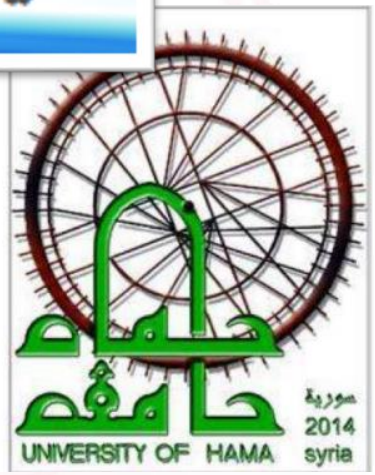
كلية الطب البشري



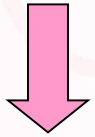
BREAST IMAGING

د. رفيف تركاوي

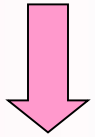
October is Breast Cancer Awareness Month

- **1 in 8 women will be diagnosed with breast cancer in her lifetime**
- **Breast cancer is the most common form of cancer in women in the U.S.**

الكشف المبكر

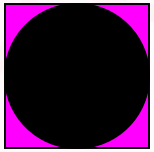


الفحص الذاتي + الفحص السريري + الصورة الشعاعية

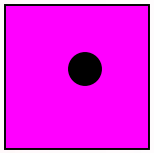


لإنقاذ الحياة

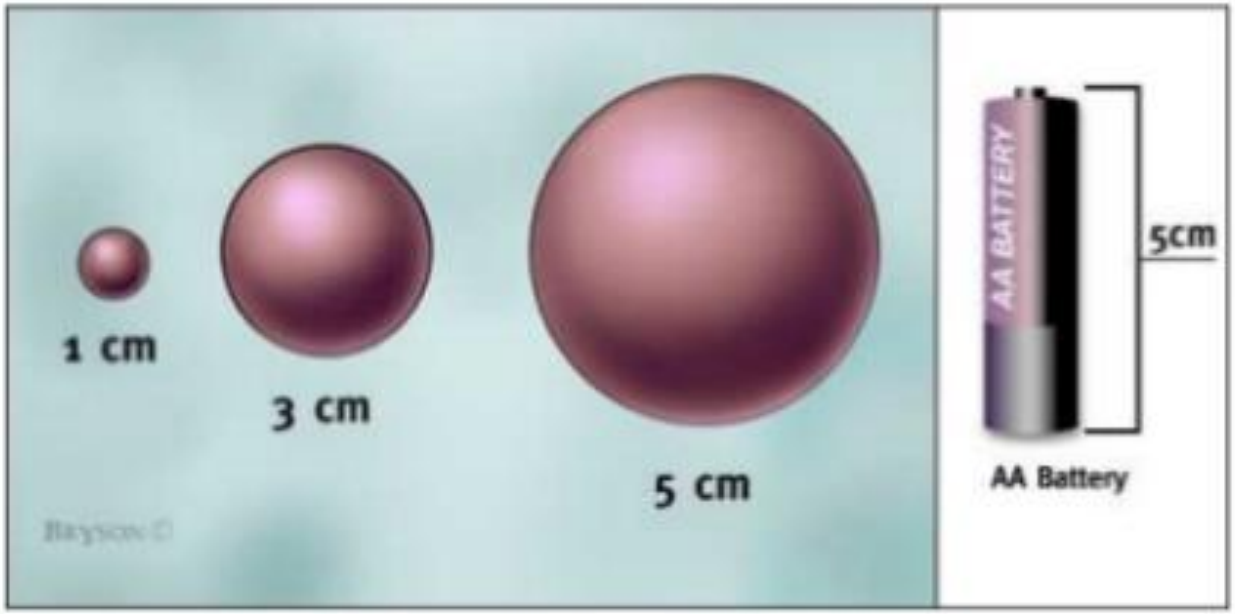
بعض الأورام تُكتشف عندما تبلغ هذا الحجم:



بينما يمكن بالفحص الشعاعي اكتشافها وهي بهذا الحجم:



تقريب لحجم الورم حسب قياسة بالسنتم



ما هي إرشادات الكشف المبكرلسرطان الثدي ؟*

- **الفحص الشعاعي** مرة كل سنة بين سن ال ٤٠-٦٩

- **الفحص الطبي أو السريري**مرة كل سنة عند الطبيب، إبتداءً من سن الأربعين وأحيانا قبل

- **الفحص الذاتي** مرة كل شهر إبتداءً من سن العشرين

(٧ أيام بعد ابتداء العادة الشهرية حين يكون الثدي أقل تحجراً)

*American Cancer Society

قبل الوصول الى مرحلة ورم ملموس أو متقدم:

الفحص الشعاعي كل سنة مرة

ابتداء من سن ٤٠

على المرأة:

إجراء فحص الأشعة:

- مرّة كل سنة للنساء اللواتي تفوق أعمارهنّ الأربعين
- في حال وجود سرطان ثدي وراثي في العائلة, البدء بإجراء الصورة الشعاعية ”عشرة سنوات قبل عمر أصغر اصابة

- لا يستغرق سوى بضع دقائق
- آمن في المراكز الحديثة والمراقبة
- يمكن ان يكون الفحص مزعجاً و مؤلما في بعض الاحيان

الكشف المبكر لسرطان الثدي

- ✓ الكشف المبكر يؤدي الى الشفاء التام في ٩٧ بالمئة من الحالات
- ✓ الكشف المبكر قد ينفي الحاجة للإستئصال الكامل ويسمح بعلاج يحافظ على شكل الثدي
- ✓ الصورة يجب أن تعاد كل سنة وإن كانت نتائجها جيدة

American Cancer Society for women at average risk

- **Women ages 40 to 44** should have the choice to start annual breast cancer screening with mammograms if they wish to do so. The risks of screening as well as the potential benefits should be considered.
- ·**Women age 45 to 54** should get mammograms every year.
- ·**Women age 55 and older**should switch to mammograms every 2 years, or have the choice to continue yearly screening.

Higher Than Average Risk

- **Women who are at high risk for breast cancer based on certain factors** should get an MRI and a mammogram every year.
- This includes women who:

• Have a lifetime risk of breast cancer of about 20% to 25% or greater, according to risk assessment tools that are based mainly on family history

• Have a known *BRCA1* or *BRCA2* gene mutation

WHAT FACTORS PUT PERSONS AT HIGHER RISK FOR BREAST CANCER?

