# Breast diseases

**Objectives:** Not given.

**Resources:**

- Girls & boys slides and notes.
- Davidson.
- Raslan's note.
- 434's, 433's & 429's teamworks.

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**To make things easier:**

I advise you to study the lecture summary first [Here] (for better understanding & to know the important points) & then study the lecture in an organized way:

Follow the lecture outline (found in the 2nd page) & divide it into 4 parts: **1- Introductory part** (Physiology, anatomy, normal variations). **2- Benign breast diseases. 3- Breast cancer. 4- Evaluation of the patient with breast disease:** History, physical examinations, investigations

**[ Color index | Important | Notes | Extra ]**

**[ Editing file ]**



Once you stop learning you start dying.

## Physiology of the breast:

Normal physiological breasts changes in females.

**Puberty:** need estrogen and progesterone

- **Estrogen**→ growth and appearance, milk-producing system.
- **Progesterone**→ lobes & alveoli, alveolar cells become secretory.
- Breast Asymmetry is common.

**Menses:**

- Progesterone: 3-7 days prior to menses, engorgement.
- Physiologic nodularity: retained fluid.
- Mastalgia = Breast pain

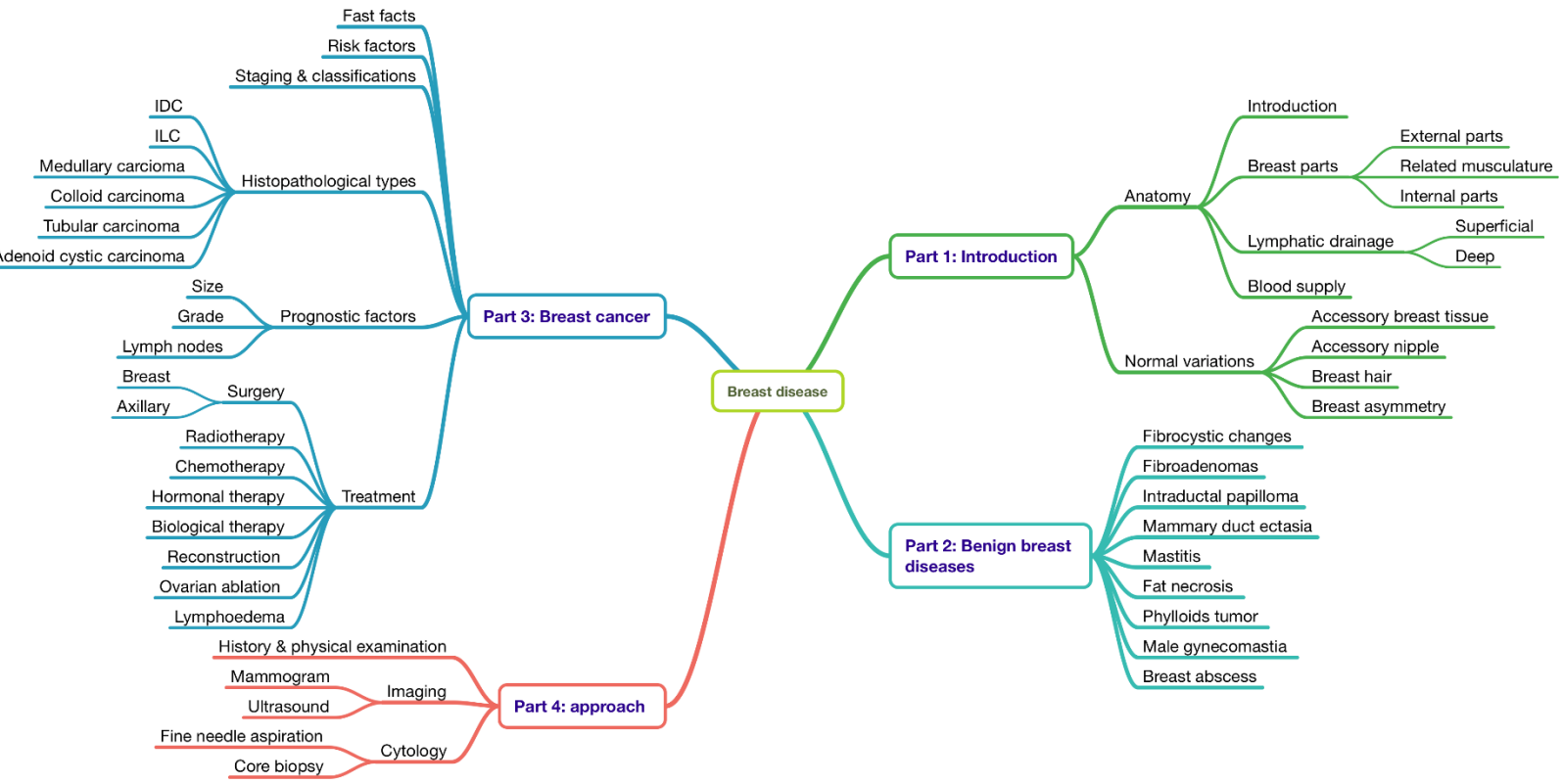
**Pregnancy and lactation:**

- **Glandular tissue** displaces connective tissue.
- Increase in size.
- Nipples prominent and darker.
- Mammary vascularization increases.
- Colostrum present.
- Attain Tanner stage V with birth.

**Aging:**

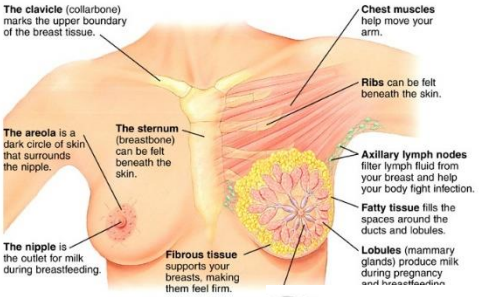
- **Perimenopause:** decrease in glandular tissue, loss of lobular and alveolar tissue.
- Fatten, elongate, pendulous.
- Infra-mammary ridge thickens.
- Suspensory ligaments relax.
- Nipples flatten.
- Tissue feels “grainy”.

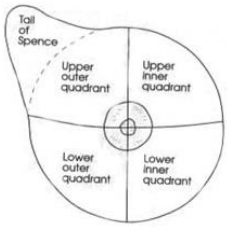
## Lecture outline:



# Part 1: Anatomy of the breast:

- Breasts (Mammary glands) are modified swaet glands.
- **Borders:**
  - **Upper border:** Collar bone.
  - **Lower border:** 6th or 7th rib.
  - **Inner border:** edge of sternum.
  - **Outer border:** mid-axillary line.
- **Divisions:** each breast is divided into **5** segments.
  - **4 quadrants:** by horizontal and vertical lines intersecting at the nipple.
    - **2 inner:** upper inner & lower inner**.**
    - **2 outer:** upper outer & lower outer.
      - ✓ Majority of breast tumors arise in the upper outer quadrant.
  - **Tail of spence (the axillary tail):** الجزء اللي اغلبنا ينساه وقت الاقزامنيشن
    - An additional lateral extension of the breast tissue toward the axilla.



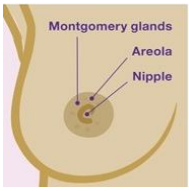




## B- Breast parts:

- **External anatomy:**

| Nipple: | Areola: | Glands of Montgomery (Montgomery's tubercles): |
|---|---|---|
| pigmented and cylindrical, lies at the 4th intercostal space. (at age 18) | pigmented area surrounding the nipple. | sebaceous glands within the areola, which act to lubricate the nipple during lactation.<br>✧ Sometimes Montgomery glands get blocked. But it's benign لأن البلوكج ممكن انه ينفتح من نفسه & just assure the patient. But if they don't open → surgical removal نادر يسوون الرموفال |

- **Related Musculature:**
  - The breast lies over the muscles that encase the chest wall.
  - **The involved muscles are:**
    - **Pectoralis major** (60%).
    - pectoralis minor, serratus anterior (30%).
    - External oblique, latissimus dorsi, subscapularis, and rectus abdominis fascia (10%).
  - **Nerve supply:**

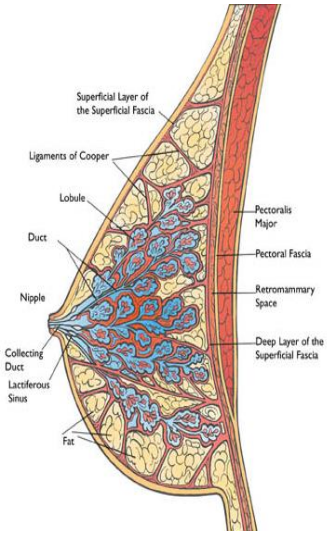



| Long thoracic nerve: | Thoracodorsal nerve: | Intercostalbrachial nerve: |
|---|---|---|
| serratus anterior | latissimus dorsi | Lateral cutaneous, sensory to medial arm & axilla. |

✧ Unilateral amastia (absence of the breast) is often associated with absence of the pectoral muscles.

- **Internal anatomy:** the breast is composed of 3 different types of tissues.
  - **Glandular tissue:**
    - Milk producing tissue.
    - Each mammary gland consists of **15-20 lobes**.
      i. Each lobe is further divided into **20-40 lobules** which are composed of clusters of milk secreting glands (alveoli \ acini) and is drained by a **lactiferous duct** that opens onto the **nipple**.

