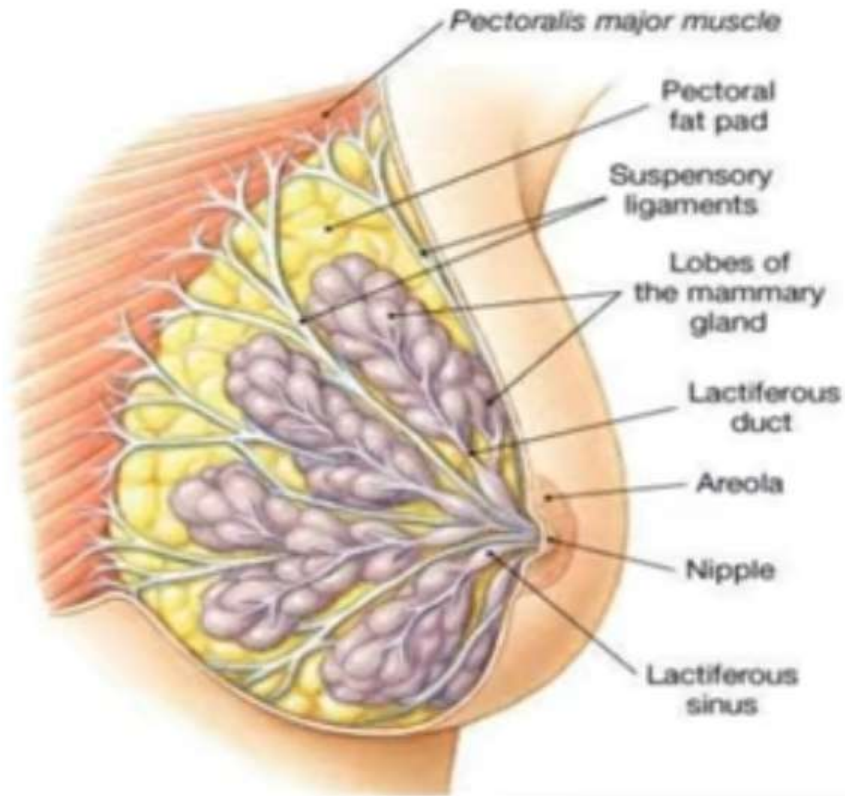




Lobes

Lobules

Ducts

sinuses

25%

has lobular

Carcinoma

insitu

invasive

75%

has ductal

Carcinoma

insitu

invasive

Breast cancer

↳ mc cancer in female [25%]

↳ Basal cell Carcinoma -
↳ squamous cell Carcinoma -

- Is the most frequently diagnosed non skin cancer in women 25%.
- 2nd commonest cause of death in women.
- 50 % of all cancers in women between 40-55 y. *middle aged female*
- 1 million case diagnosed annually in the world.
- 70% of women have no risk factor.
- One fifth of breast cancer occur in women less than 50y. *so it common in old age female..*
- Now 5 y survival rate is around 90%. *in developed countries..*
early diagnosis - screening program, ...

* 3 Type of Breast Tissue:-

- ① glandular...
- ② fibrous...
- ③ fat...

* 3 level of Breast LN:-

① low axillary LN [level 1]

→ in the ant. axillary fold called pectoral LN

→ in the post. axillary fold called subscapular LN

→ at level of axillary vein called axillary LN

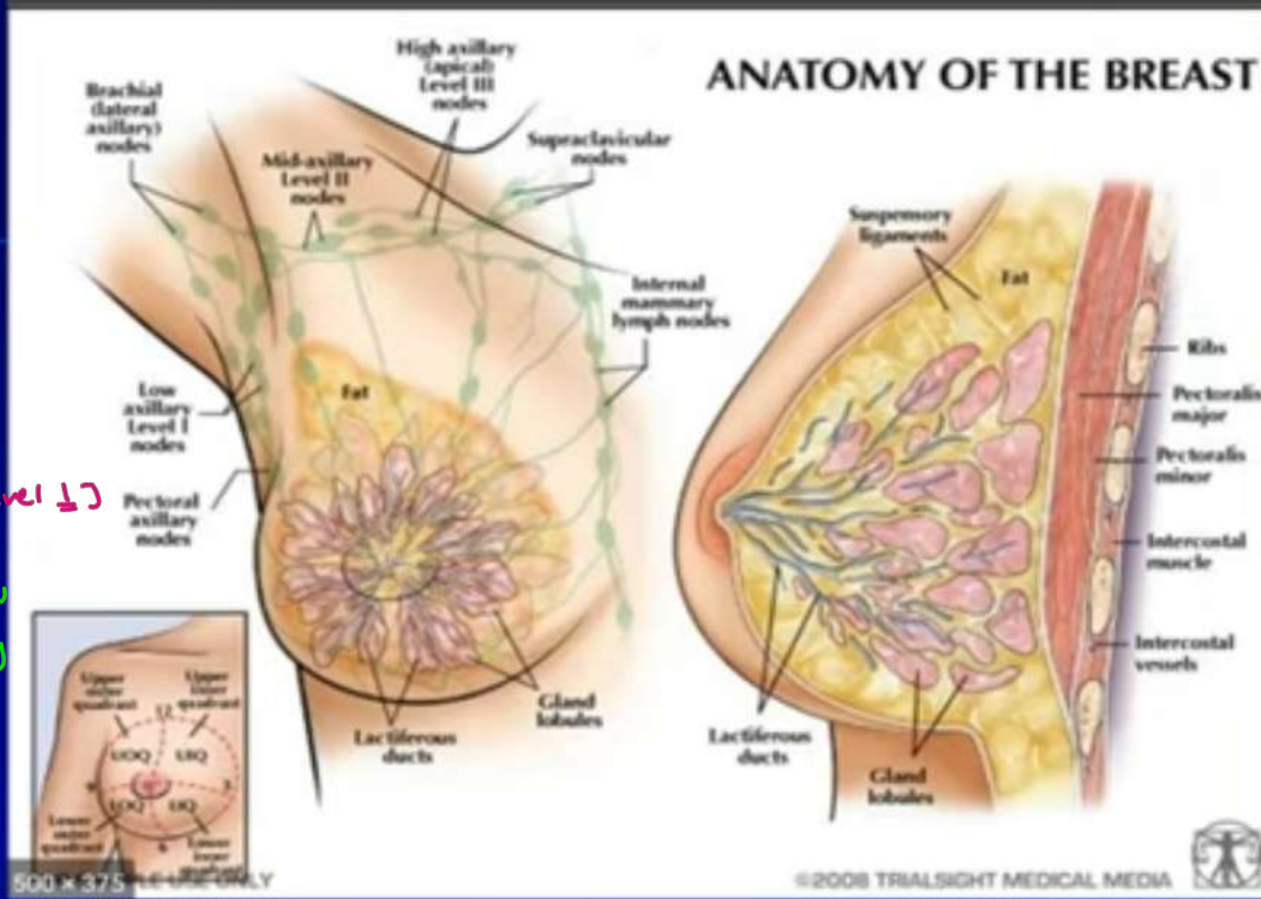
② central LN [level 2]

③ Apical LN [level 3] called infraclavicular LN...

↳ which drain into supraclavicular LN...

* 92% of Breast Cancer mets to axillary LN... [75%]

* 8% of Breast Cancer mets to internal mammary LN... [25%]



* The Breast has 16-20 lobes
lobes are called lobules
↳ have lactiferous ducts
↳ has lactiferous sinus
nipple is called...

* The mcc of Breast Cancer is:- ductal Carcinoma 75%

Etiology and risk factors

Hormonal influence

- Age of menarche, and menopause. *early menarche and late menopause → ↑ risk of Breast Cancer*
- Number of pregnancies, age of first pregnancy. *كلما جاءت Babies أكثر + كلما كان عمرها في أول حمل أصغر راح تقل نسبة Breast Cancer...*
- Nulliparity. *No pregnancy → ↑ risk of Breast Cancer...*
- Breast feeding history?. *No Breast feeding → ↑ risk of Breast Cancer...*
- Oral contraceptive pills, and HRT. *less risk than HRT ↑ risk of Breast Cancer...*
- Oophorectomy. *↓ risk of Breast Cancer* *↳ Hormone replacing therapy*

*استئصال المبايض
↓
decrease the risk of
Breast Cancer...*

- **Age** (old age → ↑ risk of Breast Cancer) * the peak incidence of Breast Cancer at age:- 69-70 years old..
- **Obesity, alcohol, lack of exercise.** ✓
- ↓ **Socioeconomic status.** (رفع المكان) → ↑ risk of Breast Cancer...
- **Dietary influence.** [lot of fat - red meat → ↑ risk of Breast Cancer]...
- **Family history:** Inherited susceptibility **10%** → of all Cancer
- ① **Early age of onset .**
- ② **Bilateral disease.**
- ③ **Multiple primaries in the same lady.**
- ④ **Two or more first degree relatives affected**
- ⑤ **BRCA I , BRCAII, P53, HER2, ER.** [the affected genes]...
 mutation in these genes... Estrogen R.

	BRCA1 <i>BReast CAncer gene 1</i>	BRCA2
	<i>[more aggressive cancer]</i>	
Breast Cancer, in unaffected women (up to age 80)	<u>60-90%</u> <i>[75 %]</i>	<u>45-85%</u> <i>[60 %]</i>
Lifetime risk of a new cancer in the other breast in woman who have already had a breast cancer in one breast	50% 5 year risk of new breast cancer 10%	50% 5 year risk of new breast cancer 5-10%

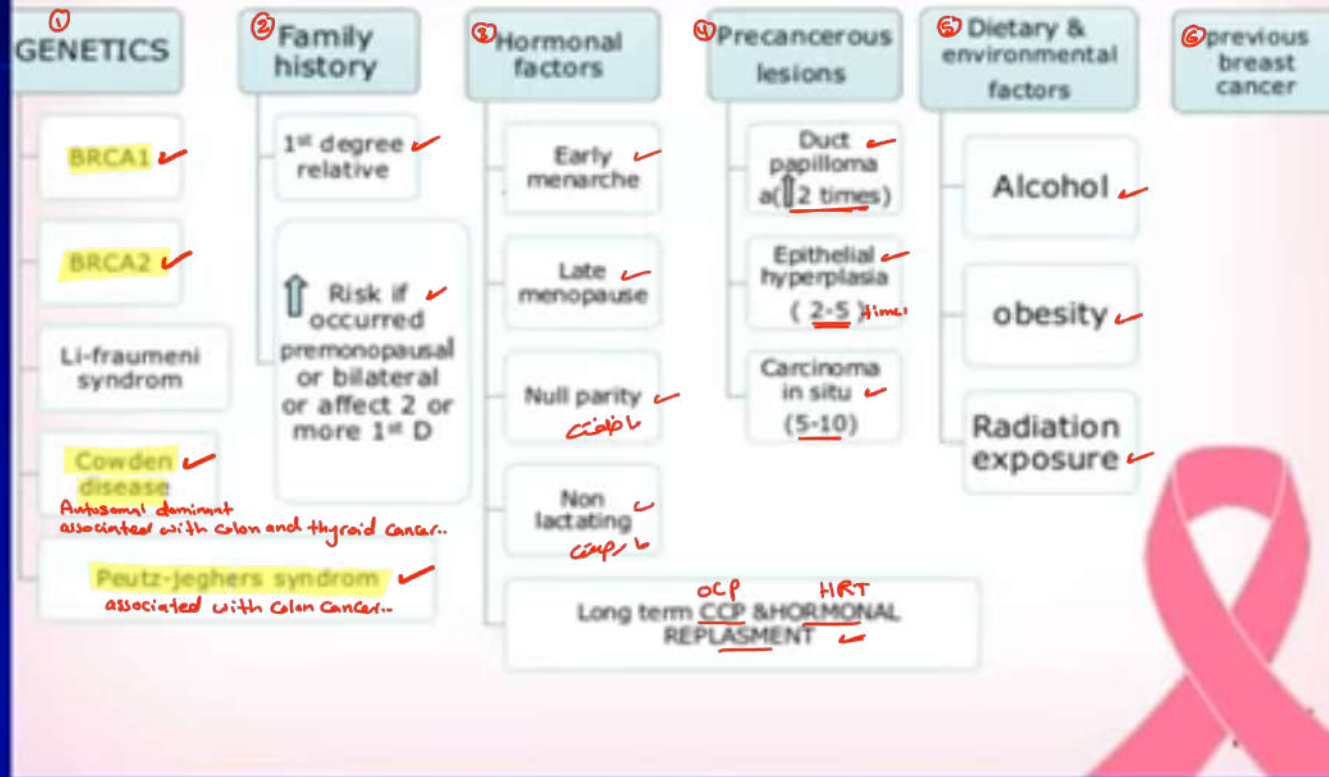
Who Should be Tested for BRCA Mutations?

You should consider genetic testing

for BRCA1 and BRCA2 mutations if any of the following factors are present on either side of your family history:

- Anyone in the family with Ovarian Cancer.^①
- Two or more first-degree relatives (mothers, sisters, daughters) with a history of breast cancer.^②
- Any first-degree relative diagnosed with breast cancer at or before age fifty.^③
- Three or more first and second-degree (grandmothers, aunts) relatives who develop breast cancer.^④
- Any first-degree relative with a history of cancer in both breasts.^⑤
- Any first or second-degree relative with a history of both breast and ovarian cancer.^⑥
- Breast cancer in any male relative

Risk factors



Risk Factors for Breast Cancer

- @ Obesity ✓
- @ Diet: Fat ✓
Alcohol
- @ Lack of Physical Activity ; Stress ✓
- @ Radiation Exposure ✓
- @ History of cancer: breast, uterus, cervix, ovary ✓
- @ Hormones: estrogens in Hormone replacement therapy & Birth control pills ✓
- @ Genetics : certain conditions that are inherited ✓



12 70% have no risk factors

Prevention *→ do Breast awareness programmes...*

Breast Cancer Risk Factors

THAT CAN BE CONTROLLED

بیشتر ریسک فاکتور ها در زنان قابل کنترل است [50%] risk factors in females



Factors that increase risk



■ **Family History**

• **Lifestyle**



• **Personal History**



Breast screening

the most important to reduce the risk of Breast Cancer
Cancer د علاج بيتم تشخيص Early تبين يستفاد...

• BSE + CBE

- 2/3 OF female discover their cancer. without BSE

Mammograms

- Reduce risk of death from breast cancer in women 50-65 y by 30%. So we start the mammogram at age 40 or 45 y/o...
فيم female بعمر 40-50 وعايدة risk factor كبر تقدر CBE كن 3 سنين...
انماضو، اولها 40 سنين ال CBE كن سنه...
له بع ماعنده risk factor

- Every 1-2 years .
screening age اهم
فعله كن سنه افضل-

- Two views cranio caudal and oblique.

- Tumors are usually , small , well differentiated , She not papate any

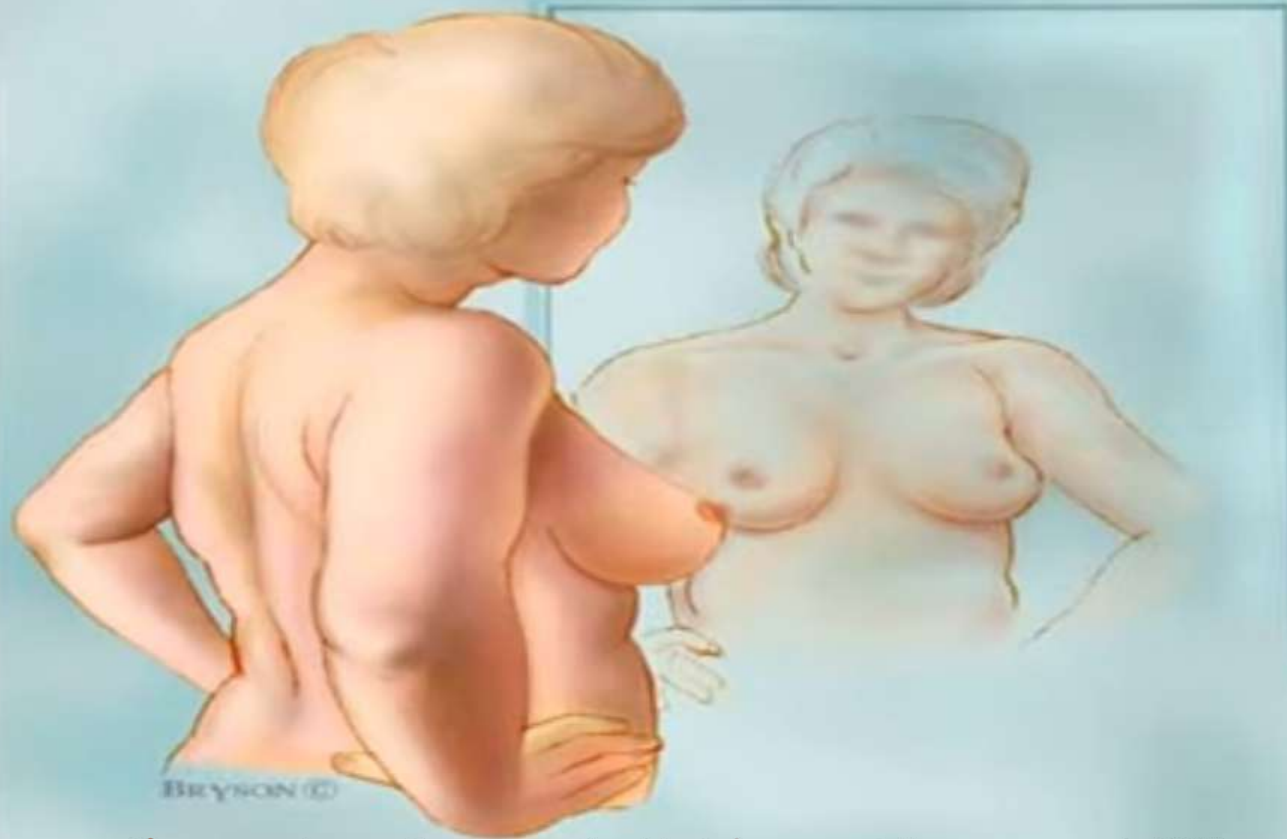
- Node negative.

- 10-15% of breast cancer are not seen in mammograms . So the CBE very important...
mass بالبحر حقه تكون حقة ضغلة لا فوضنا ...

* The US not screening modality for Breast Cancer..

... Mamo ...
Can't diagnose the small masses < 1cm...
حقة ضغلة بحال لا مامل...

* The mammogram is screening modality for Breast Cancer..