- **History of chest radiation (RR 26.0)**
- **History of breast cancer (RR varies)**
- **Extremely dense breasts compared with fatty breasts (RR 4.5)**
- **History biopsy with atypical hyperplasia 3.7**
- **Menopause >55 y compared with <45 y (RR 2.0)**
- **Nulliparity or 1st full-term pregnancy ≥30 y (RR 2.0)**
- **History benign breast biopsy vs no breast biopsy (RR 1.7)**

continued…

- **Menarche before age 12 years compared with >14 y (RR 1.5)**
- **Postmenopausal obesity vs normal weight (RR 1.5)**
- **Current use of combination menopausal hormone therapy vs never users (RR 1.2)**
- **Moderate alcohol use compared with abstention (RR 1.1)**

Mutation	Breast Cancer	Ovarian Cancer	Other sites
Normal female population	11% (to age 85)	1.2%	
BRCA1 (1/1000) Chromosome 17	57% (47%-66%)	40% (35%-46%)	? Pancreas, prostate
BRCA2 (1/1000) Chromosome 13	49% (40%-57%)	18% (13%-23%)	pancreas <5%, male breast, prostate
Li-Fraumeni Syndrome (TP53 mutation)	High risk esp young		Sarcoma, brain, leukaemia,
Lynch Syndrome (MMR genes)		9% (varies with mutation)	Colorectal, renal, endometrial, gastric,
PTEN Hamartoma syndrome (Cowden)	High (>30%)		Thyroid, endometrial, renal
Peutz – Jeghers Syndrome	45% (by age 70)		GI, colorectal, gynaecological, pancreas
ATM mutation	47% (17%-89%)		pancreas
PALB2 Mutation	33%-55%		pancreas
CDH1 Mutation	42% (lobular)		gastric

eviQ Cancer Treatments Online 2011, Cancer Institute NSW, viewed 2 March 2017, https://www.eviq.org.au/

Screening Mammogram

- Performed in an asymptomatic patient to search for possible occult (hidden) breast carcinoma.

- **Goal of screening mammography is early detection**

Diagnostic Mammogram

- Performed in a symptomatic patient most commonly with pain or a lump to evaluate for possible breast carcinoma or other causes of the patient's symptoms

Diagnostic & Screening Ultrasounds

- **Diagnostic ultrasound**: Performed to further evaluate a mammographic finding or to evaluate an area of pain or lump.
- **Screening ultrasound** may also be performed in high risk patients or patients with dense breasts.

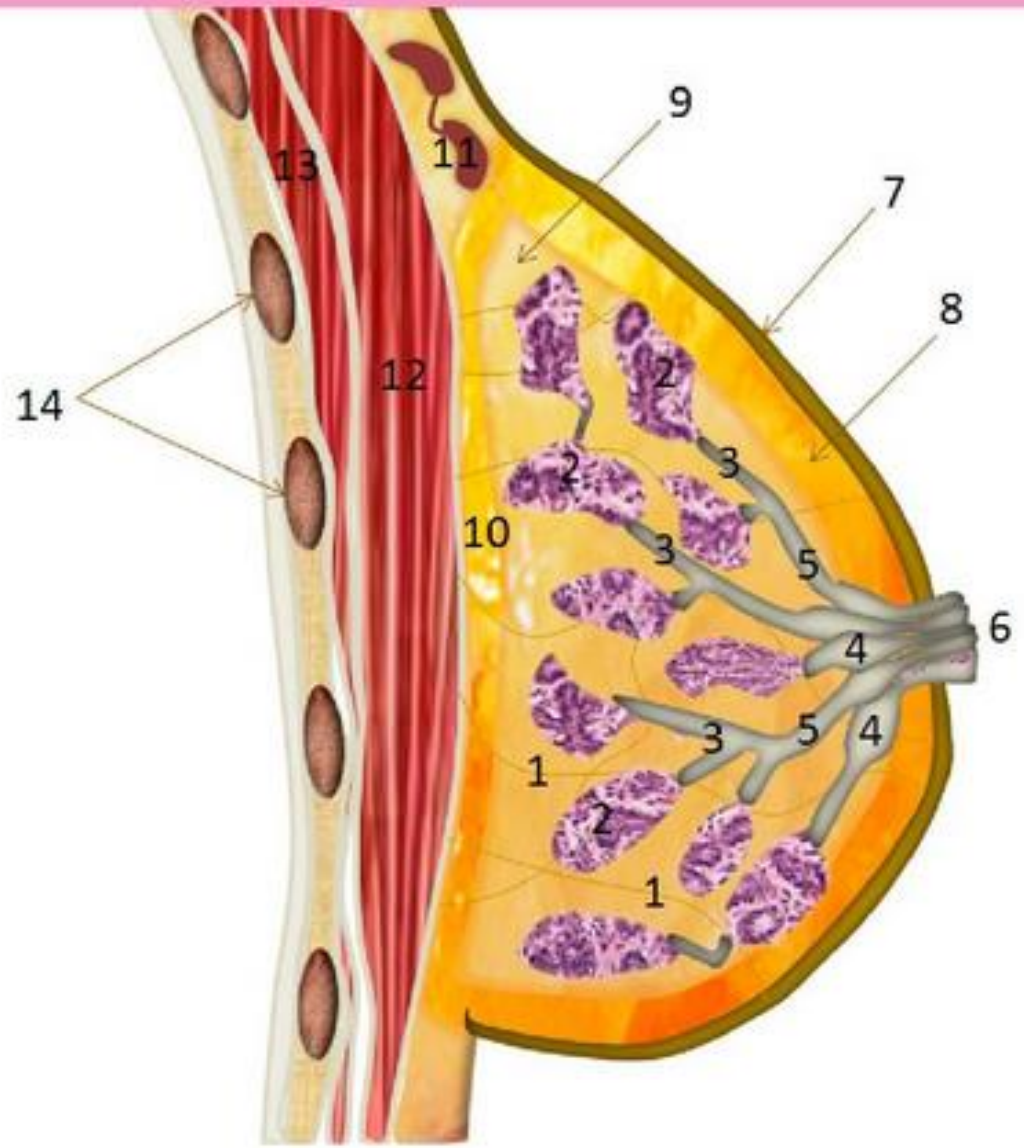
Biopsy Procedures

- Ultrasound and mammogram (stereotactic) guided biopsies including 3D MRI guided biopsies