      Lobes → Lobules → ducts → nipple




  - **Fibrous (supporting tissue):**
    - Strands of connective tissue called: suspensory ligaments of the breast (**cooper's ligaments**) extend through the breast to the underlying muscle separating the breast's lobes.
    - Responsible for skin retraction and dimpling.
    - Benign or malignant lesions may affect these ligaments. (infiltration of the ligaments by breast cancer → shortening of the ligaments → **Peau de'orange appearance**)

- **Fatty tissue:**
  - Subcutaneous and retromammary fat. It gives the bulk of the breast.
  - There is NO fat beneath the areola and the nipple.

## C- Lymphatic drainage:

- **Superficial lymphatic nodes:** drain the skin
- **Deep lymphatic node:** drain the mammary lobules

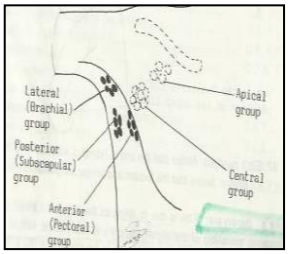
| Axillary | Infra-clavicular | Supra-clavicular | Parasternal (internal mammary) |
|---|---|---|---|
| **Central** & **Lateral** portions | | | **Medial** portion of the breast |

### Axillary lymph nodes:

- Axillary lymph nodes can be classified anatomically into 5 groups and clinically into 3 levels.

⇨ **Anatomically:**

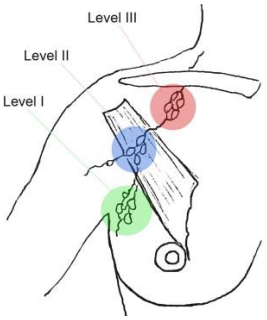
| | |
|---|---|
| **Anterior (pectoral) group:** | Deep to pectoralis major. |
| **Posterior (subscapular) group:** | Along subscapular vessels. |
| **Lateral (brachial) group:** | Along the axillary vein. |
| **Central group:** | Within the axillary pad of fat. |
| **Apical group:** | which drains all of the other groups, lies behind the clavicle at the apex of axilla |




⇨ **Clinically:** important in breast CAs.

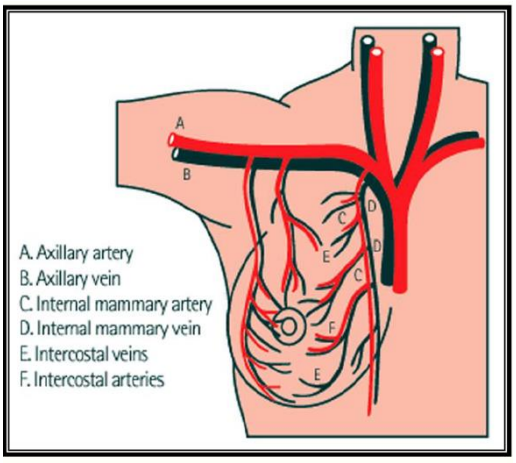
- This surgical classification is used in axillary dissection.
- It is based on the relationship of the lymph nodes to pectoralis minor.

| | |
|---|---|
| **Level 1:** | **Lateral** = below pectoralis minor tendon.<br>✧ The nearest to the breast, and the first group involved in malignancy.<br>✧ Considered the most important group, and accounts for 80% of lymphatics. |
| **Level 2:** | **Posterior** = behind pectoralis minor tendon.<br>✧ Important for axillary dissection and malignancy, accounts for 5% of lymphatics. |
| **Level 3:** | **Medial** = above pectoralis minor tendon.<br>✧ Also called: inframammary lymph nodes. |




## D- Blood supply:

| Arterial: | | | Venous: |
|---|---|---|---|
| 1. Perforating branches of. | 2. Mammary branches of | 3. Mammary branches of | Veins are corresponding to the arteries. |
| internal thoracic (internal mammary) artery | lateral thoracic artery. "from 2nd axillary" | post. Intercostal arteries. | |

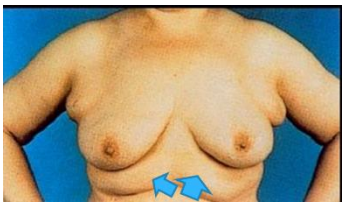


# Part 1: Normal variation of the breast:

## Accessory Breast tissue

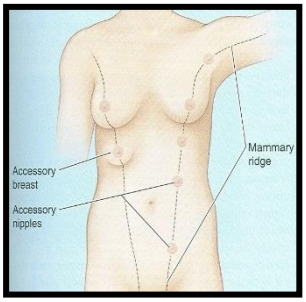
- Accessory breast is not well formed, there is **NO** full duct or secretion or nipple **ONLY** accumulation of breast tissue.
- The patient is **normal** and a swelling occurs.
  - ✓ Once the breast tissue develops, most of it condensate in the outer part (the usual site of malignancy (why usual? most of the glandular tissues lie in the upper outer part)) → During puberty it gets stimulated by hormones→ presents as a skin fold.
  - ✓ Appear as clear folds but they don't go with weight loss.
- It can get cancer.
- **Occurs during:** **puberty**, **pregnancy** or **lactation**.
- **Treatment:** nothing is done only **reassurance**. (physical examination and **ultrasound** to make sure that there's no underlying pathology)
- You can **remove it** for cosmetic reasons if **big enough** and disturbing the patient. (e.g. when she can't adduct her arm)
- During puberty → Better to wait.

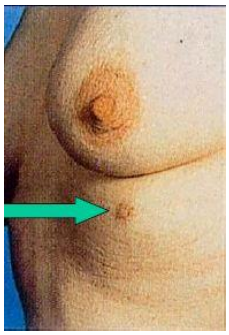
تظهر كأنها فولد تحت البرست (بس فولد بدون حلمة أو أي افرازات علشان كذا البعض يحسب انها جايه بسبب زيادة الوزن ولمن ينقصون وزن يتفاجئون بأنها ما زالت موجودة !)، ما ينخاف منها لأنها قد تظهر خلال فترة البلوغ أو الحمل أو الرضاعة..لكن لكن لكن الاحتياط واجب فنسوي اقزامنيشين والتراساوند (رخيص ومفيد)..




## Accessory nipple

- Accessory Nipples appear at birth as a congenital abnormality.
  - ✧ **ONLY** Nipples with **NO** breast tissue.
- **Site of accessory nipple:** **mammary ridge** (which extends from the axilla to the groin).
  - ✧ Axilla & inframammary are the commonest sites.
- if we are not sure which nipple is the accessory one we should do **an ultrasound** or a **ductogram** to see the duct connections to the nipple.



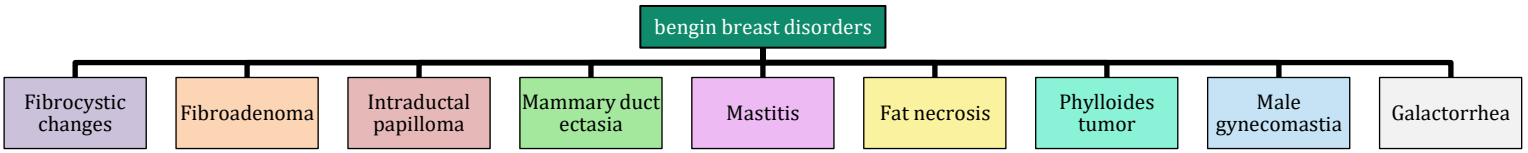
## Breast hair

- ✧ Normal not hormonal

## Breast asymmetry

- Common concern among female adolescents.
- Typically, the asymmetry is more noticeable during puberty and eventually breast size evens out during development.
- If it was a **major** and **persistent asymmetry** a breast augmentation or reduction surgical procedure may be considered **AFTER** breast development/puberty is complete (**NEVER** interfere surgically during puberty). but you should do an ultrasound to make sure there is no underlying pathology especially in elderly

# Part 2: Common benign breast disorders:




## 1. Fibrocystic changes: Most common breast pathology.

| | |
|---|---|
| **General Characteristics:** | • **Breast Cysts:**<br>⇨ Fluid-filled<br>⇨ 1 out of every 14 women<br>⇨ 50% multiple and recurrent<br>⇨ **Hormonally influenced**<br>⇨ Needle aspirated<br>• benign but some of them are complicated (where a solid component is found in the clear fluid of the cyst. & that solid component should be BIOPSIED). "almost all females at certain point of their lives develop cyst"<br>• Lumpy, bumpy breasts<br>• 50-80% of all menstruating women<br>• **Caused by:** hormonal changes prior to menses<br>• **Age: 30-50** (10% in women less than 21)<br>• **Relationship to breast cancer**: doubtful<br><br>**Histology**<br>• Adenosis<br>• Apocrine metaplasia<br>• Fibrosis<br>• Duct ectasia<br>• Mild duct ectasia |
| **Signs & symptoms:** | • **Mobility: Mobile** cysts with **well-defined** margins<br>• **Number:** Singular or multiple<br>• **Symmetry:** May be **symmetrical**<br>• **Location:** Upper outer quadrant or lower breast border<br>• **Painful? Pain and tenderness**<br>• Cysts may appear quickly and **decrease** in size<br>• Lasts half of a menstrual cycle<br>• Subside after menopause, If no HRT |
| **Investigations:** | • **Aspirate cyst fluid**<br>○ **If bloody → go for surgical biopsy.**<br>○ If non-bloody:<br>▪ Disappear completely → Observe.<br>▪ Doesn't resolve → surgical biopsy.<br>✓ If less than 3 cm → you observe.<br>✓ If more than 3 cm → aspirate it and leave the patient for 3 months, if the fluid collects again → aspirate it → (3 aspirations in total) → if collects again (after 3 aspirations) → you remove it surgically.<br>• **Imaging for questionable cysts:**<br>○ BEST MODALITY IS U\S.<br>○ In young patients: only U/S is performed show multiple cysts<br>○ In 40 and above patients: both U/S and mammogram are performed to exclude any underlying malignant pathologies. |
| **Management:** | • Treatment is based on symptoms<br>• **Reassure**<br>• ''Atypical Hyperplasia'' on pathology report indicates increased risk of breast cancer<br>• **Indication of cyst removal:** Painful cyst – bloody cyst – recurrent cyst. |