← ال BSE بنعل جہ نہایت پر aligned + day 5 خانہ بیقراری کی ال fluid + درجہ • بنقد رقصہ افضل





ہے کہ اس Female ستایہ الامم اور مایہجیرا ادرق ممکن تہد یدم فی السہد رتقل نفوس حیہ کل سہد...



Clinical Breast Examination

- Performed by doctor or trained nurse practitioner
- ✓ Annually for women over 40yrs
- ✓ At least every 3 years for women between 20 and 40 yrs
- More frequent examination for high risk patients



Diagnosis and investigations

- **History + BSE**
- **Clinical examination CBE**: Both ^①breasts,
^②Lymph nodes, ^③Axilla and ^④Supraclavicular region.

- **Imaging of breast disease**

Ultrasound → not screening modality but benefit for diagnosis--

- **Below 35 y** ✓
- **Tumor size, and margins** supplementary to mammo as screening modality. *mamogram میں مکمل نہ*
- **Solid or cystic (simple-complex)**
- **Single or multiple.**
- **Localize lesions** us **guided biopsy.**
- **Sensitivity of US for DCIS is low compared to mamos**
↳ ductal carcinoma in situ--

WHAT TO LOOK OUT FOR...

THE EARLIER BREAST CANCER IS FOUND, THE BETTER THE CHANCE OF BEATING IT. SO LOOKING OUT FOR ANY CHANGES AND GETTING THESE CHECKED BY YOUR GP IS VERY IMPORTANT.



① VISIBLE LUMP ON ARMPIT [in the axilla]



② A LUMP IN THE BREAST دائقة طرية



③ DIMPLED OR DEPRESSED SKIN



④ SWELLING OF ALL OR PART OF BREAST طامة لبرا



⑤ NIPPLE CHANGES INVERSION or retraction



⑥ REDNESS & HEAT inflammation Breast Cancer

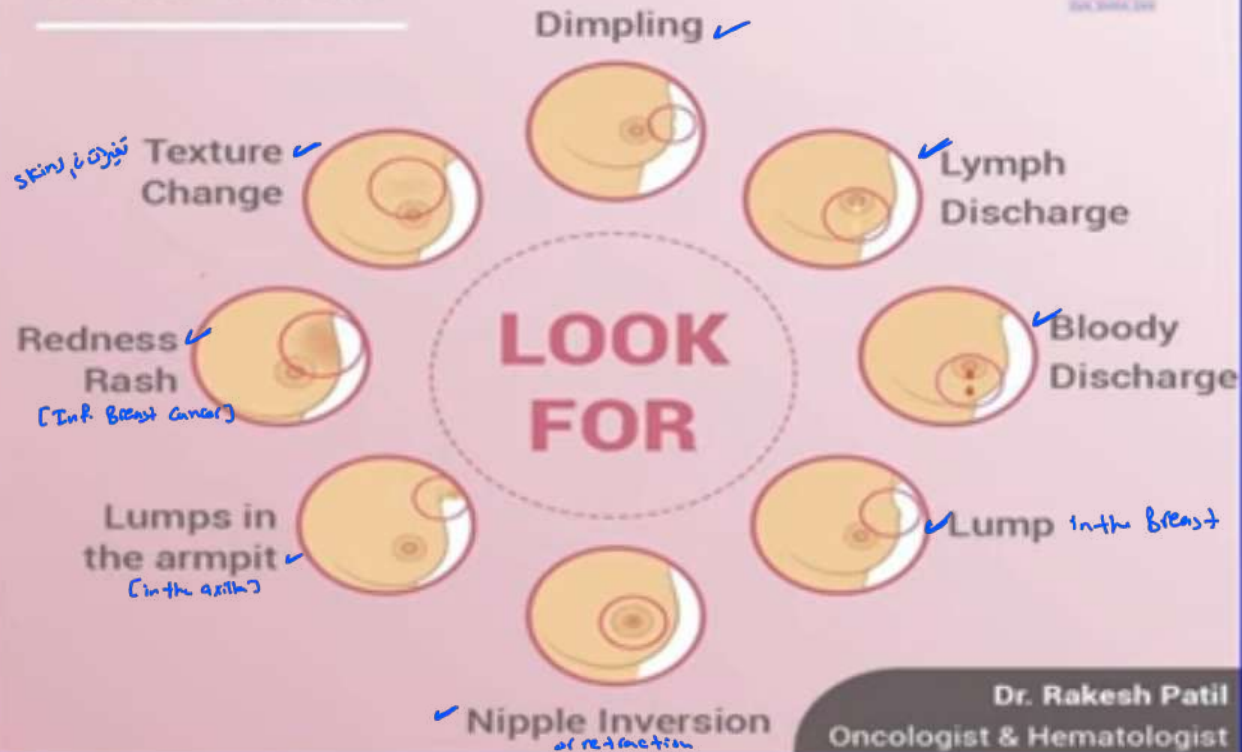


⑦ SKIN IRRITATION OR TEXTURE CHANGE or skin infiltration



⑧ BLOODY DISCHARGE [Nipple Bleeding]

BREAST CANCER SYMPTOMS



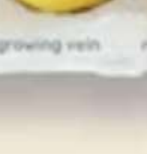
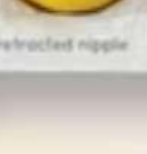
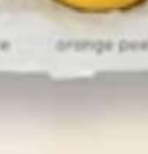
Dr. Rakesh Patil
Oncologist & Hematologist

Symptoms



WHAT BREAST CANCER CAN LOOK & FEEL LIKE

Recognize something? Don't panic, some changes are normal. But if it stays around be smart—show a doctor.

feeling a thick mass	indentation	skin sores	redness of heat	swell or new fluid	dimpling
					
					
					

 bump

 hidden lump

 growing vein

 retracted nipple

 new shape/size

 orange peel skin



"A cancerous lump is often hard and immovable, like a lemon seed."

If you find new changes like this that stay around, show your doctor.

knowyourlemons.com



Symptoms and signs

What do I look for?

Don't think of a breast self-exam as a hunt to find cancer, but to understand the normal landscape of your breasts. This involves both looking and feeling.

Look in the mirror with your arms up, then again with your hands on your hips. Stand to the side and then face forward. Check for any changes that look like these signs below.

What does a cancerous lump feel like?

A cancerous lump often feels hard and immovable, like a lemon seed. 80% of lumps are not cancerous, but the only way to know for sure is to examine the cells inside. If you feel a lump ask a doctor to investigate it with you. When breast cancer is caught at early stages the cure rate is over 90%.

When should I do it?

From the age of twenty onwards, do self-exams at least once a month to stay ahead of your health!

The best time to check your breasts is a few days after your period ends when hormones are the most normal and you're least tender (which is also an ideal time to have a doctor's breast exam and mammogram).

If you don't have a period anymore, pick any day.

A dozen signs of breast cancer, revealed.

Clinical Breast Exams

begin at age 20 with your doctor every 3 years until you are 40, then go every year. Higher risk patients may visit more, ask your doctor about your risk type.



Mammograms

usually begin when you're 40. It feels like getting your blood pressure taken. Form a screening plan with your doctor to suit your risk type. If you're too young for a mammogram and suspect something, ask about an ultrasound or biopsy, don't wait it out.

Want to calculate your risk? www.cancer.gov

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Nipple retraction

Breast cancer with associated puckering and nipple retraction



Edema and peau d'orange



Infiltration ulceration



Erythema [Redness]

↳ more than 1/3 of Breast...

↳ indicate inflammatory Breast cancer

peget dr of the nipple...



erythema in the Breast
[> 1/3]



nipple retraction



erythema in the Breast
[> 1/3]



nipple retraction



lump in the Breast



- **Mammography**

- **Not below 35y, two views + magnification views.**
- Most guide lines recommend start mammo screening at 45 Y annually until 55Y then biannually till 74 y.
- **High risk start at 40Y.**

2 years

Classification of radiological appearance BIRADS...

Parenchymal distortion, poorly defined mass,
speculated micro-calcifications

R1 normal

R2 benign

R3 indeterminate

R4 probably malignant

R5 malignant

R6 Biopsy proven malignancy

Screening

Can detect smaller cancer...



→ Average-size lump found by woman practicing occasional breast self-exam (BSE)

یعنی یہ ماہیچوں BSE ہر ۶ ماہ ایکشنڈارڈ ماس
دہی حجم کیلئے



→ Average-size lump found by woman practicing regular breast self-exam (BSE)



→ Average-size lump found by first mammogram



→ Average-size lump found by getting regular mammograms

BIRADS

Breast imaging reporting and data system collection...

Category	Management	Likelihood of Cancer in the Mammographic Finding
0	Need additional imaging or prior examinations	Recall for additional imaging and/or await prior examinations
1	Negative ✓	Routine screening
2	Benign ✓	Routine screening
3	Probably <u>benign</u>	Short interval follow-up (6 months)
4	<u>Suspicious</u>	Tissue diagnosis
5	Highly <u>suggestive</u> of malignancy	Tissue diagnosis
6	Known, biopsy-proven malignancy	Surgical excision when clinically appropriate

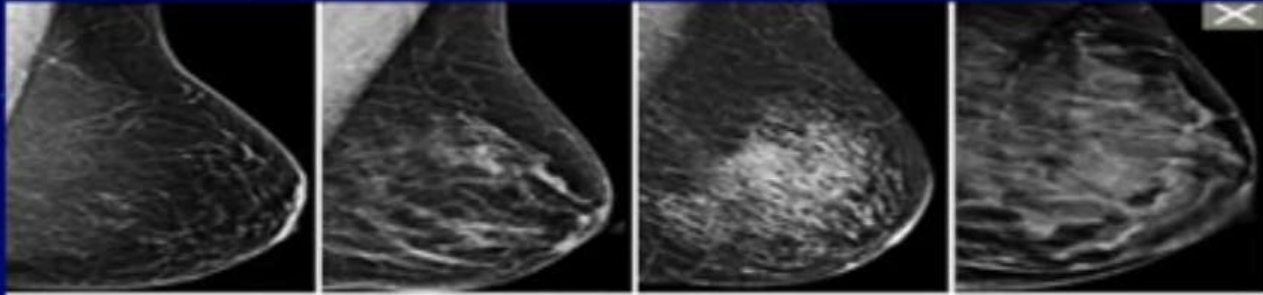
routine screening

Just follow up

need Biopsy
FNA truecut

4a Low suspicion for malignancy (>2% to ≤10%)
4b Moderate suspicion for malignancy (>10% to ≤50%)
4c High suspicion for malignancy (>50% to <95%)
≥95%

Breast density



The breasts are almost entirely fatty

density A → Breast fatty

There are scattered areas of fibroglandular density

Density B:- fibro glandular

The breasts are heterogeneously dense, which may obscure small masses

density C: heterogenous

The breasts are extremely dense, which lowers the sensitivity of mammography

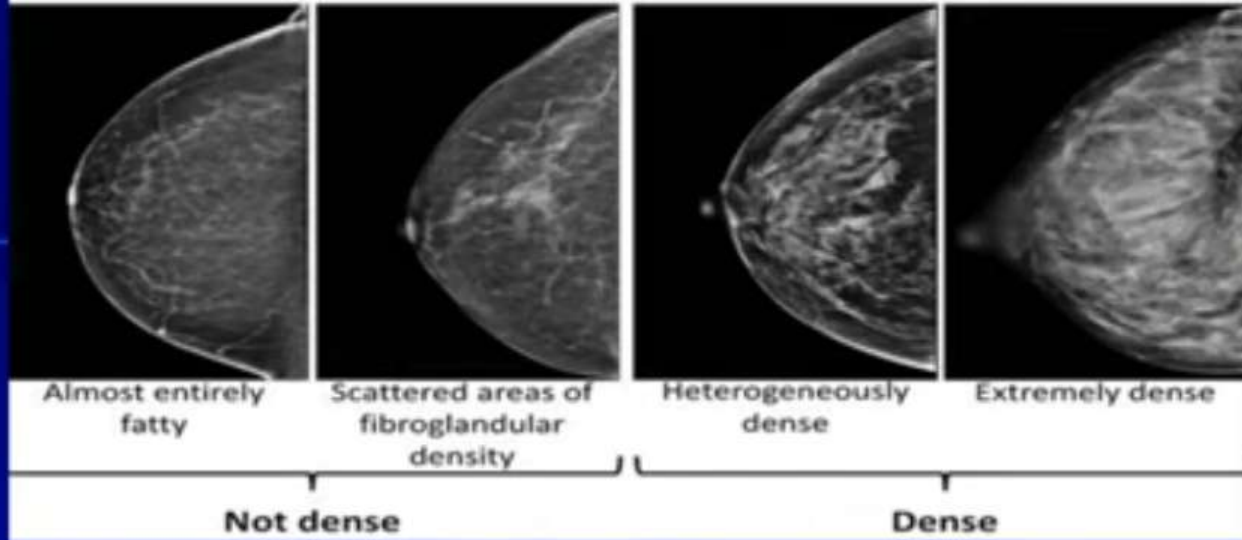
density D: severe dense Breast...
[T glandular]

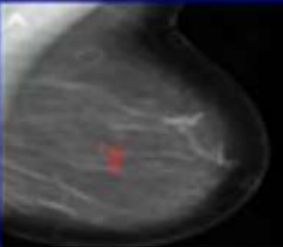
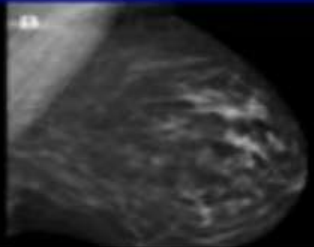
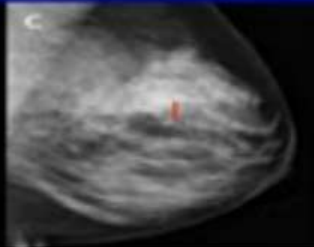
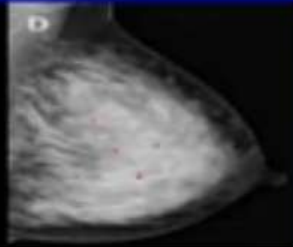
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Breast density — The four levels

Breast tissue is composed of milk glands, milk ducts and supportive tissue (dense breast tissue) and fatty tissue (nondense breast tissue). Radiologists use mammogram images to grade breast tissue based on the proportion of dense to nondense tissue. According to the BI-RADS reporting system, the levels are (from left to right) almost entirely fatty, scattered areas of fibroglandular density, heterogeneously dense and extremely dense.

[In A-B density] :-
تحت شفاف، tumor
...white mass
...white mass



			
Category A	Category B	Category C	Category D
Almost Entirely Fatty	Scattered areas of fibroglandular density	Heterogeneously dense	Extremely dense
10% of women	40% of women	40% of women	10% of women

① we can't detect the cancer...
 ② ↑ risk of Breast Cancer...
 ... Breast density, quality



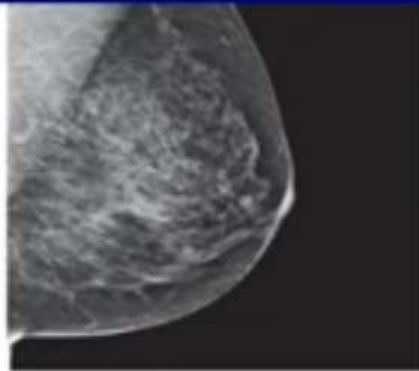
Breasts are almost all fatty tissue.

A



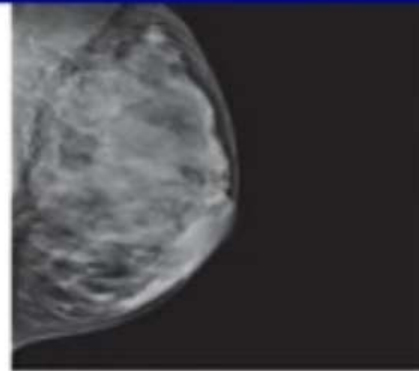
There are scattered areas of dense glandular and fibrous tissue.

B



More of the breast is made of dense glandular and fibrous tissue (described as **heterogeneously dense**). This can make it hard to see small tumors in or around the dense tissue.

C



Breasts are **extremely dense**, which makes it hard to see tumors in the tissue.

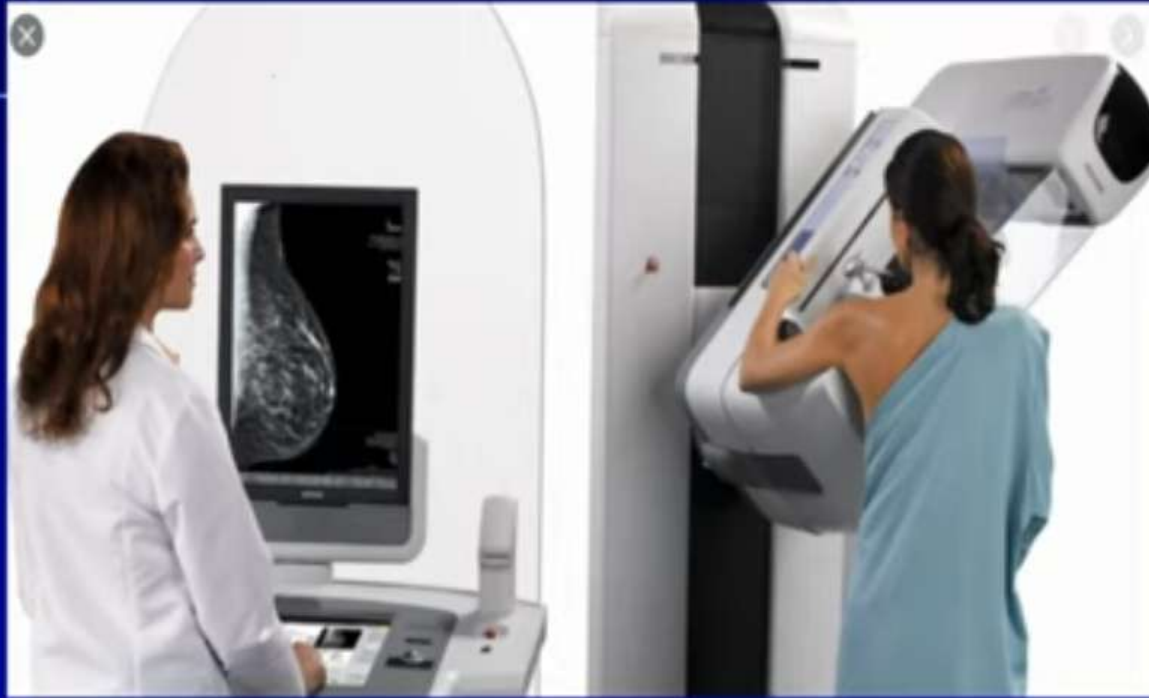
D

Two views mammograms
Cranio-caudal CC
Oblique



Tomosynthesis 3D mammo

→ as arch :- Breast 3D capabilities
more accurate + escape 200 pixels
than ordinary or digital
mamogram...