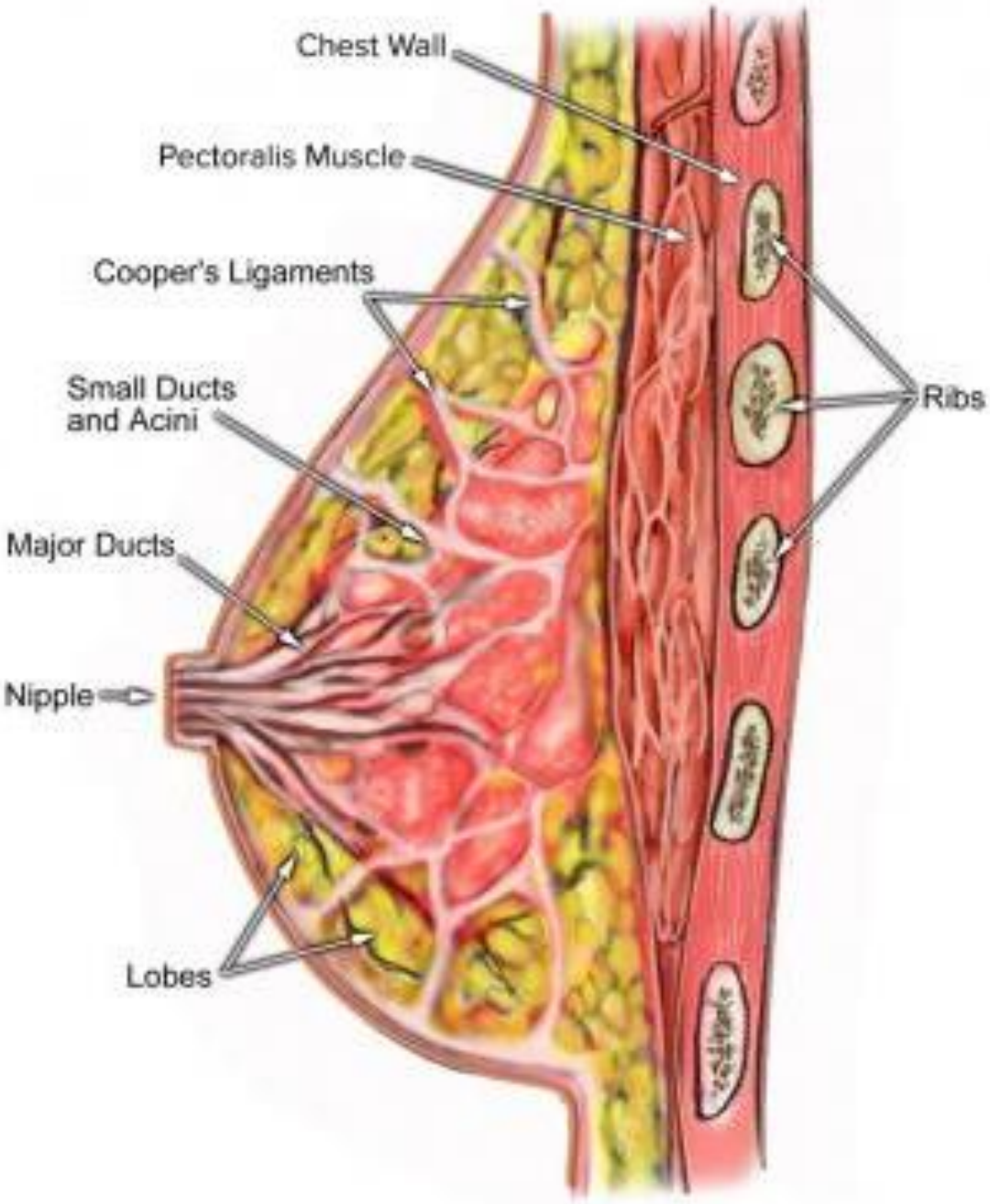
تصوير الثدي

- Anatomy التشريح
- Mammographic Technique تقنية الماموغرافي
- Evaluation of the mammogram تقييم الماموغرافي
- Ultrasound التصوير بالأمواج فوق الصوتية
- MRI الرنين المغناطيسي

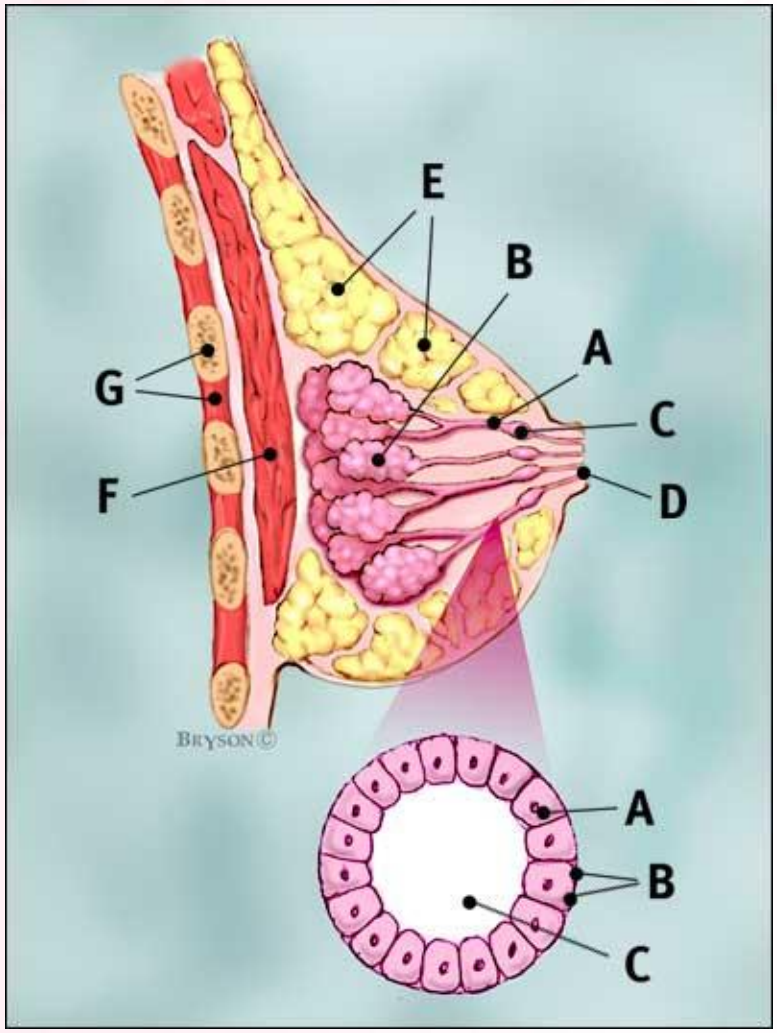
Breast Anatomy



1. Cooper's Ligaments
2. Breast Lobule
3. Extralobular Duct
4. Ductal Ampulla (Reservoir)
5. Main Duct
6. Nipple
7. Skin
8. Subcutaneous Fat
9. Mammary Layer Fatty Tissue
10. Retromammary Fat
11. Lymph nodes
12. Pectoralis Major muscle
13. Pectoralis Minor muscle
14. Rib


Chest Wall
Pectoralis Muscle
Cooper's Ligaments
Small Ducts
and Acini
Major Ducts
Nipple
Lobes
Ribs

Breast Anatomy



تصوير الثدي يستخدم لغرضين:

- للمسح عند المرأة اللاعرضية screening.
- تقييم التبدلات المرضية عند المرضى العرضيين diagnosis.

