Breast disease

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Correction File

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Anatomy of the breast

Breasts (mammary glands) are modified sebaceous glands. The breast extends from the 2nd to the 6th ribs and transversely from the lateral border of the sternum to the mid-axillary line.

Borders:

Upper border:

Collar bone.

Lower border:

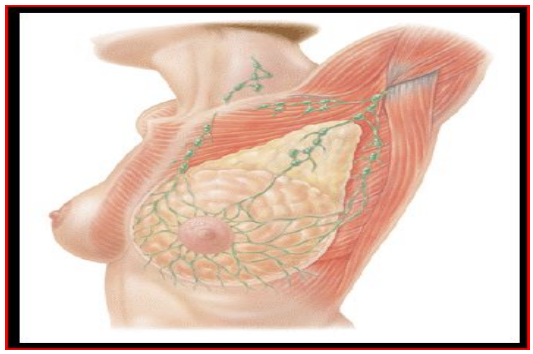
6th or 7th rib.

Inner Border:

Edge of sternum.

Outer border:

Mid-axillary line.



Breast Divisions: 5 Segments.

- **Four Quadrants**

By horizontal and vertical lines.

(upper outer quadrant, upper inner quadrant, lower outer quadrant, and lower inner quadrant)

- **Tail of Spence**

additional lateral extension of the breast tissue toward the axilla.

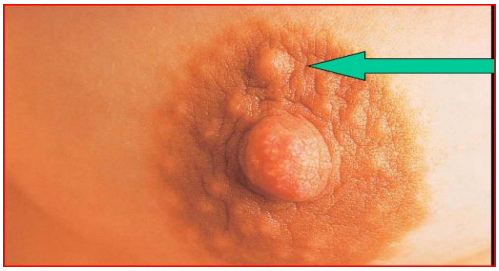
Majority of benign or malignant tumors in the Upper Outer Quadrant

External Anatomy of the Breast

- **Nipple**
  - -Pigmented, Cylindrical
  - -4th intercostal space (at age 18)
  - -Is connected to glands by lactiferous ducts
- **Areola**
  - -Pigmented area surrounding nipple
- **Glands of Montgomery**
  - -Sebaceous glands within the areola
  - -Lubricate nipple during lactation
- **Skin**

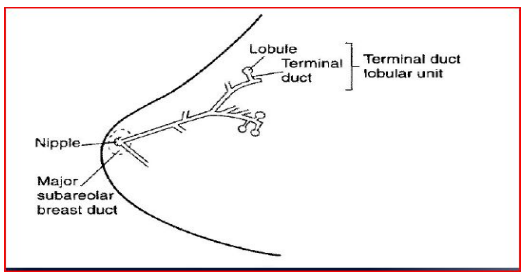
Montgomery's Tubercles

Pathologies that can arise:
-Blocked -Present as a mass



Blocked Montgomery Tubercle

Terminal Lobular Unit and Branching Systems of Ducts



Chest Muscles

- **Pectoralis Major** 60%
- **Serratus Anterior/Minor** 40%
- **Latissimus Dorsi, Subscapularis, External Oblique, Rectus Abdominis** 10%

Nerve supply: (T3-T5)

Long Thoracic Nerve

- Serratus anterior

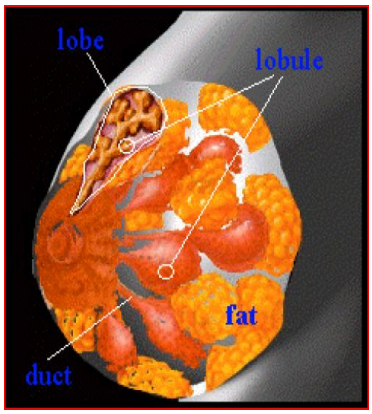
Thoracodorsal Nerve

- Latissimus Dorsi

Intercostalbrachial Nerve

- Lateral cutaneous
- Sensory to medial arm & axilla

Internal Anatomy of the Breast (Tissue Types)



Glandular Tissue

-Milk producing tissue. Each mammary gland consists of 15-20 lobes. Each lobe is further divided into 20-40 lobules composed of clusters of milk-secreting glands alveoli/acini) and is drained by a lactiferous duct that opens onto the nipple

Fibrous Tissue

Cooper's Ligaments

-Suspensor ligaments

- Extending through the breast to underlying muscle
- Benign or malignant lesions may affect these ligament

-Responsible for Skin retraction or dimpling

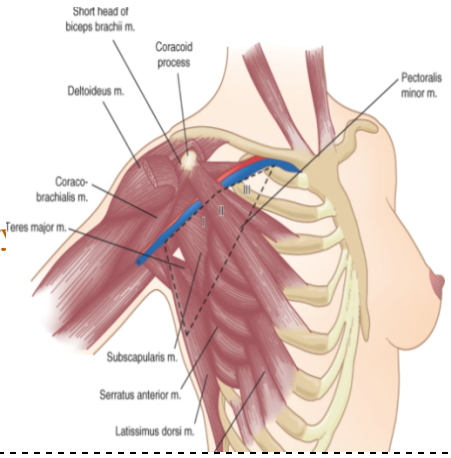
Fatty Tissue

-Subcutaneous and retro-mammary fat Bulk of breast

- No fat beneath areola and nipple

Connective Tissue (Collagen and elastin)

Axillary lymph nodes defined by pectoralis minor muscle:



-Level 1 – Lateral (anything **below** the pectoral tendon and pectoralis minor, first group involved in malignancy, account for 80% of lymphatics, is also called low axilla , it is considered the most important group.)

-Level 2 – Posterior (hiding **behind** the pectoral tendon , important for axillary dissection and malignancy and accounts 5% of lymphatics

-Level 3 – Medial **(above** pectoral tendon , it is called infraclavicular lymph nodes)

Lymph Nodes

-Palpate ALL nodes From distal arm to underarm with deep palpation

-Most drain into ipsilateral axillary lymph nodes (axilla)

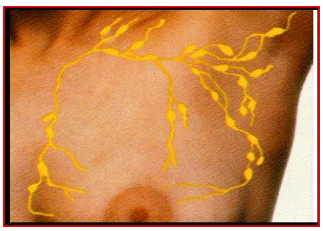
-Superficial lymphatic nodes drain **skin**.

-Deep lymphatic nodes (Axillary, Infraclavicular, Supraclavicular ,parasternal (internal mammary)) drain **mammary lobules**

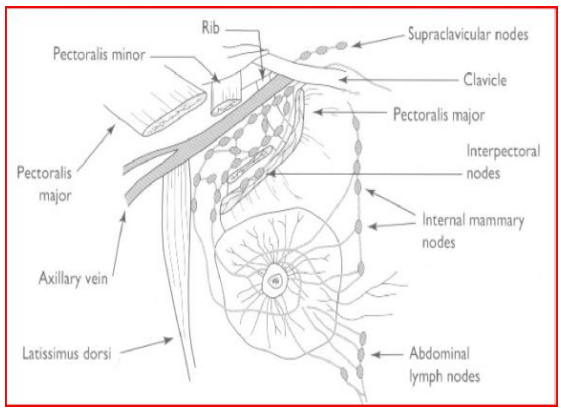
-Palpate Nodes deep in the chest or abdomen

