

# Breast Cancer Overview

## Part 1



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# Breast Cancer overview



## Objectives:

Students should be able to:

- Assess and realize the significance of risk factors.
- Take relevant focused history.
- Perform standardized breast clinical examination.
- Understanding and practicing triple assessment concept.



# Breast Cancer Overview



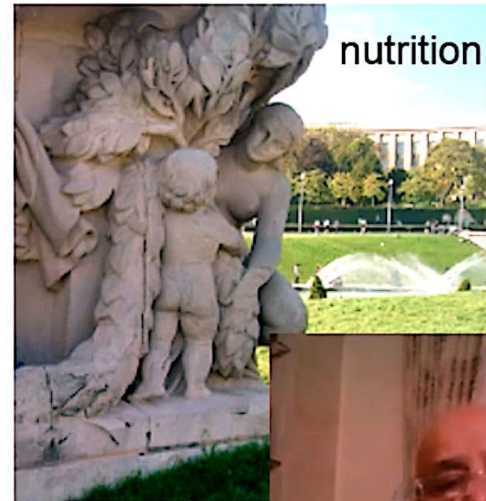
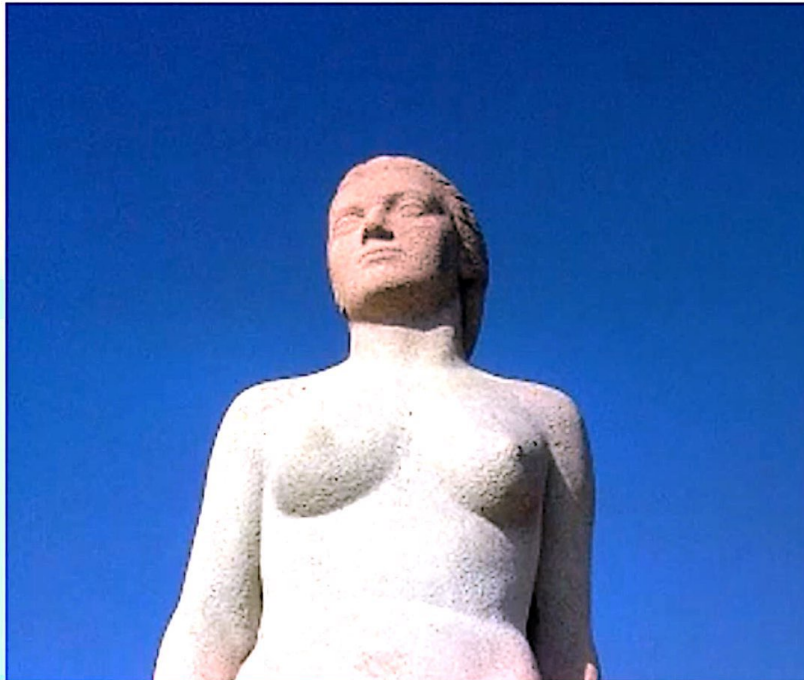
- **Lecture outlines:**
- Introduction:
- Relevant anatomy and physiology.
- Cancer facts.
- Focused history taking.
- Standardized Examination
- Breast imaging.
- Cytological and histological Examination
- Metastatic workup



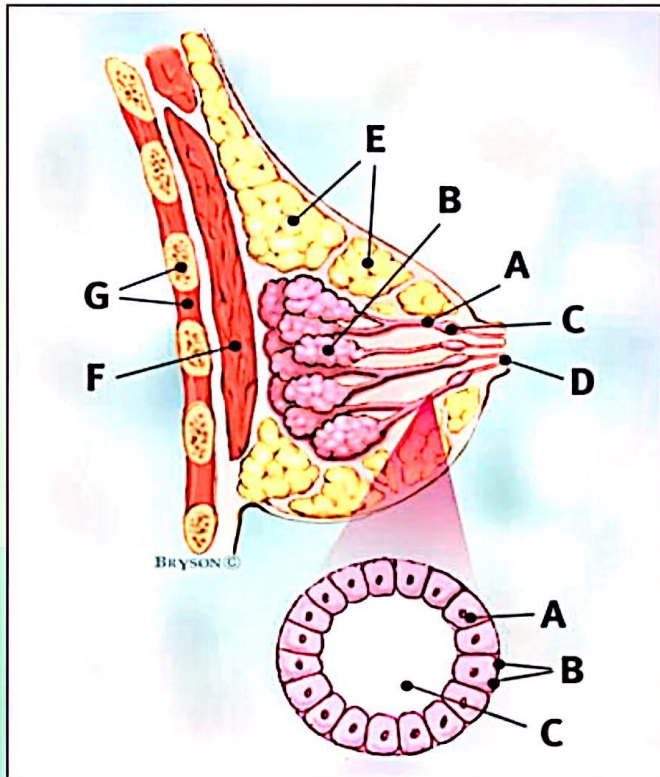
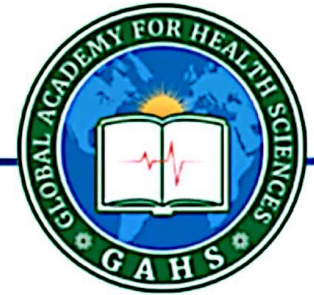
# Why Are We Concerned ?



- Body image and wellbeing.
- Positive psychological balance.



# Relevant Anatomy & Physiology



## Breast profile:

A ducts

B lobules

C dilated section of duct to hold milk

D nipple

E fat

F pectoralis major muscle

G chest wall/rib cage

## Enlargement:

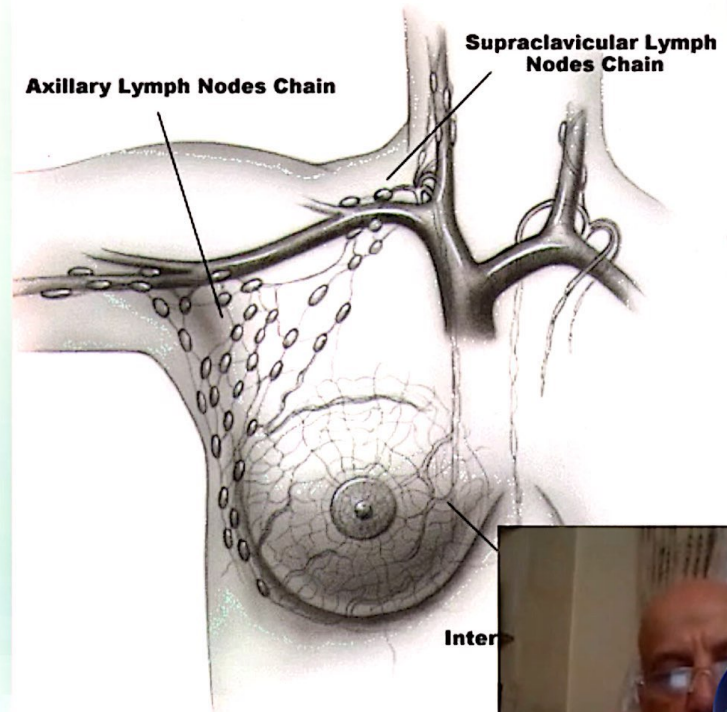
A normal duct cells

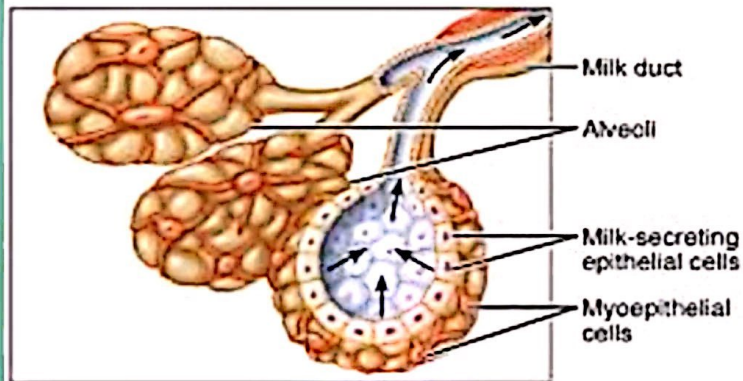
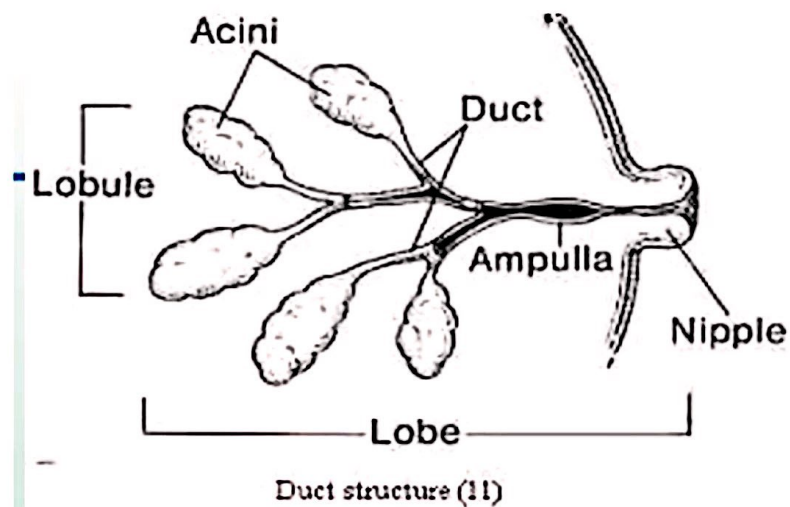
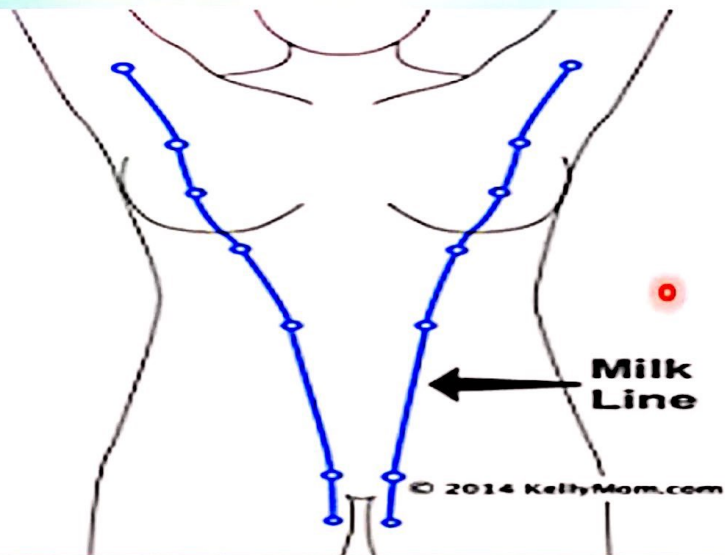
B basement membrane

C lumen (center of duct)

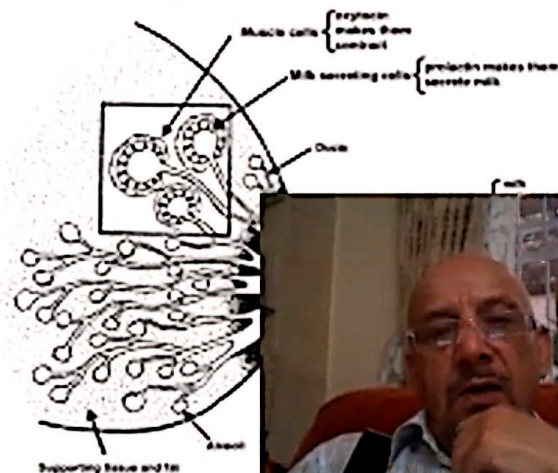


# Anatomy of the Breast & Axilla





## Breast Anatomy - Structure



# Triple Assessment



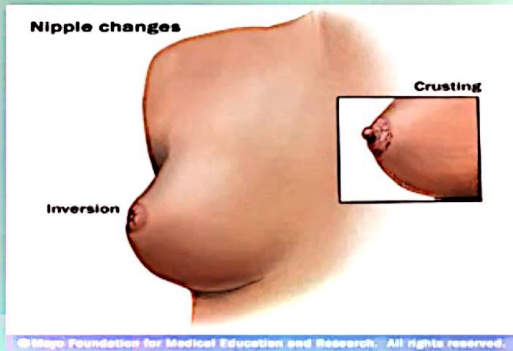
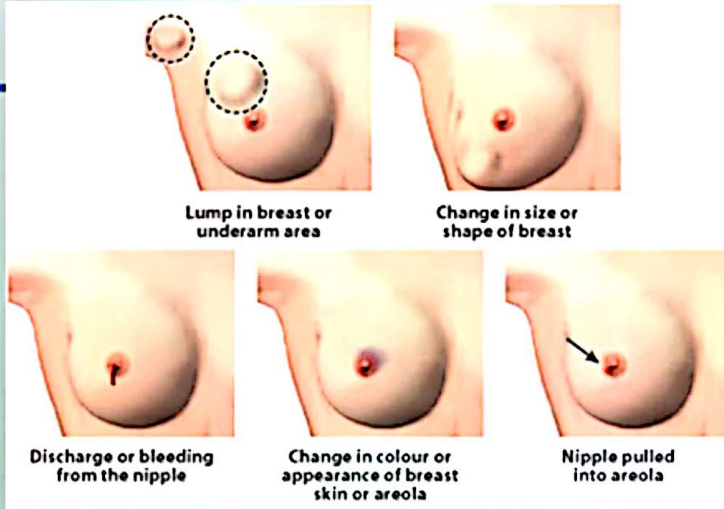
- Clinical Evaluation
- Imaging (ultrasound and/or mammography )
- Cytology or Histology

11/2/2020





# Symptoms



# Risk factors



Age

Gender (100:1)

White race

Obesity .( BMI >30)

Exogenous hormones

▪ Reproductive factors.