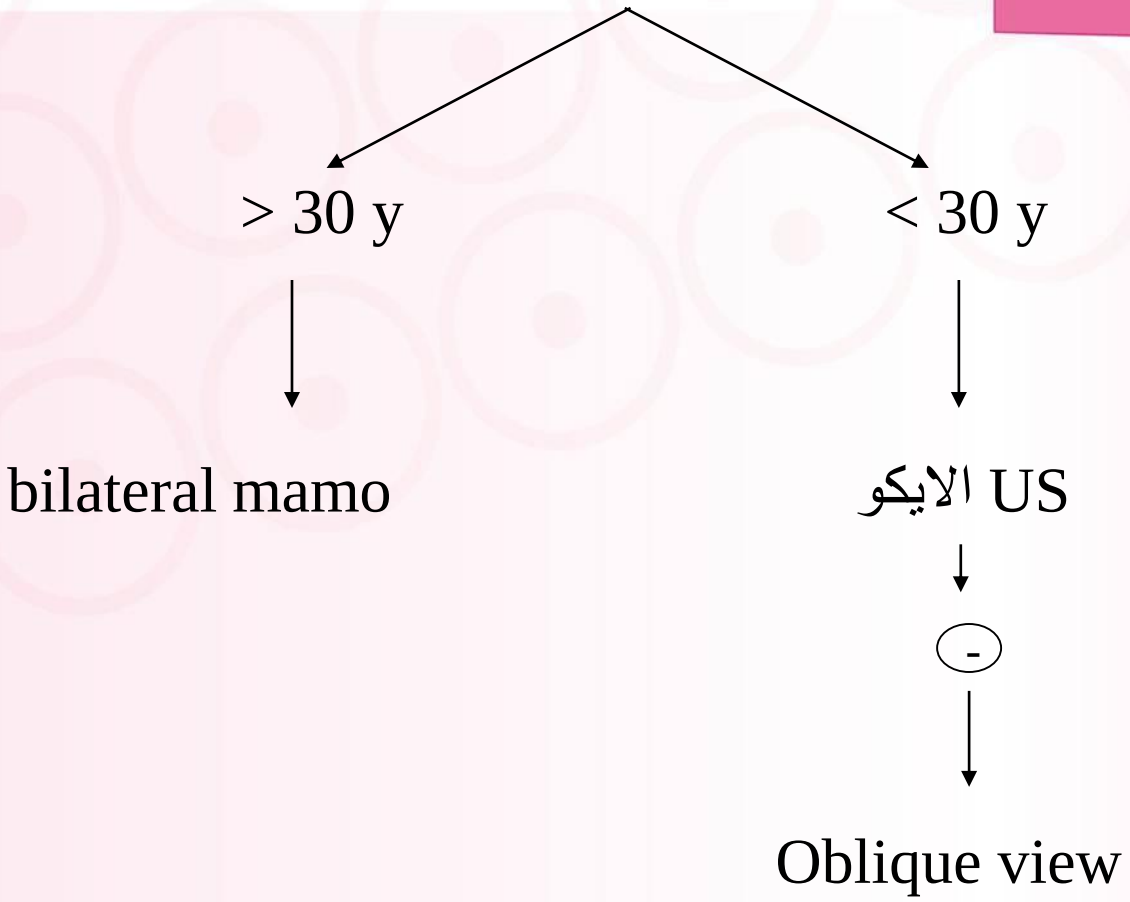
SCREENING FOR BREAST CANCER

age	Clinical examination	mammography
20-39	annually	Not recommended
40 and over	annually	annually

SCREENING FOR BREAST CANCER

- الماموغرافي هو الوسيلة الاستقصائية الوحيدة لكشف سرطان الثدي عند المرأة اللاعرضية.
- يجب اجراء الماموغرافي قبل أي تداخل (جراحي أو خزعة).
- الايكوغرافي ليس قاعدة عامة عند اجراء المسح.

