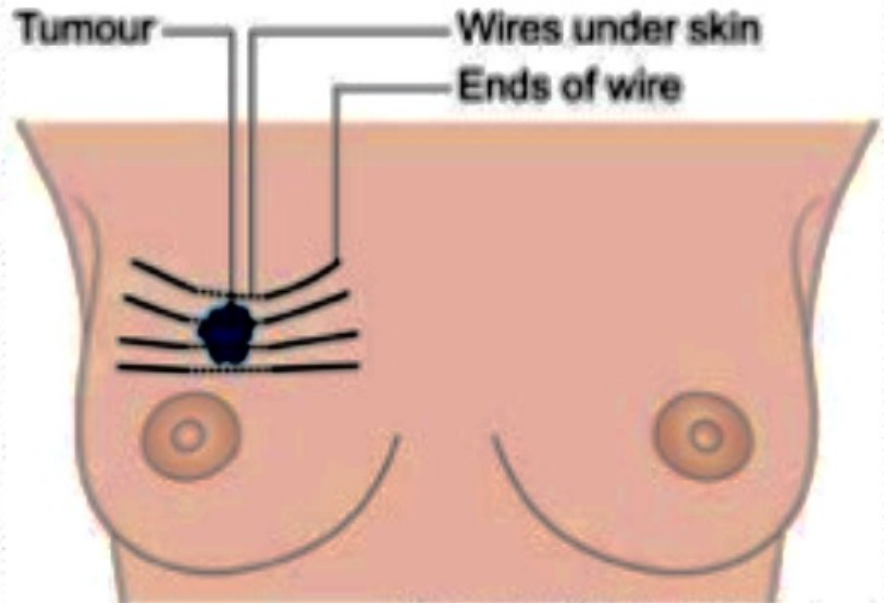
- Indications;

1. Conservative Breast Surgery adjuvant [Breast]
2. Total Mastectomy [Axilla]
3. High-risk of relapse patients
    1) Invasive Carcinoma
    2) Extensive in-situ Carcinoma
    3) Age < 35 years
    4) Multifocal disease
4. Bone secondaries [Palliative]
5. Atrophic Schirrous Carcinoma [Curative]
6. Pre-Operatively (reduce tumour size and downstage)
7. >4 +'ve Axillary LN, Pectoral fascia involvement, positive surgical margins, Extra-nodal spread

External Radiotherapy

- Over Breast area, axilla, Internal mammary and Supra-clavicular area
- Total dosage: 5000 cGy units
- 200-cGy units daily 5 days a week for 6 weeks

Internal Radiotherapy



Chest Wall	Axilla	Post-BCS
▪T3 tumour>5cm ▪Residual disease ▪LABC ▪Positive margin/close surgical margin <2cm ▪Conservative surgery ▪Inflammatory Carcinoma	▪>4 nodes +'ve ▪Extra-nodal spread ▪Axillary status unknown/ not assessed	▪MANDATORY! ▪Local + Axilla ▪Tangential fields: 50 Gy-25 fractions-5 weeks ▪Another 10 Gy to tumour bed ▪Internal Mammary and Supra-clavicular area may be included in the radiation field

III. Chemotherapy

Types;

A. *Adjuvant Chemotherapy*

- Administration of Cytotoxics after surgery
- Eliminate clinically undetectable distant spread

B. *Neoadjuvant Chemotherapy*

- Administration of Cytotoxics in large operable tumours before surgery
- Reduce loco-regional tumour burden – downstage
- Amenable to surgical resection after 3 doses

C. *Palliative Chemotherapy*

- Advanced Ca Breast
- Metastatic Ca Breast

- Indications;
  - All node +’ve patients
  - Primary tumour >1cm in size
  - Poor prognostic factors
  - Advanced Ca Breast
  - Inflammatory Ca Breast
  - Metastatic Ca Breast
- Drugs;

CMF Regime	CAF Regime	MMM Regime
▪Cyclophosphamide	▪Cyclophosphamide	▪Methotrexate
▪Methotrexate	▪Adriamycin	▪Mitomycin-C
▪5-Fluorouracil	▪5-Fluorouracil	▪Mitozantrone

Chemotherapy Regimes

- CAF and CMF – commonly used, monthly/3 weeks cycles for 6 months
- Taxanes
  - Eg: *PACLITAXEL* and *DOCETAXEL*
  - G2/M phase arrestors
  - Use: Metastatic Ca Breast

- *1st line*: CMF > CAF > MMM
- *2nd line*: Taxanes
- *3rd line*: Gemcitabine

Early breast cancer- management.