▪ **previous suspicious breast biopsy**

Personal history of breast cancer

Family history of breast cancer

one first-degree relative 2x

2 first degree relatives 3x

Inherited genetic mutations

only 5-6% of all breast cancers are directly attributable to inheritance of a breast cancer susceptibility gene such as BRCA1, BRCA2, p53

Lifestyle factors

Alcohol  $\alpha$

Smoking  $\alpha$

Exposure to therapeutic ionizing radiation.  $\alpha$

**70% of women have no risk factors!**





- Gail Model Risk of Breast Cancer
- Developed in 1994, Published in JNCI





# New recommendations on breast cancer screening

The American Cancer Society has updated its guidelines for healthy women with an average risk of getting breast cancer.

Age range	Mammogram		Clinical breast exam	
	Old	New	Old	New
<b>20-39</b>	No	No	Every 3 years	No
<b>40-44</b>	Annual	Optional*	Annual	No
<b>45-54</b>	Annual	Annual	Annual	No
<b>55+</b>	Annual	Every one or two years*	Annual	No

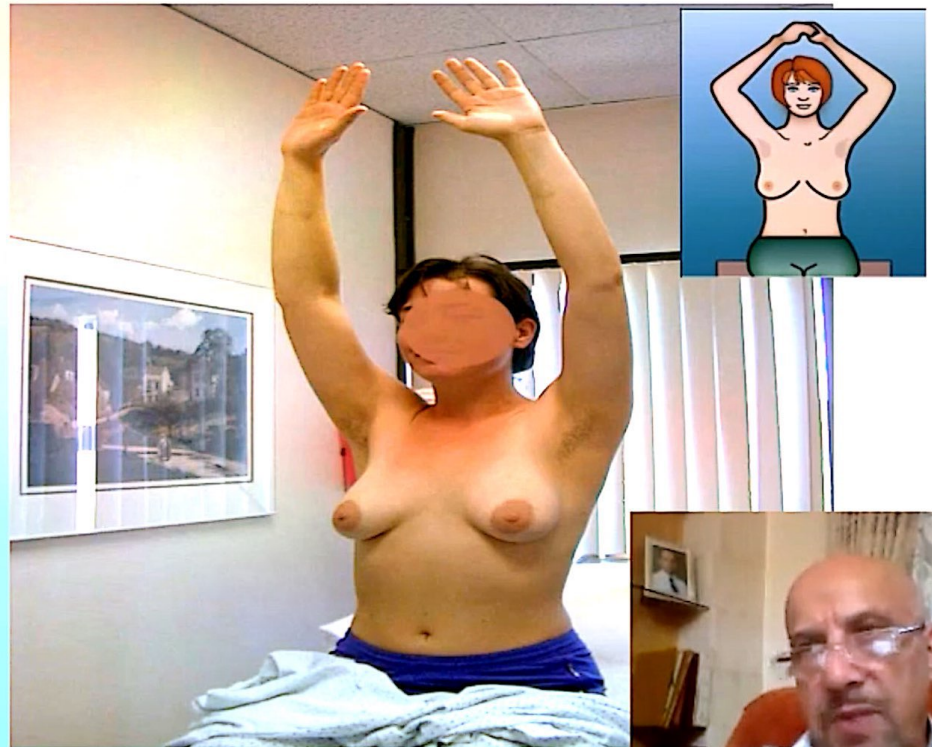
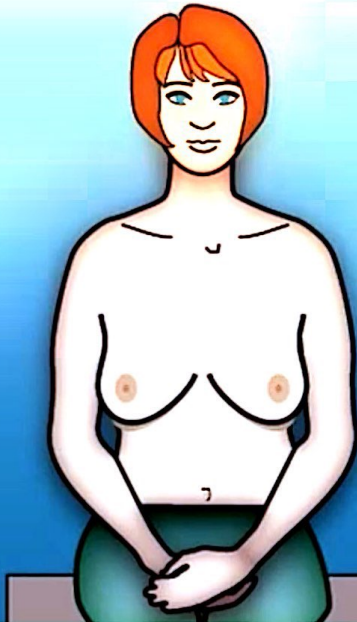
\*Based on discussion with doctor about benefits and risks of mammography.

NOTE: Screenings should continue as long as a woman has a life expectancy of 10 years and is a good candidate for breast cancer treatment.

Source: American Cancer Society



# Standardized Breast Examination





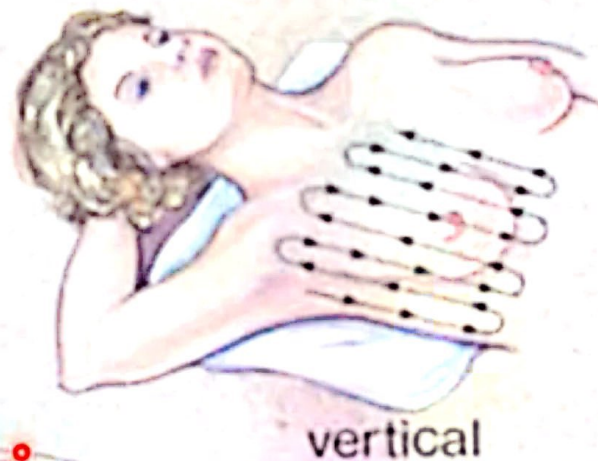
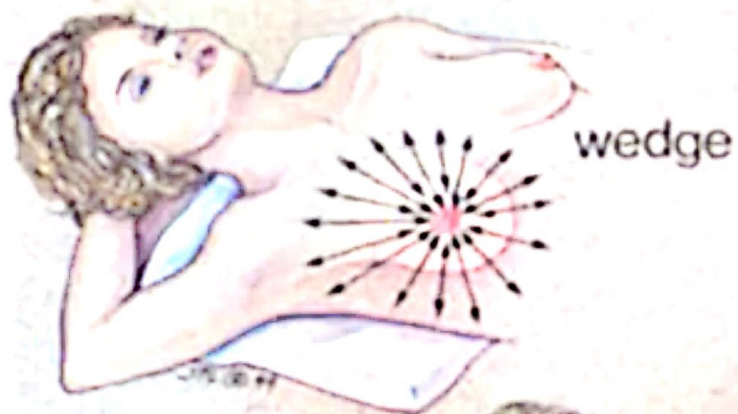






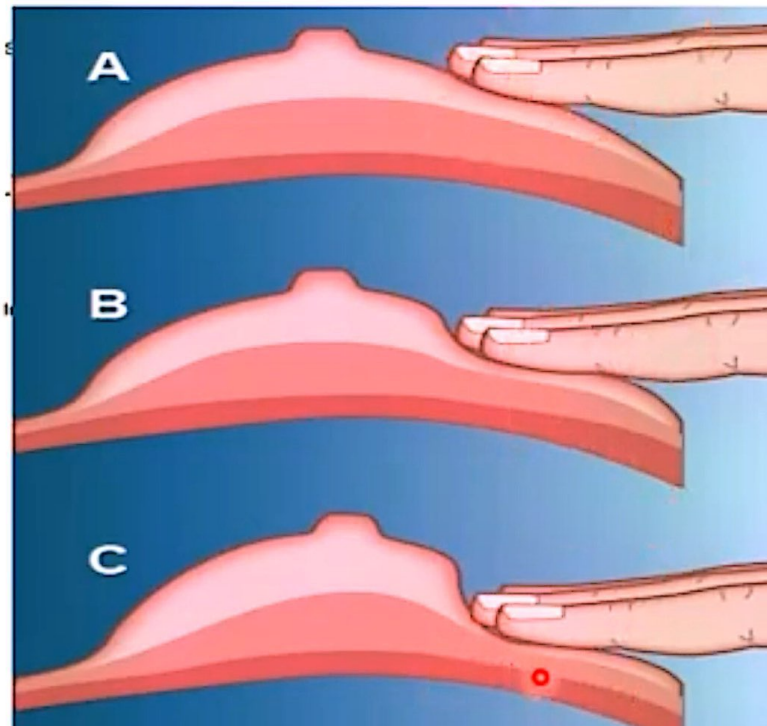


# Breast Palpation Techniques





## Levels of Pressure for Palpation of Breast Tissue Shown in a Cross-sectional View of the Right Breast

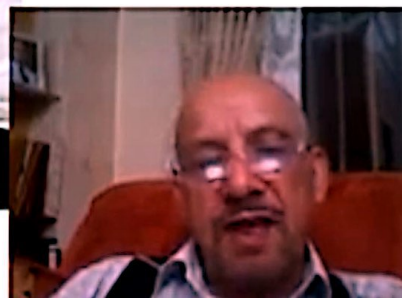
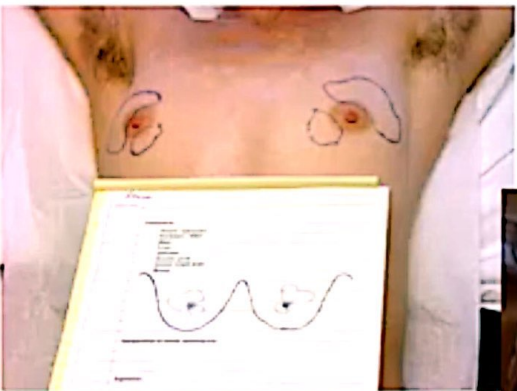


# Malignant Masses



- Hard.
- Painless: Malignant masses painful in only 10-15% of patients.
- Irregular.
- Skin Dimpling.
- Nipple Retraction.
- Bloody or Water Discharge.
- Possibly fixed to the skin or chest