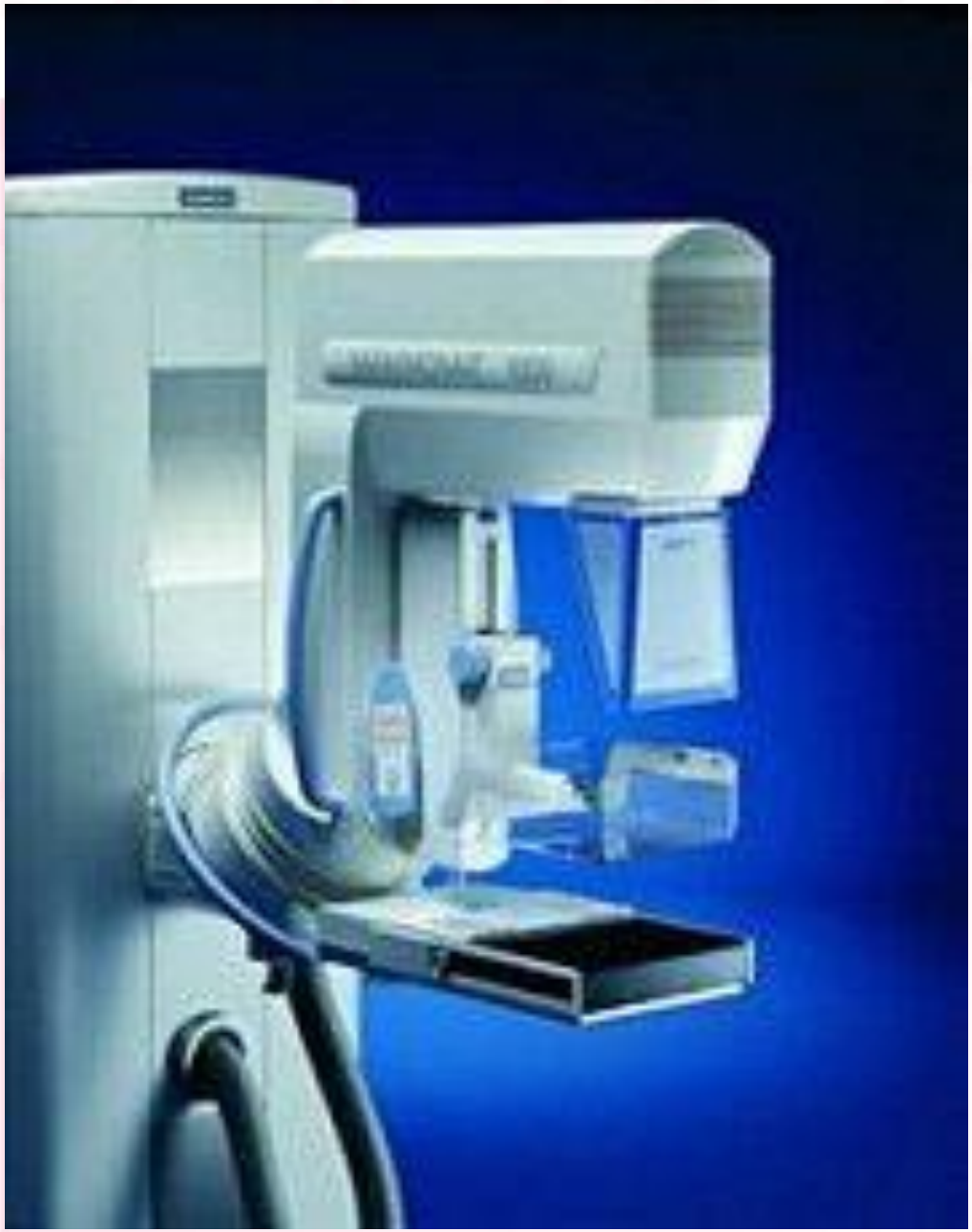
Palpable mass كتلة مجسوسة

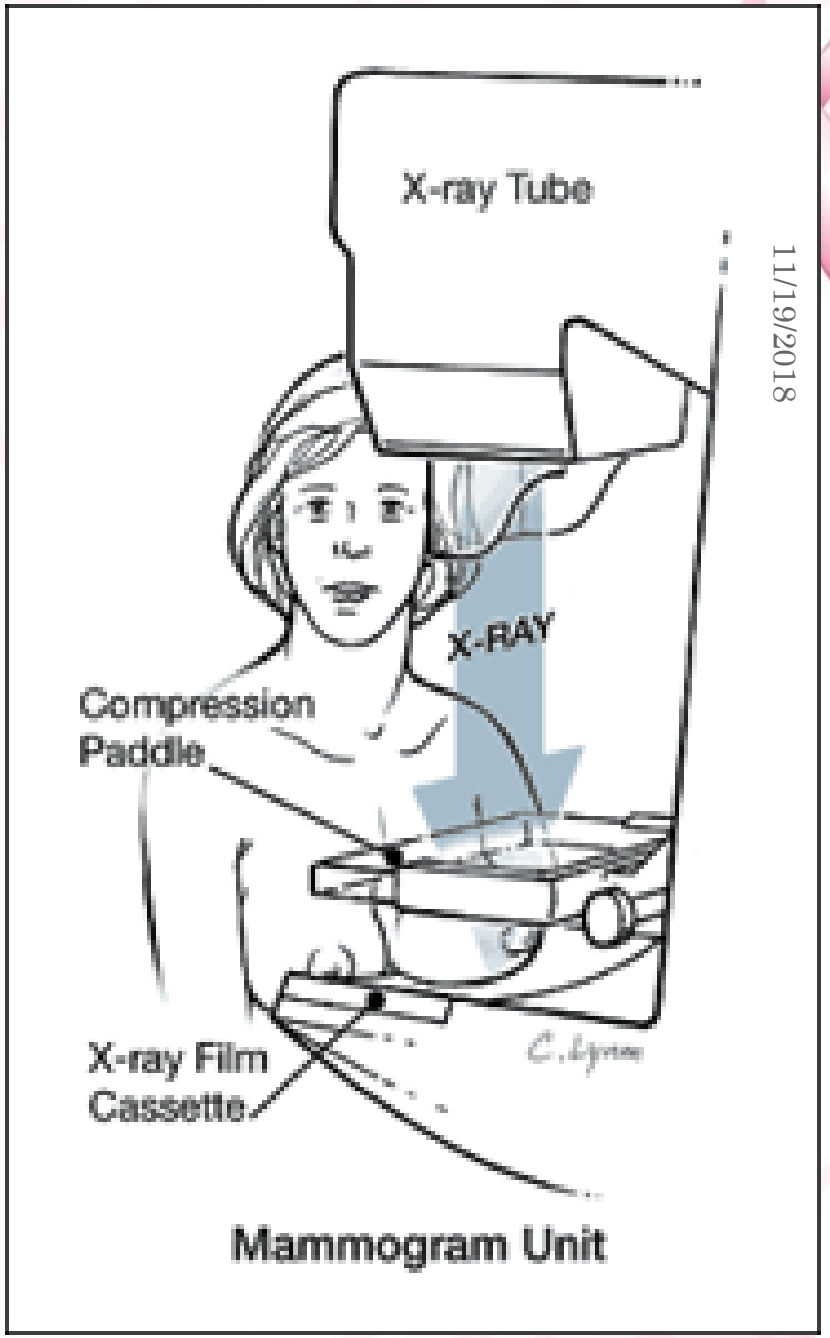


PREPARATION FOR MAMMOGRAPHY
التحضير للماموغرافي

- يجب إجراء الماموغرافي في الأسبوع الأول أو الثاني من الدورة الطمثية.
- يجب على السيدة عدم وضع deodorant، أو بودرة، أو سائل على القسم العلوي من الجسم في يوم اجراء الماموغرافي.
- يجب عدم إجراء الماموغرافي قبل ٤-٦ أسابيع من إجراء خزعة الثدي (إيجابية كاذبة).

11/19/2018




X-ray Tube
X-RAY
Compression Paddle
X-ray Film Cassette
Mammogram Unit

MAMMOGRAPHIC POSITIONING FOR SCREENING
الوضعيات الأساسية في تصوير الماموغرافي

- الوضعيات المعيارية للمسح:
  - MLO (mediolateral oblique)
  - *CC (craniocaudal) views*

MAMMOGRAPHIC POSITIONING FOR SCREENING

MLO views (الوضعية المائلة) :

- هي الوضعية الأكثر فائدة في دراسة الماموغرافي.
- تقف السيدة الى جانب جهاز الماموغرافي.
- حامل الفيلم موازي للعضلة الصدروية.
- زاوية أنبوب الأشعة يجب أن تكون بين ٤٠-٦٠ درجة.
- الكاسيت في الجانب الوحشي من الثدي.
- الحلمة يجب أن تتوضع بشكل جانبي.
- يجب تطبيق ضغط مناسب وجيد على الثدي.
- العضلة الصدروية يجب أن تشاهد الى مستوى الحلمة أو أدنى.