-Palpate Infra-mammary ridge

- Shelf in the lower curve of each breast



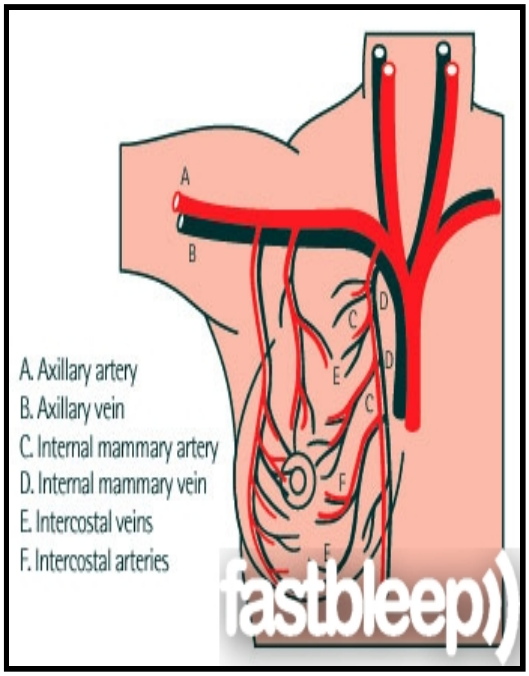
Lymph Drainage of Breast



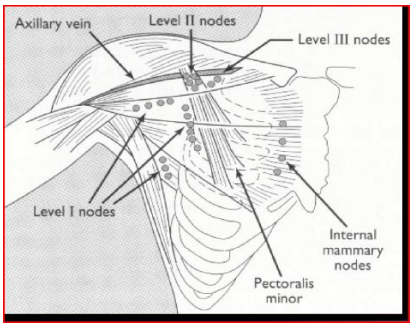
-The medial portion of the breast → to the internal mammary nodes

-The central and lateral portions 75-80% →drain to the axillary lymph node

Arterial Supply



Levels of Axillary Nodes



Anatomical classification of axillary lymph nodes:

1. Anterior (pectoral) group: deep to pectoralis major
2. Posterior (subscapular) group: along subscapular vessels.
3. Lateral group: along the axillary vein.
4. Central group: within the axillary pad of fat.
5. Apical group: which drains all of the other groups, lies behind the clavicle at the apex of axilla.

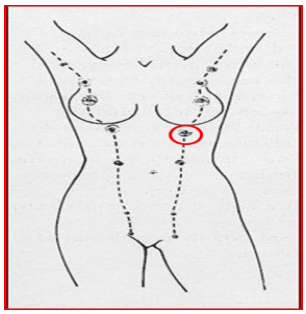
Physiology of the breast

• Puberty	• Pregnancy and lactation	• Aging
- Need estrogen and progesterone **Estrogen** - Growth and appearance - Milk-producing system **Progesterone** - Lobes and alveoli - Alveolar cells become secretory **-Asymmetry is common.**	-Glandular tissue displaces connective tissue -Increase in size - Nipples prominent and darker -Mammary vascularization increases -Colostrum present -Attain Tanner Stage V with birth	**-Perimenopause** - Decrease in glandular tissue - Loss of lobular and alveolar tissue **-Flatten, elongate, pendulous** **-Infra-mammary ridge thickens** **-Suspensory ligaments relax** **-Nipples flatten** **-Tissue feels "grainy"**

Milk Lines

Sites of Accessory Nipples and Breasts :

Most common in the axilla and inframammary



Triple Assessment : History + examination + mammogram + Fine needle aspiration (biopsy)

Points should be considered in History Taking

1- Age
2- Hormonal status (Married , Menopause , Post-menopausal and oral contraceptives)
3- Breast development starting from childhood to present
4- Size of lump related the disease
5- Pattern of pain relation to menses
6- How regular the cycle is and quantity of blood
7- Changes of brest during previous pregnancies (such as abscess, nipple discharge , retraction of nipple)
8- Number of pregnancies
9- Breast feeding
10- Abnormalities which took place during previous lactation period such as (abscess, nipple retraction and mlk retention).
11- Family history of breast diseases especially cancer and age of affecting by this disease **(** the most important relative is the mother) .
12- Nipple discharge , age of menarche , age of the 1st birth and last menstrual period
13- For post menopausal women : Hormone replacement therapy and date of menopause.

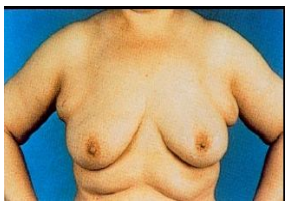
Normal Variations of Breast

1-Accessory Breast Tissue

Comes out during:
-Puberty
-Pregnancy
-Lactation
If it is big enough disturbing the patient activity, you can remove it for cosmetic reasons
You should investigate by US, physical exam make sure there is no underlying pathology
During puberty it's better to wait
-Accessory breast can get cancer

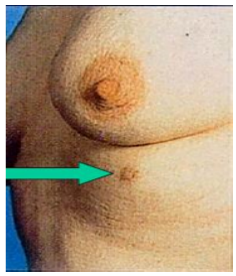
Bilateral Accessory Breasts

Always accessory breasts lacking nipple & areola
Clear folds, bilateral, if lose weight → don't go



2-Accessory Nipple

The commonest,Accessory nipple but no breast tissue
If you biopsy it you may find minimal breast tissue
Breast with Two Nipples



If you investigate the patient you have to know which one is the real functioning nipple cuz both of them in abnormal position
US → which one contain the proper duct. Remove the non functioning

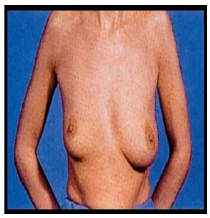
3-Breast Hair

Normal not hormonal

4-Breast Asymmetry

During puberty you don't have to interfere surgically
Make sure there is no underlying pathology
.Reduce or augmentation in adults

.Puberty never touch



Clinical Breast Exam:

Inspection: (Both Breasts)

-Skin

-Symmetry

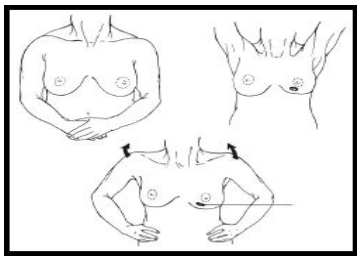
-Masses

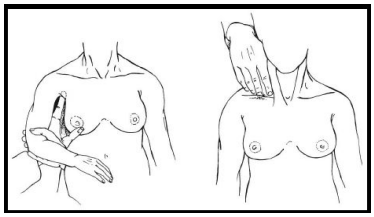
Palpable:

-Gland

-Axilla, Supraclavicular spaces

-Nipple-areola complex



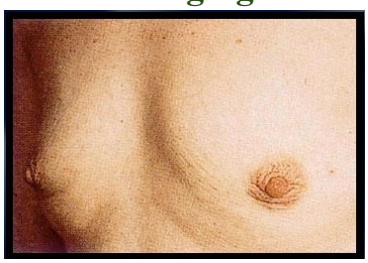


Skin Dimpling a

Dimpling due to Carcinoma

Once you lose the contour
→ there is a problem

Skin Dimpling Both Breasts Involution Due to Aging



Skin Dimpling Breast Infection

Redness → Infection
Absence of redness → Malignancy

Skin Dimpling Previous Breast Surgery

Inverted Nipple Since Puberty

Nipple retraction, it goes so benign & it goes so malignant

Retracted nipple in short time → you have to rule out malignancy

Common Benign Breast Disorders

- Fibrocystic changes - Fibroadenoma - Intraductal papilloma - Mammary duct ectasia

- Mastitis - Fat necrosis - Phyllodes tumor - Male gynecomastia

Fibrocystic Changes

- Lumpy, bumpy breasts
- 50-80% of all menstruating women
- Age 30-50 (10% in women less than 21)
- Caused by hormonal changes prior to menses
- Relationship to breast cancer doubtful

- The most common complain (pain, tenderness, discharge, feeling lump)→physical exam to rule out any masses.
- US → multiple small cysts no features suggestive of malignancy, mammogram (40's), in absence of micro calcification - presence of multiple cysts → normal not pathology → wear supportive bra, simple analgesia at maximum time of pain .