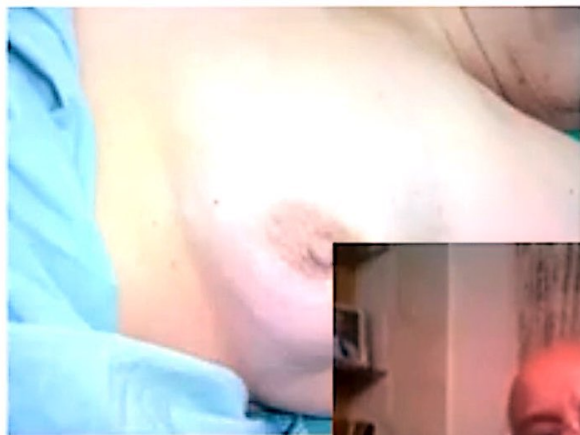




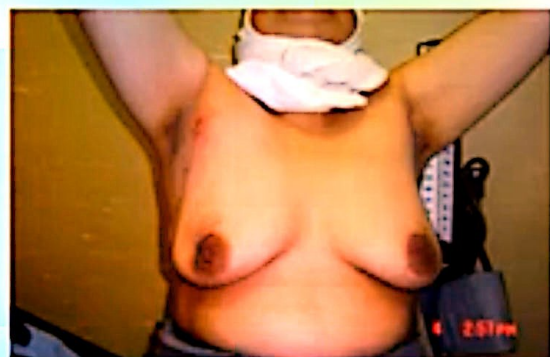
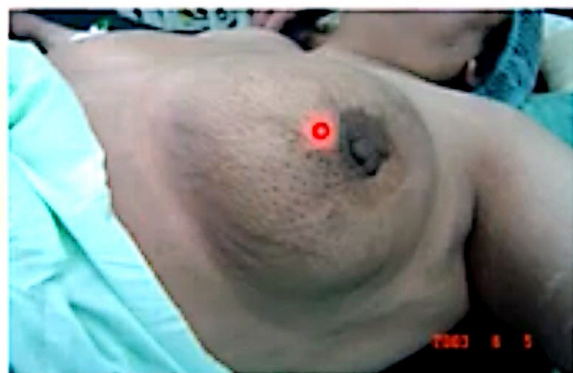
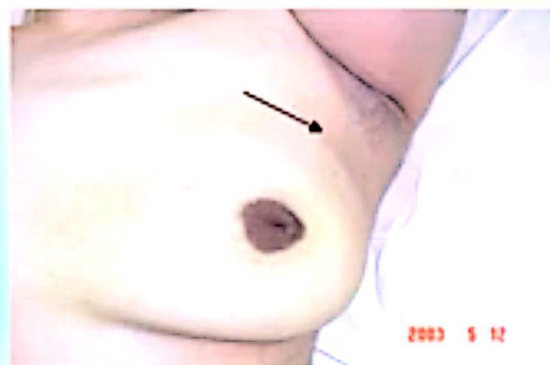


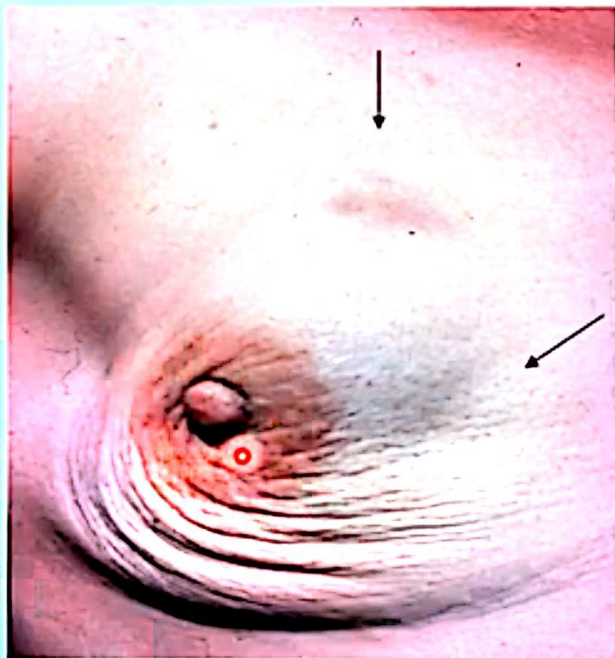
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**Peaud'orange**



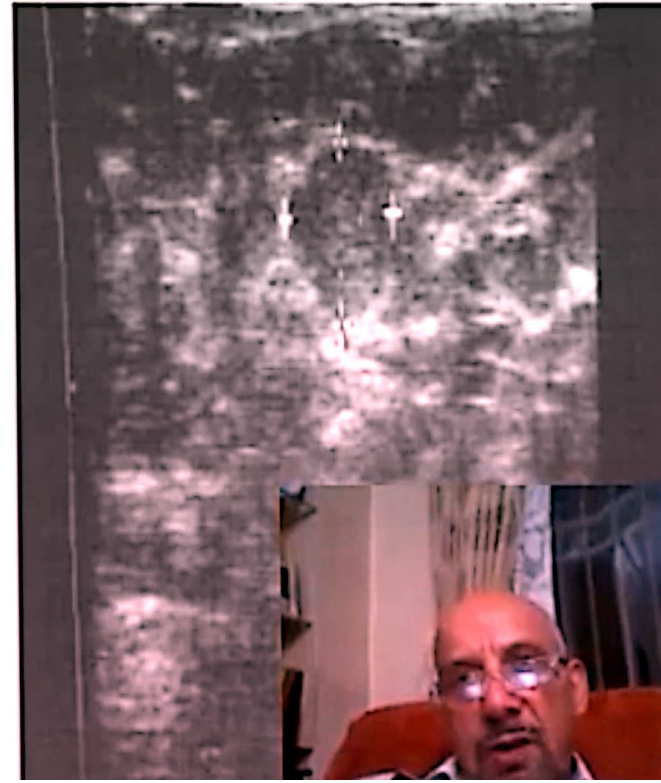
# Skin Ulceration



# Breast Ultrasound



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

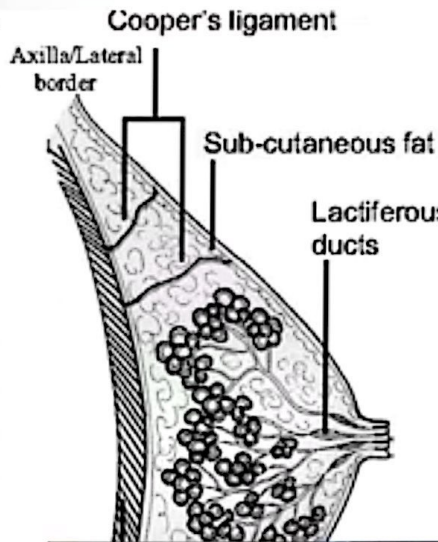
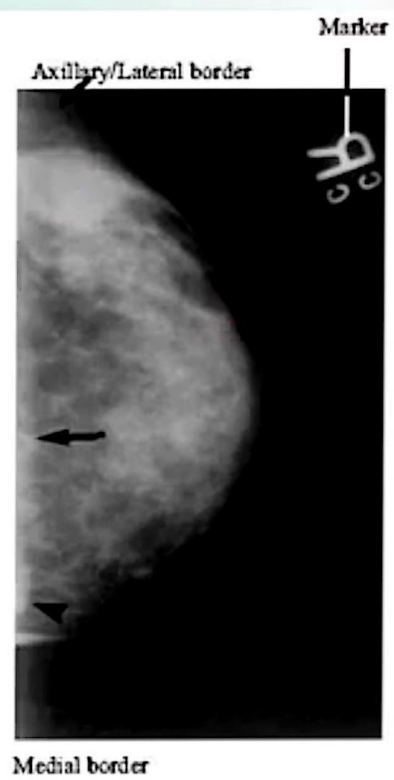
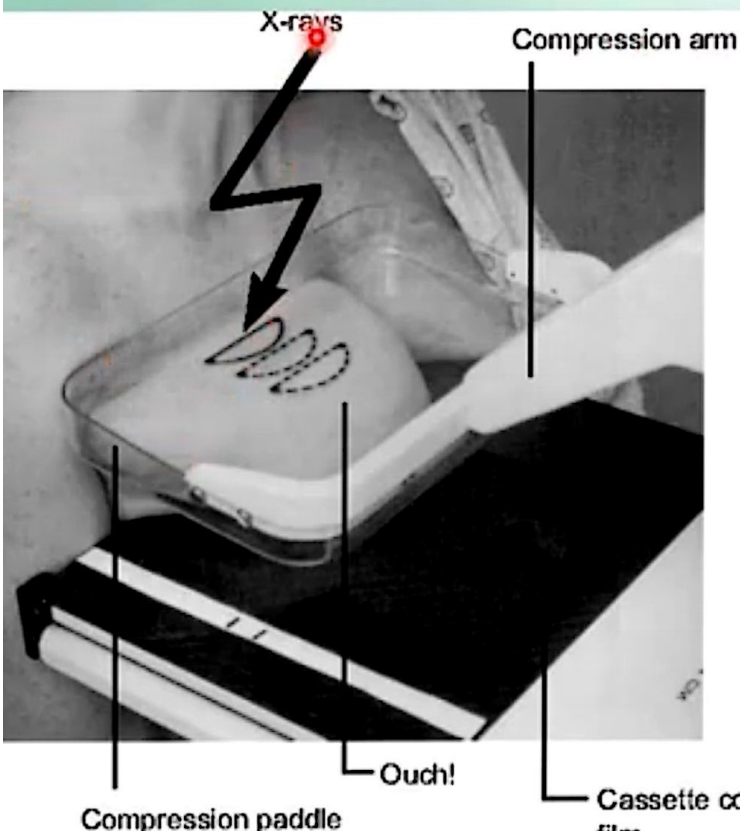


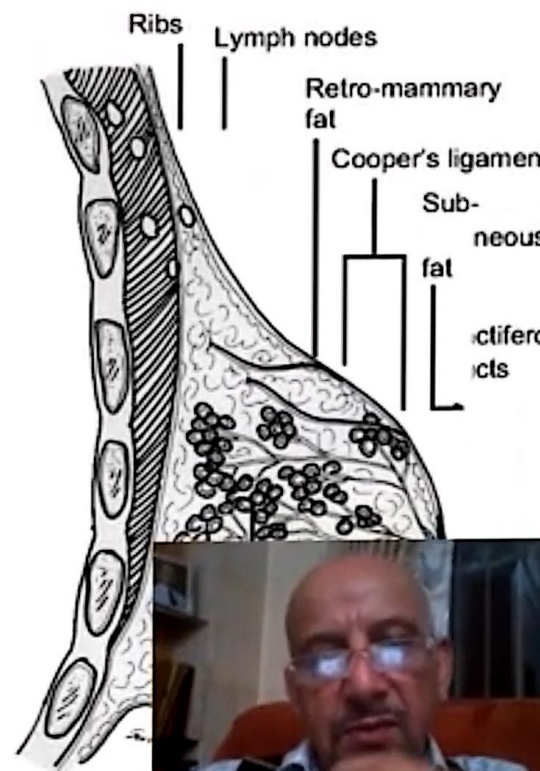
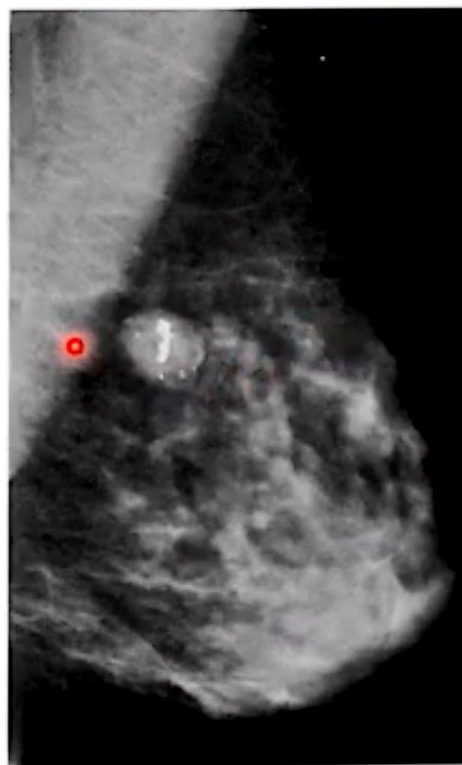
# Breast Imaging