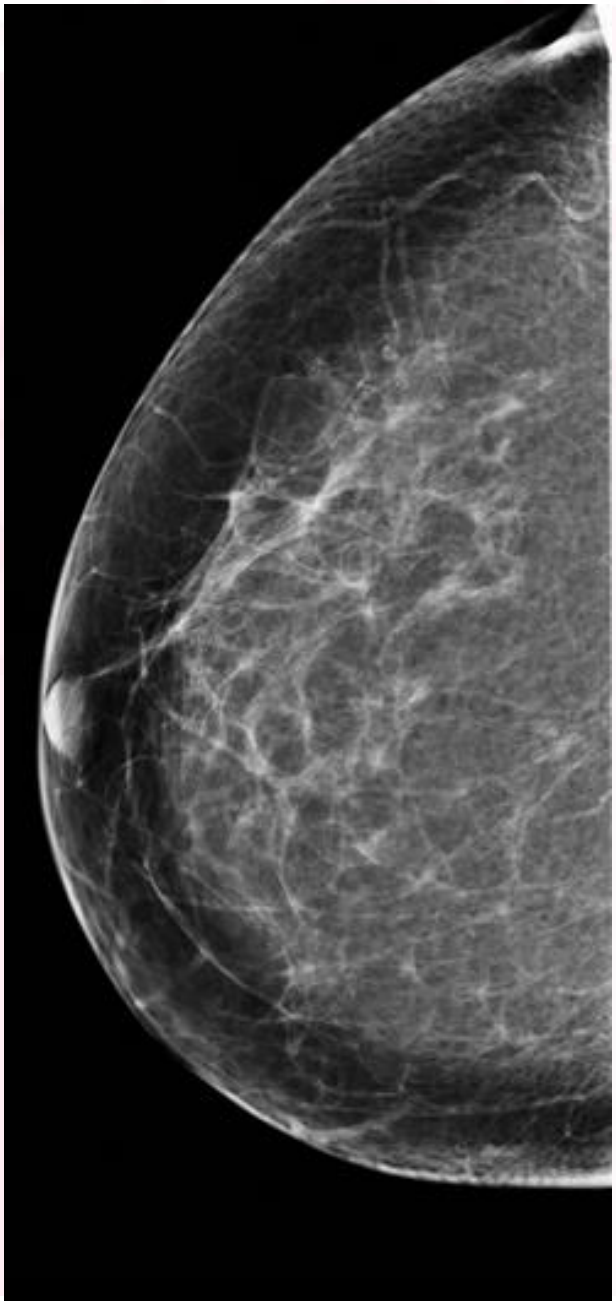
Wendolyn Hill

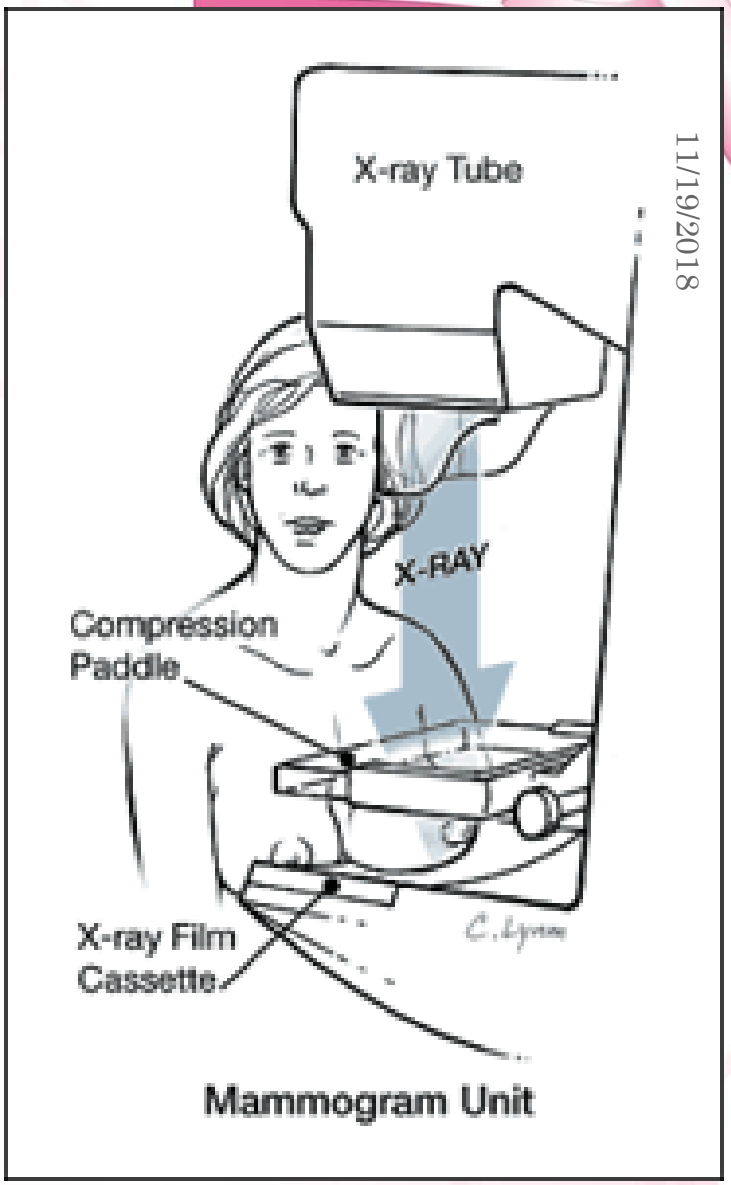
MAMMOGRAPHIC POSITIONING FOR SCREENING

CC views:

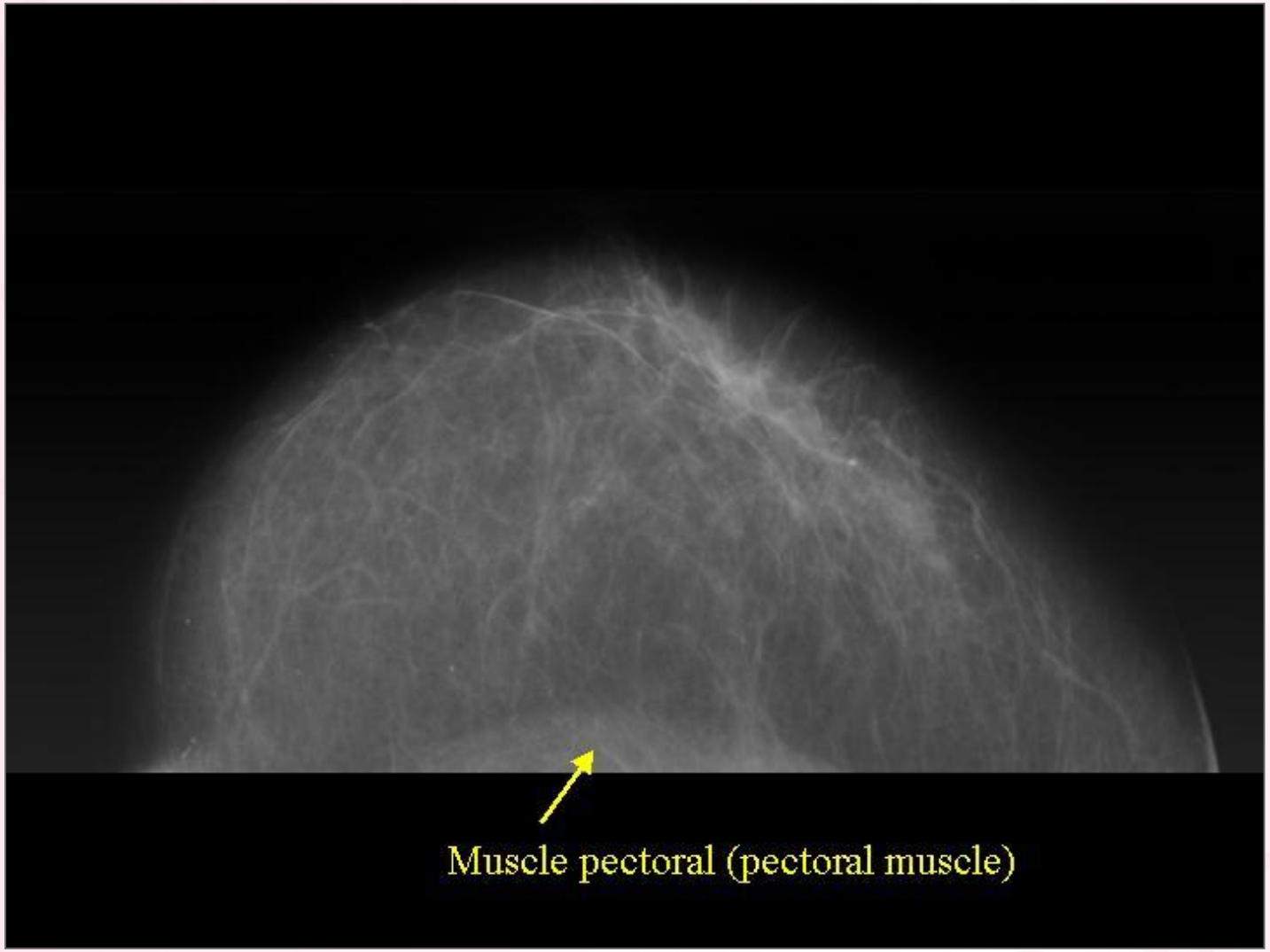
- تقف السيدة أمام جهاز الماموغرافي.
- أنبوب الأشعة عمودي على الأرض.
- الحلمة يجب أن تتوضع بشكل جانبي.

CC




X-ray Tube
X-RAY
Compression Paddle
X-ray Film Cassette
Mammogram Unit

Mammographic positioning for screening



MAMMOGRAPHIC TECHNIQUE

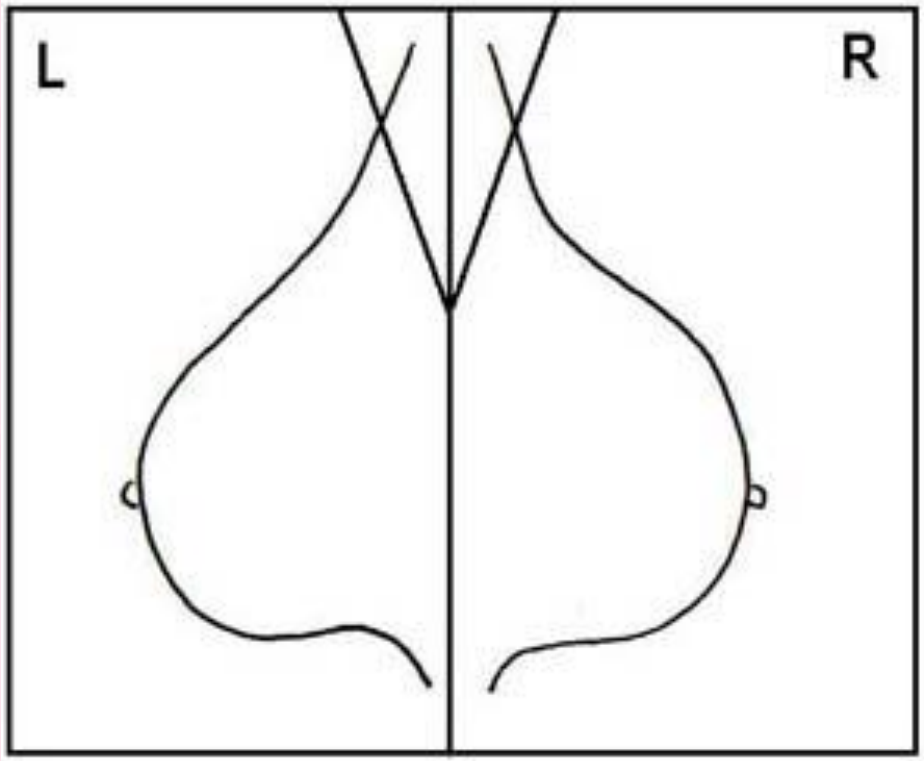
- **Compression الضغط :**

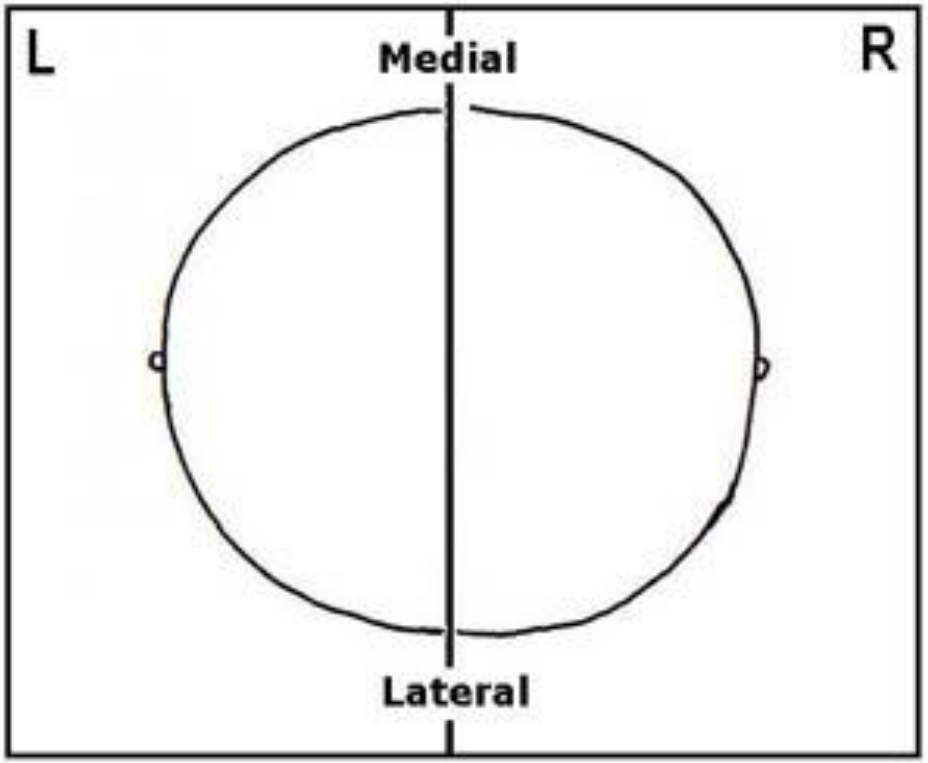
- هام لإنقاص جرعة الأشعة وتحسين نوعية الصورة .
- انقاص حركة المريض .
- انقاص ثخانة الثدي.
- انقاص الأشعة المتبعثرة.
- انقاص الغباشة بالتركيب الهندسي للثدي.