1960's
Industrial film
mammography



1970's
Xero-
mammography



1980's
Film screen
mammography



2000's
Digital
mammography



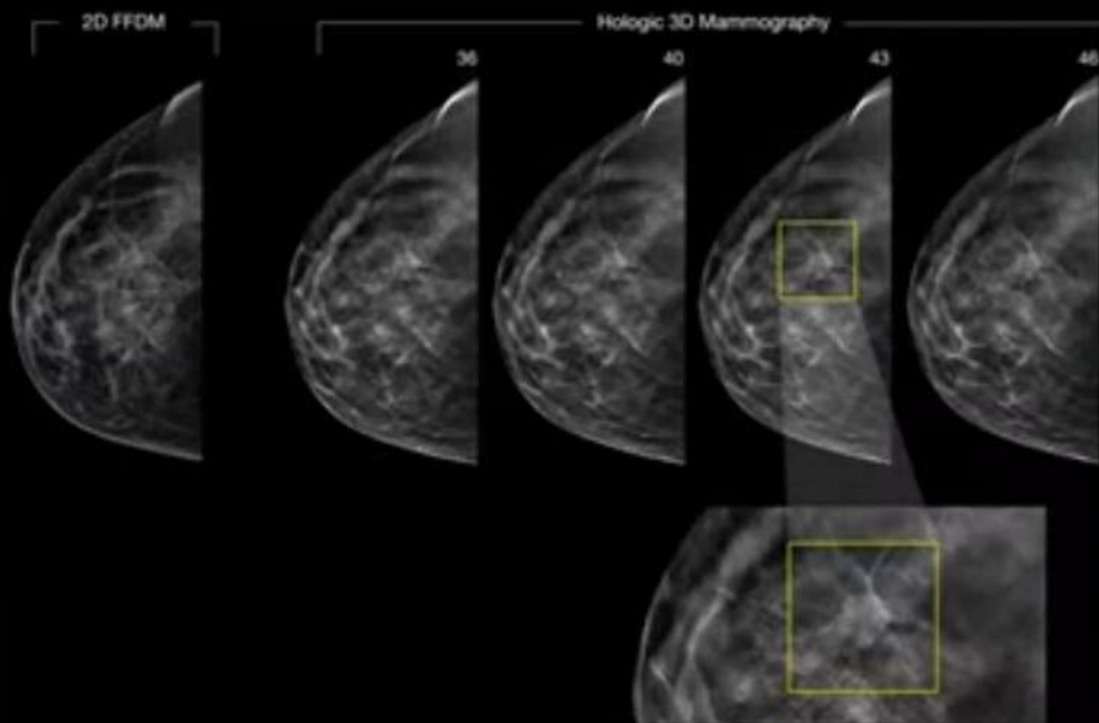
Present
Digital breast
tomosynthesis

المستقبل (سواء هنا)

↑ sensitivity 40% more than digital mamogram to detect the breast cancer...



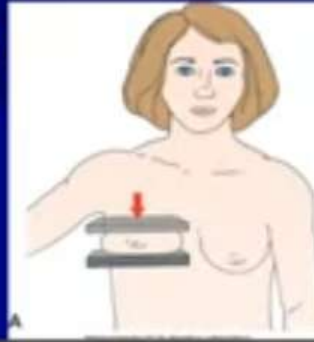
^{digital}
A malignancy easily missed with conventional 2D mammography
was clearly seen with Hologic 3D Mammography



Routine mammography Views

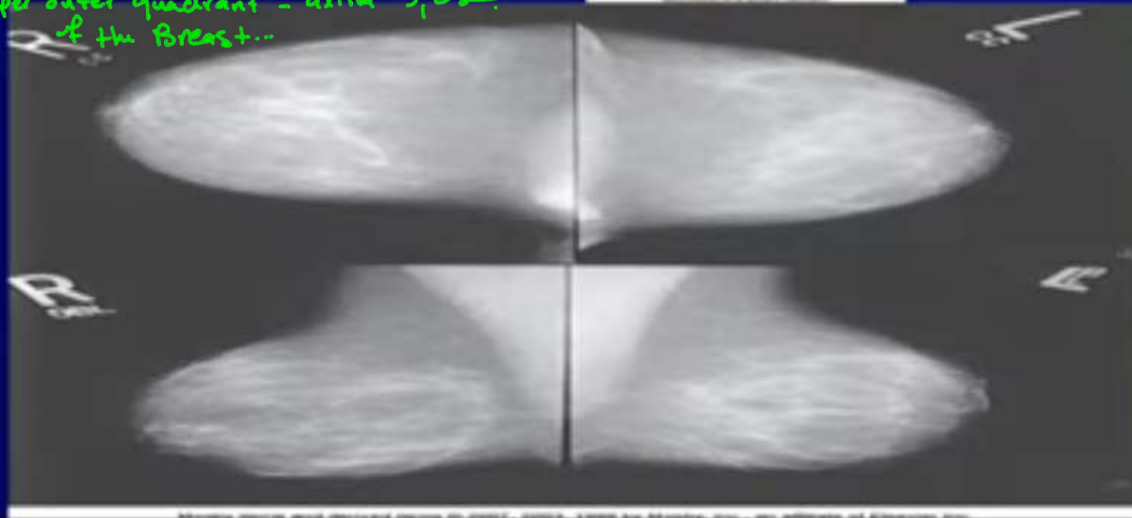
I. ✓ Cranio-caudal (CC)

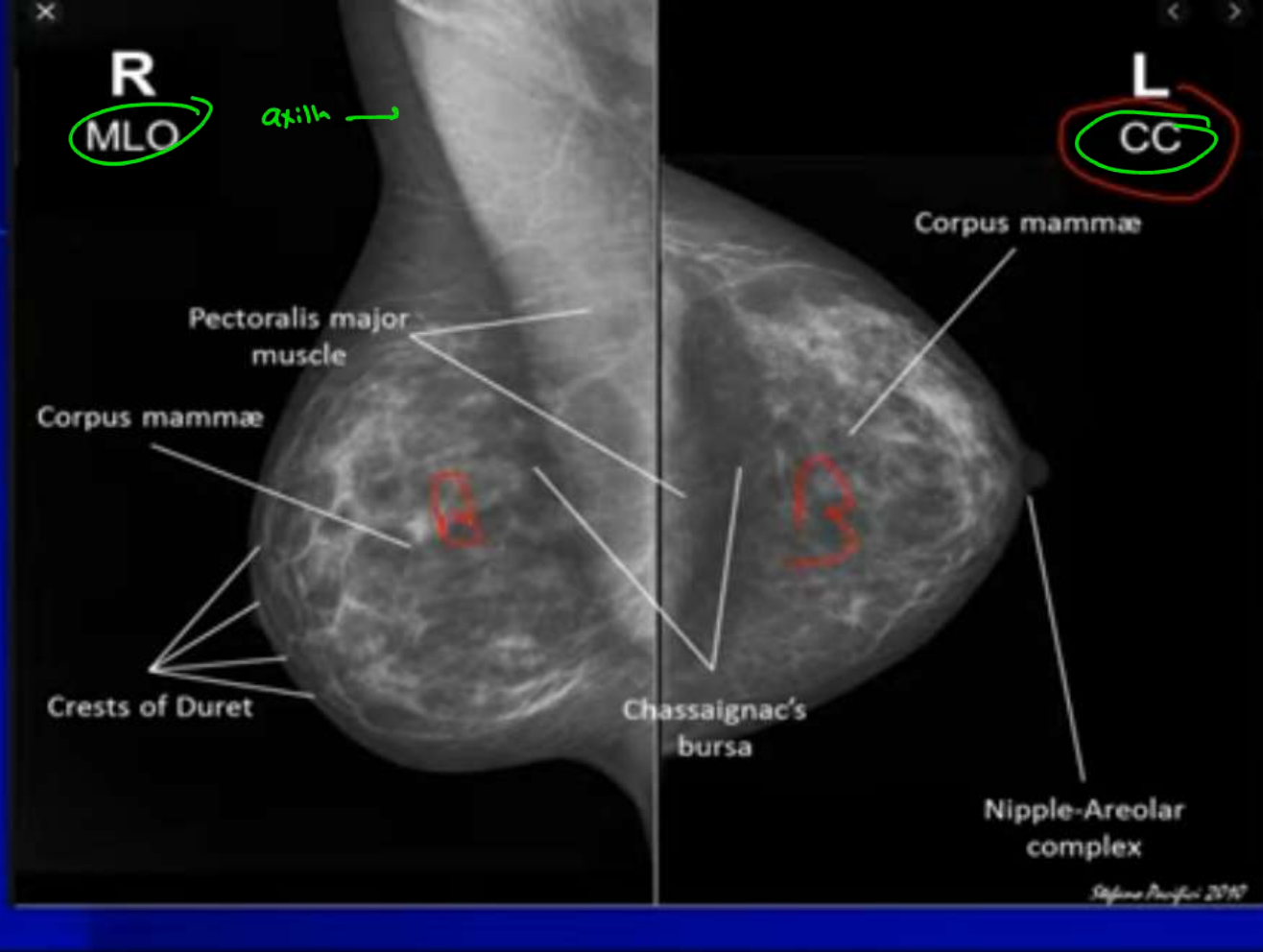
بستون در medial part of the Breast
... MLO view بستون در اکثر قسمت Breast

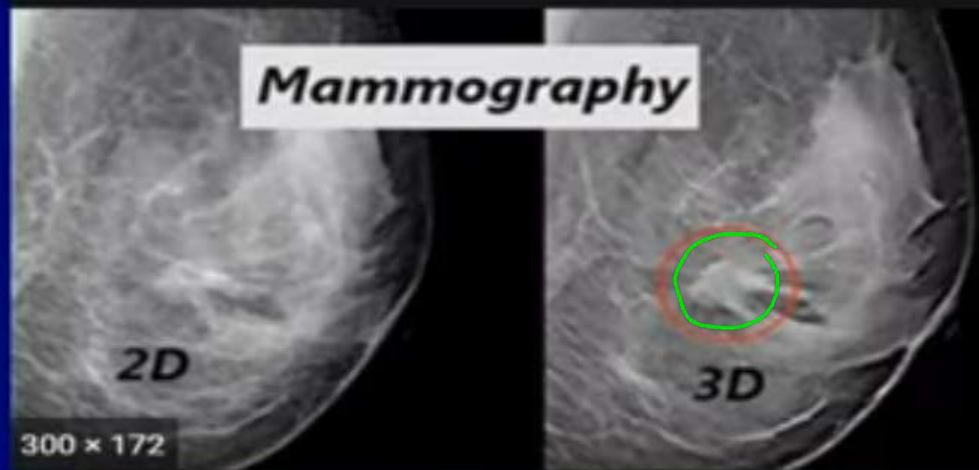
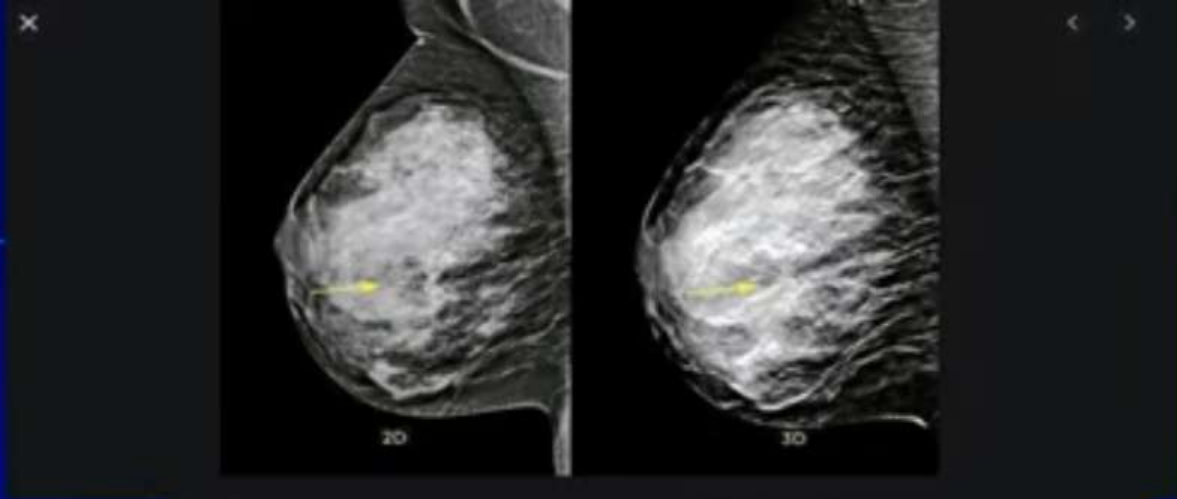


II. ✓ Medio-lateral oblique (MLO)

بستون در upper outer quadrant - axilla
of the Breast...







Cytology/pathology in Diagnosis of Breast Cancer

① FNA cytology scale (0-5)

➤ Sensitivity 95% , Specificity 95% .

② Core biopsy. [fine cut Biopsy]

③ Open biopsy.

④ MRI , PET. in special cases [not routinely]
↳ in severe dense Breast or in hereditary Breast cancer...

⑤ Tumor markers CEA , CA 15.3, bone scan .

■ MRI

■ High sensitivity 95% for IDC less DCIS.

■ High risk population. ✓

■ Low specificity. ✓

■ Dense breasts. ✓

■ PET CT Scan.

may lead to over diagnosis
[↑ False positive]
[↑ sensitivity]

فیوژن پروبیوم

Other investigations

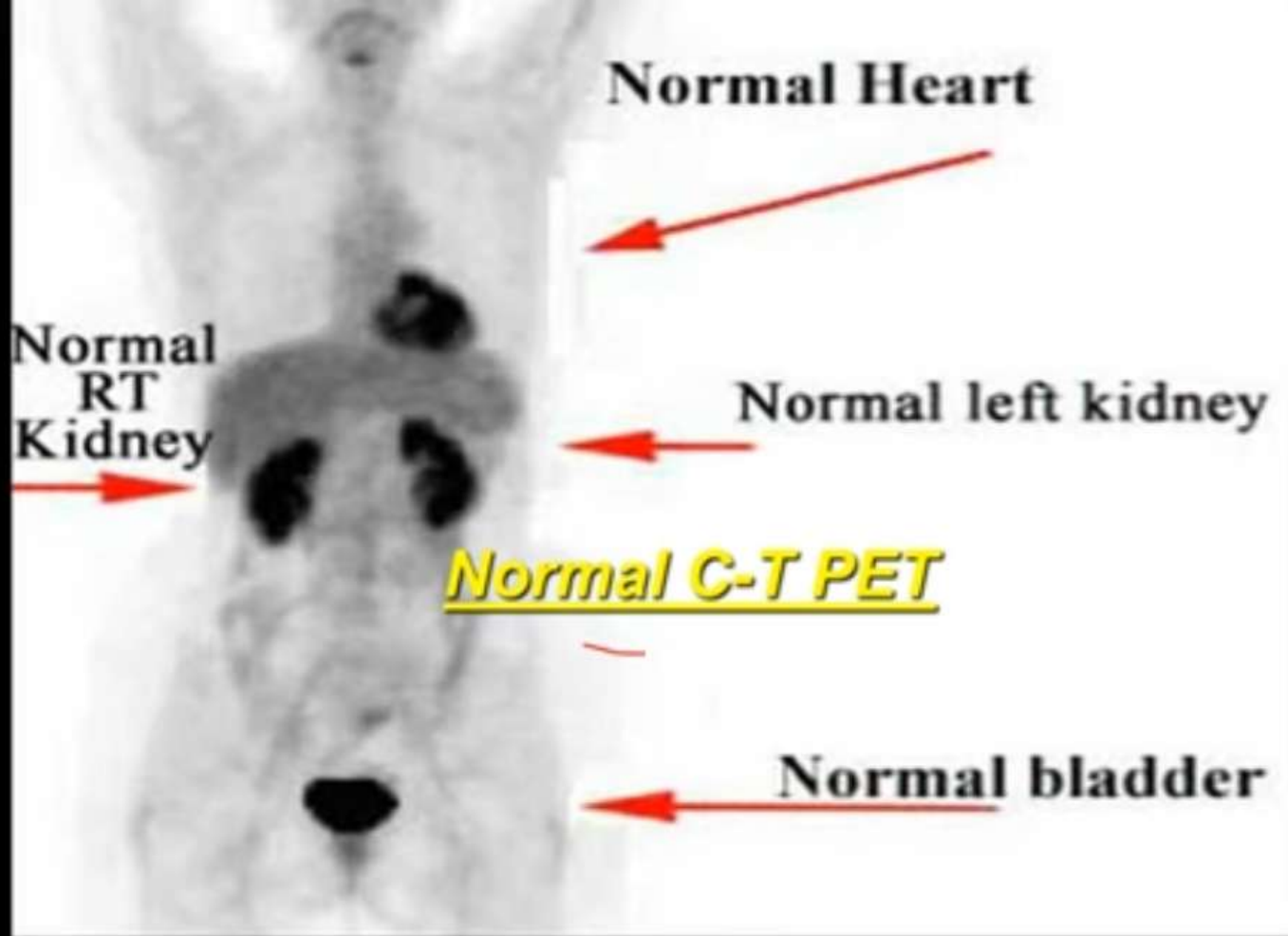
- CBC , LFTS → for liver metz [Jaundice]
- Chest X-Ray .
- Serum ^①calcium, ^②ESR, Bone ^③profile.
↳ for hypercalcaemia in Bone metz
- Liver US.
- CEA, CA15.3, CA 125. [tumor markers]

overall
normally : 5
but in smoker : 6

for Breast

diagnose the ovarian cancer.

* most common site of Breast metz :- lumbar vertebrae...
[then thoracic vertebrae then iliac spine]...