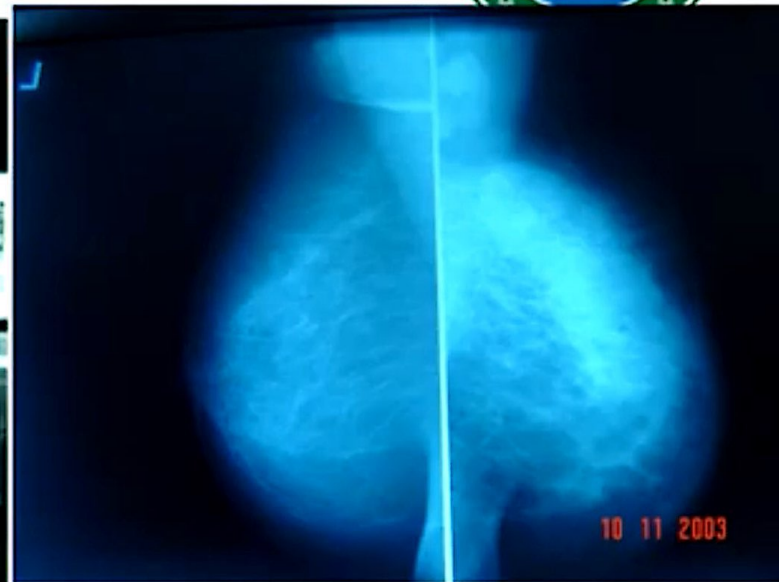
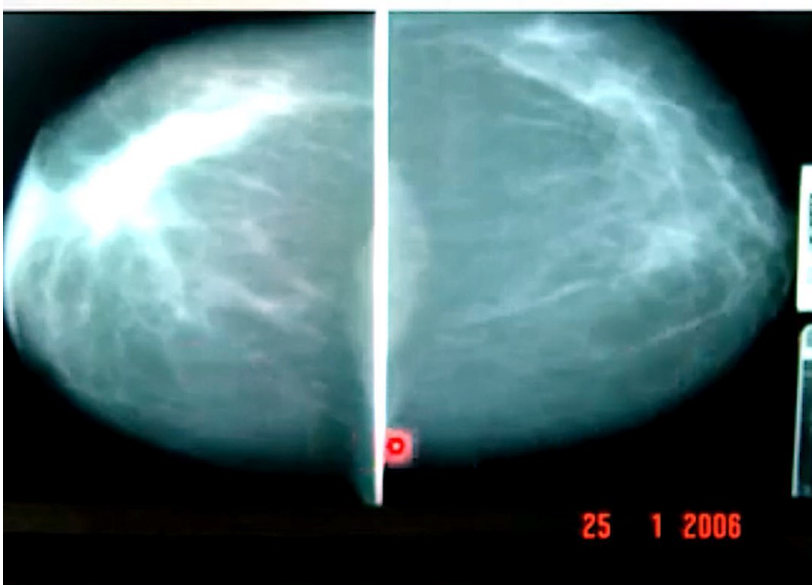
- The breast can be imaged with mammography, ultrasound or MRI.
- Mammography is the most sensitive of breast imaging modalities.
- Sensitivity is reduced in young women due to the presence of increased glandular tissue.
- For symptomatic patients, imaging always be performed as part of triple assessment.

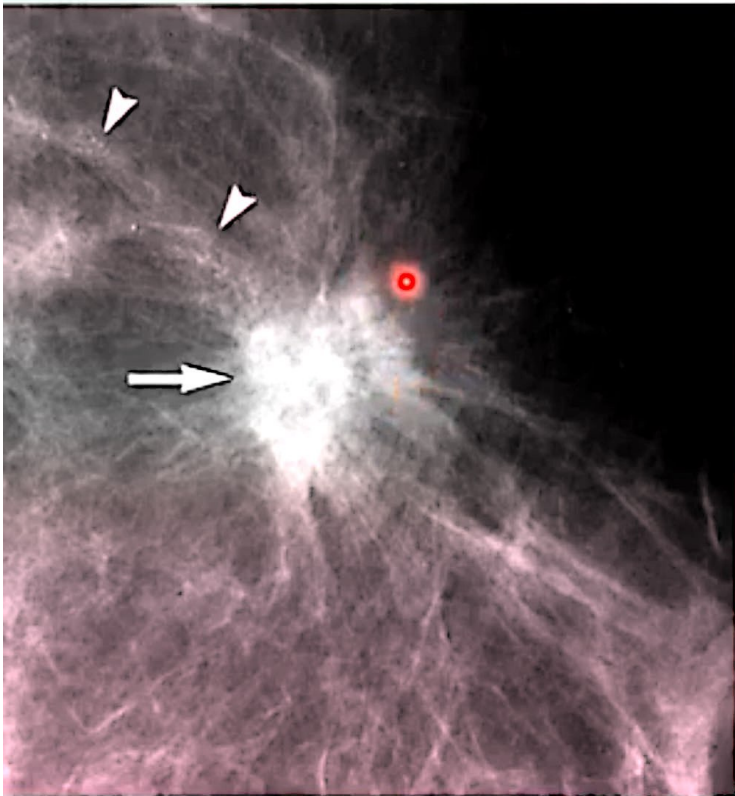


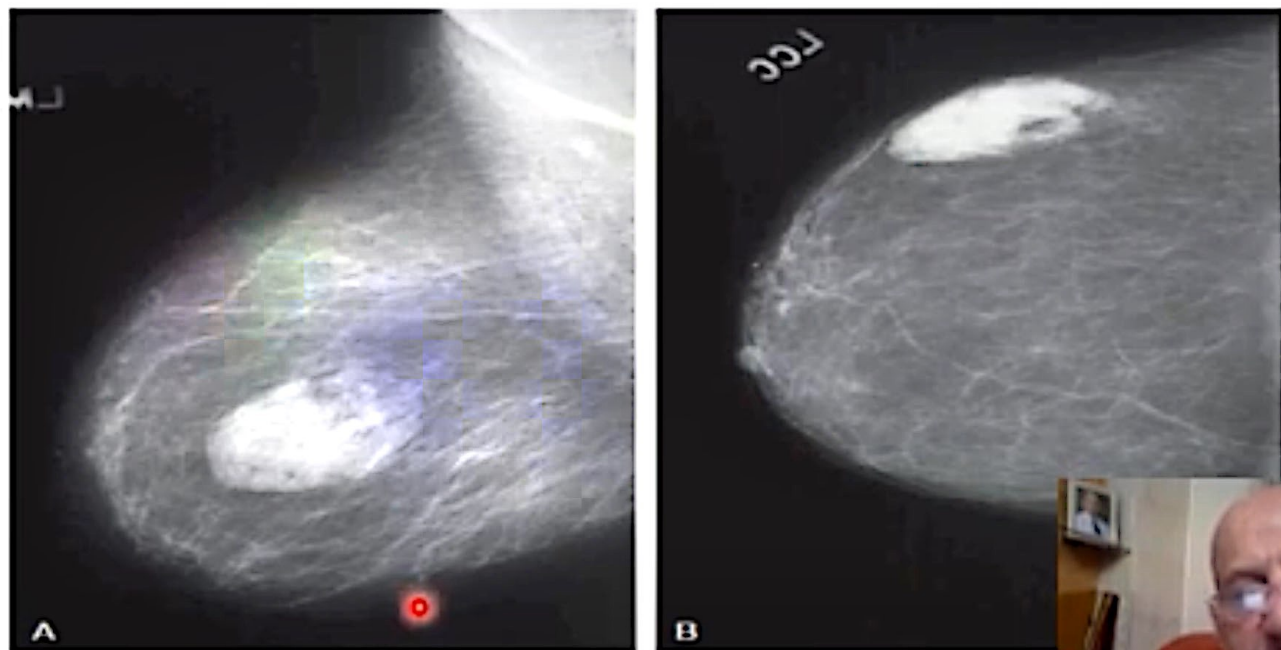






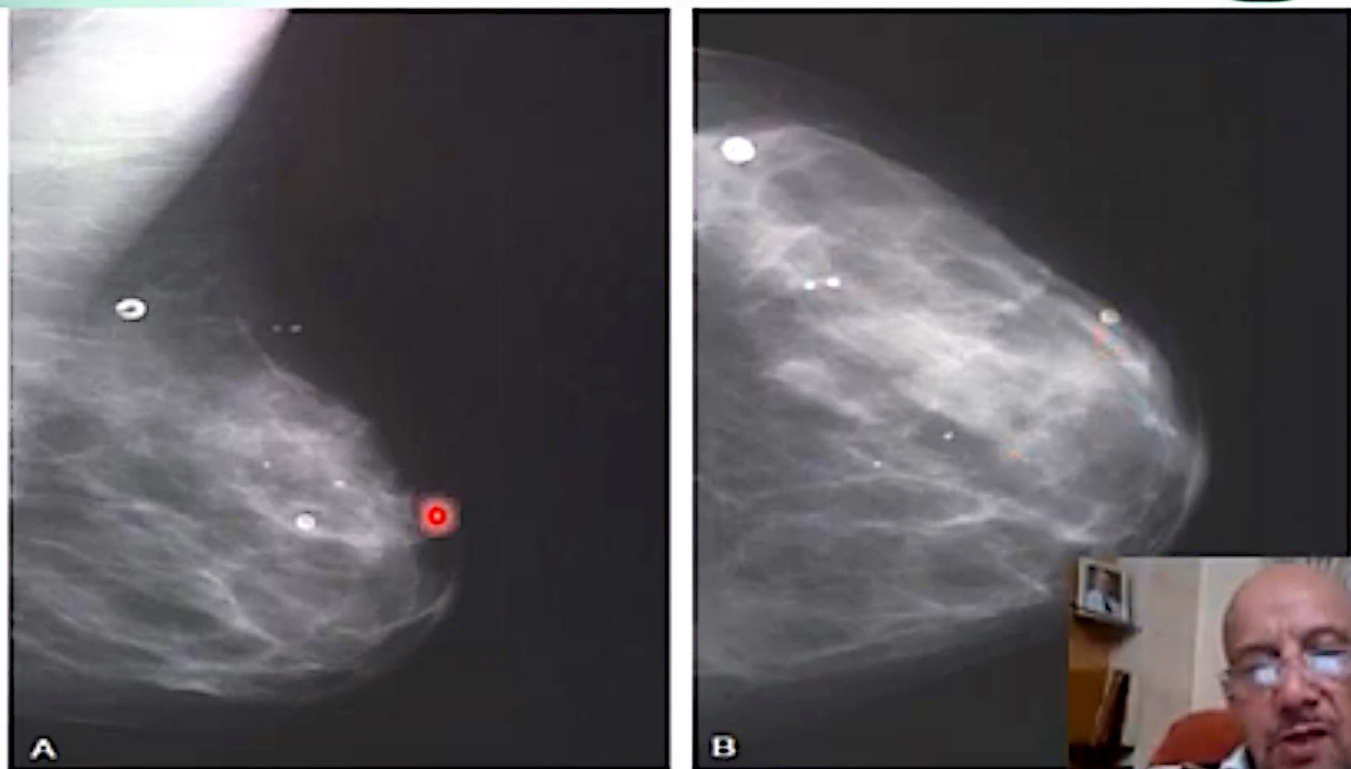






**Figure 2-4.** Hamartomas have a very characteristic appearance on mammography, composed of fatty and soft tissue densities surrounded by a fibrous capsule. **A.** The MLO view shows the "popcorn" or "fried egg" appearance of hamartoma. **B.** The CC view. (Images courtesy of Dr. Alex S. Kim, Department of Radiology, University of Michigan.)





**Figure 2-6.** MLO and CC views of the right breast demonstrate benign calcifications. (Images courtesy of Dr. Alexis Nees, Department of Radiology, University of

## Radiographic views of the breast

### Standard views:

- **45° Medio lateral Oblique (MLO view) / Lundgren's view**
- **Craniocaudal view (CC view)**