## 2. Fibroadenoma:

| | |
|---|---|
| **Characteristics:** | • Second most common breast condition (**most common lump**) كباثولوجي هي الثانية بعد السستك وكلمب هي الأولى<br>• Most common in black women.<br>• Late teens to early adulthood (15-30 years old of age).<br>• **Rare** after menopause.<br>• Totally benign, and **NO** malignancy potential.<br>Mammogram Multiple Calcified Fibroadenomas |
| **Signs & symptoms:** | • **Firm**, **rubbery**, **round**, Well circumscribed**.**<br>• **Mobility: mobile** mass.<br>• **Painful? Painless**, non-tender.<br>• **Number: Solitary**, 15-20% are **multiple**.<br>• **Location:** Mostly located in **upper-outer quadrant of the breast.**<br>• **Size:** 1-5 cm or larger (if more than 5 cm it is called a giant fibroadenoma). |
| **Investigations** | ➢ **Triple assessment: (see below in evaluation section)**<br>➢ **Imaging:**<br>○ **U/S: mostly used** because it is more common in young.<br>✧ Unclear acoustic shadow, well encapsulated, well localized containing fibrous and glandular tissues.<br>○ **Mammogram:** if patient is 40 and above.<br>➢ **Biopsy.** |
| **Treatment:** | ⇨ No need to remove it, BUT you must investigate and MAKE SURE that it is an adenoma. لازم نشوف وضعها وحجمها ونتأكد انها هي مو أي باثولوجي ثاني!<br>⇨ **When to "remove" fibroadenoma?!!**<br>⇨ **Size:**<br>▪ If > 4cm (Giant that is affecting the symmetry of the breast).<br>⇨ **Family history of fibroadenoma** (NOT because it is pre-malignant بس علشان يرتاح بال البيشنت).<br>⇨ **Location:** in a place affecting her daily activities, or her bra (inframammary fold).<br>تجي المريضة تشتكي يا دكتورة ماني قادرة ارفع يدي أو إذا لبست برا تألمني<br>⇨ **Age:** more than 40. غالبا بعد الاربعين يكون تعاملنا محسوب بورقة وقلم<br>⇨ **Weird pathology**: fibroadenoma with hyper-cellularity with evidence with atypia.<br>⇨ If getting bigger and bigger and bigger<br>⇨ If the FNA cytology report: NOT fibroadenoma or wasn't certain.<br>⇨ **Phyllodes** (A variation of fibroadenoma where there is a potential risk of malignancy (less than 1%)). |

## 3. Intraductal papilloma:

| | |
|---|---|
| **Characteristics:** | • **Slow**-growing<br>• Overgrowth of **ductal epithelial tissue**<br>• Usually **not palpable**<br>• Cauliflower-like lesion<br>• Length of involved duct<br>• **Most common cause of persistent bloody nipple discharge**<br>• 40-50 years of age |
| **Signs & symptoms:** | • **Nipple discharge:** Watery, serous, serosanguinous, or bloody discharge<br>• **Spontaneous discharge**<br>✧ Often from single duct<br>• Usually **uni**lateral<br>• 50% no mass palpated |
| **Investigations:** | ➢ **Test for occult blood**<br>➢ **Ultrasound:** young **or Mammogram:** >40<br>➢ **Ductogram**: shows you the anatomy of the duct<br>✧ you cannulate the duct then inject a contrast material → if a filling defect is seen→ take a biopsy (FNA or core biopsy)<br>✧ Single filling defect: Intraductal papilloma → benign → assure the patient (it disappears by itself, if didn't disappear → remove it surgically).<br>✧ Multiple filling defect: intraductal papillomatosis → Pre-malignant condition (take it out surgically).<br>➢ **Biopsy** |
| **treatment** | • Usually it **resolves** by itself, but if it persists →Excision of involved duct |

IDP = BLOODY NIPPLE DISCHARGE.

## 4. Mammary duct ectasia:

| | |
|---|---|
| **Characteristics:** | • Inflammation and **dilation** of **sub-areolar ducts** behind nipples, completely<br>• **Age:** 30 & above.<br>• May result in **palpable mass** because of ductal rupture.<br>• Greatest incidence after menopause.<br>• Unclear etiology: Ducts become distended with cellular debris causing obstruction.<br>✧ Dilatation → Stasis → secretions → infections (Mixed growth) → fibrosis & scarring → nipple changes. |
| **Signs & symptoms:** | • **Multi-colored discharge:**<br>○ Thick, pasty (like toothpaste)<br>○ White, **green**, greenish-brown or serosanguinous discharge<br>• **Intermittent**, **no pattern**<br>• **Bilaterally** from **multiple ducts**<br>• **Nipple itching** with **drawing** or **pulling (burning) sensation.**<br>• **Slit-like nipple.** |
| **Investigations:** | ➢ **Test for occult blood**<br>➢ **Imaging**: Mammogram and sonogram<br>➢ **Biopsy.** |
| **treatment:** | ➢ Excision of ducts if mass present<br>➢ **Antibiotics:** b\c it is mostly an abscess.<br>➢ **Close follow-up** |

nipple retraction from carcinoma

Duct ectasia = Green discharge + slit-like nipple. BREAST ABSCESS IN NON-LACTATING WOMAN = DUCT ECTASIA.

Dried Secretions from Mammary Duct Ectasia

Yellow Breast Discharge Duct Ectasia

Multi-colored Breast Discharge

Secretions form multiple ducts → non-serous pathology (fibrocystic or duct ectasia)

## 5. Mastitis: من التوبكس اللي يحبونها بالاختبارات

| | |
|---|---|
| **Characteristics:** | • **Breast infection** when bacteria enter the breast via the nipple.<br>• **Ducts** infected.<br>• Fluid stagnates in lobules.<br>• Usually **during LACTATION**.<br>• **Penicillin resistant staphylococcus** |
| **Signs & symptoms:** | • **Pain** and **tenderness**<br>• **Nipple discharge**: -Pus -Serum -Blood<br>• Localized induration<br>• **Fever and rigor**<br>• Abscess: localized tenderness, severe fever and rigor |
| **Treatment:** | ➢ **Antibiotics**<br>✧ Against staph. Source: baby's mouth (NOT EPIDERMS).<br>✧ **Empty breast if PP.** Continue breast feeding EXCEPT **if the baby got abdominal cramps or diarrhea** then she should:<br>✧ Stop breast feeding<br>✧ Use breast pump (to avoid breast engorgement)<br>➢ **Incision and drainage of abscess** |

**IMP:**

➢ Non-lactating (such as duct ectasia) = Mixed growth.

➢ Lactating (mastitis) = Staph. Aureus

Mastitis = 3-4 days of Fever & Rigor – Pain &Tenderness – lactating

Puerperal Mastitis

Puerperal Mastitis Left Breast

Inflammatory Carcinoma

Erythema and peau d'orange

**Inflammatory carcinoma =**

Old patient
+ Non-lactating
+ No Fever
+ Not that painful \ tender

## 6. Fat necrosis:

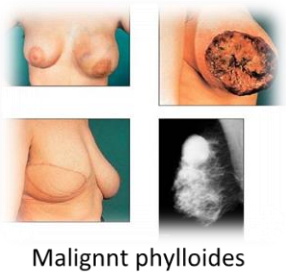
| | |
|---|---|
| **Characteristics:** | • It is **necrosis** of adipose tissue.<br>• Causes:<br>  ○ **Trauma** to breast (e.g. seat belt trauma in car accidents, or falling)<br>  ○ **Surgery** |
| **Signs & symptoms:** | • Pain or mass.<br>• Usually non-mobile mass<br>✧ تشبه الملقنسي علشان كذا لازم نسوي بايوبسي ! (طبعا مانقدر نعرف من الهستوري لأن احيانا المريضة تنسى ان صار لها حادث من الصدمة أو تحس ان الحادث بسيط ومايستحق الذكر) |
| **Treatment:** | • Resolves over time without treatment but may be excised |

Seat belt trauma

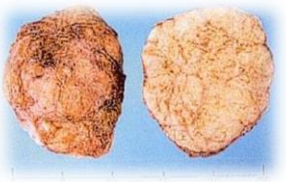
Breast hematoma

## 7. Phylloides tumor:

| | |
|---|---|
| **Characteristics:** | • Giant fibroadenoma (a variant of fibroadenoma) with rapid growth (patient presents with a history of a rapidly growing mass)<br>• Often occurs in women aged 40+<br>• **Benign with a Malignant** potential, lesions > 3 cm are more likely to be malignant. 1% turn to sarcoma.<br>  ○ The malignant form of this lesion is mostly localized but (about 10%) can metastasize hematogenously to the lungs and not to the axillary lymph nodes.<br>  ✧ Most are benign, 25% reoccur if incompletely excised. |
| **Investigations:** | ➢ **Imaging:**<br>  ✧ both mammography and ultrasound, they present as well-defined masses that are very similar to a benign fibroadenoma.<br>  ✧ The malignant forms are more likely to have cystic spaces on U/S. |
| **Treatment:** | • **Excision** is the **ONLY** treatment! Mastectomy with reconstruction (“ONE STRIGHT FORWARD ANSWER”). |