Normal Heart

**Normal
RT
Kidney**

Normal left kidney

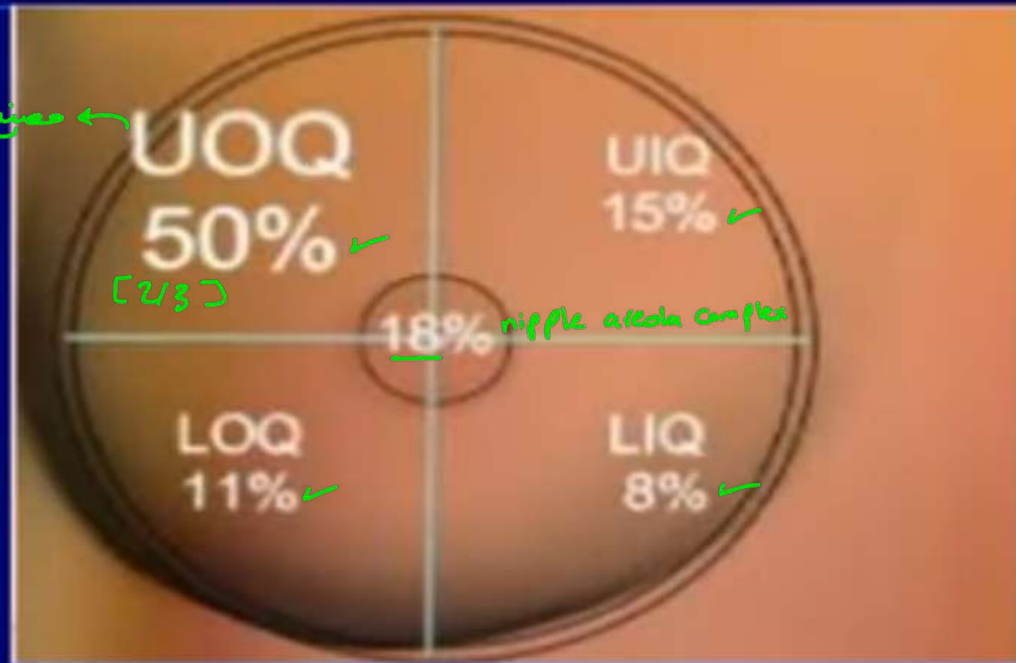
Normal C-T PET

Normal bladder

Pathology

- Breast cancer arise from terminal duct-lobular unit.
- Localized to basement membrane are in situ DCIS , LCIS .
- Invasive cancer *No any feature...*
- 80% are No Special Type (NST).
- 10% are Lobular ✓
- 5% Medullary , Mucoid , Papillary *[sub types of invasive ductal carcinoma]*

glandular tissue 1/3



Pathology of breast cancer (foot & Stewart classification)

W.H.O. Classification of Carcinoma of the Breast

Noninvasive carcinoma

Ductal carcinoma *in situ* ✓

Lobular carcinoma *in situ* ✓

Paget's disease of the nipple (without mass) ✓

Invasive carcinoma

Invasive ductal carcinoma -- 80% ✓ No special type..

Invasive lobular carcinoma -- 10% ✓

Mucinous carcinoma -- 2%

Medullary carcinoma -- 5%

Papillary carcinoma -- 1%

Tubular carcinoma -- 1%

Adenoid cystic carcinoma

Secretory (juvenile) carcinoma

Apocrine carcinoma

Carcinoma with metaplasia (metaplastic carcinoma)

Inflammatory carcinoma

sub types... ←



Breast cancer I



48:52 / 55:58



Pathology report

- Size of tumor. - differentiation of the cells...
- Type and grade (bloom - Richardson).
- Clearance of resection margins.
- Presence of tumor multi-focality. or multicentric...
- Lympho - vascular invasion.
- DCIS around tumor.
- Axillary lymph nodes. we write it after the size of tumor
- Hormone receptor status ER PR. - HER2 receptor...
↓ estrogen ↓ progesterone

TNM CLASSIFICATION

- Primary tumor
 - Tis Carcinoma in situ .
 - T1a Tumor less than 0.5cm .
 - T1b Tumor less than 1 cm .
 - T1C Tumor less than 2 cm .
 - T2 Tumor 2-5 cm .
 - T3 Tumor more than 5cm .
 - T4 Tumor extension to chest wall and skin .
- $T_1 < 2\text{cm}$

T.N.M. Staging

T (Tumor size):

Tx → Primary tumor can not be assessed & not palpable clinically
(previous excision biopsy or unplanned resection)

T0 → No evidence of primary tumor

Tis → Carcinoma in situ

T1 → < 2cm (in greatest dimension)

Tmic → microinvasion ≤ 1mm

T1a → ≤ 0.5cm

T1b → 0.5 -1cm

T1c → 1-2cm

T2 → 2-5 cm

T3 → > 5cm

T4 → any size with:

T4a → fixation to chest wall (ribs, pectoralis, intercostal muscles)

T4b → Skin involvement

✓ peau d'orange

✓ ulceration

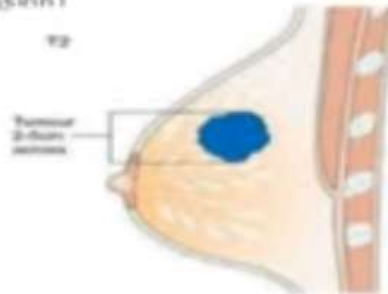
✓ fungation

✓ satellite nodules

indicate T4b

T4c → a & b

T4d → mastitis carcinomatosa



Continue

Regional lymph nodes N

- **N0:** No lymph nodes ✓
- **N1:** Mobile ipsi-lateral lymph nodes ✓
- **N2:** Fixed ipsi-lateral lymph nodes ✓
- **N3:** Metastasis to internal mammary, infra and supra clavicular lymph nodes . ✓

Distant Metastasis M

- **M0:** No distant metastasis.
- **M1:** Distant metastasis.

N (L.N. status):- All → Ipsilateral

N_x

Regional L.N. cannot be assessed (previously removed)

N₀

No regional L.N. metastasis

N₁

Ipsilateral **mobile axillary** L.N.

N₂

Ipsilateral **fixed axillary** L.N. (fixed to one another or to other structures)

N₃

Ipsilateral **infraclavicular** L.N.

ipsilateral **internal mammary with axillary** L.N.

Ipsilateral **supraclavicular** L.N.

M (Metastasis):-

M₀ → No evidence of metastasis

M₁ →

Distant metastasis (Lung, Bone, Liver, Brain) .

Contralateral breast or L.Ns. .



Staging and prognostic factors

<u>Clinical staging</u>		<u>5 y survival</u>
<u>Stage I</u>	Tumor < 2cm <u>T1N0M0</u> <u>No LN metastasis</u>	85%
<u>Stage II</u>	Tumor < 5 cm <u>T1-2 N1</u> <u>Nodes not fixed</u>	66%
<u>Stage III</u>	Tumor > 5 cm <u>Invasion of skin</u> <u>Supraclavicular LN</u>	41%
<u>Stage IV</u>	<u>Distant metastasis</u>	10%

early Breast cancer... ←

locally advanced Breast Cancer... ←

metastasis ←

T.N.M. Staging

Stage 0

carcinoma in situ .

Stage I

T < 2 cm, no nodes .

Stage II

T 2 to 5 cm, +/- nodes .

Stage III

locally advanced disease, fixed lymph nodes and variable tumor size

Stage IV

distant metastases (bone, liver, lung, brain)

Stage 1 early Breast Cancer

Early disease: tumour confined to the breast (node-negative)



Stage 2 locally advanced disease

Early disease: tumour spread to movable ipsilateral axillary node(s) (node-positive)



Stage 3 No metastasis

Locally advanced disease: tumour spread to the superficial structures of the chest wall; involvement of ipsilateral internal mammary lymph nodes

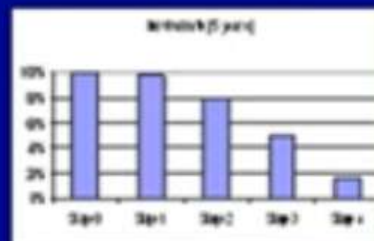
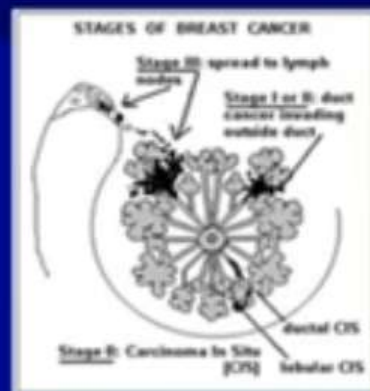


Stage 4 metastatic disease...

Advanced (or metastatic) disease; metastases present at distant sites, such as bone, liver, lungs and brain and including supraclavicular lymph node involvement

Stages of breast cancer

Stage	Tumor (T)	Node (N)	Metastasis (M)
Stage 0	Tis (LCIS, DCIS, Paget) PI	N0	M0
Stage I	T1 0-2	N0	M0
Stage IIA	T0	N1	M0
	T1	N1	M0
	T2,2-5	N0	M0
Stage IIB	T2	N1	M0
	T3 >5	N0	M0
Stage IIIA	T0	N2	M0
	T1	N2	M0
	T2	N2	M0
	T3	N1, N2	M0
Stage IIIB	T4	any N	M0
	any T	N3	M0
Stage IV	any T	any N	M1



Types of breast biopsy

- FNAC. ✓
- Tru Cut Core Biopsy. ✓
- Stereotactic needle biopsy. ✓

as a 1st mass I, didn't
Biopsy telling →

- Excision biopsy. ✓ not used but if young female has fibroadenoma 100% we can use it..

- Punch biopsy. ✓ done for paget dz of the nipple...

↳ we take piece of the lump to study it..

III- Biopsy

→ most common type of Breast Biopsy...

FNAC (Fine Needle Aspiration)

· Can be done for non-palpable masses.

· FNAC takes individual cells

Does not show architecture

C0 No epithelial cells ✓

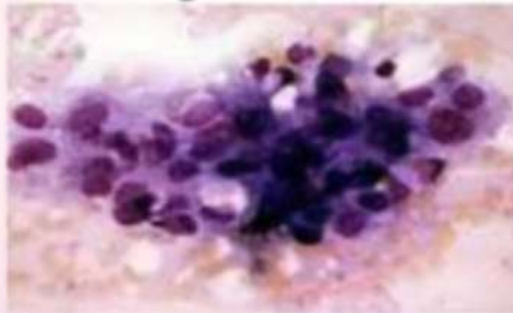
C1 Inadequate ✓

C2 Benign ✓

C3 Atypia ✓ *probably Benign...*

C4 Suspicious ✓

C5 Malignant ✓



❑ Fine Needle Aspiration Cytology (FNAC) → needle 23 and take Biopsy we take cells then put it on slide and fix it by Alcohol...

- e.g FNA of breast, thyroid, LN, Mass.



FNAC

→ To differentiate Benign from malignant masses...
[used for any mass < Breast Thyroid ..etc.]..

FNAC

- It is done with 23gauge needle and material is collected on a slide ; a smear is made using 100% alcohol
- Minimum 6 aspirations are done
- Giemsa , pap, H&E stains are used

	FNAC	Mammography
Sensitivity	90-98% high	90%
Specificity	98-100% very high	90%
False negative	2-10%	7%
False positive	Near 1-5%	10%

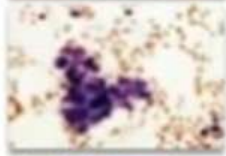
	FNAC Scoring
C ₀	No epithelial cells
C ₁	Scanty epithelial cells , benign
C ₂	Benign cells
C ₃	Atypical cells
C ₄	Suspicious cells
C ₅	Malignant cells

Cytological Diagnosis



▶ C5: Malignant

- High nuclear to cytoplasmic ratio
- Variable shape



▶ C4: Suspicious for malignancy

- ▶ Atypical cells with a high nuclear to cytoplasmic ratio and moderate pleomorphism
- ▶ benign groups and bipolar bare nuclei in the background



▶ C3: Atypical

- Mild anisonucleosis and nuclear crowding may represent hyperplastic change
- differential includes an atypical ductal or low grade *in situ* lesion



▶ C2: Benign

- Benign group of ductal epithelial cells



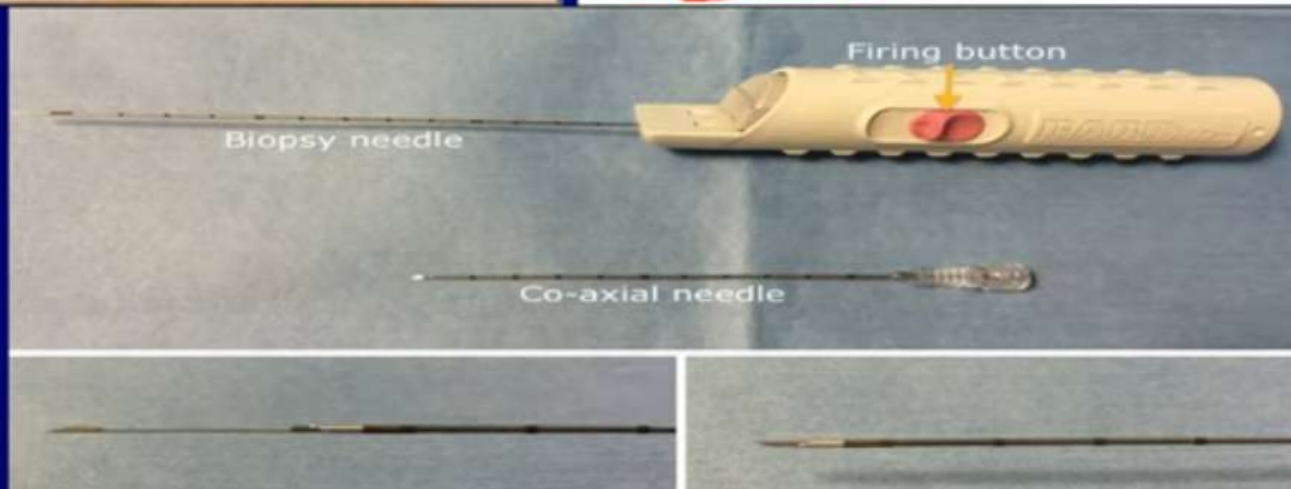
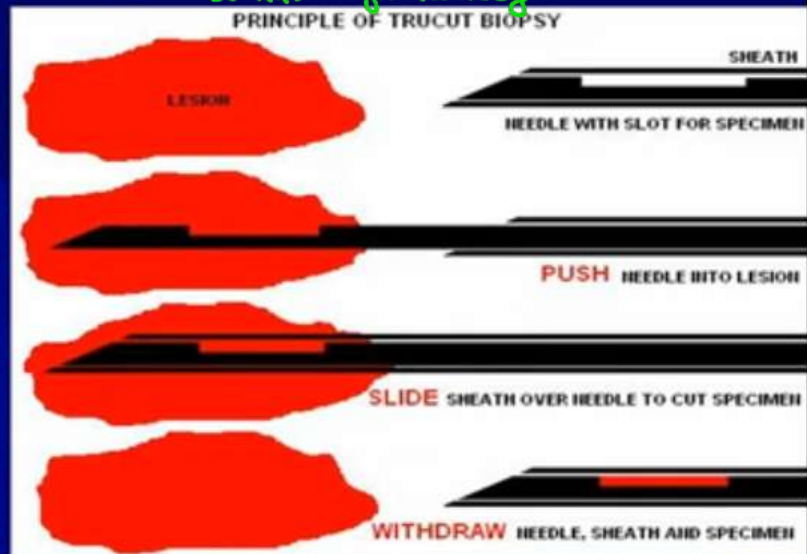
▶ C1: Inadequate

- Low cellularity specimen with blood and fragments of adipose tissue
- At least 6 epithelial cell groups are required for C2 classification

Tru-cut biopsy

take piece of tissue (core) from the Breast...
so has high accuracy..

Can diff. between the fibroadenoma and phyllodes tumor
+ Know if it insitu or invasive tumor + ER and PR status..

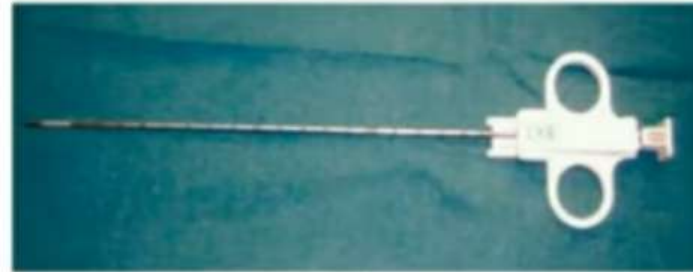


Tru-cut (Core Biopsy) Needle

Used for

- $T \geq 3$ cm
- operable cases candidate for mastectomy

- B1** Normal tissue / unsatisfactory
- B2** Benign
- B3** Lesion uncertain malignant potential
- B4** Suspicion of malignancy
- B5a** In situ malignancy
- B5b** Invasive malignancy



(a)

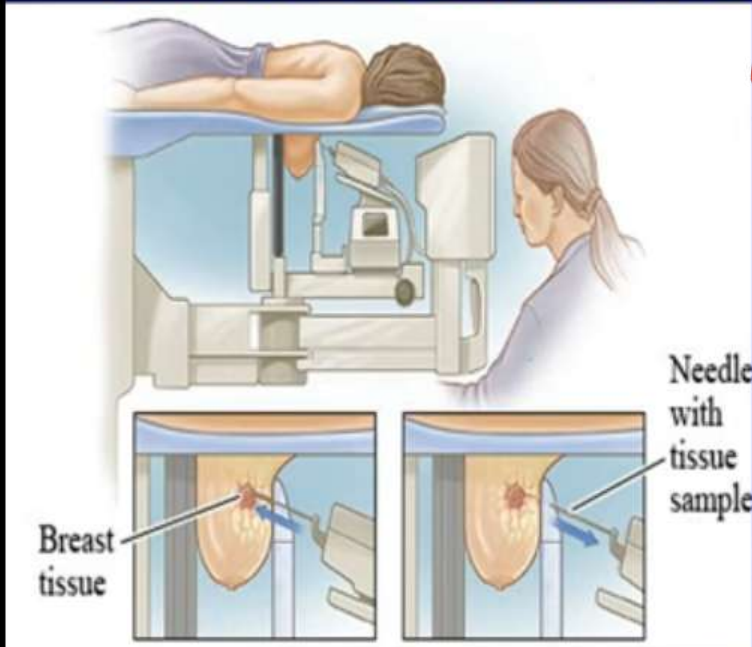


(b)

غير متروكة على الخلية...