- Breast Conservation Surgery – Wide Local Excision/ QUART/ SSM; RT locally
- Patey's Operation [MRM]
- Tamoxifen 10mg BD
- Sentinel Lymph Node Biopsy [SNLB]
- Regular follow-up with
  - Radioisotope Bone scan
  - CEA tumour marker
- Indications for Total Mastectomy in EBC;
  - Tumour size >5cm
  - Multicentric tumour
  - High-grade (poorly-differentiated) tumour
  - Tumour margin not clear after BCS

ADVANCED CARCINOMA BREAST

Refers to;

- ✓ Locally Advanced Carcinoma Breast [LACB]
- ✓ Inflammatory Ca Breast
- ✓ Bilateral Ca Breast
- ✓ Metastatic Ca Breast
- ✓ Fixed axillary/supra-clavicular LN

IV. Hormonal therapy

Principles

- It is used in ER/PR positive patients in all age groups (earlier it is used in perimenopausal age groups).
- It is relatively safe, easy to administer.
- It gives prophylaxis against carcinoma of opposite breast.
- It is useful in metastatic breast carcinoma.
- Hormone therapy (tamoxifen) is useful in breast cancer in elderly (positive ER) after wide local excision or occasionally as tamoxifen alone.
- It is now not used in ER negative patients.
- Menopausal status; nodal status; chemotherapy used are not factors to defer the use of hormone therapy.
- Hormone therapy reduces the recurrence rate and so probably improves the life span and quality of life.

Includes

- Oestrogen receptor antagonists—*Tamoxifen*.
- Ovarian ablation by surgery (Bilateral oophorectomy) or by radiation.
- LHRH agonists (Medical oophorectomy).
- Oral aromatase inhibitors for postmenopausal women.
- Adrenalectomy or pituitary ablation.
- Progesterone receptor antagonist.
- Androgens—Inj Testosterone propionate 100 mg IM three times a week.
- Aminoglutethimide—blocks the synthesis of steroids by inhibiting conversion of cholesterol to pregnenolone—*Medical adrenalectomy*.
- Progestogens, e.g. Medroxyprogesterone acetate.

Hormone therapy for carcinoma breast

In pre-menopausal women

- Tamoxifen – antioestrogen
- Ovarian ablation by surgery/by Goserelin/by radiation
- Progestogens – Medroxyprogesterone 400 mg
- Androgens – Fluoxymestrone

In post-menopausal women

- Tamoxifen
- Aromatase inhibitor like letrozole 2.5 mg OD
- Progestogens
- Androgens
- Medical adrenalectomy using aminoglutethemide (Mitotane) – as major source of oestrogen after menopause is adrenal gland. Cortisone supplement is also needed to prevent feedback rise of ACTH which may block the effect of aminoglutethemide

Surgical endocrine ablations

- Bilateral oopherctomy
- Bilateral adrenalectomy.
- Pitutary ablation

TAMOXIFEN

- It is an antioestrogen. It blocks oestrogen receptors.
- Dose is 10 mg BID for 5 years.

Adverse Effects

- *Tamoxifen flare*—flushing, tachycardia, sweating.
- Occasionally it causes bone pain which should be differentiated from pain due to bone metastasis.
- It increases the incidence of endometrial cancer.

Advantages

- It reduces the recurrence rate by 25%.
- It improves the prognosis.
- It is used presently in all age group, ER +ve patients.
- Cheap, easily available, less toxic effects, very effective.
- It is equally effective in carcinoma male breast.
- It is presently also **under trial** for certain benign diseases of breast (*ANDI, Cyclical mastalgia*).

LETROZOLE

- It is a non-steroidal competitive inhibitor of the enzyme 'aromatase'. This enzyme converts adrenal androgens to oestrogen (aromatization). So it is an aromatase inhibitor.
- Other aromatase inhibitors are *anastrozole and exemestane*.
- Letrozole is used as an adjuvant endocrine therapy in post-menopausal women with hormone sensitive breast cancer. (In pre-menopausal women this will cause rise in gonadotrophins and ovarian aromatase is not well suppressed). It can also be used in metastatic and recurrent cases. It slows down and stops the growth of oestrogen sensitive breast tumours. It reduces oestrogen level by 98%. Its half life is 45 hours. It decreases the bone density.
- Dosage of letrozole is 2.5 mg once daily.
- It is given for 5 years or for 2 years following 3 years of tamoxifen.
- Side effects of letrozole are vaginal dryness, night sweats, hot flushes, vaginal bleeding, cardiovascular problems and osteoporosis.