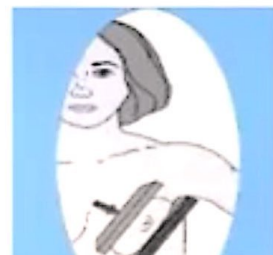
RCC

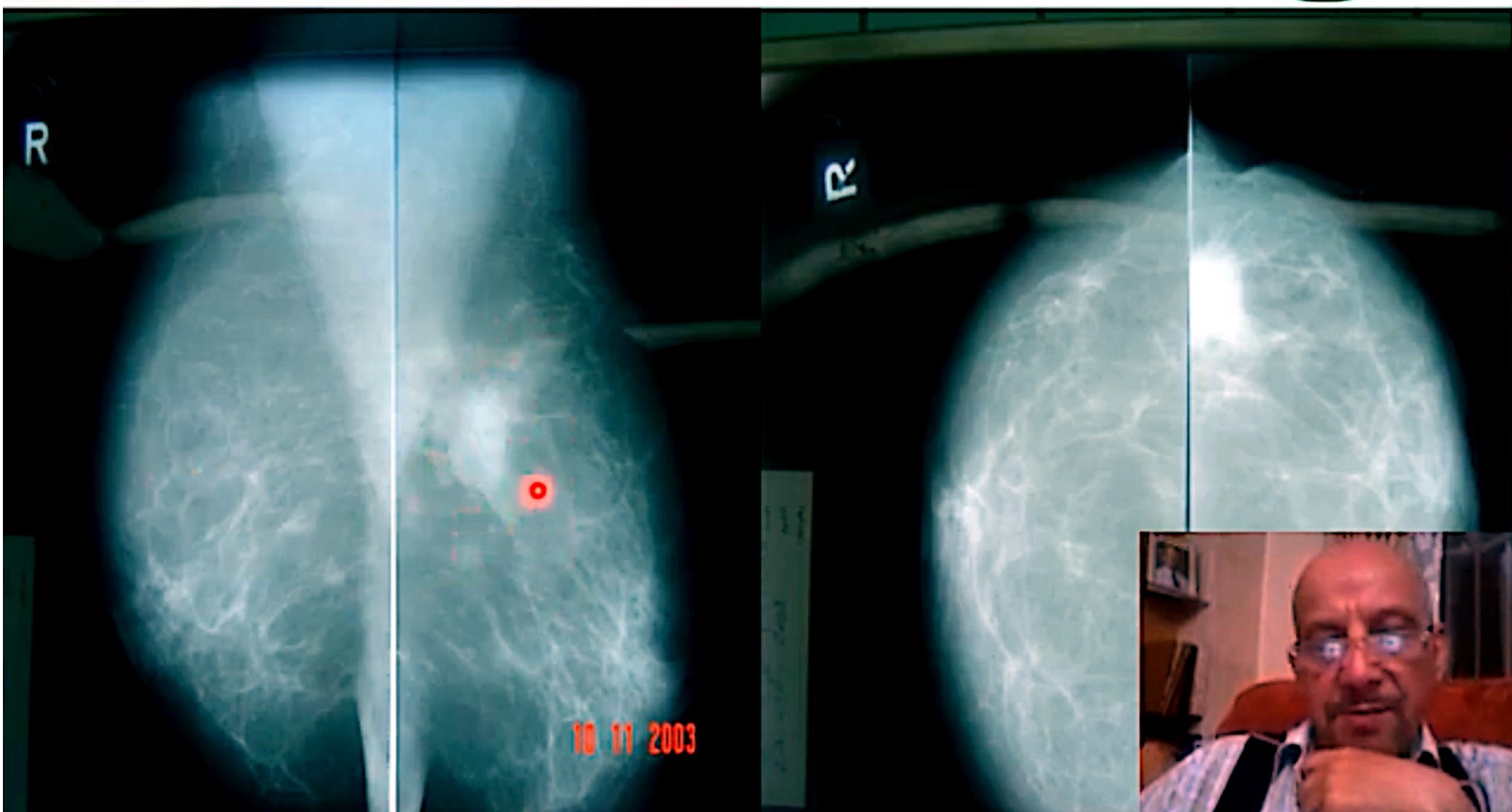


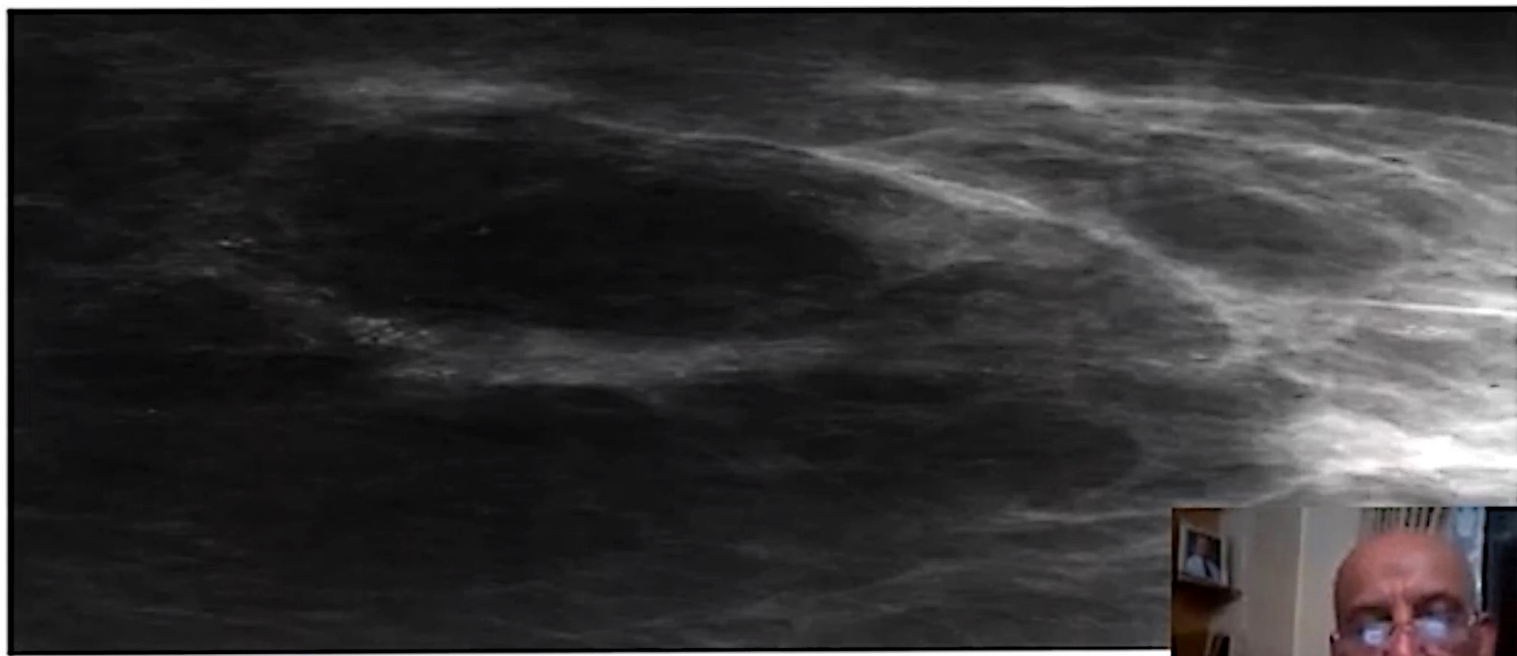
LCC



RMLO

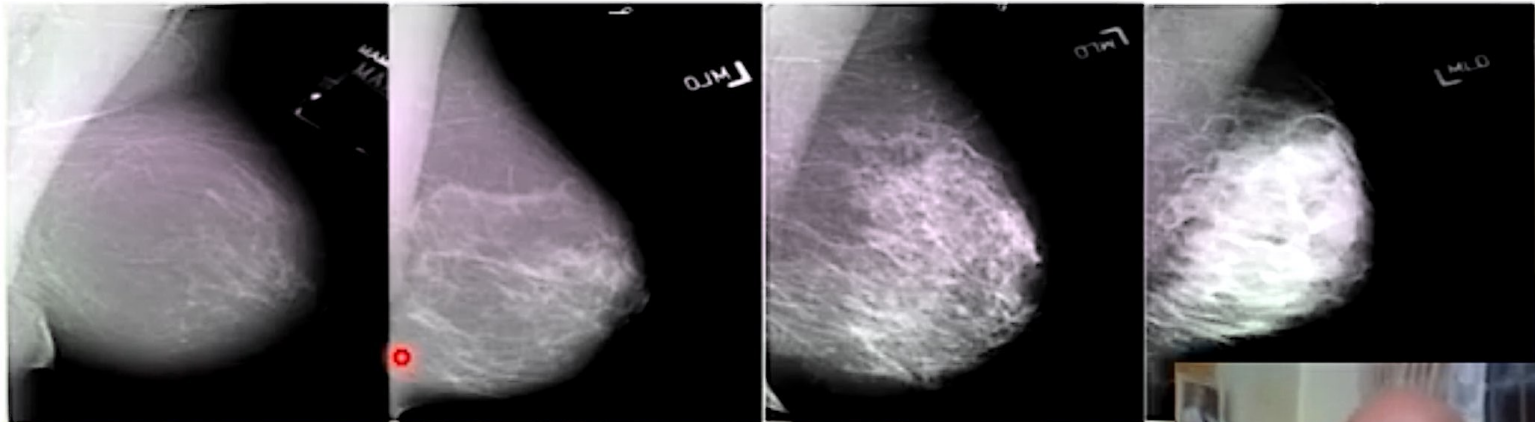






**Figure 2-7. Magnification CC view demonstrating segmentally distributed, pleomorphic calcifications. Pathology demonstrated DCIS and invasive carcinoma. (Image courtesy of Dr. A. Al-Hajri, Department of Radiology, University of Medicine and Sciences, Babylon, Iraq.)**

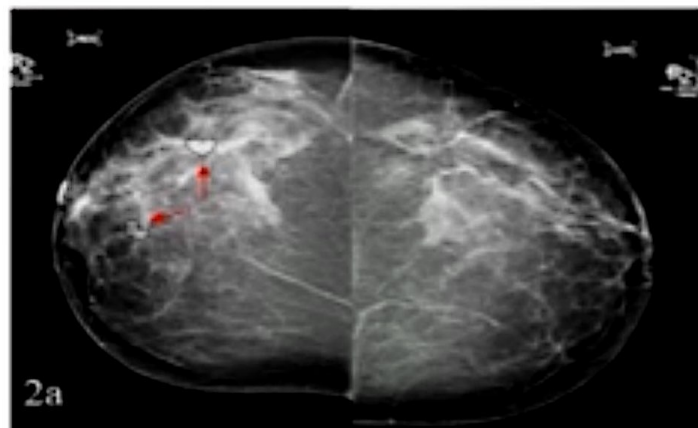
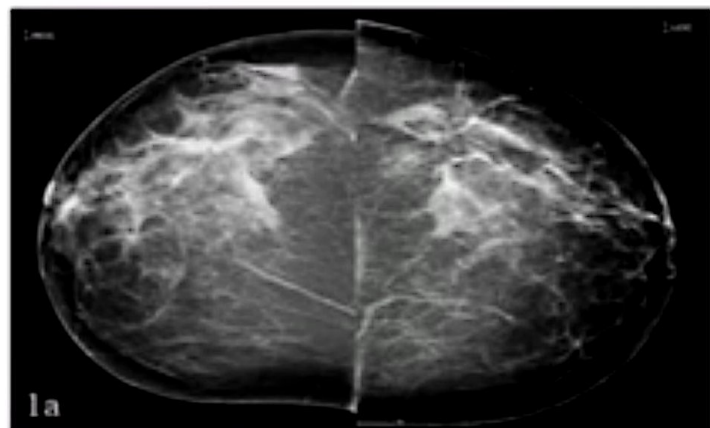




**Breast composition and its mammographic appearance.<sup>3</sup>**









## BI-RADS mammographic assessment categories

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

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



## Fine Needle Aspiration Biopsy (FNAB)

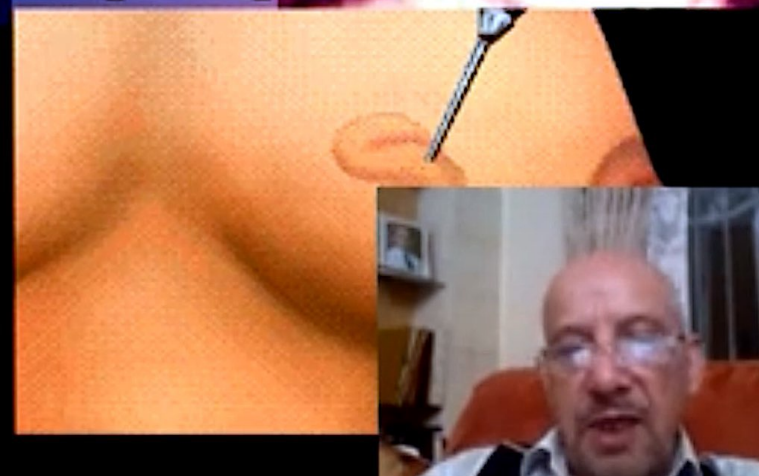
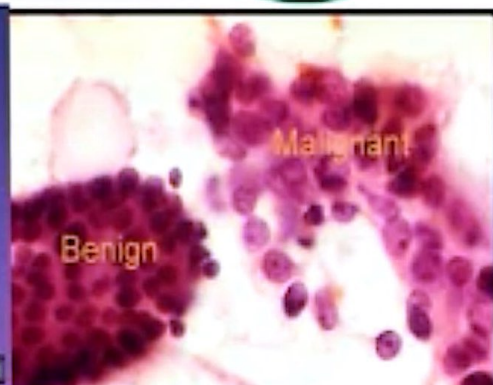
Fine needle **aspiration** biopsy is usually done in an office.

A small needle is inserted into the **tumor** and a sample of tissue is drawn up into the needle.