Stereotactic needle biopsy

used in not palpable lesion



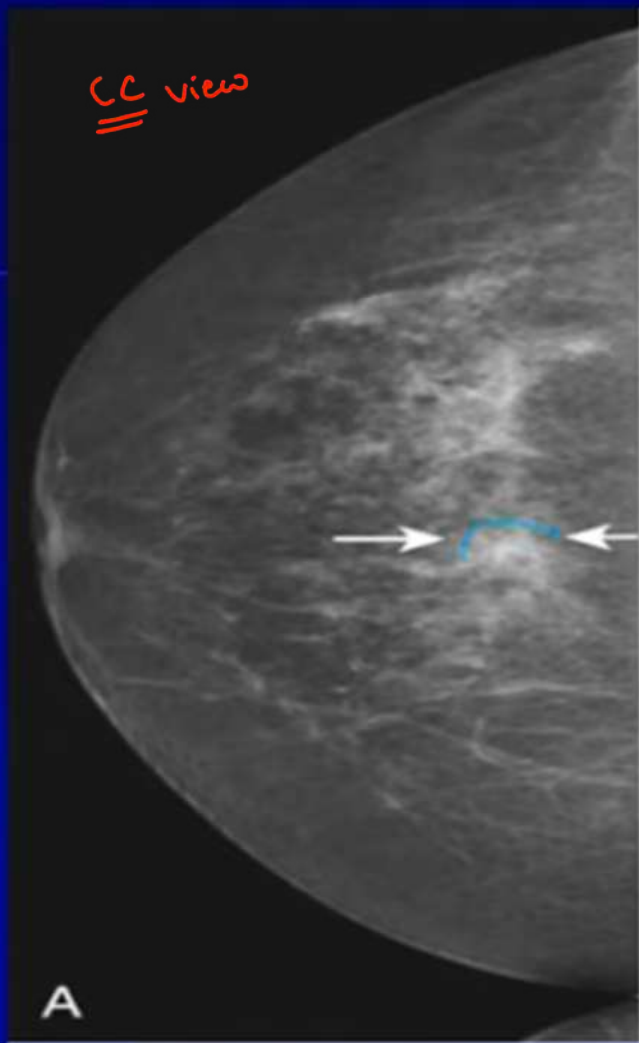
Breast is Hung down
Needle automatically
take Biopsy from
suspicion lesion



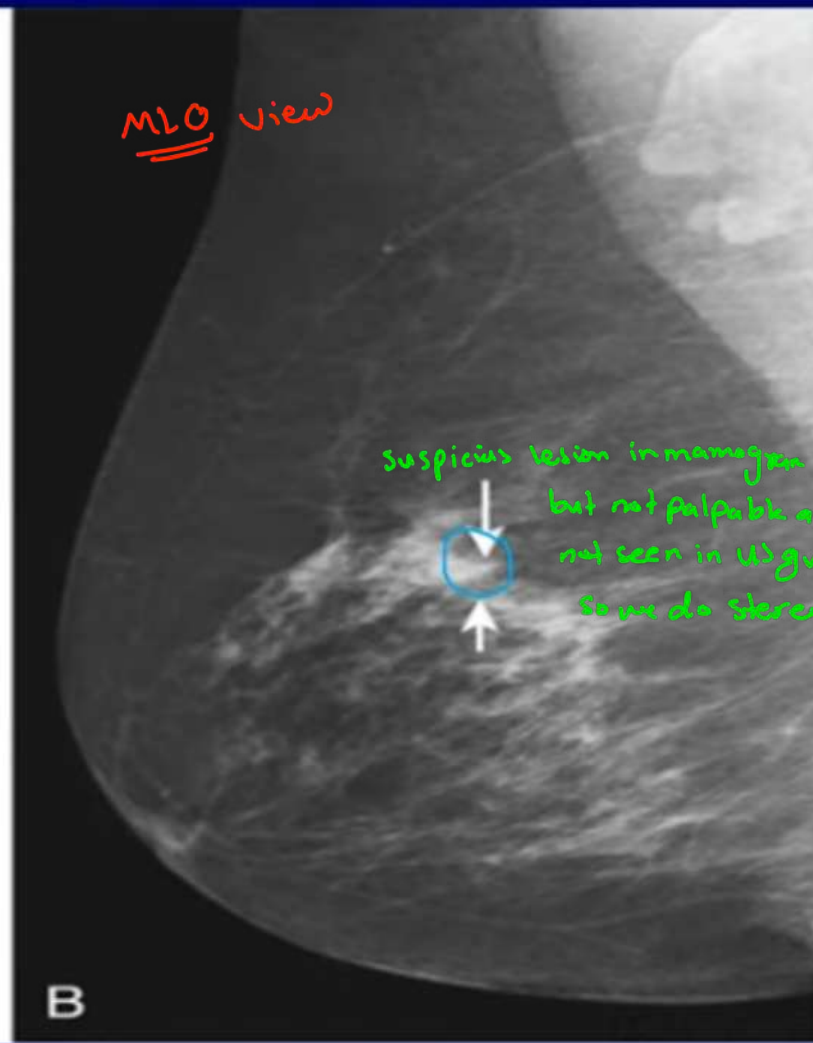
mass :- mammo kisi 3-4 mm → we should take from it Biopsy but this mass not palpable so we do US guided Biopsy but if we don't see it also we do Stereotactic needle Biopsy...



CC view



MLO view



suspicious lesion in mammogram
but not palpable and
not seen in US guided Biopsy
so we do stereotactic needle Biopsy

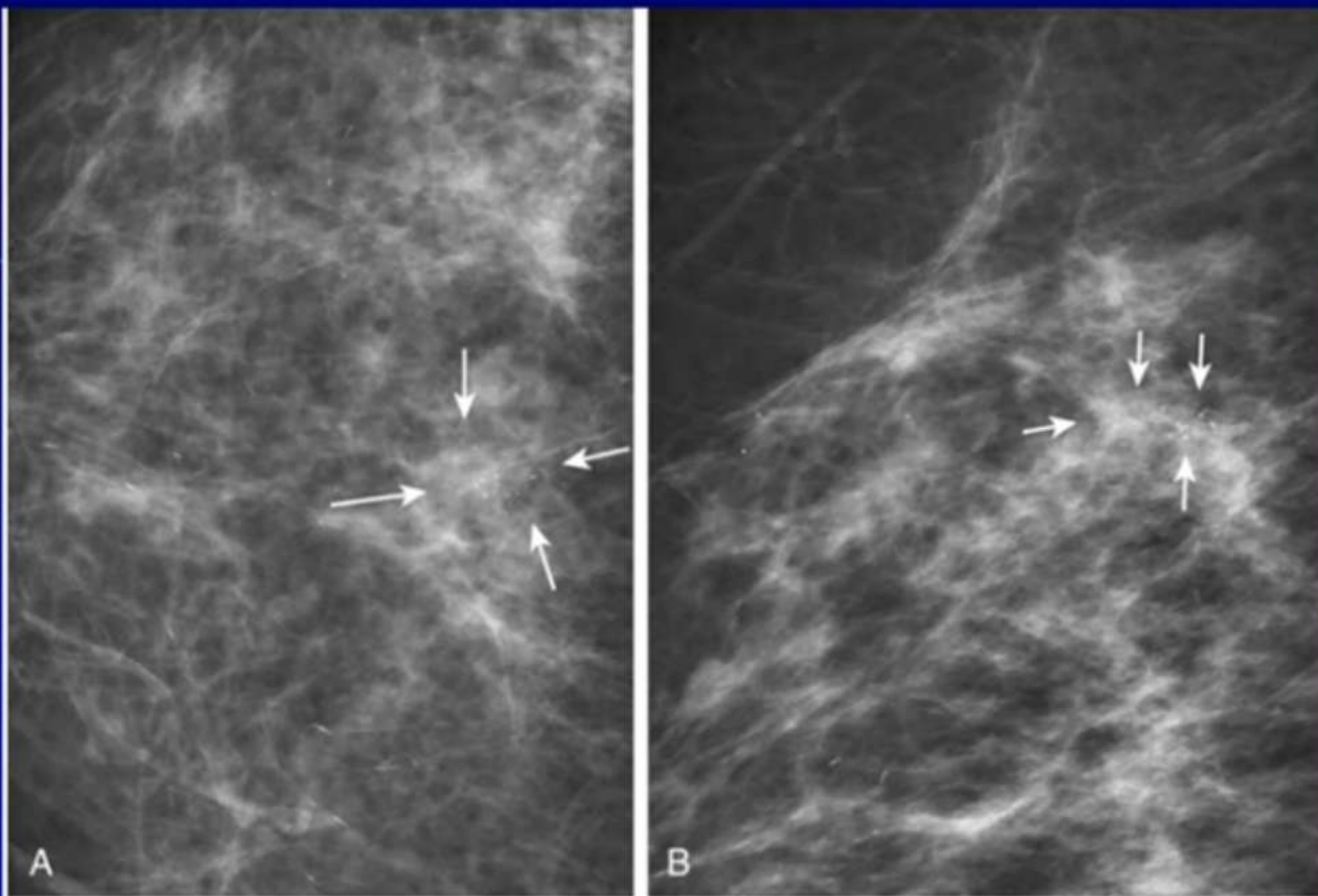


FIGURE 2  Right magnification mammogram views (craniocaudal [A] and lateral [B])—r...

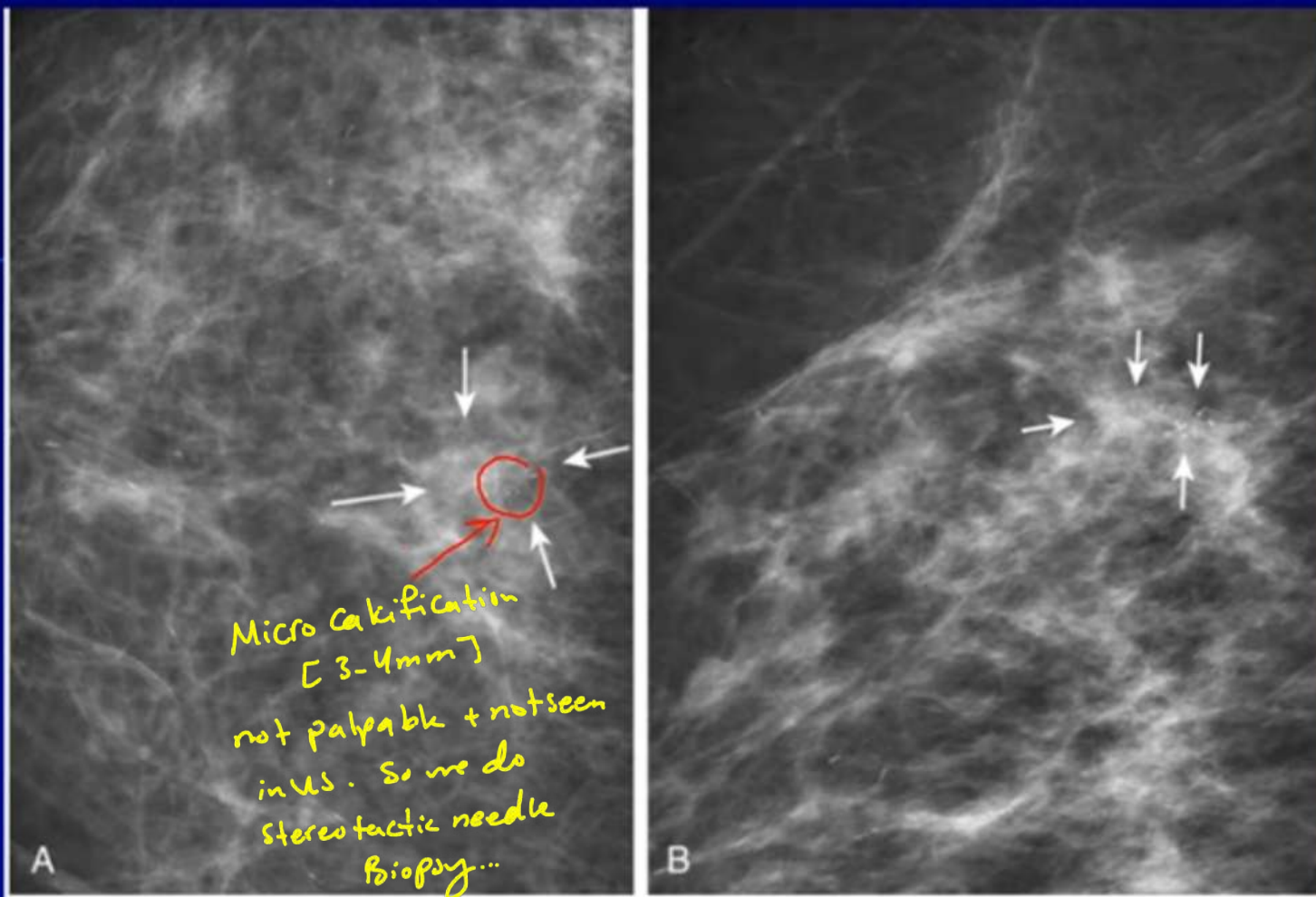


FIGURE 2  Right magnification mammogram views (craniocaudal [A] and lateral [B])—r...

Carcinomas in situ [No invasion of the BM]...

① **DCIS** 70 - 75 %
True malignancy
Low incidence common.

② **LCIC** 25 % - 23 %
↑ risk of invasive Breast cancer to time [But not true malignancy]...

③ **Paget's disease** of nipple **without mass** 1-2 %.

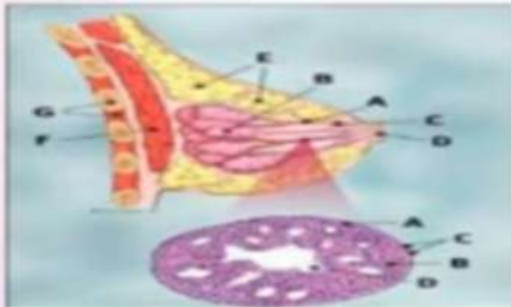
Carcinoma in situ

(doesn't penetrate the basement membrane)

Contact BM...

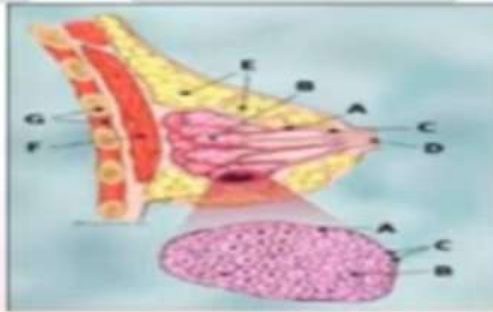
Ductal carcinoma in situ

- originat from terminal duct lobular units
- C/P: mass . pain . discharge
- ipsilateral ✓
- common(25-70%)



Lobular carcinoma in situ

- no clinical sign ✓
- no microcalcifications by mammogram ✓
- bilateral ✓
- less(25-35)



paget disease

- Affecting nipple and areola
- Eczema like condition
- female > 40
- 1-2% of breast cancer



Carcinomas in situ

LOBULAR CARCINOMA IN SITU *as:- Atypical ductal hyperplasia...*

- Not true malignancy. *but ↑ risk of Breast cancer...*
- Cancer risk is 1%.
- 2/3 in Ipsilateral breast.
- Bilateral in 30%, multifocal in 50%. *or maybe multicentric... quite common...*
- Monthly BSE, Biannual CBE, Annual Mamo.
- 5 Years prophylactic tamoxifen. *anti estrogen...*
- No rule for local excision, chemo-radiation. *except in the polymorphic lobular carcinoma insitu [Bad]
not true malignancy. & is
↓
True malignancy...*

DCIS

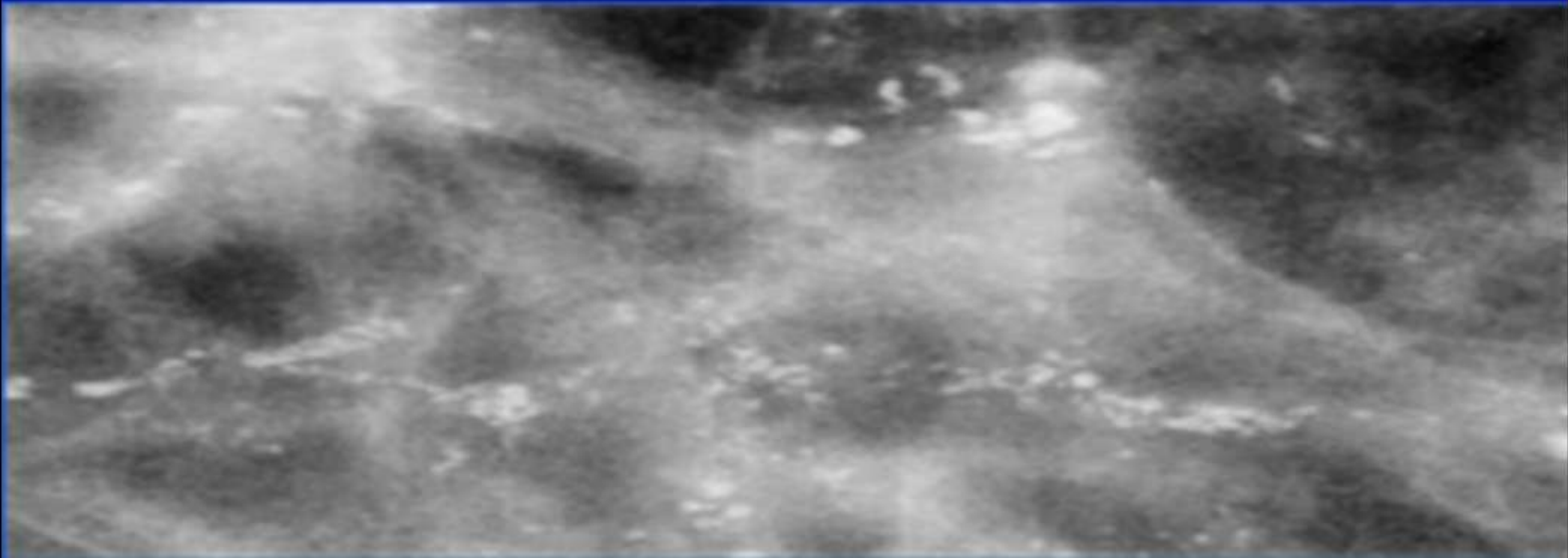
the malignancy we have to deal with it...

- Impalpable disease .

we can see it in Mamm [micro calcification]

- Majority asymptomatic .

- 75%-85% present as micro - calcification .