Rx. for symptomatic fibrocystic disease: Stop caffeine, NSAIDs, Vit. E, evening primrose oil (danazol & OCP as last resort.

Fibrocystic Disease

Common benign breast condition consisting of fibrous (rubbery) and cystic changes in the breast.
Most common cause of green, straw-colored, or brown nipple discharge.

Histology

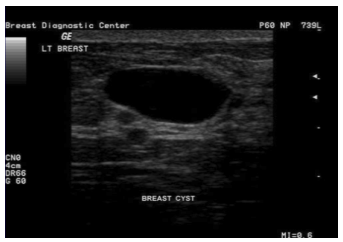
- Adenosis
- Apocrine metaplasia
- Fibrosis
- Duct ectasia
- Mild duct ectasia

Signs and Symptoms

- Mobile cysts with well-defined margins
- Singular or multiple
- May be symmetrical
- Upper outer quadrant or lower breast border
- Pain and tenderness
- Cysts may appear quickly and decrease in size
- Lasts half of a menstrual cycle
- Subside after menopause
  -If no HRT

Breast Mass

Breast Cysts



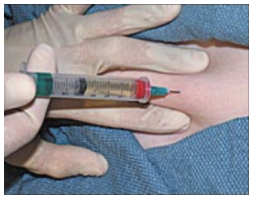
Cyst is benign developmental changes ,it is due continues of hormone that affect the breast, Fluid-filled, 1 out of every 14 women ,50% multiple and recurrent,Hormonally influenced

Patients have breast cyst may after that disappear , increase , decrease or develop another one

First we need to determine the size of cyst by ultrasound , if <1cm→ don't worry or multiple cyst also don't worry b/c it is part of fibrocystic

Persistent, same side, painful, or >1 cm → aspirate → if blood comes preform surgery immediately b/c it may indicate ,cancer ,but if it comes yellowish to brownish → aspirate till dry fluid come then re-checked by ultrasound after 3 days and also send the fluid to cytology to make sure doesn't contain active cell or malignant cell.

Treatment



-Aspirate cyst fluid

-Imaging for questionable cysts US: **1-Cystic** → aspirate → cytology **2-solid**

-Treatment based on symptoms

-Reassure

-Atypical Hyperplasia'' on pathology report indicates increased risk of breast cancer

Cyst on ultrasound	• Contain no or few echoes. • Have smooth margins. • Are often compressible with the ID. • Have posterior enhancement (increased echoes = whiter).

Sclerosis: Occurs in stromal involution. They include; A) Radial scars. B) Complex sclerosing lesion. C) Sclerosing Adenosis. All can produce stellate lesions or localized calcification that mimic breast cancer in mammography. Radial scars are difficult to differentiate on imaging from small cancers. Most scars are removed.

Breast Pain	
Cyclical pain – hormonal	**Non-cyclical pain**
Dull, diffuse and bilateral Luteal phase Treatment: Reassurance, NSAIDS, evening primrose oil	Non-breast vs breast Imaging Treatment: Reassurance, NSAIDS, evening primrose oil

Fibroadenoma

Benign tumor consisting of stromal overgrowth, collagen arranged in "swirls".

-Disease of young (puberty → early 30's). Most common breast mass (the most common benign tumor) induced by hormones (ovarian affect the breast).

-In US it will give acoustic shadow but not clear, will capsulated, wil localized contain fibrous and glandular tissue

-Induced by hormones → no need to remove it

- First you have to investigate and make sure it is fibroadenoma.
- Second most common breast condition.
- Most common in black women.
- Late teens to early adulthood.
- Rare after menopause.

Signs and Symptoms

- ❖ Firm, rubbery, round, mobile mass
- ❖ Painless, non-tender
- ❖ Solitary- 15-20% are multiple
- ❖ Well circumscribed
- ❖ Located in Upper-outer quadrant
- ❖ 1-5 cm or larger

-Dx. Clinical exam by biopsy. Negative needle aspiration looking for fluid, US, core biopsy.

-Rx. Large or growing lesions → Surgical resection, Small fibroadenoma → Observe closely

Indication to remove fibroadenoma:

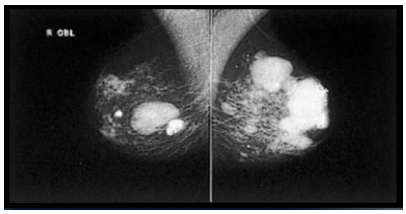
- >4 cm.
- Giant fibroadenoma (affecting the symmetry of the breast).
- Painful, localized
- FHx. of malignancy (does NOT mean that fibroadenoma is pre-malignant but done only to **relieve the patient's worries)**
- In a place affecting patient activity or her bra (inframammary fold).
- Non proper age (40)
- Weird pathology e.g. fibroadenoma with hypercellularity with evidence of atypia.
- Phyllodes (it's variation of fibroadenoma but there is a potential **risk of malignancy less than 1%)**

If left alone it"ll either remain the same or regress (some patients during pregnancy it regresses) or increase in size or calcify

Juvenile Hypertrophy: Uncontrolled overgrowth of breast tissue after puberty. - Usually bilateral. - Due to increase in stromal tissue, not lobules of ducts. - Presenting symptoms: pain in shoulders & back & large breasts. - Treated with reduction .mammoplasty

Mammogram

Multiple Calcified Fibroadenomas



Usually we don't do mammogram for fibroadenoma unless 40 and above

Those below 40, we do for them ultrasound

Intraductal Papilloma the

- Benign
- Slow-growing
- Overgrowth of ductal epithelial tissue
- Usually not palpable
- Cauliflower-like lesion
- Length of involved duct
- **Most common of bloody nipple discharge**
- 40-50 years of age

Bloody Breast Discharge

Signs and Symptoms

- Watery, serous, serosanguinous, or bloody discharge
- Spontaneous discharge

spontaneous, coming from one specific duct →pathology

- Squeeze → not pathology
- Usually unilateral
- Often from single duct- Pressure elicits discharge from single duct
- 50% no mass palpated
- Investigation: -US- Mammogram → >40
- MRI → young, high suspension of malignancy

Investigation:

- Test for occult blood
- Ductogram

inject the contrast material through the duct → if there is filling defect this is intraductal papilloma

- Biopsy

Treatment

- If it persist Excision of involved duct
- Most of the time it relative by it self,

Galactorrhea

Commonest ever:1-bilateral : in Lactation

2- pituitary adenoma (persistent headache)

Mammary Duct Ectasia Dilatation of ductal system

Age 30 and above

Inflammation and dilation of subareolar ducts behind nipples

May result in palpable mass because of ductal rupture

Greatest incidence after menopause

Etiology Unclear

- Ducts become distended with cellular debris causing obstruction

-Dilate → stasis → secretion → infection (mixed growth) → fibrosis, scarring, → nipple changes and retraction