Malignnt phylloides



## 8. Male gynecomastia:

| | |
|---|---|
| **Characteristics:** | • Diffuse **hypertrophy** of breast.<br>• 30-40% of male population.<br>• **Age:** Adolescence and older men<br>• **Caused by:** imbalance of estrogen/testosterone<br>• **Associated with:**<br>  ○ Medical conditions (hepatitis, COPD, hyperthyroidism, TB)<br>  ○ May be associated with genetic cancer families: Colon, prostate cancer<br>  ○ Medications associated with gynecomastia:<br>  - Marijuana<br>  - Narcotics<br>  - Phenothiazines<br>  - Diazepams<br>  - Anything that affects the CNS<br>• Must exclude testicular and adrenal malignancies (hormone producing tumors).<br>  ✧ Especially in young b\c they may have congenital adrenal hyperplasia.<br>  ✧ Send him to urology & make sure that he doesn’t have any testicular or prostatic problems. |
| **Treatment:** | ➢ **If pre-puberty:** wait to see if it resolves.<br>➢ **Change medication.**<br>➢ **Treat underlying illness.** |

## 9. Breast abscess:

| | |
|---|---|
| **Treatment** | ➢ **Incision & drainage.**<br>➢ **Antibodies.**<br>➢ **Needle aspiration.** |

Arrow points to inverted nipple

Draining Breast Abscess

Abscess Drained under Local Anesthesia

Before treatment

Local anesthetic

After treatment

- Left – before management

- Right – after recurrent aspiration and antibiotics

# Part 3: Breast Cancer:

## Fast facts: Just go through them. It's not community medicine IT IS SURGERY.

- Cancer #1 in female, killer #1 in female, cancer #1 in the whole world.
  - ✓ Killer of women, USA 1:8, KSA? 1:15
  - ✓ 187000 cases of cancer breast in one year (USA)
  - ✓ 45000 deaths due to it in one year (USA)
  - ✓ Breast cancer is the most common cause of death from cancer in western women
  - ✓ Every day in Australia, over 30 women discover they have breast cancer
  - ✓ In Australia 11,400 people (11,314 women and 86 men) were diagnosed with breast cancer in 2000.
  - ✓ 9 out of 10 women who get breast cancer do not have a family history of the disease
  - ✓ Age is the biggest risk factor in developing breast cancer – over 70% of cases occur in women over 50 years
  - ✓ Women aged 50–69 who have a breast screen every two years can reduce their chance of dying from breast cancer by at least 30%
  - ✓ Breast cancer is the most common cancer in women aged over 35 years - 25% of all cancers diagnosed
  - ✓ The average age of diagnosis of breast cancer in women is 45 - 55 years
  - ✓ During the period 1994 to 1998, the five year survival rate for women diagnosed with breast cancer was 85 %
  - ✓ Although we know of many factors that contribute to the risk of women getting breast cancer, the cause remains unknown

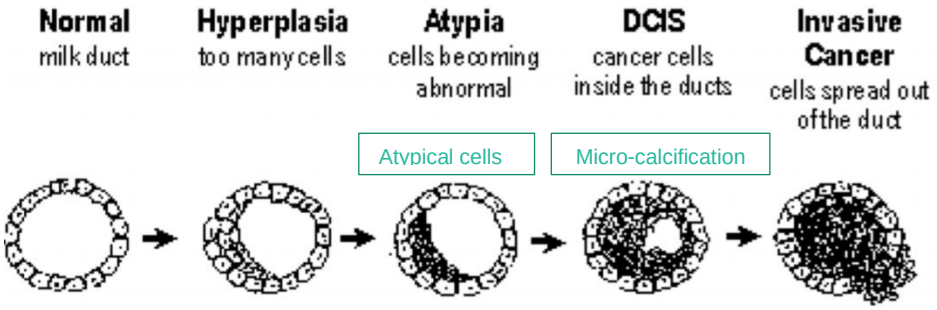
## Risk factors:

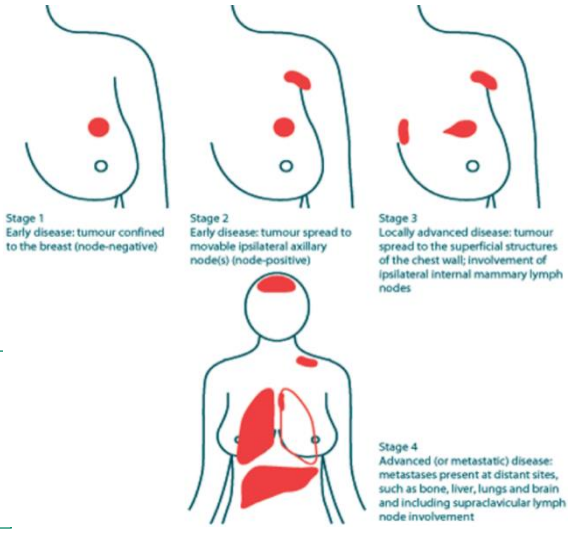
| | |
|---|---|
| **Relative risk > 4** | • **Age** (older age group higher risk)<br>• **Country of birth** (North America, Northern Europe)<br>• Mother and sister with **history of breast cancer,** especially at an early age<br>• Biopsy confirmed **atypical hyperplasia** and a **history of breast cancer** in **a first degree relative.** |
| **Relative risk 2.1** | • **Nodular densities** on mammogram occupying >75% of breast volume<br>• **History of cancer** in one breast<br>• **Radiation** to chest Biopsy-confirmed atypical hyperplasia without a family history of breast cancer |
| **Relative risk 1.1** | • **Socioeconomic status** (high)<br>• **Place of residence** (Urban • Race/ethnicity (White >45 and Black 40 years of age<br>• **Age at** first full-term pregnancy, age at menarche, age at menopause<br>• **History of primary cancer** in endometrium, ovary<br>• **Obesity** (Obese breast cancer > 50 years, Thin breast cancer |

## Staging and classification:

| Stage 0 | Stage 1 | Stage 2 | Stage 3 | Stage 4 |
|---|---|---|---|---|
| Neither palpable tumor | Tumor**< than 2 cm**. | **2 cm - 5 cm** | Tumor **> than 5 cm** | Tumor of any size<br>**Distant metastases** such as bone, liver, lungs, brain |
| **Nor** axillary lymph nodes. | **No** lymph node involvement | 1 ipsilateral axillary lymph node involvement (movable) | Skin involvement or fixation, and involvement of fixed lymph node | supraclavicular node involvement |

- 50 y/o female with a 2-cm tumor and liver metastasis → stage 4
- Stage I: Conservative surgery (lumpectomy) + Radiotherapy, but if pregnant: (early pregnancy → Mastectomy, Late pregnancy → induce labor then lumpectomy + Radiotherapy).




Goal of the basic mammogram screening is to catch the patient at the DCIS phase. (80% of DCISs are curable). (Mammogram → micro-calcifications are found → biopsy → okay it's a DCIS that's good→ treatment (either by local lumpectomy or mastectomy deepening on the size of the mass – Axillary lymph nodes are not removed since DICS don't spread to them).

## HISTOPATHOLOGICAL TYPES OF BREAST CANCER:

| | | | |
|---|---|---|---|
| **Infiltrating (or invasive) Ductal Carcinoma (IDC)** | **Starting in**:<br>A milk passage, or **duct**, of the breast, this cancer breaks through the wall of the duct and invades the **breast's fatty tissue**. | **80%** of all breast cancers.<br>**Most common type**. | **Metastasis:**<br>through the **lymphatic system** and through the **bloodstream** |
| **Infiltrating (or invasive) Lobular Carcinoma (ILC)** | **Starting in**:<br>Milk-producing glands. | **10-15%** of invasive breast cancers are **invasive lobular carcinomas**. | These are **multi-centeric**, and they can appear in the other breast as well (**bilateral**). |
| **Medullary Carcinoma** | Has a relatively **well-defined distinct boundary** between tumor tissue and normal breast tissue. | **5%** of all breast cancers. | **Better** than that for invasive lobular or invasive ductal cancer |
| **Colloid Carcinoma** | Also called **mucinous carcinoma**, is formed by mucus-producing cancer cells. | **Rare** type of invasive disease. | **Better** than for invasive lobular or invasive ductal cancer. |
| **Tubular Carcinoma** | Tubular carcinomas are a special type of invasive breast carcinoma. | **2%** of all breast cancers | **Better** prognosis than invasive ductal or lobular carcinomas and are often detected through breast screening. |
| **Adenoid Cystic Carcinoma** | it is more usually found in the salivary glands. | This type of cancer **rarely develops** in the breast; | **Better** prognosis than invasive lobular or ductal carcinoma. |

## PROGNOSTIC FACTORS:

- Size of tumor
- Grade of tumor
- Lymph nodes involvement

# Treatment:

**Treatment of DCIS:** Depends on the degree of DCIS the options of treatment are:

- Total mastectomy
- Lumpectomy
- Lumpectomy and radiation therapy for DCIS that does not spread to the axillary lymph nodes so the breast is usually not removed.