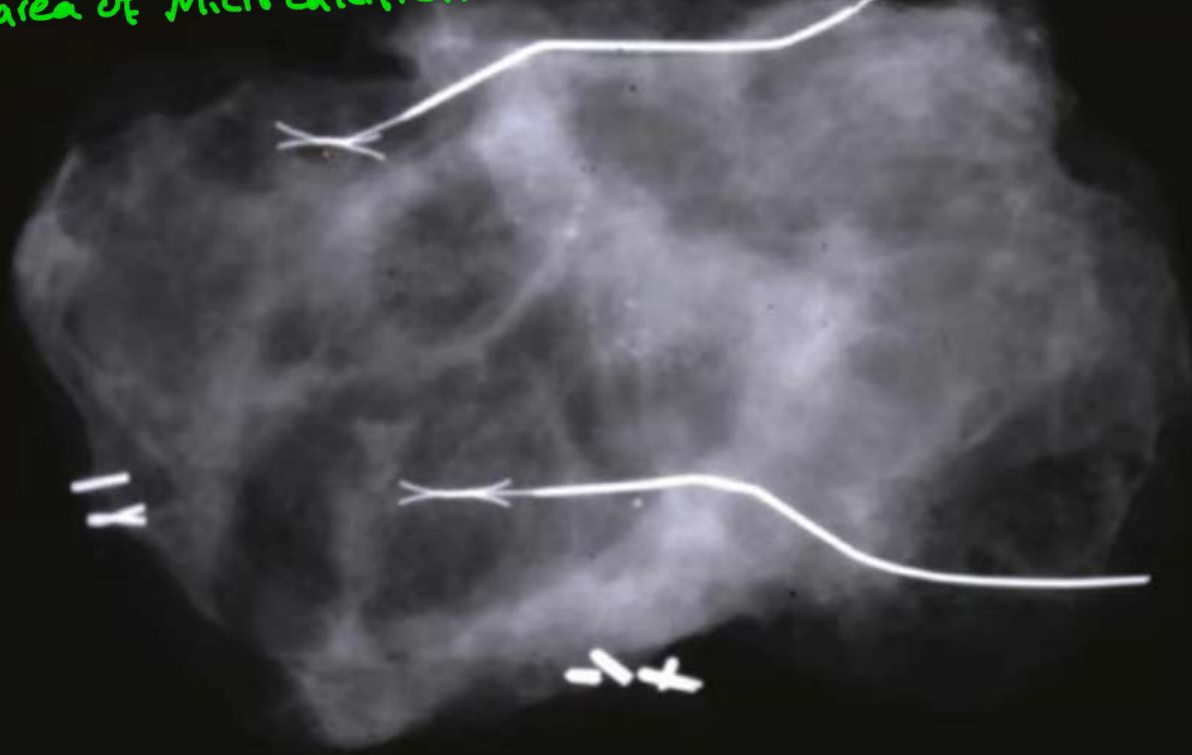
Ductal carcinoma in situ

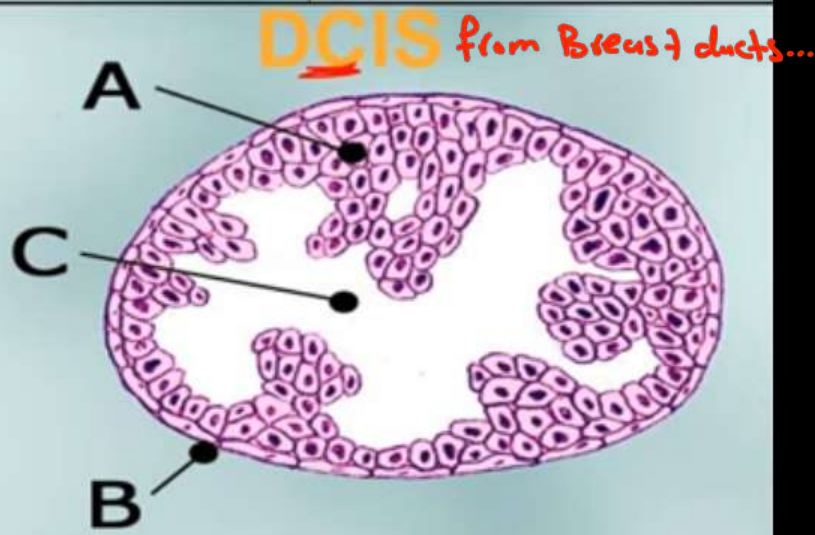
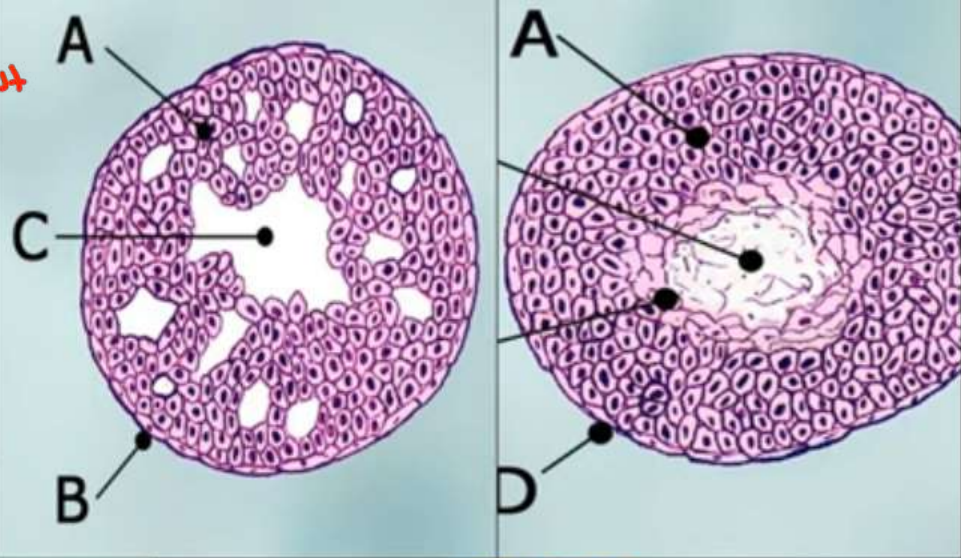
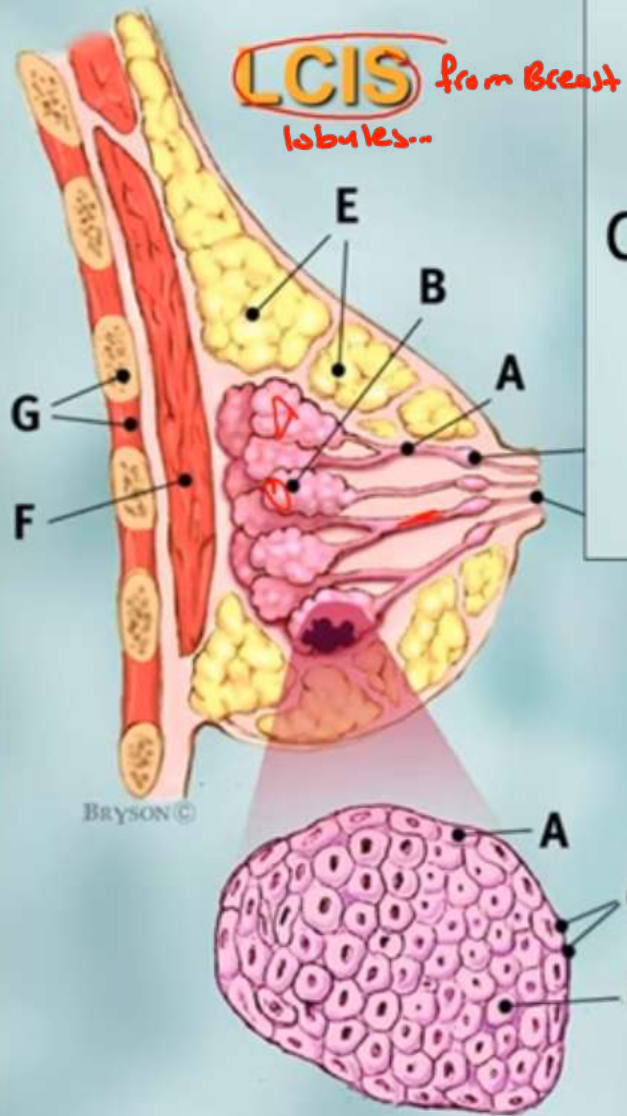
- M cells in Ductal system, no stromal invasion.
or BM invasion
- Abnormal calcification in Mammos.
micro
- Lymph node Mets < 1%.
- BCS, RT, AND, Tamoxifen.
axillary node dissection...
- Estrogen receptor status is important.
and PR

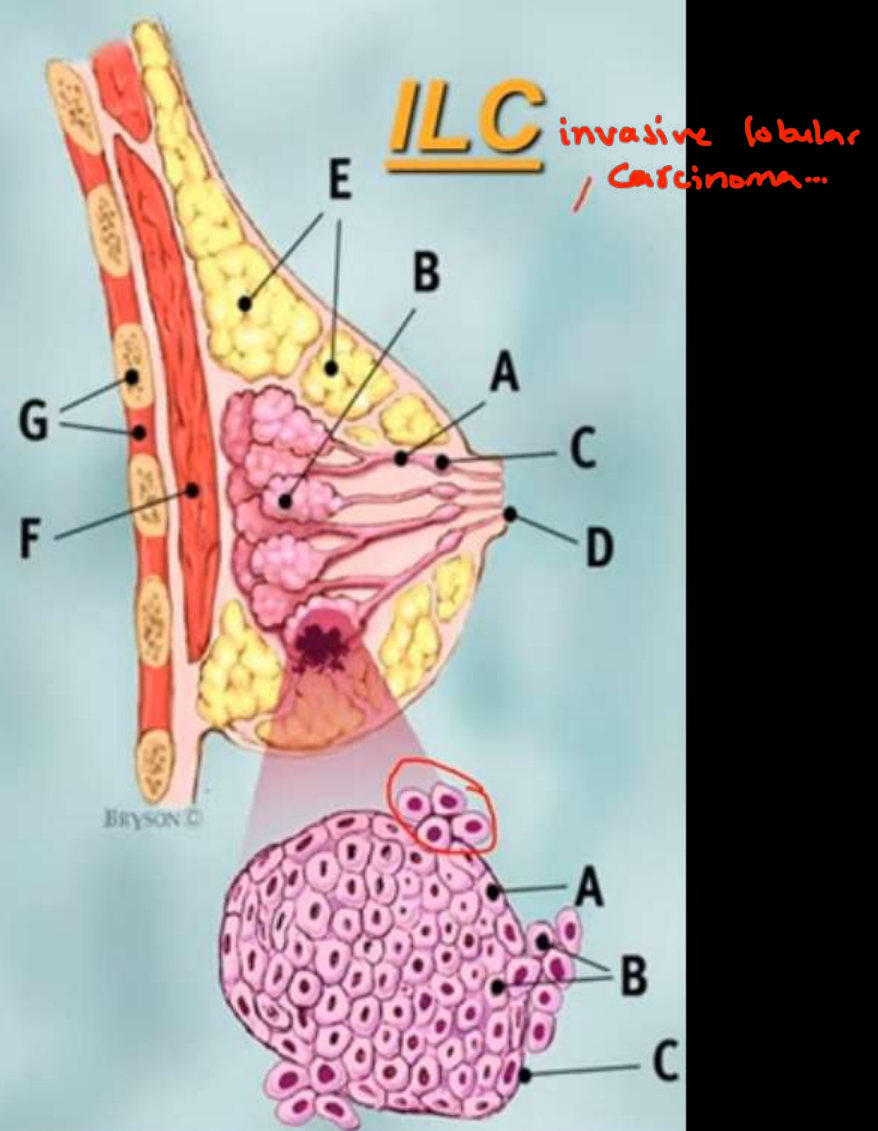
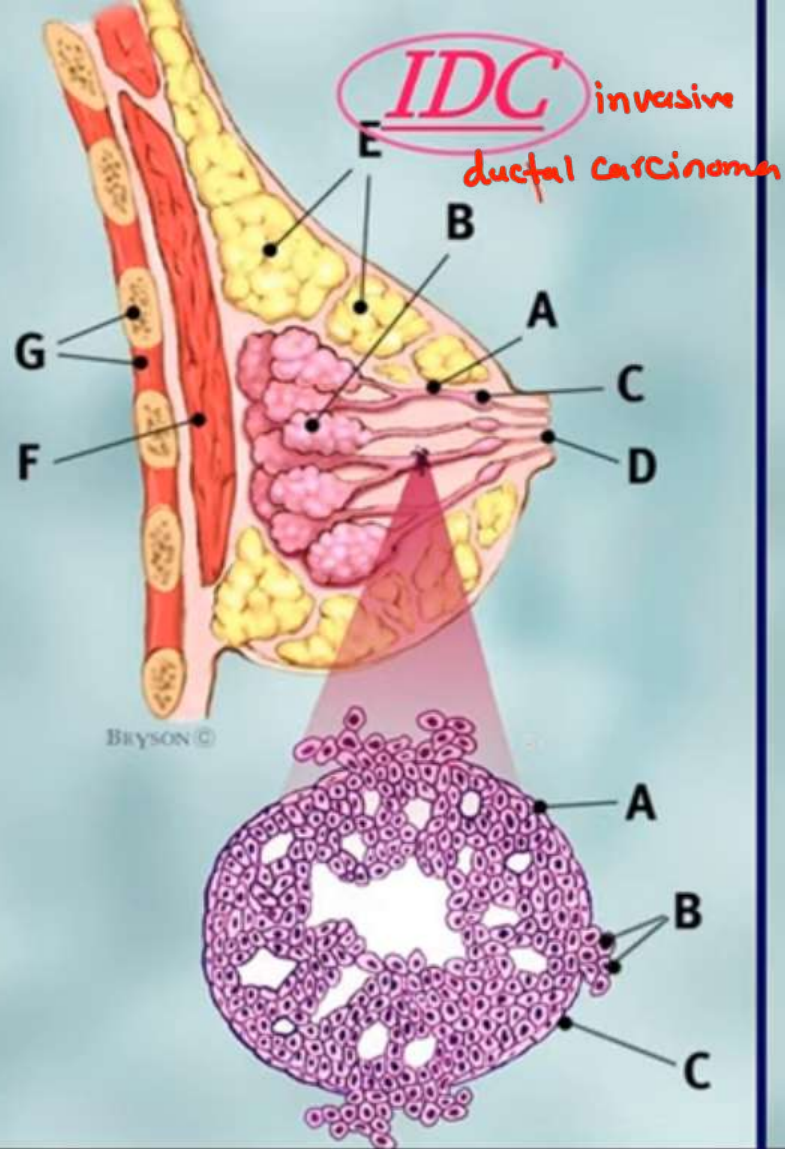
Breast conserving
surgery

Radiotherapy...

localization of the ductal carcinoma in situ area to remove it later on...







[VNPI] Van Nuys Prognostic Index (VNPI)

↳ To grade the carcinoma in situ depend on:-

- ① size of lesion
- ② margin.
- ③ pathological classification.

PROGNOSTIC INDICATOR	SCORE GIVEN		
	1	2	3
Size of lesion (mm)	< or = 15	16-40	> or = 41
Margin width (mm)	> or = 10	1-9	<1
Pathological Classification	Non high grade without necrosis	Non high grade with necrosis	High grade with necrosis



[مستند ۱۷]
بسیار عالی است
... age

Modified Van Nuys Prognostic Index

<u>Score</u>	<u>1</u>	<u>2</u>	<u>3</u>
Size (cm)	≤ 1.5	1.6 - 4.0	≥ 4.1
"Group"	- necrosis	+ necrosis	G3
Margins (mm)	> 10	1 - 9	< 1
Age	> 60	40-60	< 40

Total Score

4 - 6	lumpectomy alone
7 - 9	lumpectomy + XRT
10 - 12	mastectomy

Problems

- Not validated on external datasets
- Model revisions have likely resulted in over-fitting on the training dataset
- Only a small minority of all DCIS patients fall at either extreme

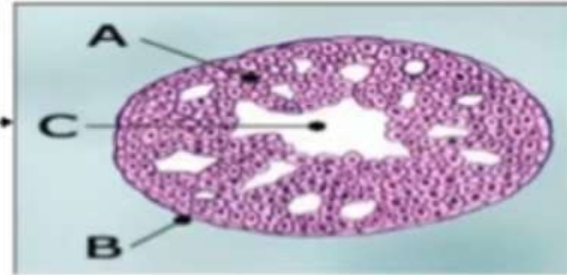
[مقطع نفوذ المار]

DCIS TYPES

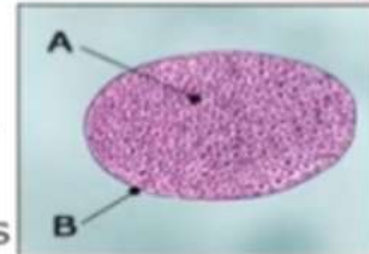
① Papillary Subtype



② Cribiform Subtype

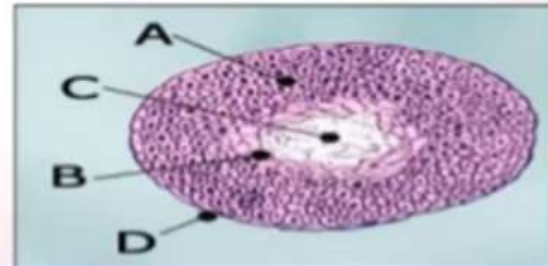


③ Solid Subtype



④ Comedo Subtype

More malignant than non-comedo subtypes
(40% progress to invasive type)



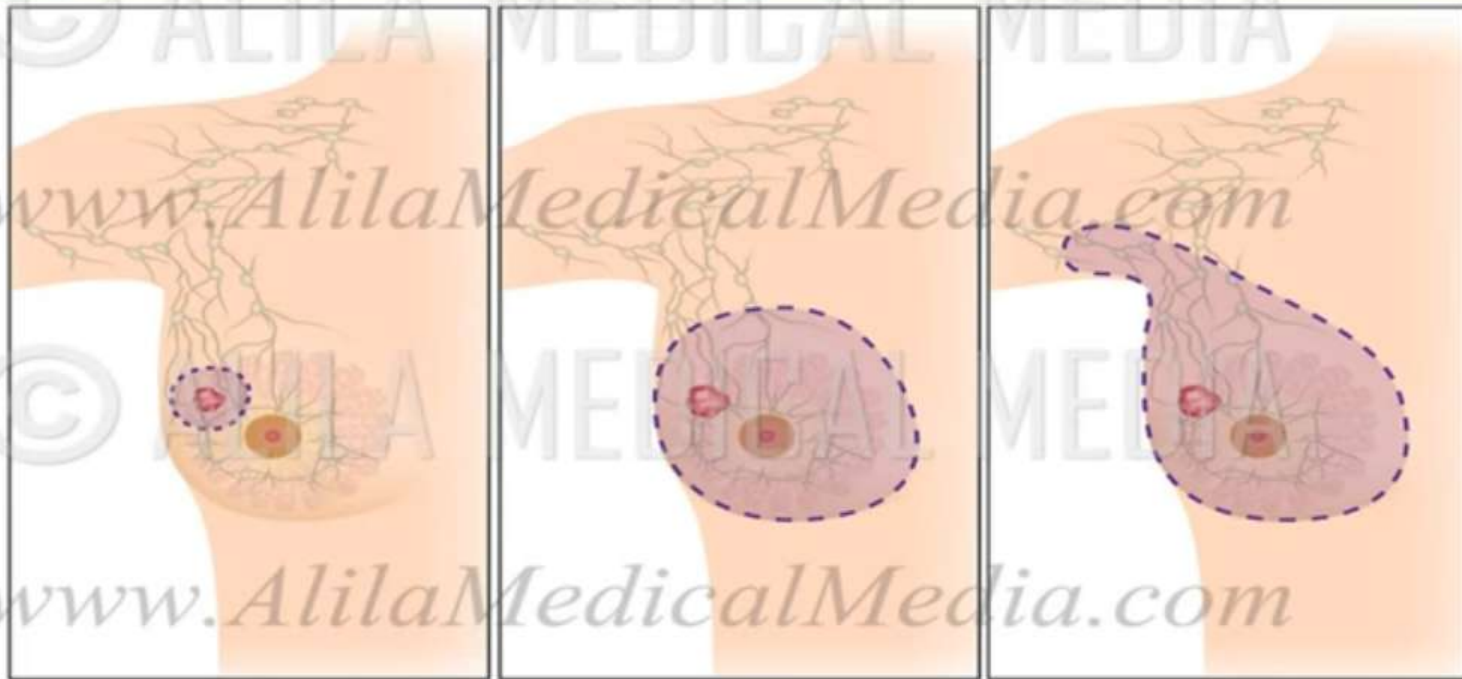
Management options

Surgery : is crucial element in multi-disciplinary treatment of breast cancer. MTD to decide the best ttt option for this pt...