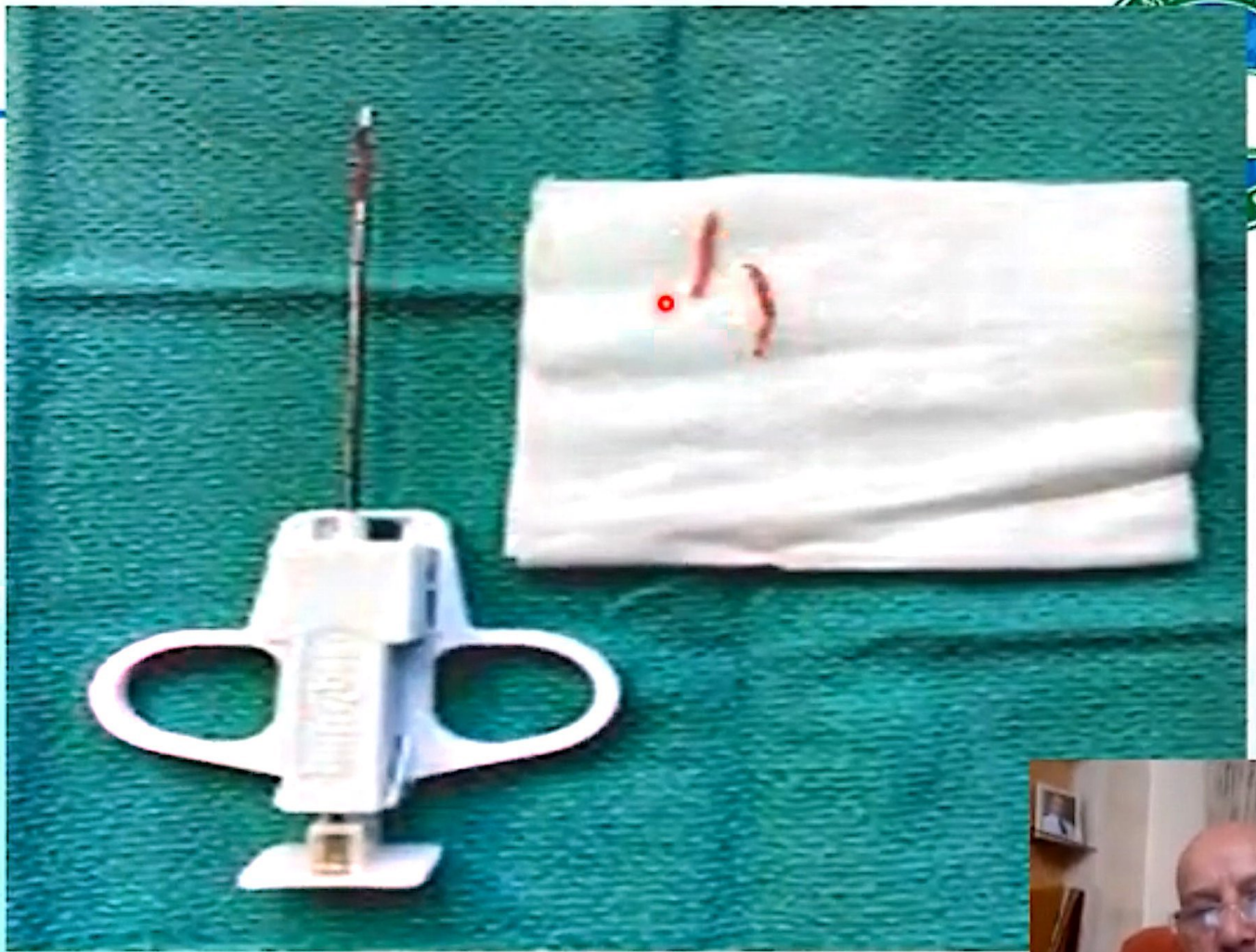
Material from the needle is put on a slide and examined for the presence of malignant cells.

It is a simple procedure done with minimal discomfort.

Disadvantage: May not always rule out **cancer** when it is negative.







# Biopsy



## FNA

- 🎗 relatively atraumatic
- 🎗 sensitivity of %99-73
- 🎗 ideal for simple cyst aspiration
- 🎗 can't distinguish in-situ vs invasive cancer

## CNB

- 🎗 cutting needle
- 🎗 greater trauma
- 🎗 high sensitivity - 100%
- 🎗 distinguishes between invasive and in-situ
- 🎗 stereotactic with mammography and US



## **Incisional biopsy**

**Incisional biopsy is done under local anesthesia, often with mild sedation.**

**It is an outpatient procedure.**

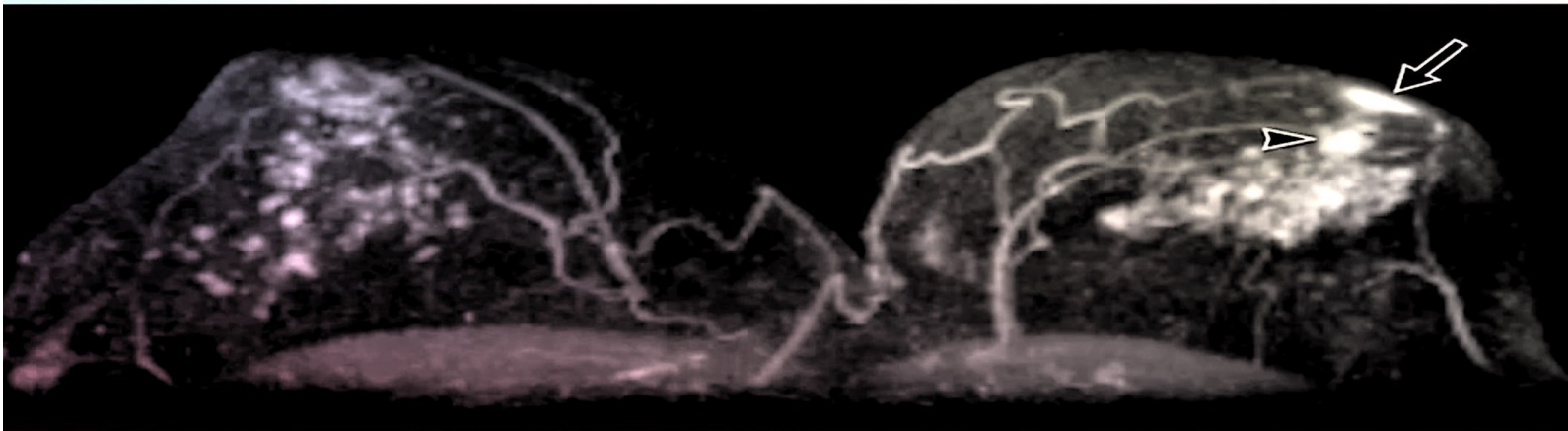
**Only part of the tumor is removed for diagnosis.**

**Incisional biopsy is usually done when the tumor is large.**

**It is rarely performed except in special circumstances.**



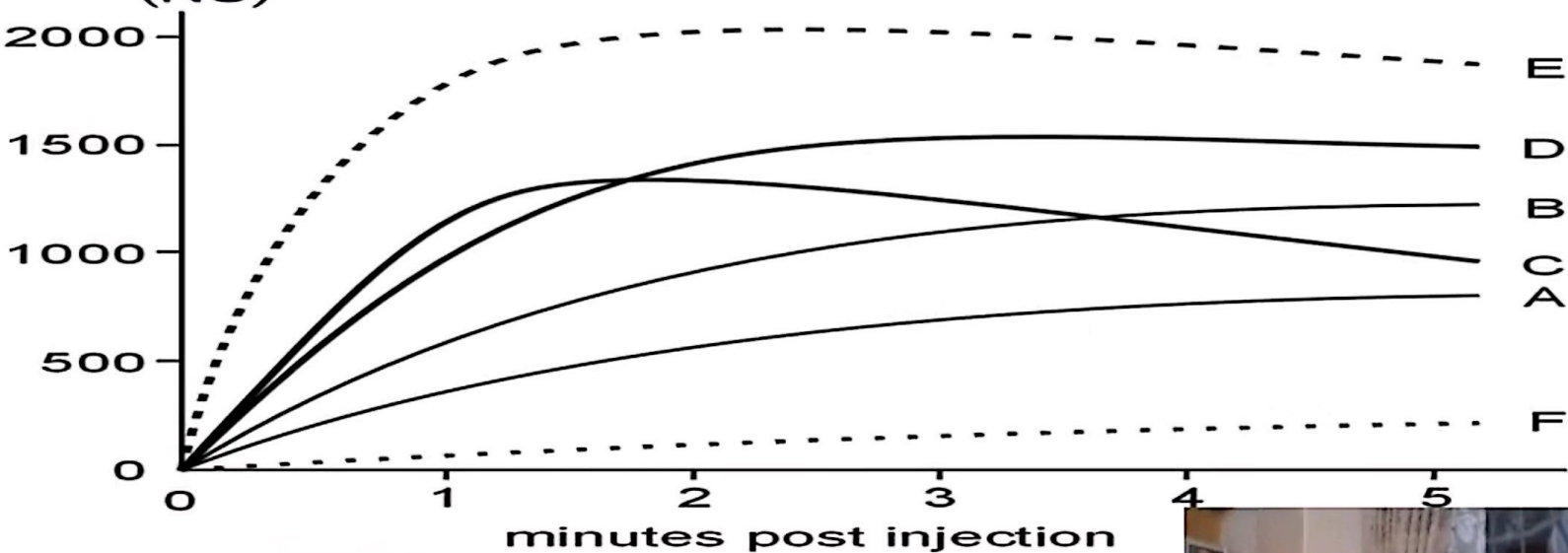
# Paget's Disease of the Nipple







enhancement  
(NU)



### MR Imaging, breast

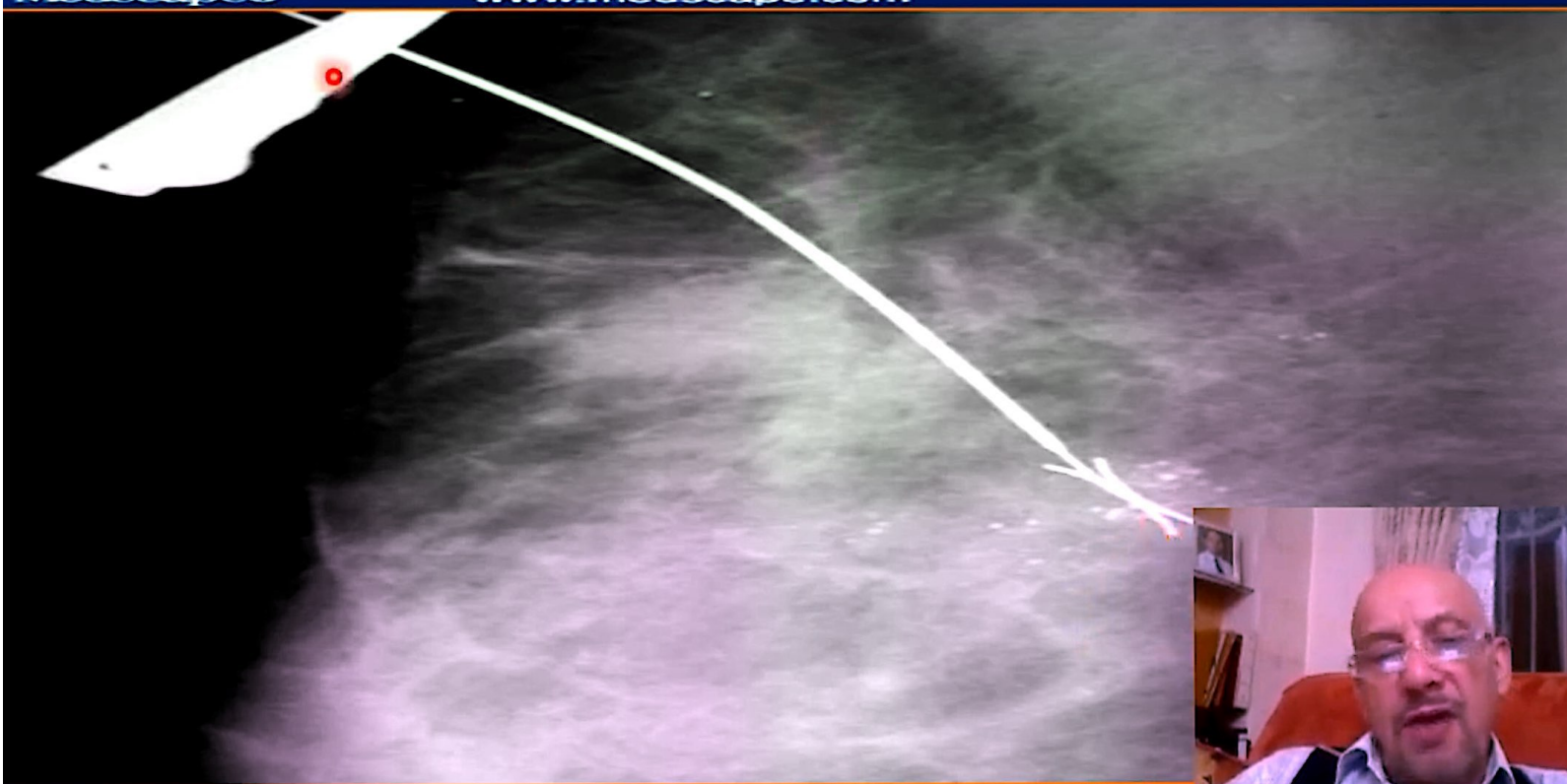
Enhancement curves for carcinomas. About 90% of enhance according to the patterns represented by D and E. NU = normalized units