## Before you start treating:

Treatment is guided by the biological features of the tumors (How do you get them? Core biopsy):

⇨ **Estrogen receptor (ER) & progesterone receptor (PR) status:** tells you whether the patient is good for **hormonal therapy** or not (if positive → give hormonal therapy).

⇨ **HER2:** cytoplasmic protein that is overexpressed in about 20% of breast cancer patients, if +ve → good for biological therapy. (Biological therapy is given for one and a half year and it's good in preventing brain metastases)

⇨ **KI67:** How quick and how slow this cancer is multiplying (if below 14 → slow cancer → chemotherapy won't be effective) (if above 14 → Fast growing tumor → chemotherapy will be effective)

- ✓ Hormonal + chemotherapy + biological therapy = systemic therapy.
- ✓ Surgery + Radiotherapy = Locoregional.

## Lines of treatment of breast cancer:

ذاكروهم وحطوا فبالكم ان د. امل قالت لا تتعمقون مره بالتريتمنت

### 1- Surgery:

❖ **Surgical Intervention**:

- **Breast:** 2 options: **Mastectomy** (whole breast removal) or **breast conserving surgery** (Lumpectomy) (removing the cancer)
- **Axilla:** 2 options: **axillary lymph node dissection** (Removal of all axillary lymph nodes) or Sentinel lymph node biopsy. (if +ve → you clear all the lymph nodes).

❖ For Stage I, II either **WLE** (wide local excision) or **mastectomy** + **axillary nodes**.

### 2- Radiotherapy:

⇨ In cases of lumpectomy → to reduce chances of recurrence. (**NEVER** do conservative surgery **WITHOUT** radiation).

⇨ Radiotherapy is not usually given during pregnancy as it may harm the developing baby. (For more details, check page 11).

❖ **What are the side effects?**

| During course of treatment: | After course of treatment: |
|---|---|
| **Common:** | |
| Skin reddening – Fatigue – Loss of hair – Sore throat | Discomfort and sensitivity – Increased firmness – Swelling of the treated breast |
| **Rare:** | |
| Skin blistering – Nausea – Rib fractures (Less than 1:100 experiences fracture in the treated area) | Pneumonia & scarring (2:100 experience it between 6 weeks and 6 months after therapy has finished) |

### 3-Chemotherapy:

- Usually given in cycles every 3 or 4 weeks.
- Look at KI67 (>14 → give chemotherapy, if <14 → don't give).
- **The common schedules include**:
  - ✓ CMF (cyclophosphamide, Methotrexate and 5-flurouracil)
  - ✓ AC (Adriamycin, cyclophosphamide)
  - ✓ Taxol or Taxotere.
- **Side effects:** Fatigue, anorexia, Nausea and vomiting, **Hair loss**, Effects on blood, Mouth Problems, skin problems, Fertility, Bowel problems.
  - ✓ The most important side effects are: **neutropenia** (infections) + **loss of hair** especially in women.

### 4- Hormonal therapy:

- They bind to the estrogen \ progesterone receptors and block their proliferative actions on mammary epithelium.
- Giving as tablets for 10 years.
- In **ER & PR positive patients**
- Prevents progression & metasets of the disease.
- Two main side effects: DVT and endometrial cancer. ولكن المنافع أكبر من المضار

**Tamoxifen**

- A drug that has been used for the treatment of breast cancer. It can increase survival for some women with breast cancer and significantly reduce their risk of developing cancer in the opposite breast. Tamoxifen is sometimes used for patients whose breast cancer recurs.
- It is also being tested to see if it can prevent the development of breast cancer in unaffected women who are at an increased risk because of a strong family history of the disease.
- **How it is given?**
  - Tamoxifen is taken by mouth. Tablets are either 10 mg or 20 mg. The usual dose is 20 mg daily. It is usually started after surgery or after the completion of radiation treatment.
  - Tamoxifen should take it at the same time each day.
- **How long is the treatment?** Currently the recommended length of Tamoxifen therapy is five years.
- **What are the side effects?**

| Common side effects: | Uncommon side effects: |
|---|---|
| – Hot flushes or sweats<br>– Irregular menstrual periods (in women who have not gone through the menopause)<br>– Vaginal irritation, including vaginal dryness or discharge<br>– Fluid retention and weight gain | – Light-headedness, dizziness, headache or tiredness<br>– Rash<br>– Nausea |

## 5- Target therapy (biological therapy):

- Giving for one and a half year, every three weeks**.**
- **In HER2 positive patients.**
- **Prevents brain metastasis.**
- **It is cardiotoxic** (so monitor patient's cardiac state)

## 6- Reconstruction:

- **The aim of breast reconstruction:** is to rebuild the breast shape and, if desired, the nipple and the surrounding darker skin (areola).
- **What are the benefits?** Reconstruction usually does not restrict any later treatments that may be necessary, nor does it usually interfere with radiotherapy, chemotherapy or hormone therapy.
- The patient will not need to wear an external prosthesis.
- Follow-up after the operation is no more difficult and any recurrence of cancer in the area can still be detected.
- Some women feel more self-confident and feminine when they have a permanent prosthesis or reconstruction.
- **What are the choices?** There are two main types of breast reconstruction:
  - ✓ tissue or skin expander with breast implant: A tissue expander is inserted after the mastectomy to prepare for reconstruction. The expander is gradually filled with saline to stretch the skin enough to accept an implant beneath thechest muscle
  - ✓ flap reconstruction

In cases of Mastectomy → mention it.
**3 ways:**
- Transverse Abdominis with its skin, subcutaneous tissue, nerve supply, blood supply
- Latissimus dorsi
- Tissue expander under pectoralis major → inflate it weekly until it gets compatible with the other side → remove it → put silicon.

## 7- Ovarian ablation:

The ovaries make most of the estrogen in women's bodies, so removing them lowers the amount of estrogen in the body and helps slow or stop hormone receptor-positive breast cancer from growing.

# Lymphoedema:

### What is it?

- Lymphoedema is long-term **swelling of the arm after axillary surgery or radiotherapy** to the axilla.
- Symptoms include a general heaviness of the arm, a swelling of the fingers or sometimes difficulty putting on a long sleeve.
- The earlier treatment is started the easier it is to achieve good results.
- Less than 1 in 10 women who have had either lymph glands removed or radiation to the armpit will develop noticeable lymphoedema. This risk
- increases to 1 in 3 if the pt. had both of these treatments.

### When can Lymphoedema happen?

Lymphoedema can occur any time after the operation, even up to ten years.

# Part 4: Evaluation of the patient with breast disease:

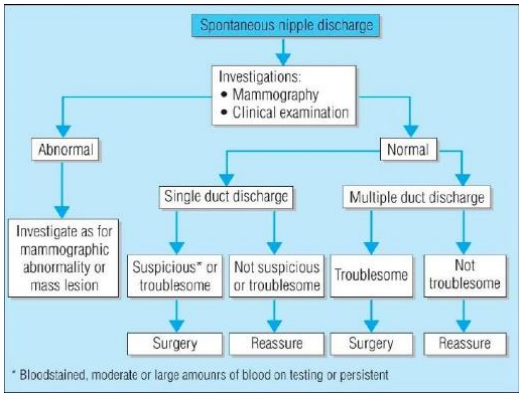
When a patient presents with a breast lump, triple assessment must be done: 1-Hx & PE. 2- Imaging. 3- Cytology.

ماحبيت ازودها عليكم بالهستوري والاقزام فيس حطيت معلومات السلايدز مع نوتس الدكاترة، لكن فيه ملف (هنا) سويته للاقزامنيشن والهستوري اوف ذا برست مروا عليه بعد ماتخلصون دراسة المحاضرة فاقروا الكلام اللي بتمعن وروحوا للملف - بيفيدكم بالاوسكي-.

## 1- History & physical examination:

### History:

- **Chief complaint**: women usually come to see a breast surgeon because of the following:
  - ⇨ **Breast lump** (painful or non-painful): 60%
  - ⇨ **Breast pain without lump**: 10% **which can be:**
    - **Cyclical pain:** Dull, diffuse and bilateral
    - **Non-cyclical pain:** Imagining should be done
  - ⇨ **Nipple discharge:** 5%
    - **Questions to ask:** spontaneous or on pressure? Single or multiple ducts? Color?
    - **Cause in non-pregnant women:** Carcinoma, Intraductal papilloma, Fibrocystic changes, Duct ectasia, Hypothyroid, Pituitary adenoma, and Lactation.
    - **Investigations:** H&P, R\O mass by exam and mammogram, consider ductography.
    - **Management:** Observation, single duct excision, total duct excision.
    - **Can be:**
      - **Physiological:** Multiple ducts - Bilateral - Non-spontoons
      - **Pathological:** Single duct - Unilateral - Spontoons.