-Periductal mastitis and abscess with mixed bacteria (non lactating women) and stuph aureus (with lactated)

Mammary Duct Ectasia versus Breast

slit-like nipple characteristic of mammary duct ectasia

nipple retraction from carcinoma

Signs and symptoms

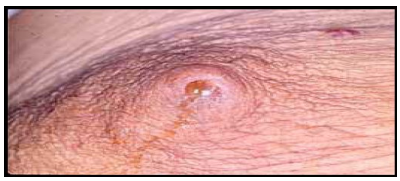
- Multi-colored discharge
  - Thick, pasty (like toothpaste)
  - White, green, greenish-brown or serosanguinous
- Intermittent, no pattern
- Bilaterally from multiple ducts
- Nipple itching
- Drawing or pulling (burning) sensation

Treatment

- Test for occult blood
- Imaging
  - Mammogram
  - Sonogram
- Biopsy
  - Excision of ducts if mass present
- Antibiotics b/c most of the time it is abcess and if it is big abscess you have to drain it
- Close follow-up

Dried Secretions from Mammary Duct Ectasia

Yellow Breast Discharge Duct Ectasia



Multi-colored Breast Discharge

Multiple ducts, multiple secretions → fibrocystic or duct ectasia- non serious pathology

Mastitis

Breast infection when bacteria enter the breast via the nipple Penicillin resistant staphylococcus is the common cause

- Ducts infected, fluid stagnates in lobules and usually occurs during lactation

Signs and symptoms include:

- Pain and tenderness
- Nipple discharge: Pus, Serum and Blood
- Localized induration
- Fever

Treatment

-Antibiotics against staph.aureus what's come from the mouth of the baby.

-Continue breast feeding

-Close follow-up

left breast

Puerperal Mastitis

SUMMARY BOX 19.2

Breast infection

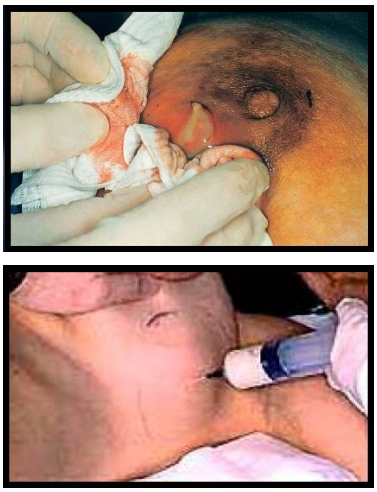
- Antibiotics should be given early to reduce abscess formation
- Hospital referral is indicated if infection does not settle rapidly on antibiotics
- If an abscess is suspected, this should be confirmed by ultrasound or aspiration
- If the lesion is solid on ultrasound or aspiration a core biopsy should be performed to exclude an underlying inflammatory carcinoma.

Inflammatory Carcinoma
Erythema and peau d'orange

Breast Abscess

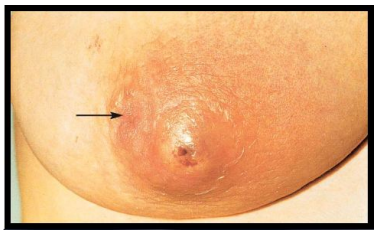
Treatment: Antibiotics, Needle aspiration and Incision and drainage

Abscess Drained under Local Anesthesia



Non-Lactating Breast Abscess

Arrow points to inverted nipple



Puerperal Breast Abscess

Abscess occurred during lactation

Before treatment **Local anesthetic** **After treatment**

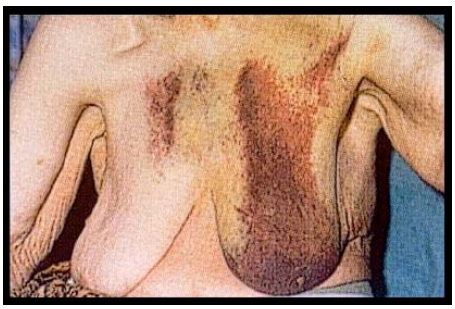
Peripheral Breast Abscess

Before management **After recurrent aspiration & antibiotics**

Fat Necrosis: Is necrosis of adipose tissue Causes: Trauma to breast and Surgery especially after car accident or fall

Can present with:
-Pain or mass
-Usually non-mobile mass
-Resolves over time without treatment (may be excised)

Radiological cannot differentiated from malignancy
Diagnosis:core biopsy to differentiate between it and malignancy



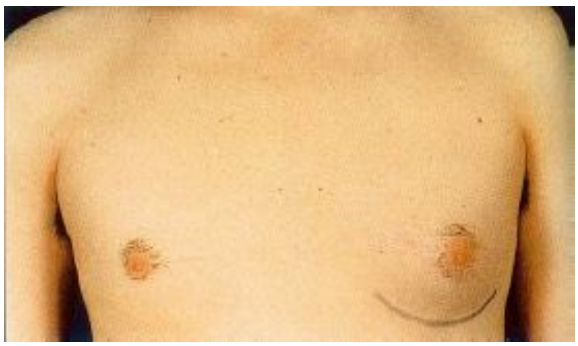
Breast Hematoma

Seat Belt Trauma

Left-Sided Gynecomastia

Treatment

- If pre-puberty
  - Wait to see if it resolves
- Change medication
- Treat underlying illness (hepatitis, COPD, hyperthyroidism, TB)
- Occurs in families with genetic mutation
  - Colon, prostate cancer
- In male you have to roll out testicular or liver or even adrenal tumor especially in young b/c they may have congenital adrenal hyperplasia



Medications associated with gynecomastia:
-Marijuana -Narcotics -Phenothiazines -Diazepams-AnythingthataffectstheCNS

Treatment
• If pre-puberty → wait to see if it resolves • Change medication • Treat underlying illness • Occurs in families with genetic mutation → Colon , prostate cancer

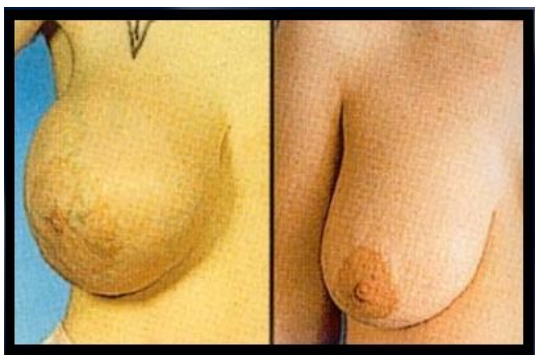
Types of Breast Cancer: Derived from the epithelial cells that line the terminal duct lobular unit.