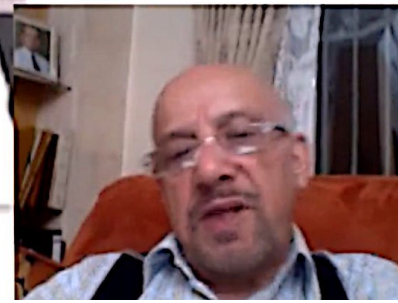


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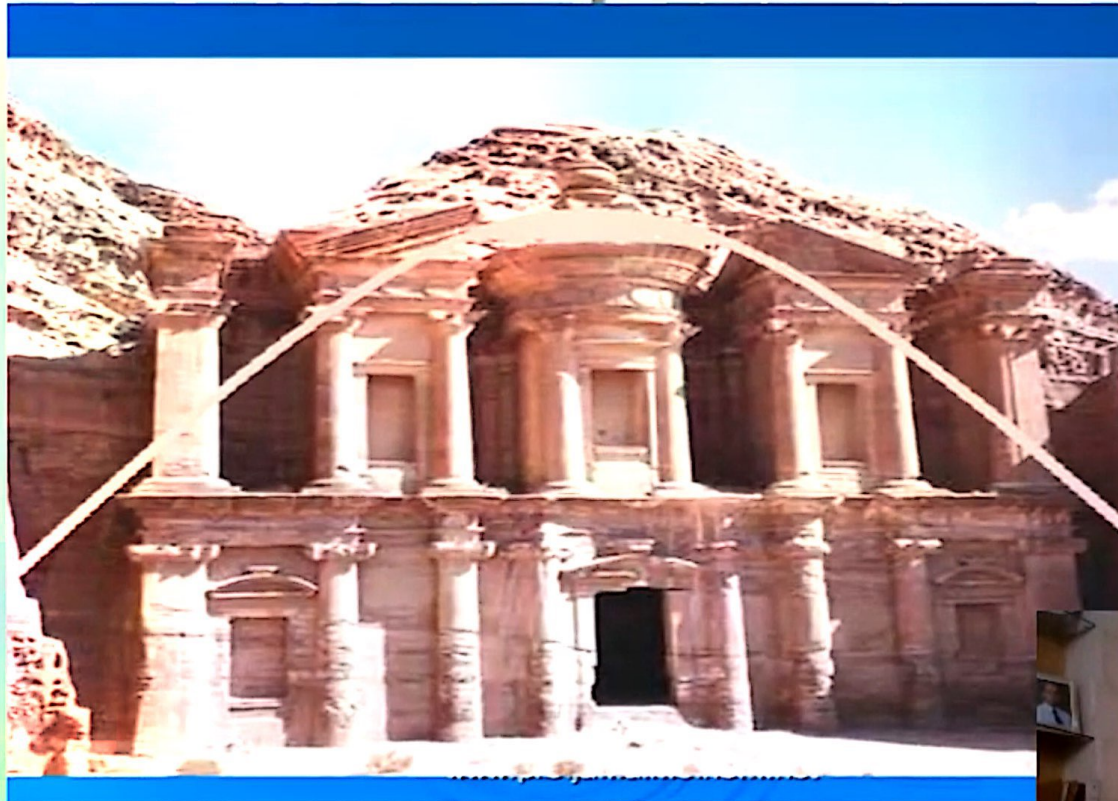


# Stereotactic Image- Guided Breast Biopsy





Thank you



# Breast Cancer Overview Part 2

Staging & Surgical Management



**Jamal Masad Melhem**

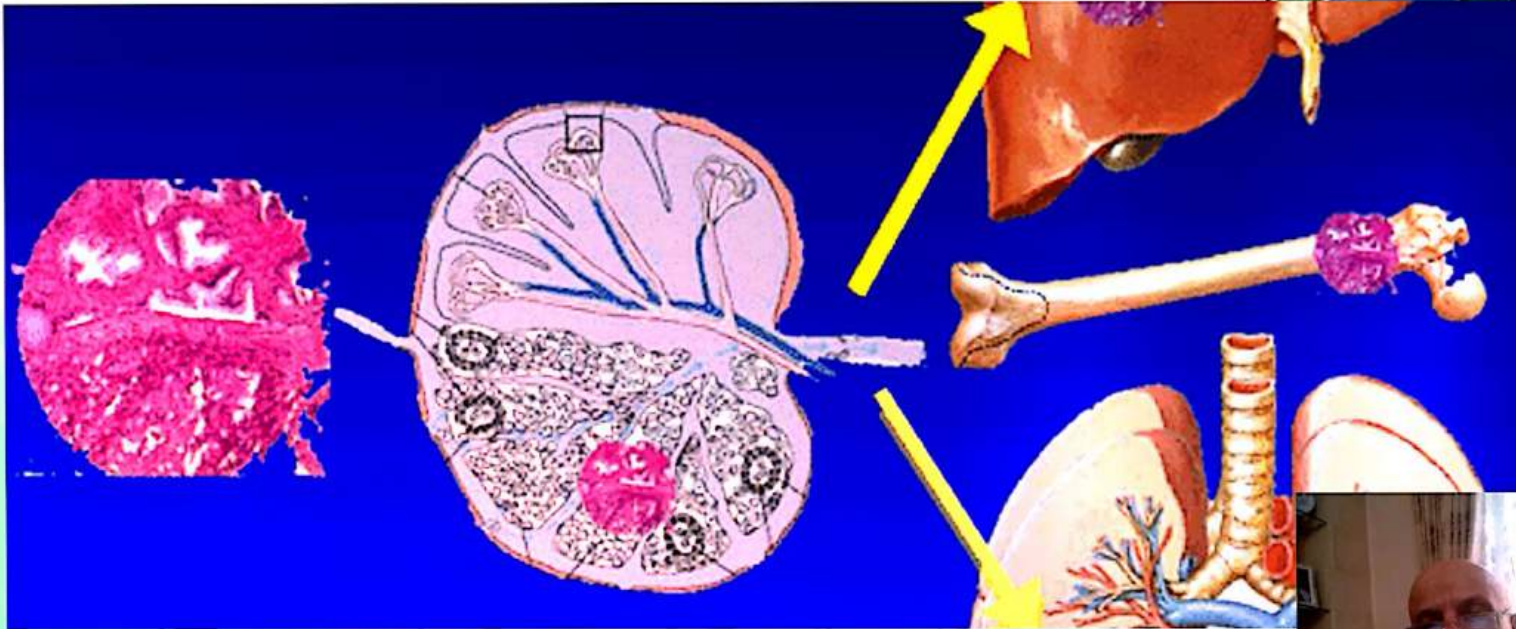
Professor Surgical oncology

Jordan University

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May go to Brain → Don't DO CT, unless  
pt has symptoms



- Staging should be done after doing the proper evaluation
- Of the primary tumor in the breast and axilla by imaging and
- Biopsy. (T&N)



# Bone Scan



CT For chest & Abdomen



increase Activity







*Bone. M<sup>D</sup> infiltration*  
↑

- CBC count with differential and platelet count
- Chemistry and renal function studies
- Liver function tests
- Tumor markers CA 15.3

*→ pt may develop Anemia due to*

11/1/2020



# Objectives of staging



- Provides useful prognostic information.
- Allows decisions to be made regarding adjuvant therapy.
- Allows comparison of treatment outcomes between different centers.



# TNM Criteria



- **T = Primary Tumor** *by US*
  - Tis = carcinoma in situ
  - T1 = less than 2 cm in diameter
  - **T2 = between 2 and 5 cm in diameter**
  - T3 = more than 5 cm in diameter
  - T4 = any size, but extends to the skin or chest wall
- **N = Regional Lymph nodes** *By examination*
  - N0 = no regional node involvement
  - **N1 = metastasis to movable same side axillary nodes**
  - N2 = metastasis to fixed same side axillary nodes
  - N3 = metastasis to same side internal mammary nodes
- **M = Distant Metastasis**
  - **M0 = no distant metastasis**
  - M1 = distant metastasis

**T2N1M0**



# Clinical Staging



	T	N	M	5-Year Survival
<b>Stage 0</b>	Tis	NO	M0	> 95%
<b>Stage I</b>	T1	NO	M0	Overall = 85%
<b>Stage II</b>				Overall = 66%
<b>(Stage IIA)</b>	T0	N1	M0	
	T1	N1	M0	
	T2	NO	M0	
<b>(Stage IIB)</b>	T2	N1	M0	
	T3	NO	M0	
<b>Stage III</b>				Overall = 41%
<b>(Stage IIIA)</b>	T0	N2	M0	
	T1	N2	M0	
	T2	N2	M0	
	T3	N1, N2	M0	
<b>(Stage IIIB)</b>	T4	Any N	M0	
	Any T	N3	M0	
<b>Stage IV</b>	Any T	Any N	M1	Overall 10%

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15







Stage 0



Stage I



Stage II

>2cm



Stage III

>1W



Stage IV  
mets.





## 5-year relative survival rates for breast cancer by stage

- The 5-year relative survival rate for women with **stage I** breast cancer is close to **100%**.
- For women with **stage II** breast cancer, the 5-year relative survival rate is about **85%**.
- The 5-year relative survival rate for stage III breast cancers is about **70%**. But often, women with these breast cancers can be successfully treated.
- Breast cancers that have spread to other parts of the body are more difficult to treat and tend to have a poorer outlook. Metastatic, or **stage IV** breast cancers, have a 5-year relative survival rate of about **20%**. Still, there are often many treatment options available for women with this stage of breast cancer.