  - ⇨ **Change in breast contour:** 2%
  - ⇨ **Nipple – areolar complex disorder:** 1%
  - ⇨ **Axillary mass:** 1%
  - ⇨ **Screen detected lesion.:** 1%
  - ⇨ **Anxiety:** 20%
- **History of presenting illness:**
  - Full and complete history should be taken, particular attention should be paid to:
    - Breast development stating from childhood to present.
    - Endocrine status of patient mainly menstruation and OCP.
    - Size of lump in relation to menses.
  - Pattern of pain in relation to menses.
  - How regular the cycle is and quantity of blood?
  - Retraction of nipple - milk retention - Nipple discharge.
  - Age at menarche, age at 1st birth, Menopause.
  - Number of pregnancies.
  - Changes in breast during previous Pregnancies e.g. abscess, nipple discharge
  - Breast feeding. (Keep in mind: if > 6 months → protective, If less → not "protective")
  - Abnormalities which took place during Previous lactation period e.g. abscesses,
- **Family history:** Family history of breast diseases especially cancer and particularly in near relatives.
- **Medication history:** Hormonal replacement therapy? Oral contraceptives

### Physical examination:

- Disrobed from waist and above.
- Examine in sitting and supine position and 45o position.
- Inspection with arms by the side and above head:
  - Size, symmetry, skin changes, nipple complex.
- Examine normal side first.
- Examine axilla, arm, SCF.
- Examine abdomen.
- Examine the back.

### Breast self examination:

- **When?**
  - **Once a month**, preferably just after a period.
  - If the woman is postmenopausal, she may choose a day that she will remember each month.
- **Why?** To be most effective, BSE should be done regularly and carefully
- **Steps:** Just go through it.

| Step 1: Look at your breasts. | Step 2:Feel your breasts/ |
|---|---|
| • Changes in the size and shape of your breast<br>• any dimpling, puckering or skin changes<br>• anything different about your nipples | You may find it easy to examine your breasts in the shower. You may also like to check your breasts lying down with a pillow under your shoulder. In either position raise your arm above your head. Use the flat part of your fingers to feel each part of your breast. Move the skin over the underlying tissue in a gentle rotating movement. Look for: Lumps, discharge, thickening, any other changes. |

# 2- Imaging:

## When to image?

- Investigation of a palpable lump or nipple discharge.
- Screening in appropriate groups (asymptomatic 40 y/o)
- Metastatic adenocarcinoma with an unknown primary.

## Modalities:

### 1- Mammogram

- **When?** After age of 40
- **Detects?** Densities and calcification
- **Advantages:** Estimated reduction in mortality 15 – 25%, 10% false positive rate - BEST MODALITY FOR MICROCALCIFICATIONS. Whole idea of early screening is to detect micro-calcifications.

- **DIAGNOSTIC VS. SCREENING MAMMOGRAPHY:**
  - **Diagnostic mammography:** performed to evaluate a breast complaint or abnormality detected by clinical examination.
  - **Screening mammography:** performed for asymptomatic well women to detect unsuspected lesions. E.g. routine screening for women who are 40 years or older.

- **CARDINAL MAMMOGRAPHIC FEATURES OF MALIGNANCY:**
  - **Speculated mass** (stellate lesions): check for the presence of a surgical scar. All other stellates are presumed invasive carcinoma that requires work up and biopsy. If unexplained, don't be seduced by stability.
  - **Architectural distortion without mas:** should be treated as stellate lesion.
  - **MICRO-calcifications with casting or irregularity:**
    - 60% of localized biopsies are for calcifications, but only 25% yield malignancy.
    - For any micro-calcification, a **biopsy** must be done
      - (why? About 15% will turn to be pre-malignant "ductal carcinoma in situ") or turn to be malignant), and when the pathology report comes to you, make sure that it says "calcifications seen" so you know that you didn't biopsy the wrong area.
    - Distribution (Casting, linear, segmental, clustered).
    - Very fine white specks that usually are non-cancerous but can sometimes be a sign of cancer. (The mAcro ones are larger and almost non-cancerous and require no treatment. Fibroadenomas usually appear as mAcrocalcifications.)
  - **Circumscribed density with indistinct margins.**
  - **Asymmetry density.**

- 2 views: **CC** (craniocaudal) the camera shoots up then down & **MLO** (Medio-lateral-oblique) where the camera rotates 45º and then it shoots, edge of pectorals major is seen in this view.
- **BI-RADS** classification:

| 0 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Needs additional imaging (Poor quality image) | Negative.<br>Routine in 1 year. | Benign finding<br>Routine in 1 year | Probably benign.<br>6 months follow up | Suspicious abnormality.<br>biopsy | Highly suggestive of malignancy – action must be taken |

  - Class 6: diagnosed by the image

### ROLE OF ULTRASOUND

- Characterize a mammographic abnormality.
- Characterize a mammographically occult
- clinical abnormality.
- Initial examination in the younger woman.
- Imaging guided biopsies (extension of palpation)
- Some utility in distinguishing benign from malignant lesions.
- Still **no role on screening** (Because it cannot detect micro-calcifications), even in the mammographically dense breast.
- Developing role in monitoring neo-adjuvant therapy.
- BEST MODALITY TO DETECT A **cyst**, or to follow a tumor.

**2- Ultrasound:**

⇨ It is **EXCELLENT** in giving the status of axillary lymph nodes

### ADVANTAGES & DISADVANTAGES:

| Advantages: | Disadvantages: |
|---|---|
| • Painless.<br>• Does not use ionizing radiation.<br>• Very good at detecting cysts.<br>• Can "see through" mammographically dense breasts. | • Not good for screening the breast.<br>• Cannot always characterize lesions precisely.<br>• More operator-dependent than mammography. |

### ULTRASONOGRAPHY FEATURES:

| CYSTS | BENIGN MASSES | MALIGNANT MASSES |
|---|---|---|
| • No or few echoes.<br>• Smooth margins.<br>• compressible with the ID.<br>• posterior enhancement (increased echoes = whiter). | Smooth margins | Irregular or indistinct margins. |
| | Pure hyperechoic | Hypoechoic, speculated |
| | Elliptical shape (wider than tall) | Taller than wide or rounded (special types). |
| | Lobulated | Duct extension |
| | Complete tine capsule | Micro lobulation |
| | Don't disturb surrounding tissues. | Cut across surrounding tissue planes |
| | Uniform internal appearance | Heterogenous internal appearance. |

**ULTRASOUND CORRELATION:** Ultrasound/clinical correlation is as important as ultrasound/mammographic correlation! Ultrasound can be considered as an *extension of palpation*.

| Challenges of ultrasound correlation: | Fundamentals of mammographic/ultrasound correlation: |
|---|---|
| • Small lesions in larger breasts.<br>• Small lesions deep within echogenic parenchyma<br>• Dense parenchyma interspersed with fatty lobules.<br>• Surgically scarred breasts.<br>• Multiple mammographic lesions.<br>• Complicated cysts.<br>• Cellular malignancies. | • Correlate lesion location, size, margin.<br>• Don't assume that previous imaging assessment was correct (pull out all the films if necessary).<br>• Take account of both mammographic & ultrasonography appearances. |

**Key points:**

⇨ Meticulous imaging technique.
⇨ Careful correlation of mammogram with ultrasound, and imaging clinical findings.
⇨ Clear communication reduces errors.

**3- 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

## 3- Cytology:

| | |
|---|---|
| **Fine-needle aspiration cytology:** | • Procedure description: a **thin** needle is inserted into the mass for sampling of cells that are later on examined under a microscope.<br>• Clinical, U/S guided, mammotomes.<br>• Fast, inexpensive.<br>• Institution dependent.<br>• Unable to differentiate between in-situ vs CA.<br>• Sensitivity 80-98%<br>• False negative 2-10%<br>• Scoring of result code 9 → code 5 |
| **Core biopsy** | • Tissue diagnosis - Receptor status.<br>• 14-18 gauge spring loaded needle.<br>• Multiple.<br>• **Painful** & Costly |
| **Open biopsy:** | Atypical lesions - LCIS - Radial scar - Atypical papillary lesions - Radiologic pathologic discordance - Phyllodes - Inadequate tissue harvesting |
| **Stereotactic biopsy:** | mammogram with biopsy. |

**in girl's slides ONLY :**

**Screening:** <u>when to start screening?</u>

- **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.

**BRCA:**

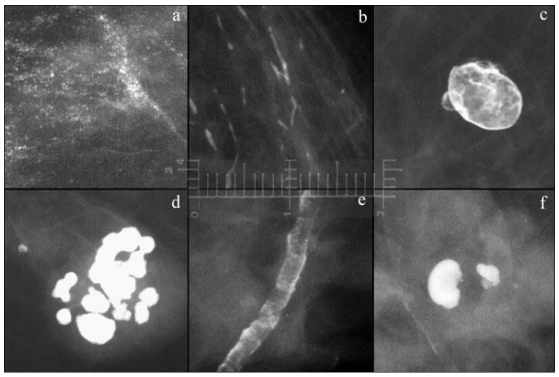
- Account for 25% of early onset breast cancers.
- 36 85% lifetime risk of breast cancer.
- 16 – 60% lifetime risk of ovarian cancer
- **Management:**
  - Monthly BSE – 18 y.o , 6 month SBE & annual mammo – 25 y.o
  - Discuss risk reducing options
  - Prophylactic Mastectomies
  - Salpingooophorectomy upon completion of child bearing
  - 6 month transvaginal US & CA125 – 35. y.o

**Genetic:**

- 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 \ Lymphoma on the same side.
- Family member with BRCA gene.
- Male breast CA.
- Ovarian CA.

- Normal unilateral mammogram with two standard views.
- This normal mammogram is an example of a fibrofatty pattern.