Noninvasive (In-situ)	Invasive
Remain within the basement membrane of the tubule and draining ducts. Two types : A) Ductal Carcinoma In Situ (DCIS): The most common. In mammogram there's micro calcification, which could be either localized or widespread. B) Lobular Intraepithelial Neoplasia. Incidental finding. Managed with regular follow-ups	Move out from the basement membrane of the ducts and lobules into the surrounding tissues. Two types: A) Ductal, which has five subtypes : I) Tubular. II) Cribriform. III) Mucinous. (produce mucin) IV) Papillary. V) Medullary. (High-grade, pleomorphic cells surrounded by lymphoid cells) B) Lobular. (Large at the time of diagnosis)

Phylloides Tumor(cystosarcoma)
Giant fibroadenoma with rapid growth

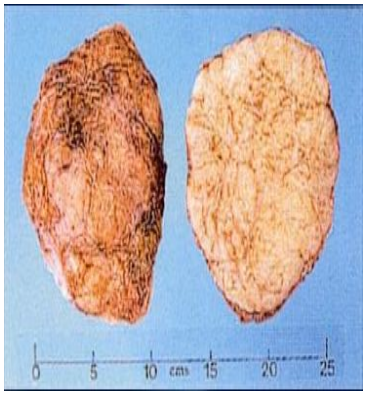
- **Malignant potential**,lesions > 3 cm are more likely to be malignant
- **Mostly not metastasize**
- Often occurs in women aged 40+
- Giant fibroadenoma (a variant of fibroadenoma) with rapid growth (patient presents with a history of a rapidly growing mass)
- Most are benign, 25% recur locally if incompletely excised
- The malignant form of this lesion mostly locally malignant (about 10%) can metastasize hematogenously to the lungs and not to the axillary lymph nodes.
- **Investigations**: Imaging: both mammography and ultrasound, they present as well-defined masses that are **very similar to a benign fibroadenoma.** The malignant forms are more likely to have cystic spaces on U/S
- Treatment
  - Excision,(mastectomy) is the only treatment!Chemotherapy and radiotherapy are not effective.

Giant Fibroadenoma

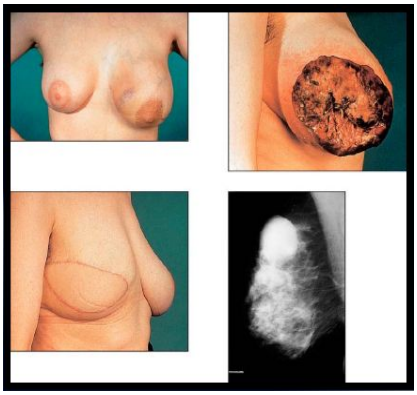


Before Surgery **After Surgery**

Cross Section of Giant Fibroadenoma



Malignant Phylloides Tumor



Differential Diagnosis of Nipple Discharge

95% because of benign disease , may be Serous, serosanguinous, bloody, clear, milky, green, blue-black

-Common causes in non-pregnant women

- Carcinoma
- Intraductal papilloma
- Fibrocystic changes
- Duct ectasia
- Hypothyroid
- Pituitary adenoma
- Lactation
- Cyst communicating with duct system

-All colors are not important except blood because it indicates about Intraductal lesion which 20% of Intraductal lesions are malignant . Also if blood comes from multiple ducs, more suspicious to be malignant

-You need to do biopsy to know if it is benign or malignant

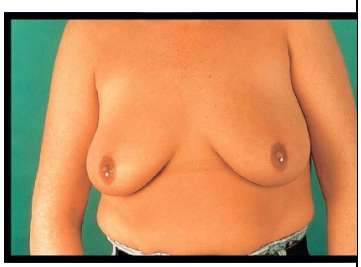
-Clinical Characteristic Physiologic-non pathological:

- Usually bilateral
- Multiple ducts
- Non-spontaneous

pathological:

- no squeezing
- one duct
- unilateral
- bloody discharge

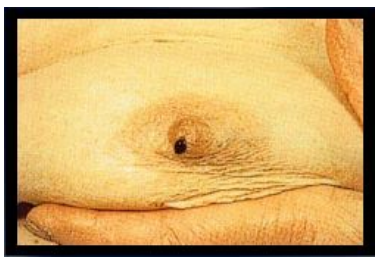
Screen for phenothiazine us and stimulation

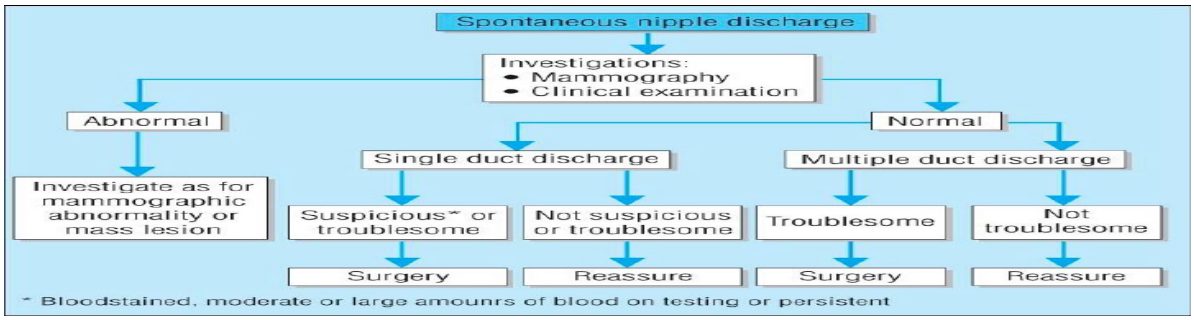


-Clinical Characteristic Pathologic discharge

- Spontaneous
- Unilateral
- Single duct
- Discolored discharge

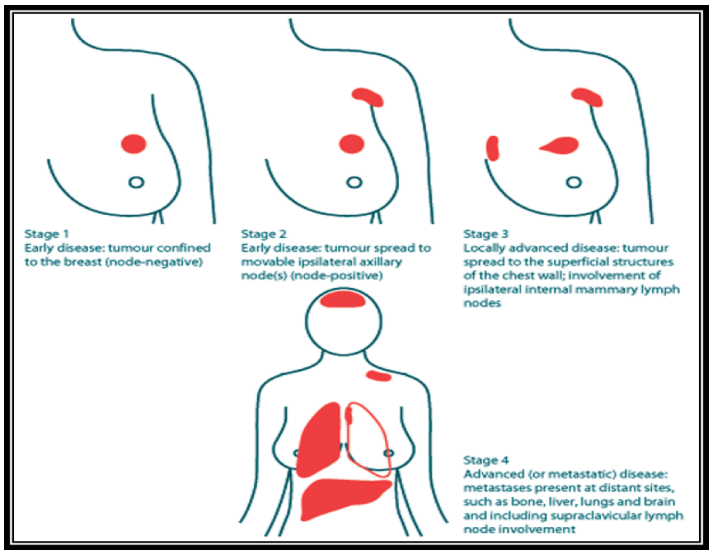
-Bloody Nipple Discharge

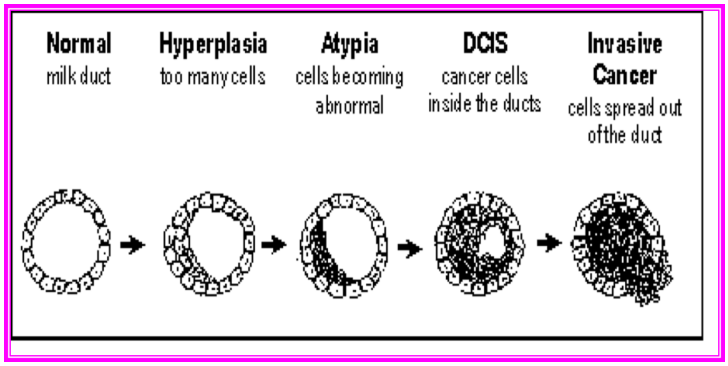




Breast cancer

-Staging and classification of breast tumor





-Treatment of DCIS

Depending on the degree of DCIS the options of treatment are

- **Total mastectomy**
- **Lumpectomy**
- **Lumpectomy and radiation therapy**

DCIS does not spread to the axillary lymph nodes so these are usually not removed.