- Main benefit is to achieve loco-regional ^① control of existing disease. ^{نسيج الـ primary}
- Reduce the risk of loco-regional recurrence. ^②
- Combination with chemo-radiotherapy less aggressive surgery is needed on breast and axilla.

... Mastectomy يعني روع قنصفت من الـ

Types of mastectomy



← Lumpectomy
Called wide local excision
with safe margin...

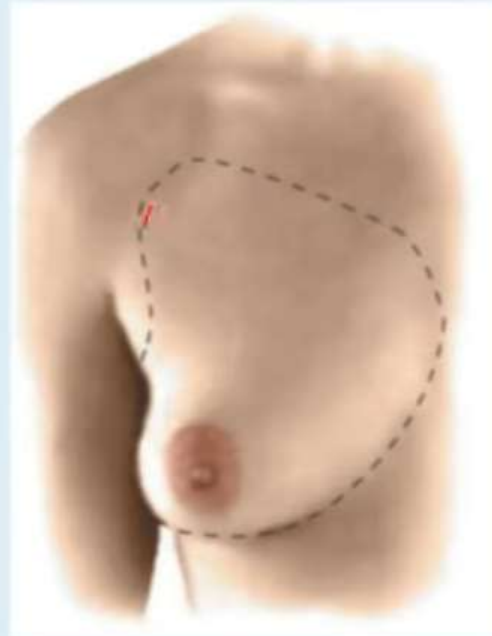
Total Mastectomy
Called simple mastectomy
به بنشيد از Breast

بنشيد از Breast + axillary LN
Modified Radical
Mastectomy

Types of mastectomy

1. Total or simple mastectomy:

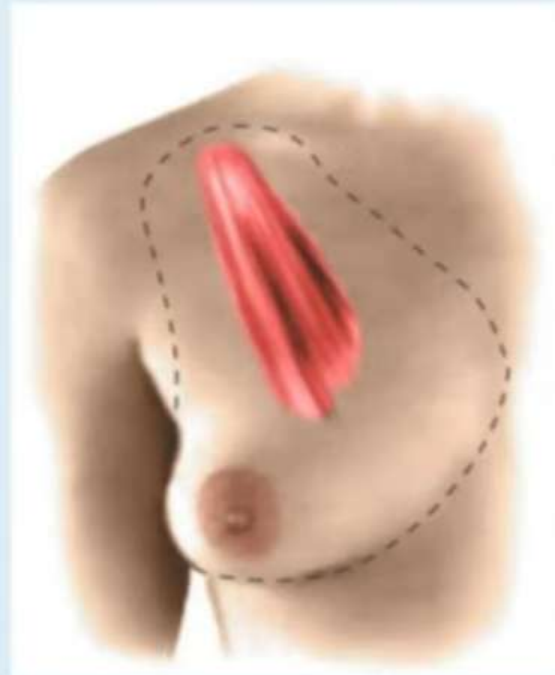
- ✓ Removal of the entire breast tissue, [only]
- ✓ No dissection of lymph nodes or removal of muscle.
- Sometimes adjacent lymph nodes are removed along with the breast tissue.



Types of mastectomy

2. Modified Radical Mastectomy (MRM):

- Removal of breast tissue and axillary lymph nodes.
- No removal of pectoral muscle.
- 3 modifications:
 - a. Patey's ✓
 - b. Scanlon's ✓
 - c. Auchincloss. ✓



Types of mastectomy

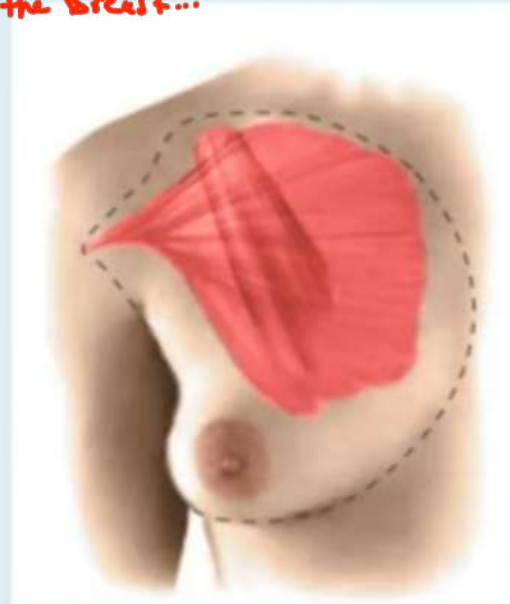
ناتجها lead to disfiguring [deformity] of the Breast...

3. Halsted's Radical Mastectomy:

- Most extensive type.
- Breast tissue, axillary lymph nodes and pectoral muscles are removed.

ذات مایهها Disadvantages:

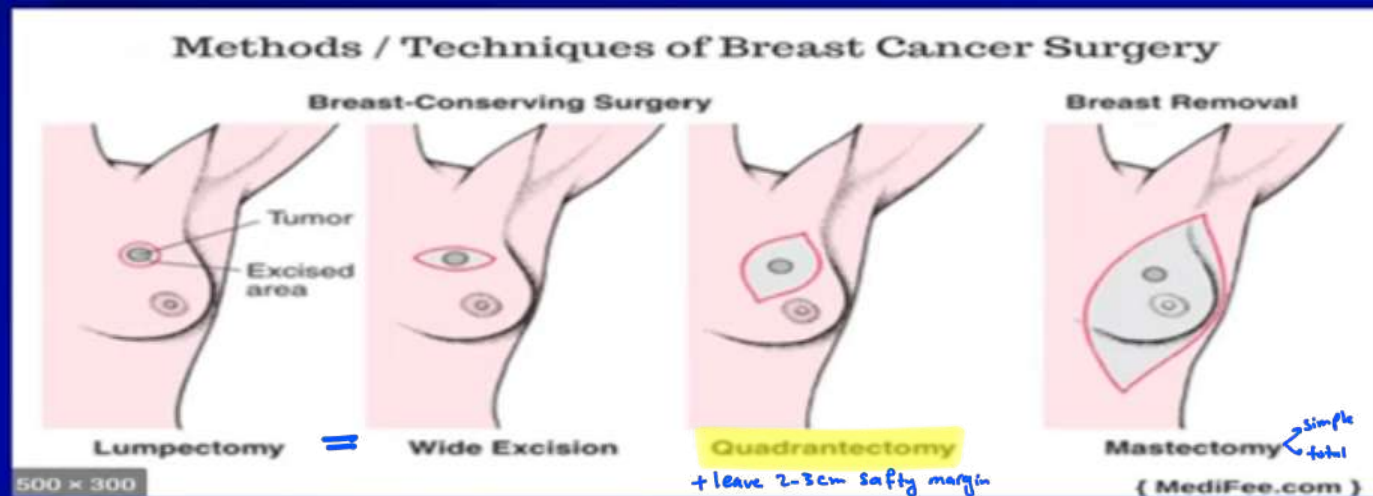
- Bad scars and unacceptable deformity. ✓
- Reduced range of mobility of shoulder ✓



Breast conservation:

Best for females [preferred] especially in young age female...
* done for 2/3 of the cases in the step...
* 1/3 of the cases we do for them Mastectomy...

- **Small tumor 4-5 cm large breast.** ✓
radiotherapy بعد العملية في وقت محدد خلاص تقاويه
في البلاء...
- **Peripheral location.** ✓
- **No multi-centricity.** ✓ or multifocal
- **No extensive LN involvement no Metz.** ✓
- **Removal of tumor with one cm of surrounding normal breast tissue.** ✓
so we leave safety margin 1 cm overall...
- **Axillary lymph node clearance.** ✓
- **Post op radiotherapy.** ✓
اهم نقطة →
- **Post op chemotherapy.** ✓



5. BREAST CONSERVATIVE SURGERIES

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

Removal of unicentric tumour with 1cm clearance margin.

Incision: Over tumour + Axillary Dissection + RT

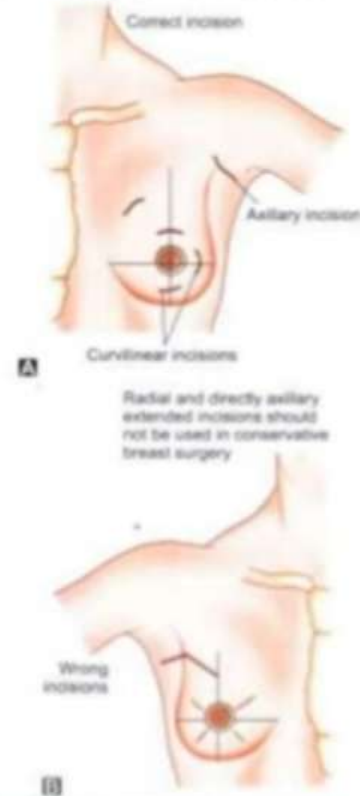
2. **Quadrantectomy:**

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

3. **Skin Sparing Mastectomy**

4. **Lumpectomy (=WLE)**

Term rarely used



Figs 8.84A and B: Curvilinear incision should be placed in conservative breast surgeries. Never place wrong radial incisions because if conversion to total mastectomy is needed then placement of incision will be difficult. In conservative breast surgery for axillary dissection axillary incision to the axilla should be placed.

Mastectomy

A. Traditional Non Sparing Mastectomy

1. Super (Extended) radical (Urban)
2. Radical mastectomy (Halstedt)
3. Modified radical mastectomy
 - Patey's operation
 - Auchen-closs operation
4. Total mastectomy
5. Simple mastectomy
6. Toilet mastectomy

B. Sparing Mastectomy [preferred]

1. Skin sparing mastectomy (S.S.M)
2. Nipple sparing mastectomy (**N.S.M**)
3. Subcutaneous mastectomy



متى معنا

Subtype	Characteristics	Markers
Luminal A	Low grade High ER ~40% of all breast cancer Good prognosis	ER+, PR+, HER2- Low Ki-67 (<14%)
Luminal B	Higher grade Lower ER ~20% of all breast cancer Poorer prognosis than luminal A	ER+, PR+/-, HER2+/- High Ki-67 (>14%)
HER2-enriched	High grade Often node positive P53 mutations ~10%-15% of all breast cancer	ER-, PR-, HER2+
Basal-like	High proliferation BRCA dysfunction ~15%-20% of all breast cancer Poor prognosis	ER-, PR-, HER2- CK5/6 Or EGFR+

Continue

Patey mastectomy(modified radical mastectomy)

- ✓ ■ Multifocal disease Large tumor more than 4-5 cm
- ✓ ■ Central lesion. below the nipple areola complex...
- ✓ ■ Small breast.
- ✓ ■ Patient wish. يعني ما بتقدر تجميع على الصفة لتد مع تافه الـ radio مختلفه رغبنا هذه الطريقه ...
- ✓ ■ Nipple involvement.

Axillary dissection

Level of Axillary dissection

Anterior
posterior
lateral

➔ Level I : Lateral to pectoralis minor

■ Level II Behind pectoralis minor [central LN]

■ Level III Medial to pectoralis minor (apex) ^{and above it}

■ Sentinel lymph node biopsy 95% used for females have Breast cancer

✓ ■ Axillary node sampling + axillary LN mets but clinically or in US not detected in axillary area...

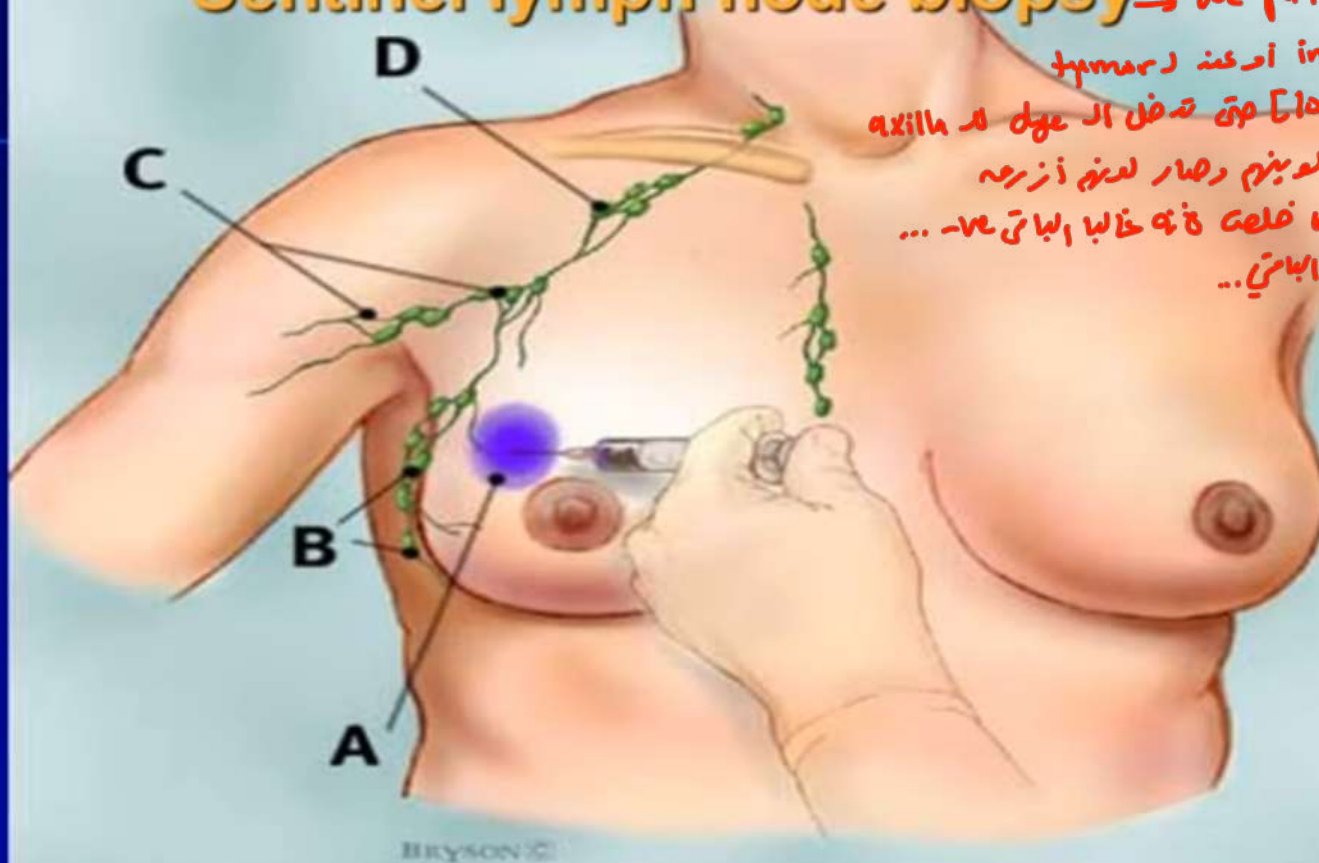
✓ ■ Axillary node clearance So we do Sentinel LN Biopsy

✓ ■ Internal mammary lymph 5%

حائشياً لهم رتبة حائش جع المرونة ..

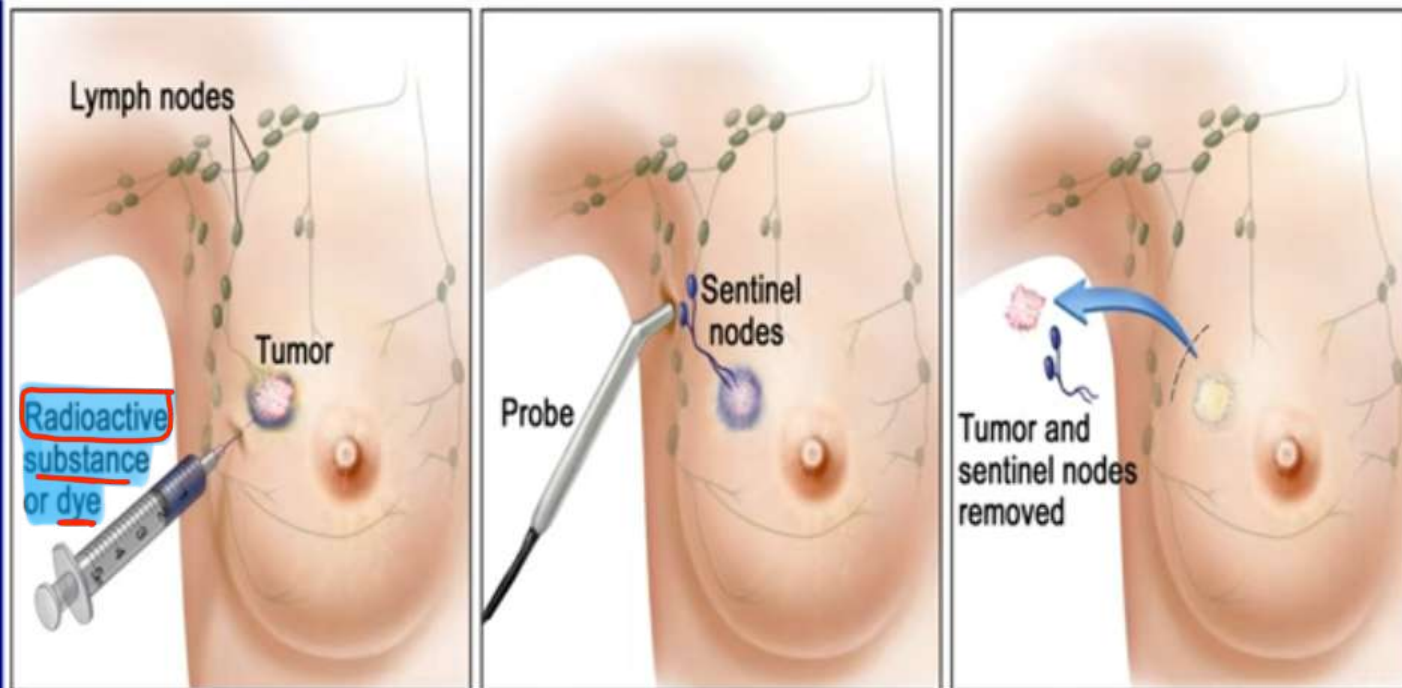
* Female has Breast Cancer + (true) axillary LN we should do axillary dissection...