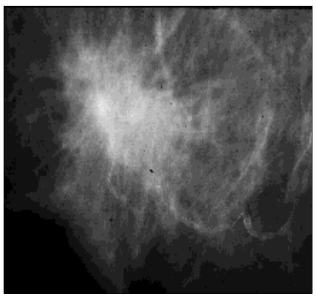
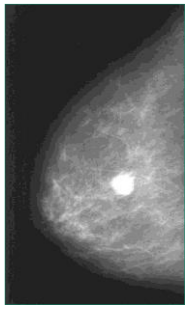
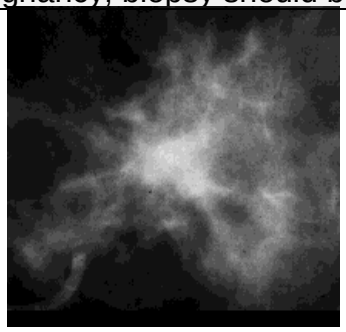
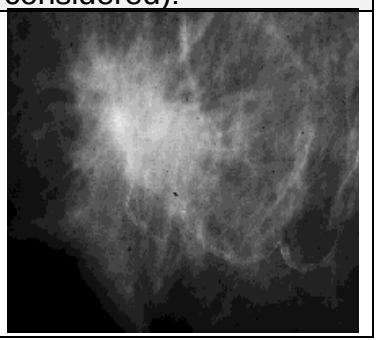
Artifacts on mammographic images can be misinterpreted as originating from the affected breast. They can often pose as clinical and technical troubleshooting difficulties for the interpreting radiologist. They can arise from the patient in the form of hair, deodorant, or body parts (such as a nose or arm projected on to the film). The mammography x-ray unit, film, cassette, or screen can also contribute to possible artifacts. This mediolateral oblique view from a screening examination demonstrates static. This film artifact is caused by improper humidity conditions.

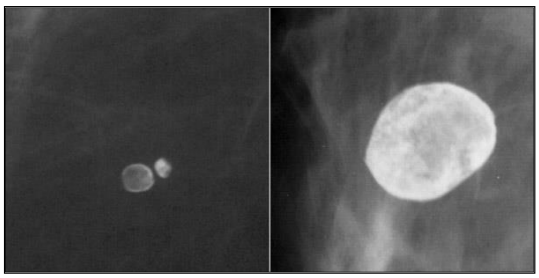


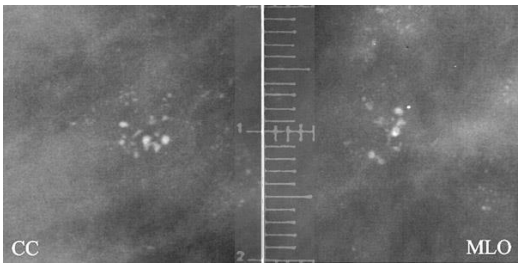

**Benign calcifications:**

A. punctate: when multiple, small (<1mm), smooth, dense, and round
B. linear:
C. spherical (lucent)
D. popcorn
E. vascular
F. smoothly dense

**Spiculated mass:** (suggestive of malignancy, biopsy should be considered):

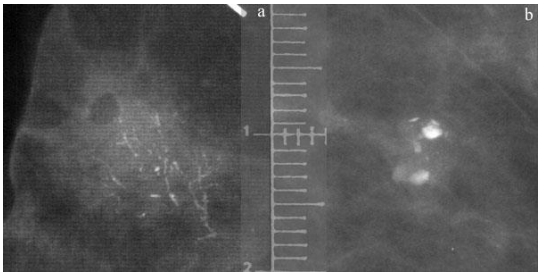







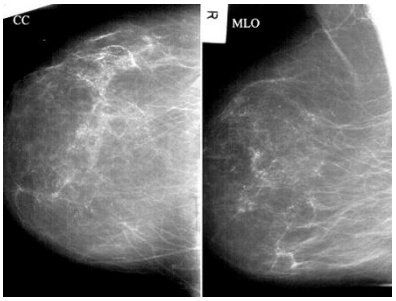



**Spherical or lucent centered calcifications:**
There are benign calcifications that range form under 1 mm to over a centimeter. These deposits have smooth surfaces, are round or oval, and tend to have a lucent center. The wall is thicker than "eggshell" forms. They arise from areas of fat necrosis, calcified duct debris, and occasional fibroadenoma.

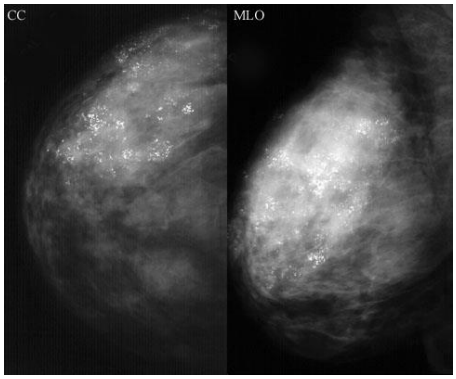
**Grouped or Clustered:**
(Historically, the term clustered has can noted suspicion, the term shall now be used as a neutral distribution modifier and may reflect benign or malignant processes): The term is used when multiple small calcifications occupy a small volume of tissue (less than two cc.).

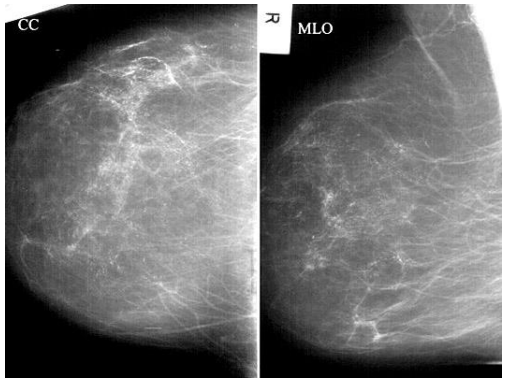



**Linear:**
Calcifications arrayed in a line that may have branch points. a-DCIS b-




**Segmental:**
These are worrisome in that their distribution suggests deposits in a duct and its branches raising the possibility of multifocal breast cancer in a lobe or segment of the breast. Although benign causes of segmental calcifications exist such as "secretory disease": this distribution is of greater concern when the morphology of the calcifications is not specifically benign.



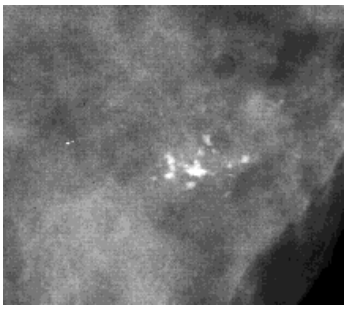




**Diffuse/Scattered:**
These are calcifications that are distributed randomly throughout the breast.

**Multiple groups:**
Multiple groups may be indicated when there is more than one group of calcifications that are similar in morphology and distribution widespread distribution, even over an entire breast is worrisome if unilateral, while bilateral changes are suggestive of a benign process.

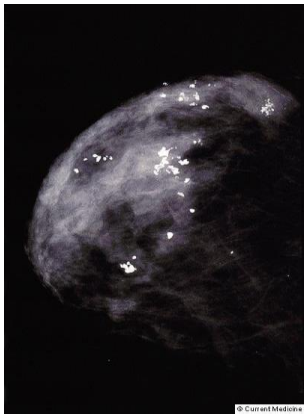
**Intermediate concern calcifications:**
group of poorly defined calcifications, some round, others irregular with a clustered distribution. These particular calcifications were benign related to sclerosing adenosis, however similar appearances are common enough in small cancers to merit biopsy.

**Pleomophic (granular):**
grouped irregular calcifications were found to be benign (fibroadenoma).



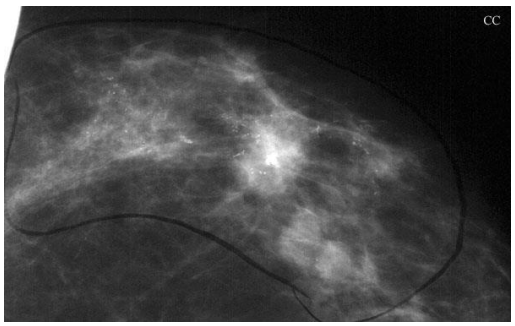
**Pleomophic (granular):**
irregular calcifications were associated with ductal carcinoma (cancer).

Malignant mass. Intraductal and invasive ductal carcinoma not otherwise specified (NOS), nuclear grade 3. Invasive ductal carcinoma (NOS) is the most common type of breast cancer and represents 65% of the breast cancer in the United States [5]. When the histologic pattern does not fit a specific subtype, it is labeled NOS. These cancers can present as a palpable mass or a spiculated mass on mammography. Malignant-type calcifications can be seen and are usually associated with an intraductal component. Ultrasound usually demonstrates a hypoechoic spiculated mass that may be taller than wide. A, Mediolateral oblique view demonstrates a dense, spiculated mass with associated architectural distortion within the superior aspect of the breast. There are associated malignant-type calcifications. B, Directed ultrasound of the breast demonstrates a spiculated hypoechoic mass corresponding to the mammographic lesion. Ultrasound-guided core biopsy revealed invasive ductal carcinoma.