-Lines of treatment of breast cancer

1.Surgery: for Stage I, II either *WLE or mastectomy[1] + axillary nodes.

2.Radiotherapy.: is usually associated with surgery due both are used for treatment of local cancer

3.Chemotherapy : There are a lo oft side effects of chemotherapy , the most important are neutropenia (infections) + loss of hair especially in women.

Giving chemotherapy before surgery is called neoadjuvant chemotherapy

Giving chemotherapy after surgery is called chemotherapy

4.Hormonal therapy : Hormonal therapy is given to patient with estrogen receptor (ER) positive ،so it stops the progression of the disease and protects other breast. Side effects of HT of hormonal therapy is DVT and uterine cancer. Used usually in Those elderly 80-90 usually we treat them by HT because they can't tolerate surgery. e,g: tamoxifen

5.Ovarian ablation.

6. Reconstruction

7. Target therapy (biological therapy) :such as Trastuzumab is given to patient with hair 2 cancer.

Hair 2 is a plasmic protein that in many causes of breast cancer are overexpressed.

Biological therapy stops progression of the disease and prevents metastasis to brain.

Disadvantages : expensive + cardiotoxic

WLE : Wide local excision is remove the tumor with surrounding tissue and is also called [1] lumpectomy or breast conserving surgery

Mastectomy : remove a whole breast

Types of breast cancer

• Infiltrating (or invasive) Ductal Carcinoma (IDC)

Starting in a milk passage, or duct, of the breast, this cancer breaks through the wall of the duct and invades the breast's fatty tissue. It can spread to other parts of the body through the lymphatic system and through the bloodstream. Infiltrating or invasive ductal carcinoma accounts for about 80 percent of all breast cancers.

•Infiltrating (or invasive) Lobular Carcinoma (ILC)

–This type of cancer starts in the milk-producing glands. About 10 to 15 percent of invasive breast cancers are invasive lobular carcinomas.

•Medullary Carcinoma

This type of invasive breast cancer has a relatively well-defined distinct boundary between tumour tissue and normal breast tissue. It accounts for about 5 percent of all breast cancers. The prognosis for medullary carcinoma is better than that for invasive lobular or invasive ductal cancer.

•Colloid Carcinoma

This rare type of invasive disease, also called mucinous carcinoma, is formed by mucus-producing cancer cells. Prognosis for colloid carcinoma is better than for invasive lobular or invasive ductal cancer.

•Tubular Carcinoma

Accounting for about two percent of all breast cancers, tubular carcinomas are a special type of invasive breast carcinoma. They have a better prognosis than invasive ductal or lobular carcinomas and are often detected through breast screening.

•Adenoid Cystic Carcinoma

–This type of cancer rarely develops in the breast; it is more usually found in the salivary glands. Adenoid cystic carcinomas of the breast have a better prognosis than invasive lobular or ductal carcinoma.

Doctor notes : You can't treat the breast cancer by the surgery without addressing axilla.
Addressing axilla is done by physical examination of axillary lymph nodes then ultrasound of axilla and after that by either :- :
1- Axillary clearance (Axillary lymph nodes dissection) --> Remove level 1 and 2 lymphatics
2- Sentinel lymph nodes biopsy,
If positive → We need to do axillary lymph nodes dissection

Side effects of axillary lymph nodes dissection is lymphatic edema , infection and shoulder dysfunction and seroma

The purpose of axillary lymph nodes dissection in breast cancer is control the disease and stage the disease..

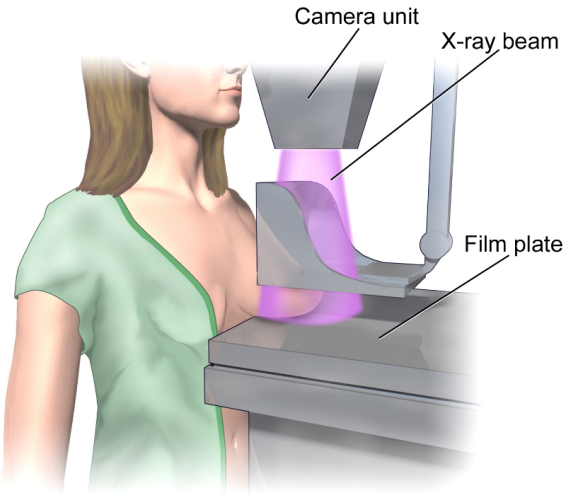
The prognostic factors of breast cancer are : Size, Nodes and grades (G1,G2 and G3 the worst)

Breast mass with nipple retraction occurs because cooper ligaments are invaded by cancer.due of sub dermal lymphatic channel are full of cancer cells **(puedo orange).** If you leave this cancer and not treat it, it will start erode the skin → fungating mass.

Mammography is x-ray of the breast

- Screening and diagnostic tool
  -After age of 40
- Estimated reduction in mortality 15 – 25%
- 10% false positive rate
- Densities and calcification
- Cardinal mammographic features of malignancy :

1. Spiculated mass.
2. Architectural distortion without mass.
3. Micro-calcifications with casting or irregularity.
4. Circumscribed density with indistinct margins.
5. Asymmetric density



Mammogram

Calcification

Macrocalcifications

- Large white dots
- Almost always non-cancerous and require no further follow-up