Sentinel lymph node biopsy → we put dye [isosulfan blue]

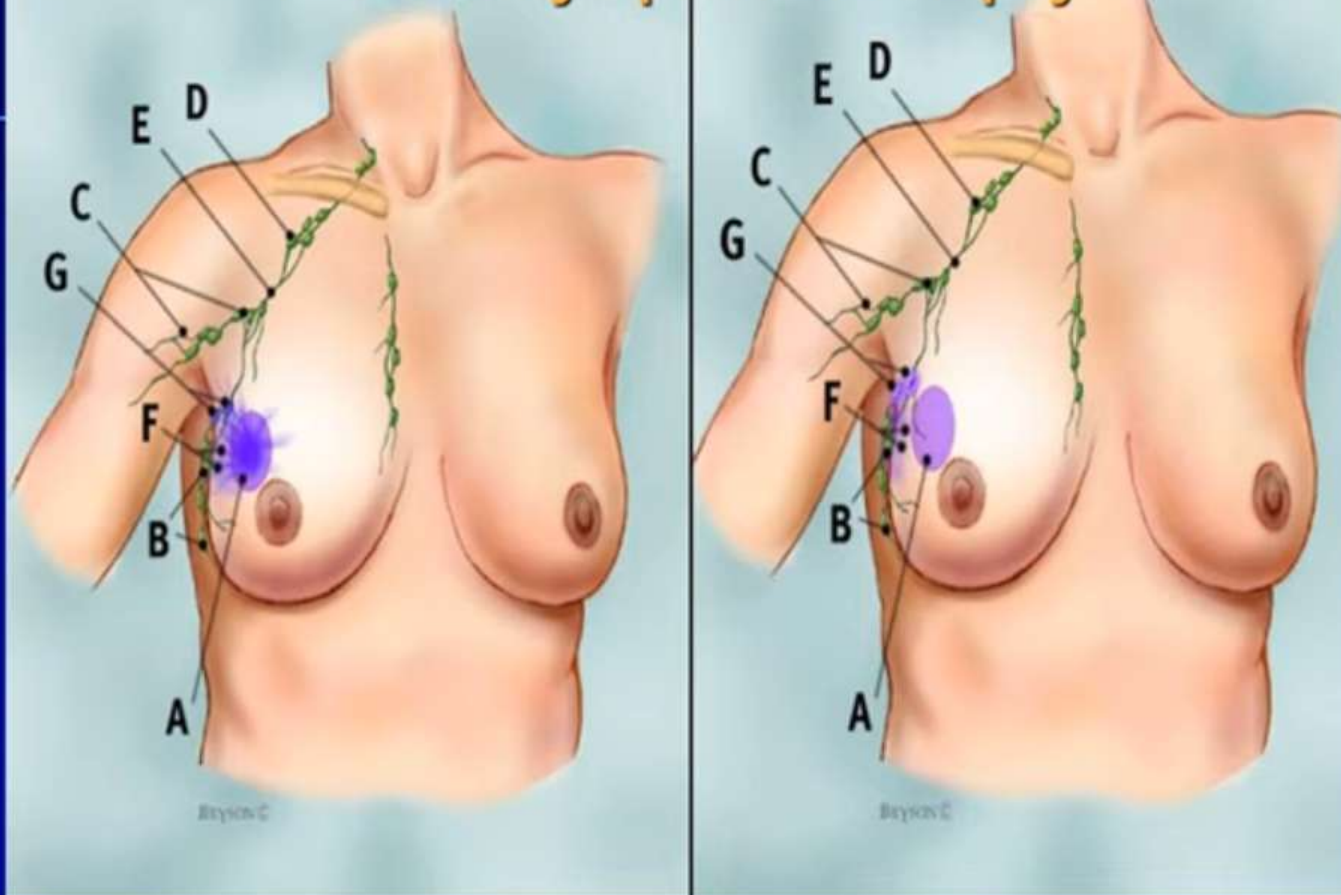


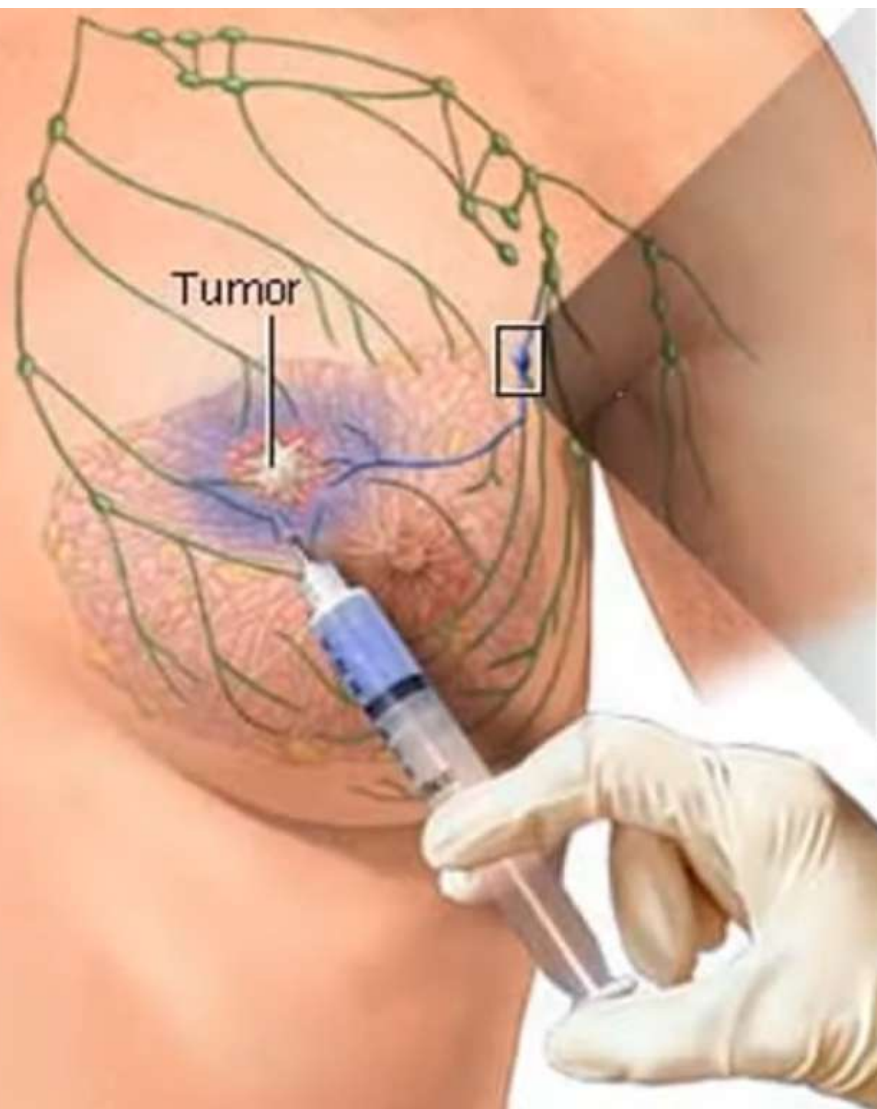
تنگنه insub areolar space
 Breast [damin] قوت قوت ال dye ال axilla
 روت قوت بنافه اول 2 LN قوت قوت روت روت روت
 روت روت -ve ← ما بنفد قوت قوت روت روت روت -ve ...
 +ve ← روت روت روت روت ...

SLNB



Sentinel lymph node biopsy





Sentinel lymph
node and vessels



Valves allow
fluid to flow in
one direction
only

© ADAM, Inc.

Box 1

American Society of Clinical Oncology Guidelines: Indications for Sentinel Lymph Node Biopsy, 2005 and 2015

T1, T2

Unicentric or multicentric

Ductal carcinoma in situ with mastectomy

Any age

Any body mass index

Male or female

Prior excisional biopsy

Before or after neoadjuvant therapy

May omit axillary dissection for patients with one or two positive sentinel lymph nodes

ALND Is Not Required for Patients Who Meet All of the Following Criteria:

T1 or T2 tumors

Clinically node negative (even if ultrasound node positive)

One or two positive SLNs without evidence of significant extracapsular extension

Patient agreement to complete whole **breast** radiation therapy

Patient agreement to complete adjuvant systemic therapy (cytotoxic, hormonal, or both)

ALND May Be Required for Patients Who:

Have T3 tumors

Have more than two positive SLNs

Have been identified as having matted axillary nodes or preoperatively palpable nodes

Are receiving neoadjuvant chemotherapy

ACOSOG, American College of Surgeons Oncology Group; *ALND*, axillary lymph node dissection; *SLN*, sentinel lymph node.

129 Radiotherapy

- Essential part after breast cancer surgery. *post op. especially in BCS...*
- After wide local excision.
- T3 ,any T 4 , inflammatory breast cancer.
- To breast flaps, *in mastectomy* for patients with high risk of local recurrence
- Large tumors , node +ve
- Lympho-vascular invasion
- Axillary radiotherapy
- 5 Days a week for 3-5 weeks

← mastectomy مئة كلام بيا : radiotherapy حسب معايير معينة ...

Systemic adjuvant therapy

Include

- Hormonal ✓
- cytotoxic chemotherapy ✓

→ post mastectomy. [adjuvant chemotherapy]...

[neoadjuvant chemotherapy]

↓
pre operative

Woman risk of recurrence

- Nodal status
- Tumor size
- Tumor grade

Hormone receptor status

Menopausal status, age

Vascular, neural invasion

Endocrine therapy

SERM

The most important...

1. Tamoxifen *Steroidal drug*

- Synthetic partial estrogen agonist.
- Anti estrogen , compete with estrogen on its receptors. *on Breast [act as estrogen in uterus]...*
- Reduce recurrence rate by 25% and death by 17%.
- Reduce risk of contralateral breast cancer by 50%.
- For estrogen receptors +ve.
- Pre and post menopausal patients
- Preventive agent.

TAMOXIFEN

- **Dose:** 20mg daily for 2-5 years

Side effects

- Endometrial cancer.
 - DVT, PE.
 - Hot flushes weight gain.
 - Loss of libido, vaginal dryness.
 - Hyper-calcaemia.
 - Nausea and vomiting.
2. **Raloxifene evista** 60-120 mg daily
- Antiestrogen on breast and uterus
 - Positive effect on lipid profile,

Aromatase inhibitors

just used in post menopausal women...

- Prevent conversion of androgens to estrogen in fat and muscle, and breast cells.
- Post menopausal women
- Anastrozole (Arimadex) 1mg daily
- Letrozole (Femara) 2.5 mg daily
- NO side effects of tamoxifen
- Pure antieostrogen
- Fluvestrant (Fasoladex)
- 100 Time affinity of TAM on estrogen receptors
- IM injection 250mg monthly
- No hot flushes , no effect on uterus.

Biological response modifiers

- Bind with certain proteins in breast cancer cell, prevent their growth
- Trastuzumab(Herceptin) ✓
- Humanized monoclonal antibody
- In over expression of HER2/neu in one third of breast cancer patients.
- LHRH agonist ✓
- Goserelin acetate (zoladex) 3.6 mg sc monthly
- Ovarian ablation in premenopausal women
- Reversible

Ovarian ablation

- **Surgical(open, laparoscopic)**
- **Low dose radiotherapy**
- **Medical by LH-RH analogue**
- **Benefit only premenopausal women**
- **Oestrogen receptor +ve women.**

Cytotoxic chemotherapy

- **Reduce recurrence rate by 30%**
- **Reduce mortality by 17%**
- **Effect decline with age**
- **Same effect for node+ve and node –ve patients, OR status**
- **Standard regime was CMF 6 cycles**
- **Advanced disease CAF 4 cycles**
- **Taxanes paclitaxel .**

Primary systemic chemotherapy

Neoadjuvant chemotherapy

- **Systemic chemo before surgery**
- **Reduce tumor size and lymph node status.**
- **Change your surgical options.**
- **Response in 75-90%.**
- **Pathological response less than 15%**

Locally advanced breast cancer

LABC

↳ Stage 3 Breast Cancer...

- **30%** of breast cancer. but with screening programme the incidence reduced.
- **30%** will have metastasis
- **Tumor which is not cured by local means**
- **T3-4 NO-2 MO**
- Measure oestrogen receptors.
- Neoadjuvant chemotherapy Surgery, followed by chemo-radiation.



locally advanced Breast cancer with
ulceration and fixation...
[حالت متقدمة من سرطان الثدي مع
التهتك والالتصاق...]



Inflammatory breast cancer

↳ 2-3% of Breast Cancer...

- ^{very} Aggressive type LABC stage III 1-6% ^{or 2-3% of i}
- Young age, rapid onset.
- Inflamed, tender breast, peau d' orange
- Mass, no mass.
- Erythematous, indurated, edematous breast ^{as cellulitis}
- Failure of two weeks antibiotic therapy ^{[infection] so + treated by antibiotic if it not improved}
- Diagnosis by core biopsy, stage III B-C ^{after 2 week this indicate inflammatory breast cancer}
- Neo-adjuvant chemotherapy ^{pre op}
- ^① Surgery, ^② radiotherapy ^③ chemotherapy.
- Bad prognosis. + ^{↑ mortality rate...}

IBC

- Rapid onset of breast erythema , brawny induration edema and/or peaud'orange, and/or warm breast, with or without an underlying palpable mass.
- Duration of history no more than six months.
the duration less than 6 month
- Erythema occupying at least one-third of the breast.
- 75% have palpable axillary LNs.
severe enlarged axillary LN...
- Pathologic confirmation of invasive carcinoma by *Dermal lymphatic invasion by tumor cells.*

↳ indicate IBC ...



IBC

→ may associated with
nipple retraction...



Local recurrence

سے ہٹنا مل جاتا ہے۔

- The best treatment for local recurrence is prevention
- If after breast conservation surgery do completion mastectomy

After mastectomy

- Small recurrence local excision
- Multiple recurrence wide local excision +skin graft
- Radiotherapy if not given
- Chemotherapy
- Bone metastasis

Prognosis

I- Tumor related factors:

1- L.N. status:

- 1) Number of L.N.
- 2) Size of L.N.
- 3) Level of L.N

2- Tumor size:

3- Tumor grade

4- T.N.M staging

5- Metastasis

6- Tumor site

7- Histopathologic type

8- Biological markers:

- 1) Hormone receptor status
- 2) Cathepsin D
- 3) P53
- 4) HER-2/neu

II- Patient related factors:

1- Age

2- Sex

3- Pregnancy

4- Obesity



Male breast cancer

- **MBC** 1% of breast cancer.

① Increase estrogen (Cirrhosis, Obesity). *as in gynecomastia.*

② Decrease testosterone (Infection – Trauma, *on testis..*
undescended testicle). *↳ Mumps virus...
[lead to pancreatitis - orchitis - parotitis - Breast Cancer]..*

*especially if it
Bilateral...*

- ③ **BRCAI, BRCAII.** *mutation.*

- Most are invasive ductal 95%, HR +VE.

- Diagnosis: by Triple Assessment *[hX + Clinical exam - radiology - Biopsy].*

- Treatment is modified radical mastectomy

- Radiotherapy ✓ *or maybe chemotherapy..*

- Tamoxifen, LHRH analogue

- CMF

MBC



Breast mass during pregnancy (Gestational Breast Cancer)

مريض حامل

- **1.5%** of women in child bearing period.

- Most common non-gynecological cancer.

1- Ovarian

2- Uterine

3- Breast Cancer

} gestational tumors...

- Gestational breast cancer.

- One year delay in **50%**

- Lactational changes should be symmetrical.

in Lf and Rt

but if it Asymmetrical

think about Breast Cancer...

- Breast u/s core biopsy.

- **Mastectomy**: is usually recommended.

at 2nd trimester of pregnancy.

... Chemo therapy

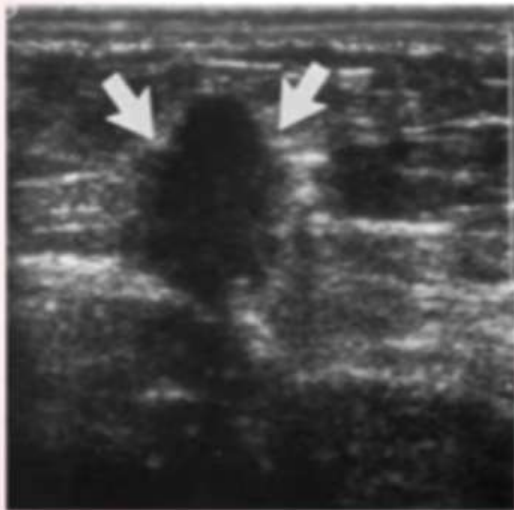
... Chemo therapy

... sentenal LN Biopsy

منه بغيره، التغيرات
بالثدي بسبب الحمل...

Carcinoma

- ill-defined margins,
- low-level
- heterogeneous internal echoes



Solid benign mass



Ultrasound of a non-cancerous benign fibroadenoma

Cyst

- absence of internal echoes (anechoic interior),
- clearly defined posterior wall, and
- enhancement of distal echoes