⇒ Do surgery then CK

⇒ chemotherapy



# Histological Grades



Prognosis

Grade

## Grade 1



**Glandular/Tubular Differentiation:**  
 >75% of tumor forms glands

**Nuclear Pleomorphism:**  
 Uniform cells with small nuclei similar in size to normal breast epithelial cells

**Mitotic Count:**  
 < 7 mitoses per 10 high power fields

## Grade 2

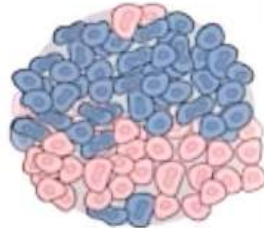


**Glandular/Tubular Differentiation:**  
 30% to 75% of tumor forms glands

**Nuclear Pleomorphism:**  
 Cells larger than normal with open vesicular nuclei, visible nucleoli, and moderate variability in size and shape

**Mitotic Count:**  
 8-15 mitoses per 10 high power fields

## Grade 3



**Glandular/Tubular Differentiation:**  
 <10% of tumor forms glands

**Nuclear Pleomorphism:**  
 Cells with vesicular nuclei, prominent nucleoli, marked variation in size and shape

**Mitotic Count:**  
 > 16 mitoses per 10 high power fields

*poorly diff.*

Grade I tumors have a total score of 3-5

Grade II tumors have a total score of 6-7

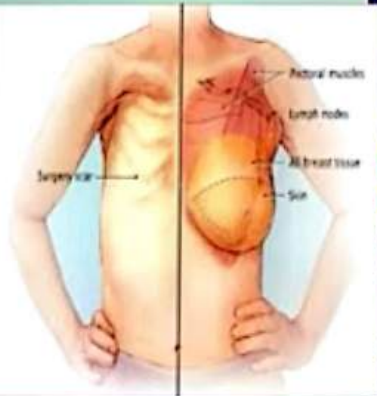
Grade III tumors have a total score of 8-9





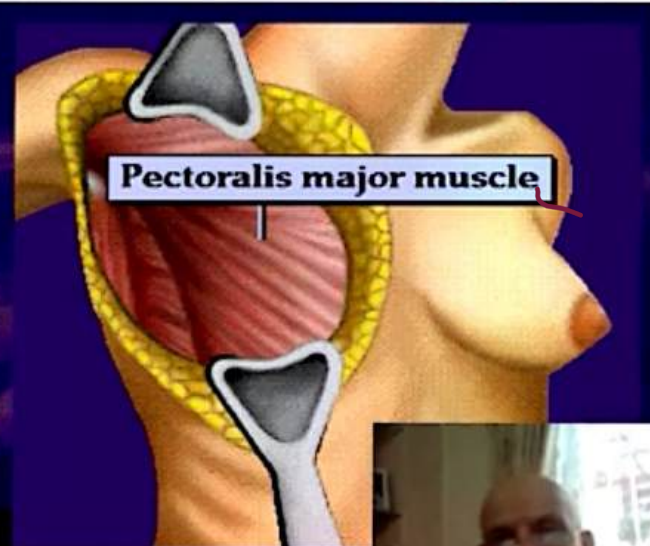
①

## Radical mastectomy



In radical mastectomy the muscles of the chest (e.g., **pectoralis major** and **pectoralis minor**) along with the breast and **lymph nodes** are all removed.

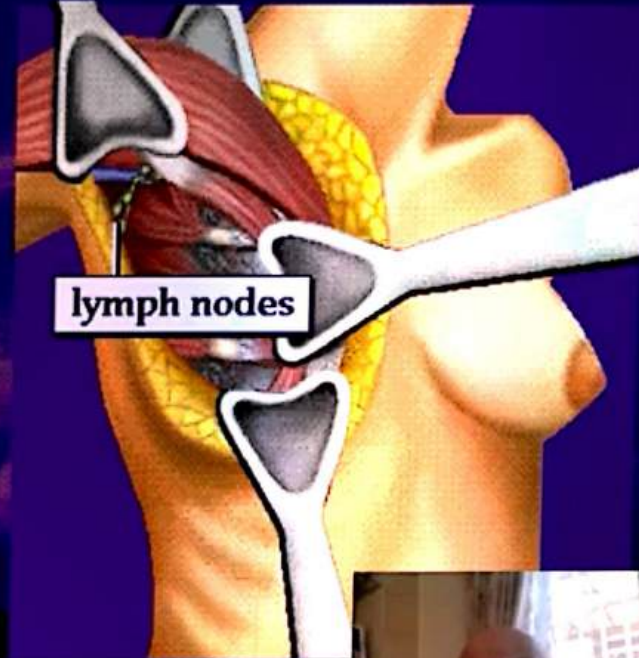
Radical mastectomy is now rarely performed. It is usually reserved for very large **cancers** that have grown into the muscle.



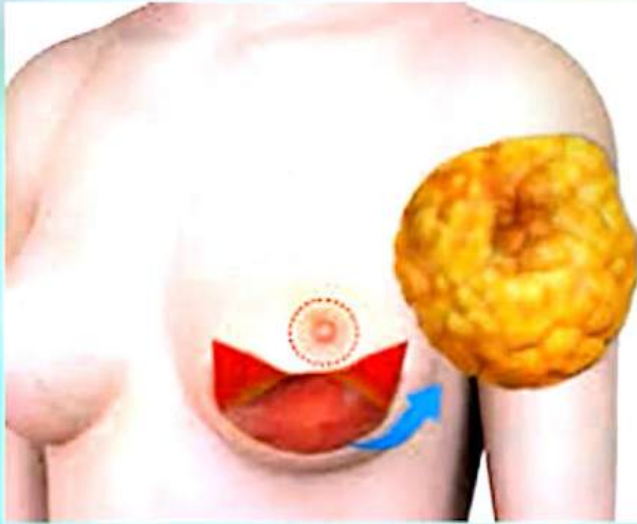
↳ loss shoulder stability

**MODIFIED RADICAL MASTECTOMY**

*≈ R. mastectomy*



Do skin sparing mastectomy



or replace it by silicone implant



### ③ Trans- flap

- \* Transverse Rectus Abdominous myocutain \*
- less popular





From Back → less complication  
→ But we loss its Function



## Latssimus flap

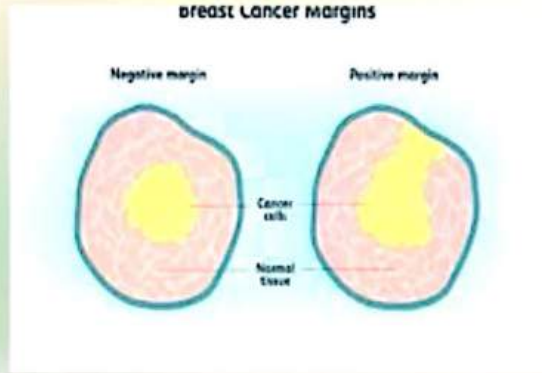
Large Defects in Medium-Sized or Small Breasts



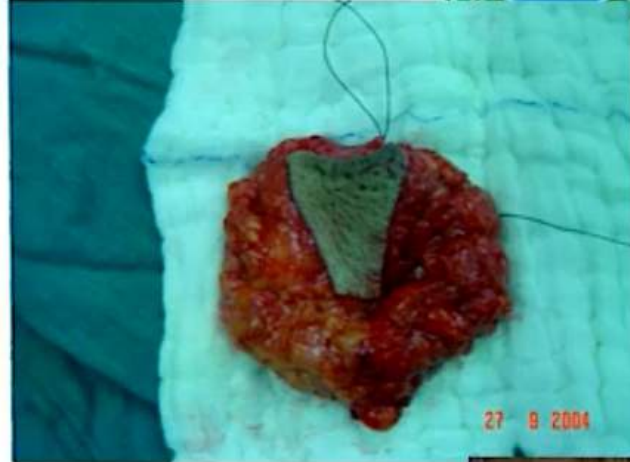
[www.profjamaimehem.net](http://www.profjamaimehem.net)

Purely ms not Fat  
ms will Atrophied ← with time





*wide local excision  
with safety margins*



# Types of Breast Conserving Operations



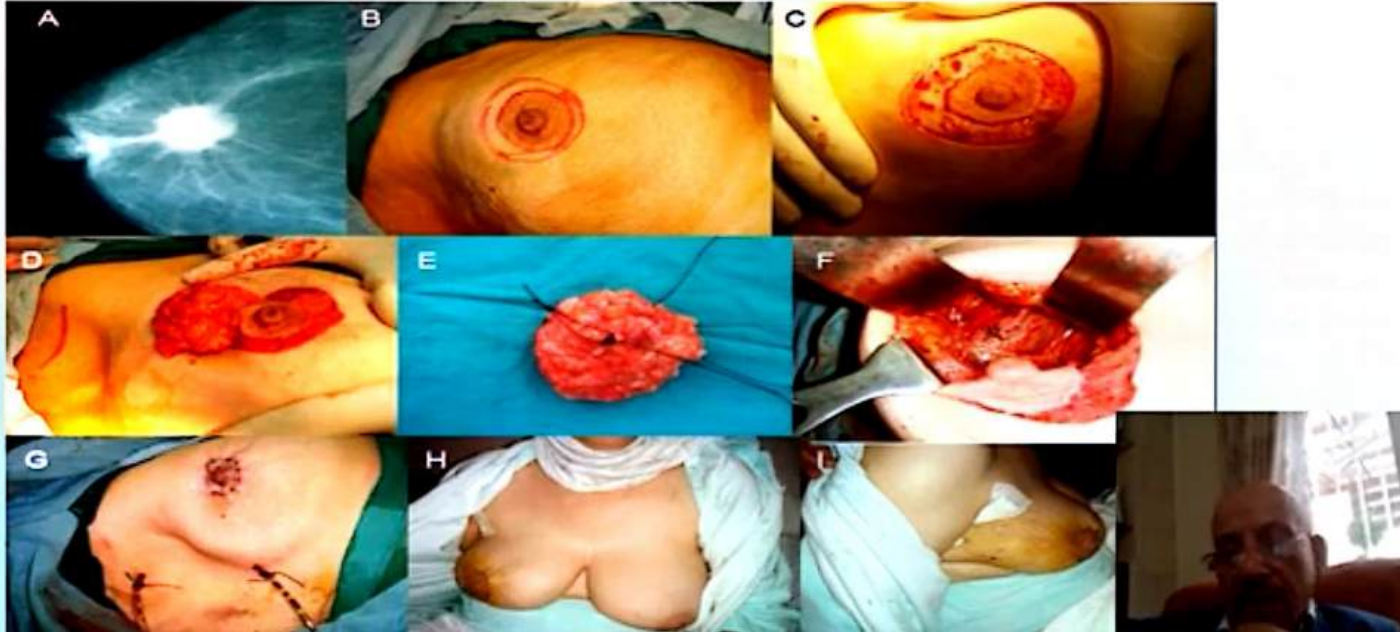
- Segmental mastectomy, quadrectomy, Partial mastectomy

*not standard / in the past*





# neoplastic surgery



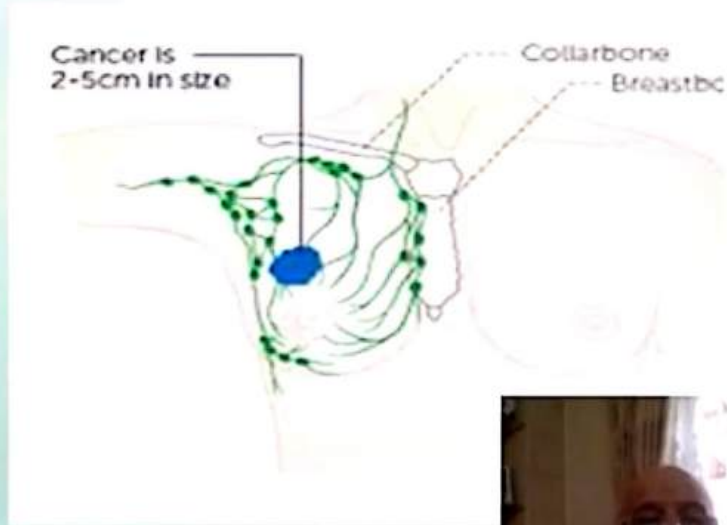
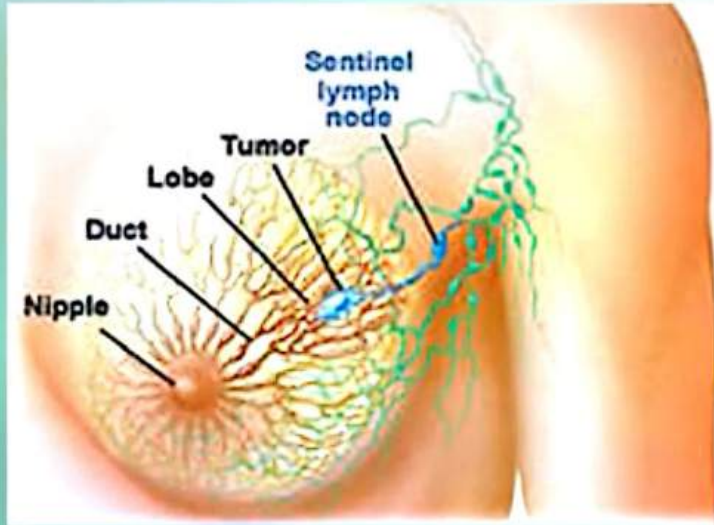
Don't Mastectomy - Infection

# Local Flaps



[www.profjamalmelhem.net](http://www.profjamalmelhem.net)





• Do level 2 or 3

• use  $\rightarrow$  First LN  $\rightarrow$  Ax. dissection or not



**Thank You**