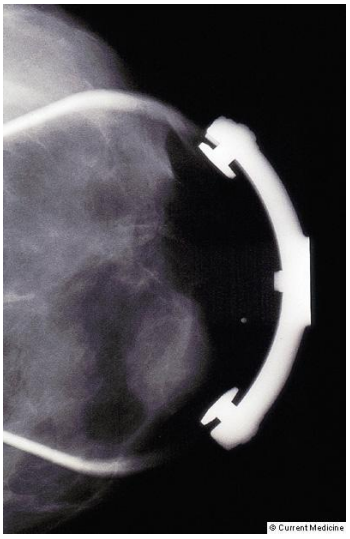


Benign microcalcifications. **A**, Hyalinizing fibroadenoma, craniocaudal view. There are multiple scattered dense, large, coarse popcorn-like calcifications associated with a dense fibronodular pattern. When these calcifications begin to form, they may be suspicious in appearance, prompting biopsy. The calcifications may be too small to characterize, toothlike in configuration, and of varying densities. Hyalinizing fibroadenomas occur more commonly in older women. **B**, Secretory calcifications, mediolateral view. Rod-shaped, smoothly marginated, dense, coarse calcifications in a pattern directed toward the nipple. These calcifications are commonly associated with ductal ectasia and periductal mastitis [2].

Close up (magnified) view of heterogeneous granular calcifications of infiltrating ductal carcinoma.

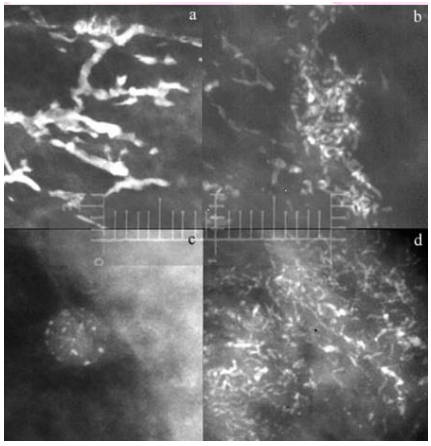



Segmental distribution of microcalcifications is almost always suspicious

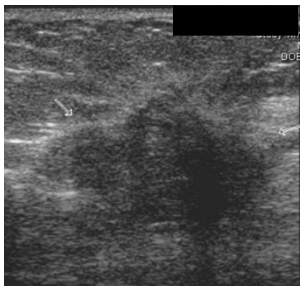


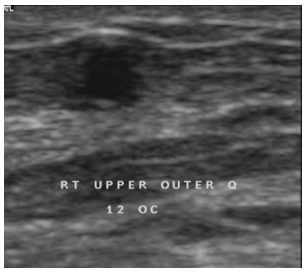
Benign mass: fibroadenoma. The fibroadenoma is a benign breast mass with no increased malignant potential. Because histologically it contains epithelial cells, a cancer could theoretically arise from within it [4]. Although they are typically found in younger premenopausal women, fibroadenomas are discovered in postmenopausal women as well. Owing to their sensitivity to hormones, increasing numbers of older patients on exogenous hormone replacement therapy have demonstrated the presence of benign fibroadenomas.
**A,** Craniocaudal spot compression view demonstrates a slightly obscured ovoid mass within the medial aspect of the left breast.
**B,** Directed ultrasound of the medial left breast demonstrates a smooth, marginated, well-defined ovoid homogeneously hypoechoic mass with increased through transmission corresponding to the mammographic mass.
Ultrasound core-needle biopsy confirmed a benign fibroadenoma.


Malignant microcalcifications. Ductal carcinoma in situ (DCIS), comedo type, magnification view. Before the advent of improved mammographic screening, the diagnosis of DCIS was made infrequently. Note the fine, linear, heterogeneous calcifications arranged in a cluster. There is also an associated ill-defined mass lesion. Although the hallmark imaging feature for DCIS is the presence of microcalcifications, DCIS can also present less frequently mammographically as a mass without associated microcalcifications.

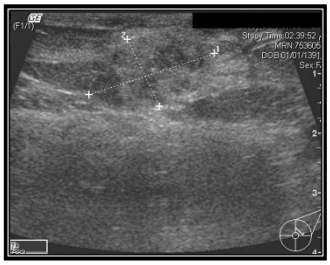



Fine and/or branching (casting) calcifications: These are thin, irregular calcifications that appear linear, but are discontinuous and under 0.5 mm. in width. Their appearance suggests filling of the lumen of ducts . A,b,d branching c:cyst wall

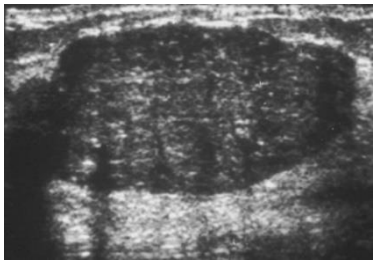




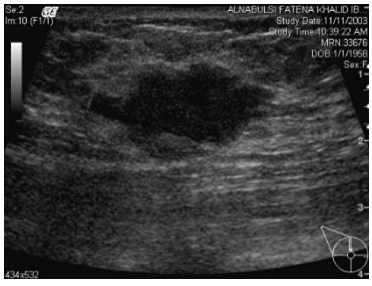

**Irregular shape**

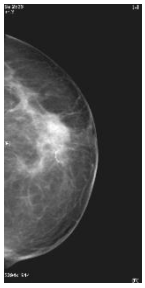


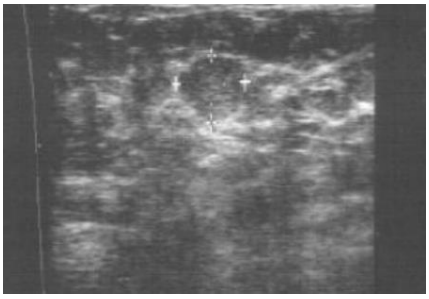
**ill-Define margins**



**Ultrasound Fibroadenoma**



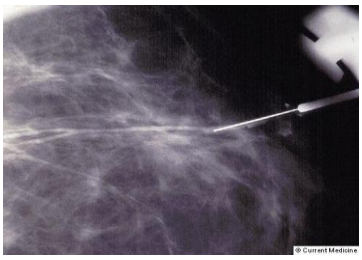




**Spiculated margins**

Benign mass: simple cyst. This patient presented with a new generally well-defined mass on her screening mammogram. Ultrasound demonstrates a well-defined, smoothly marginated anechoic ovoid mass with increased through transmission consistent with a benign simple cyst. Because this finding indicates a benign lesion, the patient was told to return to annual screening follow-up. Cysts can present as a palpable mass or a focal tender area within the breast. A majority of cysts are found in asymptomatic women on their screening mammogram. On mammography, they appear as a mass and may have associated benign rim or eggshell microcalcifications. Ultrasound is the confirmatory diagnostic test demonstrating a well-defined mass devoid of internal echotexture. If any internal echoes are demonstrated, ultrasound-guided needle aspiration is recommended to fully exclude malignancy.

Phyllodes tumor. The phyllodes tumor or cystosarcoma is believed to be related to the fibroadenoma. The malignant form of this lesion (about 10%) can metastasize hematogenously most commonly to the lungs and not to the axillary lymph nodes. Most of these tumors are benign, but approximately 25% recur locally if they are incompletely excised. Lesions larger than 3 cm are more likely to be malignant. By both mammography and ultrasound, these lesions present as well-defined masses that are very similar in appearance to a benign fibroadenoma. On sonographic evaluation, the malignant forms are more likely to have cystic spaces [8]. This craniocaudal view demonstrating a large, well-circumscribed, dense, palpable mass within the lateral aspect of the breast. According to the patient's history, this mass had rapidly increased in size. Ultrasound core biopsy revealed phyllodes tumor.



Ductography. For further evaluation of spontaneous nipple discharge, a painless ductogram can be performed. Using aseptic technique, a 30-gauge sialography catheter is used to cannulate the effected single ductal orifice. Approximately 0.2 to 0.4 mL of radiographic contrast is injected through the catheter. Magnification views in the true lateral and craniocaudal projections are then obtained. Ductography is useful in detecting the location of the lesion (or lesions) within the ducts and the extent of involvement. This information can be extremely helpful in presurgical planning. **A**. Normal ductogram. Magnification view demonstrates a normal contrast-opacified duct. There is no dilatation or filling defect. **B**. Abnormal ductogram. Magnification view demonstrates a single lobulated filling defect in the cannulated duct with associated ductal ectasia. Before surgery, a preoperative ductogram was performed with injection of a combination of radiographic contrast and methylene blue to localize the specific duct. The patient was found to have a solitary papilloma.

# MCQS

1. **What causes dimpling in breast cancer?**
   A. Cooper ligaments.
   B. Lactiferous duct.
   C. Long thoracic nerve.
   D. Inframammary lymph node.
2. **A patient presented with hard mass on the outer upper area of the breast. Which lymph node you have to examine?**
   A. Posterior axillary.
   B. Anterior axillary.
   C. Lateral axillary.
   D. Medial axillary
3. **What is the most common site of breast cancer?**
   A. Superior & lateral.
   B. Superior & medial.
   C. Inferior & lateral.
   D. Inferior & medial.
4. **Women with mastitis:**
   A. Stop breast feeding.
   B. Clean nipple with alcohol.
   C. Surgical drainage.
   D. Continue breastfeeding.
5. **Self-breast exam is done every?**
   A. Month.
   B. 3 Months.
   C. 6 Months.
   D. 12 Months.
6. **After undergoing a radical mastectomy, the patient complained of not being able to raise her hands above her shoulder. What is the most likely affected structure?**
   A. Long thoracic nerve.
   B. Thoracodorsal nerve.
   C. Intercostalbrachial nerve.
   D. Musculocutaneous nerve.
7. **Aspiration of a breast cyst revealed the presence of blood. What is the best next step?**
   A. Genetic testing.
   B. Cytology
   C. Mastectomy.
   D. Examination.

1. A
2. B
3. B
4. D
5. A
6. A
7. B