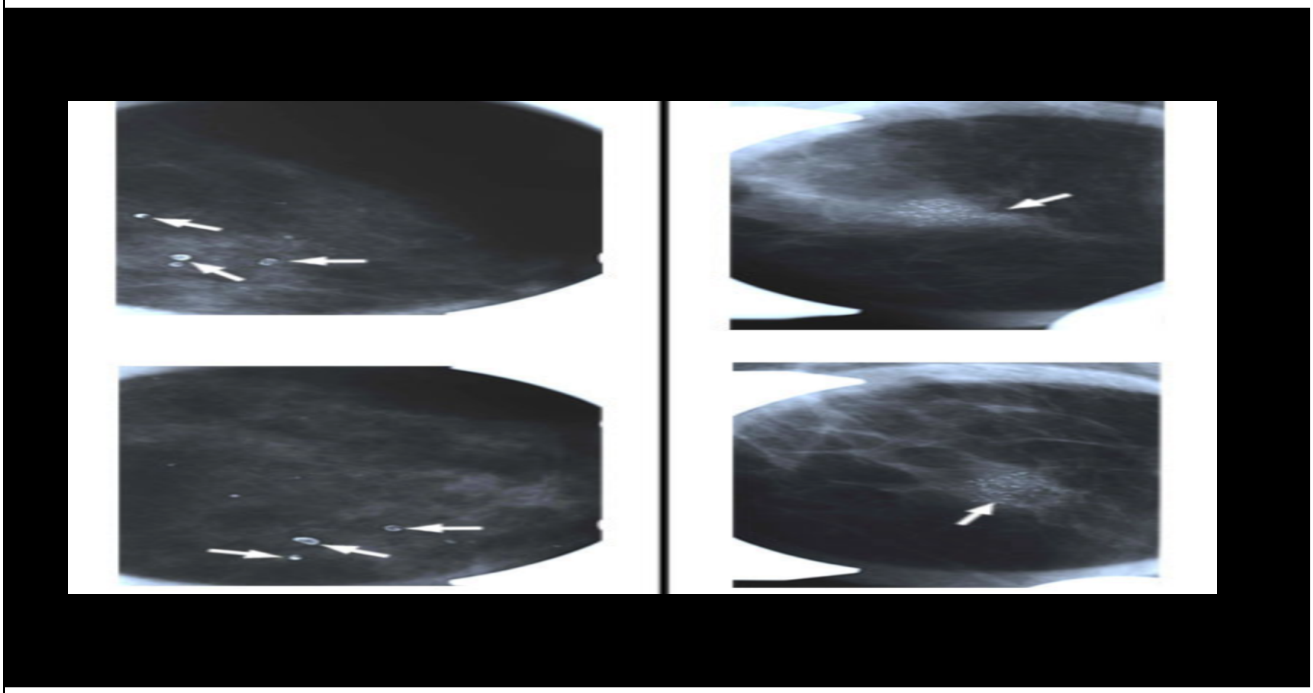
Microcalcifications

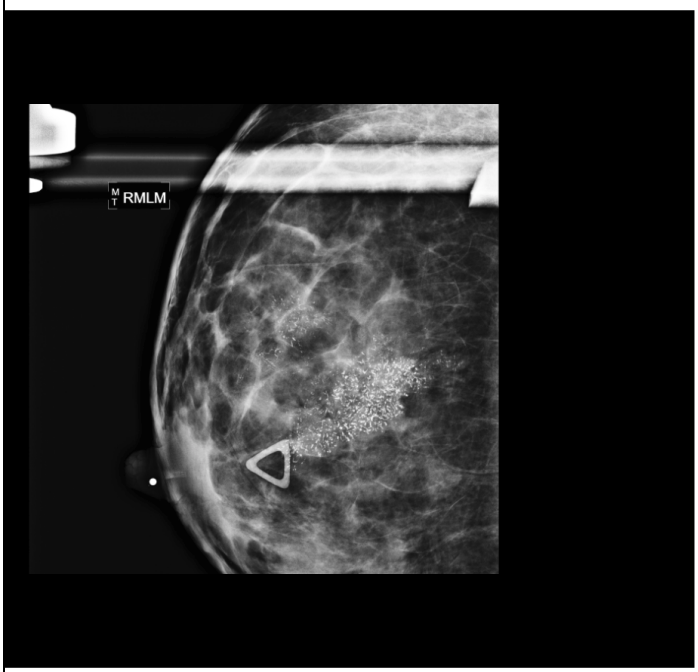
- Very fine white specks
- Usually non-cancerous but can sometimes be a sign of cancer
- Size, shape and pattern

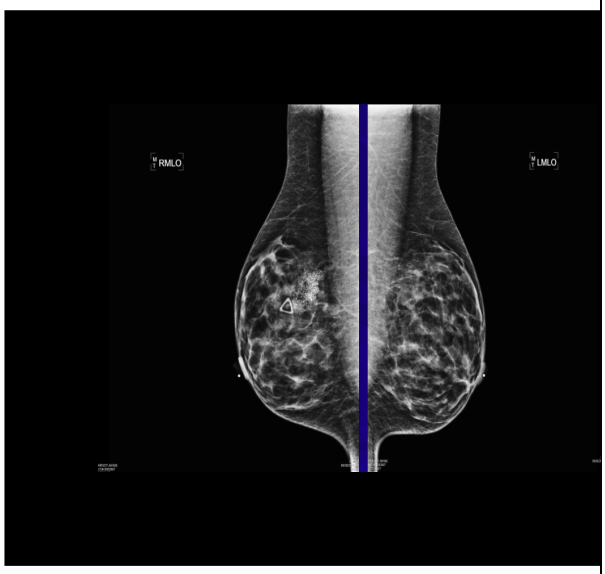
Features	BI-RADS Classification
Need additional imaging	0
Negative – routine in 1 year (no comment)	1
Benign finding – routine in 1 year	2
Probably benign – 6 month follow-up	3
Suspicious abnormality – biopsy recommended	4
Highly suggestive of malignancy – appropriate action must be taken	5

Doctor notes : **Benign calcifications are taking the distribution of ducts. Once you see the calcification is big and has no specific shape or distribution → benign calcification , while malignant are small , sometimes we use lens to look at it.**

Mammography (Calcification)







Benign calcifications	a-punctate b-linear (Fibroadenoma and DCIS) c-spherical d-popcorn(with Fibroadenoma) e-vascular f-smoothly dense

Uses of ultrasound on the breast disease	• Imaging guided biopsies, • Some utility in distinguishing benign from malignant lesions • Still no role on screening, even in the mammographically dense breast. • Initial examination in the younger woman (less than 40) • Not good for screening the breast. • More operator-dependent than mammography • Cannot always characterise lesions precisely • Very good at detecting cysts • Does not using ionizing radiation

Ultrasound	
Malignant	**Benign**
Hypoechoic, spiculated	Pure hyperechoic
Taller than wide	Elliptical shape (wider than tall)
Duct extension	Lobulated
Microlobulation	Complete tine capsule
Heterogeneous internal appearance	Uniform internal appearance
Irregular or indistinct margins	Smooth margins

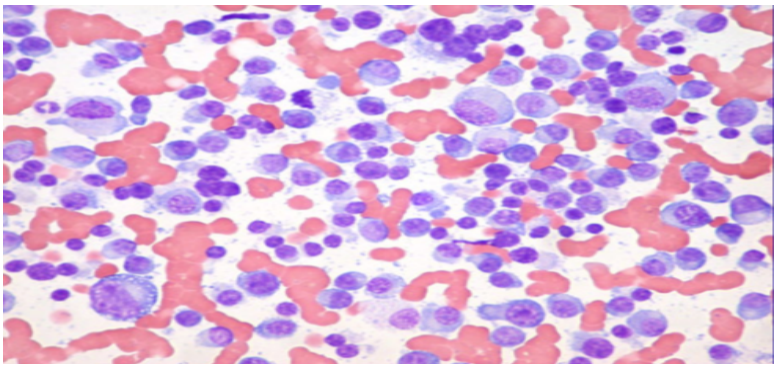
MRI	
High risk patients - History of breast cancer - LCIS, atypia - 1st degree relative with breast cancer - Very dense breast	High sensitivity - 10 – 20% will have a biopsy

Diagnosis

Fine needle aspiration :

is taking up the cells and send it to cytology
Characteristics

- Fast, inexpensive
- 96% accuracy
- Institution dependent
- Unable to differentiate between in-situ vs CA

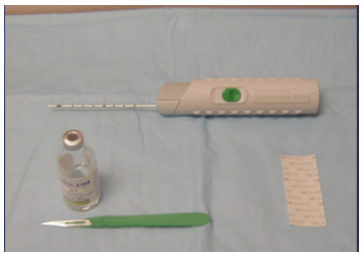


Core biopsy : Image guided and Stereotactic

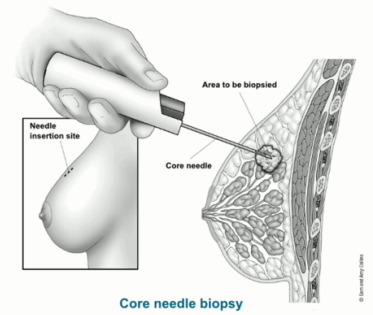
Core Needle Biopsy:

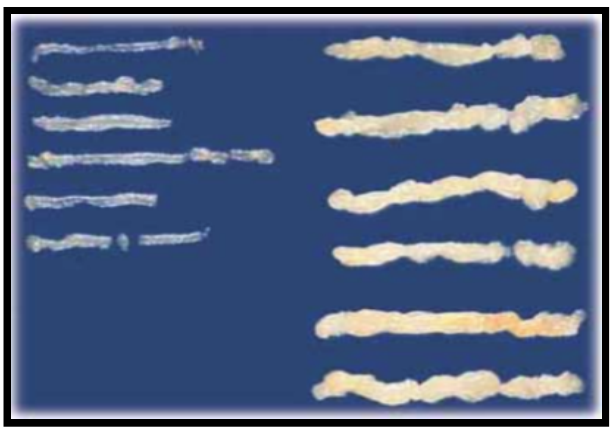
1) 14 – 18 gauge spring loaded needle

2) Tissue 3) Multiple



Large Core Biopsy: 6 – 14 gauge core, Large Samples and Single insertion

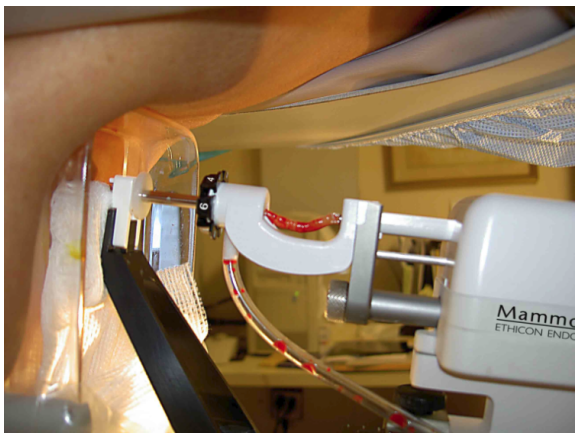


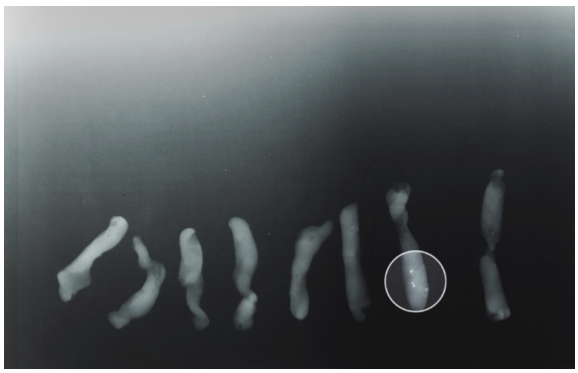


Core Biopsy **Vacuum Assisted**

Stereotactic Biopsy mammogram with biopsy

- Suspicious mammographic abnormalities
- Patients lay prone





Excisional Biopsy

- Atypical lesions
- LCIS
- Radial scar
- Atypical papillary lesions
- Radiologic-pathologic discordance
- Phyllodes
- Inadequate tissue harvesting

Screening

Prior breast cancer or atypia
- Annual mammography
- 6 month CBE

Family Hx
- 10 years younger than relative's diagnosis
- 6 month CBE

BRCA
- 25 y.o, annual mammography
- 6 month CBE

Genetics

- Early age of onset
- 2 breast primaries or breast & ovarian CA
- Clustering of breast CA with:
  - Male breast CA
  - Thyroid CA
  - Sarcoma
  - Adrenocortical CA
  - Pancreatic CA
  - Leukemia/Lymphma on same side of family
- Family member with BRCA gene
- Male breast CA
- Ovarian CA

BRCA

- Account for 25% of early-onset breast cancers
- 36 - 85% lifetime risk of breast cancer
- 16 – 60% lifetime risk of ovarian cancer

Management

- Monthly BSE – 18 y.o
- 6 month CBE & annual mammo – 25 y.o
- Discuss risk reducing options
- Prophylactic Mastectomies
- Salpingo-oophorectomy upon completion of child bearing
- 6 month transvaginal US & CA125 – 35. y.o

Surgical Recall

1-What are the suspensory breast ligaments called?
Cooper's ligaments

2-Which option is the best initial test to evaluate a breast mass in a woman younger than 30 years?
Breast ultrasound

3-In what circumstance does mastitis most often occur?
Breast feeding

4-What bacteria are most commonly the cause of mastitis? Staph. aureus (from baby's mouth)

5-What are the different types of invasive breast cancer?
Infiltrating ductal carcinoma (75%)
Medullary carcinoma (15%)
Infiltrating lobular carcinoma (5%)
Tubular carcinoma (2%)
Mucinous carcinoma (colloid) (1%)
Inflammatory breast cancer (1%)

6-Why is mammography a more useful diagnostic tool in older women than in younger?
Breast tissue undergoes fatty replacement with age, making masses more visible; younger women have more fibrous tissue, which makes mammograms harder to interpret

7-What are the indications for biopsy?
Persistent mass after aspiration Solid mass
Blood in cyst aspirate
Suspicious lesion by mammography/ultrasound/MRI
Bloody nipple discharge
Ulcer or dermatitis of nipple Patient's concern of persistent breast abnormality

8-What are the sites of metastases?
Lymph nodes (most common) Lung/pleura
Liver
Bones
Brain

9-What is the treatment of inflammatory carcinoma of the breast?
Chemotherapy first! Then often followed by radiation, mastectomy, or both

10-What is the major absolute contraindication to lumpectomy and radiation?
Pregnancy

11-How is the diagnosis of lobular carcinoma in situ made?
LCIS is found incidentally on biopsy

12-What is the most common cause of bloody nipple discharge in a young woman?
Intraductal papilloma

13) What is the most common breast tumor in patients younger than 30 years?
Fibroadenoma

14-Is benign gynecomastia a risk factor for male breast cancer?
No

15-What is the most common cause of green, straw- colored, or brown nipple discharge?
Fibrocystic disease

16-What is the most common cause of breast mass after breast trauma?
Fat necrosis

17-What is the clinical presentation of a fibroadenoma?
Solid, mobile, well-circumscribed round breast mass, usually 40 years of age

18-What are the causes of male gynecomastia ?
Medications
Illicit drugs (marijuana)
Liver failure
Increased estrogen
Decreased testosterone

19-What is the treatment of male gynecomastia?
Stop or change medications; correct underlying cause if there is a hormonal imbalance; and perform biopsy or subcutaneous mastectomy (i.e., leave nipple) if refractory to conservative measures and time

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MCQs.

1) Which of the following is a feature of fibroadenoma?
A- Soft
B- Fixed
C- Mobile
D- > 40 years of age

2) A 52 y/o female presented with swelling & redness in her right breast, not painful or tender and not associated with fever. What is the most likely diagnosis?
A- Fibroademona
B- Mastitis
C- Inflammatory carcinoma
D- Fat necrosis

3) **What are possible complication of Axillary nodes dissections ?**
A-Lymphedema
B-Cardiotoxicity
C-Hair loss
D-Lower limb edema

4) Which of the following can't be detected of breast disease under ultrasound ?
A-Internal appearance
B-Cysts
C-Calcifications
D-Surface

1-C , 2-C (if it was acute, painful, fever in a lactating women the answer will be B), 3-A, 4-C