TRANSTUZUMAB (Herceptin)

- It is a monoclonal antibody that blocks HER-2/neu receptors thereby preventing growth of cancer cells. It is a new drug. It is presently marketed as herceptin. It is c-ErbB2 (growth factor receptor) inhibitor. It is a newer biological agent.
- It has very little effect on HER-2/neu negative cancers.
- It is useful only in HER-2/neu positive cancers. It is currently approved by FDA for use only in metastatic disease. It is given as intravenous infusion.
- Studies have shown substantiate improvement in disease free and overall survival rate.
- It has got cardiac side effects.

Management of ACB

- **LACB**
  - Neoadjuvant Chemotherapy
  - Response assessment
    - Non-responders: RT + Surgery
    - Responders: Surgery (Toilet Mastectomy/MRM)
- **Inflammatory Ca Breast**
  - *'Mastitis carcinomatosis'/ 'Lactating Ca of Breast'*
  - T4d LACB (Stage IIIB)
  - Neoadjuvant ChemoT and RT
  - Surgery (if downstaged) + Axillary clearance

Metastatic breast cancer

- Hematogenous spread to;
  - Bone: most common. Vertebra – Batson's (valveless) venous plexus and posterior intercostal veins, Ribs, Humerus, Femur
  - Lungs – '*Cannon-ball*' 2^0 in parenchyma, Pleural effusion, Chest wall 2^0
  - Liver
  - Brain
- Treatment strategies;
  - Chemotherapy: CMF/CAF
  - Radiotherapy
  - Tamoxifen, Oophorectomy
  - Transtuzumab, Bevacizumab
  - Hypercalcemia – Hydration, steroids, Palmidronate 90mg i.v once a month
  - Internal fixation of pathological #

Carcinoma breast in pregnancy

- Incidence is 3%
- Treatment is modified radical mastectomy (MRM)
- Chemotherapy can be given in 2nd trimester with care
- Radiotherapy has no role
- As commonly ER negative, hormone therapy is not used
- When distressing secondaries are present termination of pregnancy may be required
- *Women with breast cancer can become pregnant 2 years after the completion of therapy, as recurrence is more common in 2 years*

Breast cancer in pregnancy- management

1st Trimester	2nd Trimester	3rd Trimester
▪MRM	▪MRM	▪MRM
▪Axillary node +'ve: Termination of pregnancy + Chemotherapy	▪Chemotherapy carefully	▪After delivery – Chemotherapy with suppression of lactation

Note the following;

✓Hormone treatment contra-indicated: Teratogenic

✓Radiotherapy: No role

✓MRI is the investigation of choice

✓Can become pregnant *2 years* after completion of therapy as recurrence rates are highest in 2 years

Follow up after breast cancer therapy.

- **Clinical examination in detail at regular interval.**
- **Yearly / two yearly mammography of treated and contralateral breast is a must.**
- **Bone scan/ CT chest , abdomen/ tumor markers are done only if there if there is clinical suspicion of spread / metastases . It is not a regular routine follow up method at present.**

The Male Breast

Gynecomastia

- The most common breast problem in men is gynecomastia.
- Gynecomastia is a benign hypertrophy of breast tissue.
- The unilateral gynecomastia patient usually presents with a discoid mass symmetrically placed beneath the areola, which may be tender to palpation.

Causes of gynecomastia

Physiological

Pathological

- Drug-induced (e.g. hormone supplements, alcohol, cimetidine, digoxin, phenothiazines, tricyclic antidepressants, some antihypertensive agents)
- Increased oestrogen production (e.g. hepatoma, testicular and adrenal tumours or paraneoplastic syndrome)
- Reduced production of testosterone (e.g. Klinefelter's syndrome, mumps orchitis)
- Testicular feminisation syndrome

– Prepubertal gynecomastia

- Rare, adrenal carcinoma and testicular tumor can cause this.

– Pubertal gynecomastia

- Occurs in 60-70% of pubertal boys.

– Senescent gynecomastia

- 40% of aging men have this to some degree.
- Drugs, such as steroids, digitalis, hormones, spironolactone, and antidepressants can cause this.

Male breast carcinoma

- 0.7% of all breast cancers
- <1% of male cancers
- Average age of diagnosis is 63.6 years old
- Painless unilateral mass that is usually subareolar with skin fixation, chest wall fixation,, and ulceration.
- Mostly ductal carcinoma
- Males generally present at later stage than woman
  - Overall survival worse in men, however when compared stage for stage the survival rates are similar.