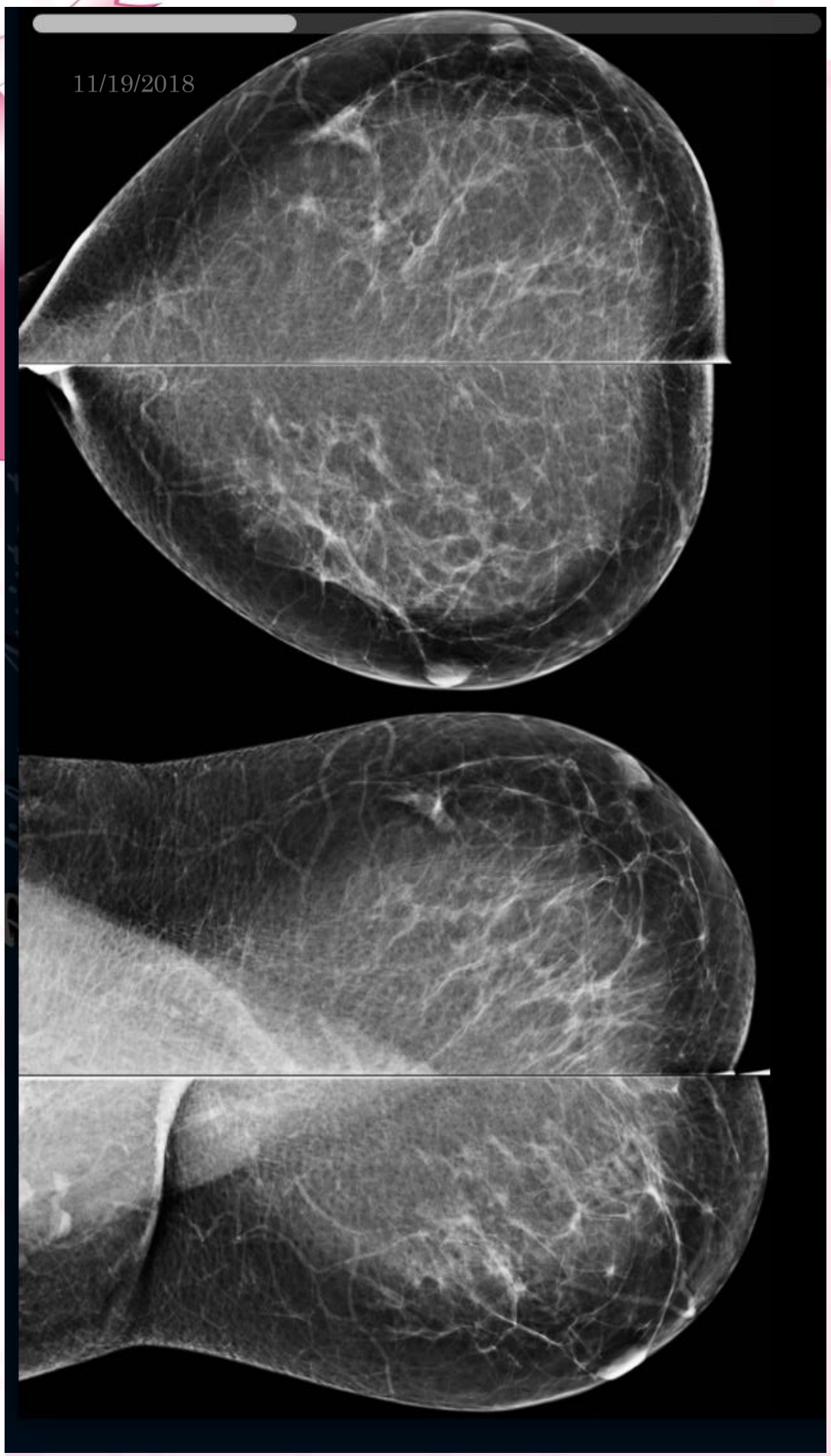
MAMMOGRAPHIC TECHNIQUE

- **Radiation dose (الجرعة الشعاعية):**
- جرعة الأشعة قليلة جداً.
  - the radiation dose to the breast is limited to less than 3mGy per view (CC + MLO).

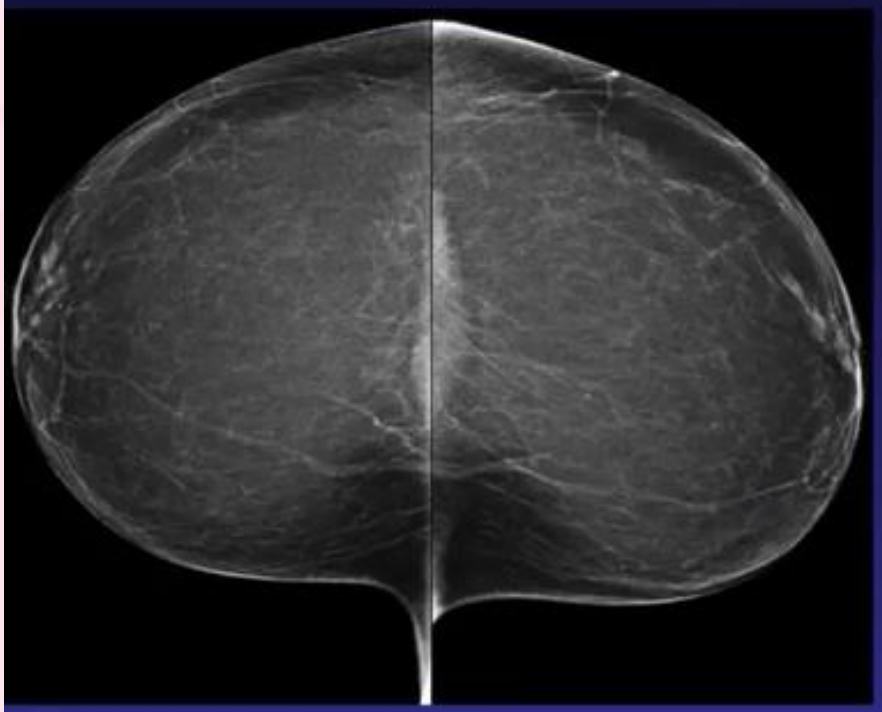
POSITIONING THE MAMMOGRAM FOR VIEWING






11/19/2018

Standard Views

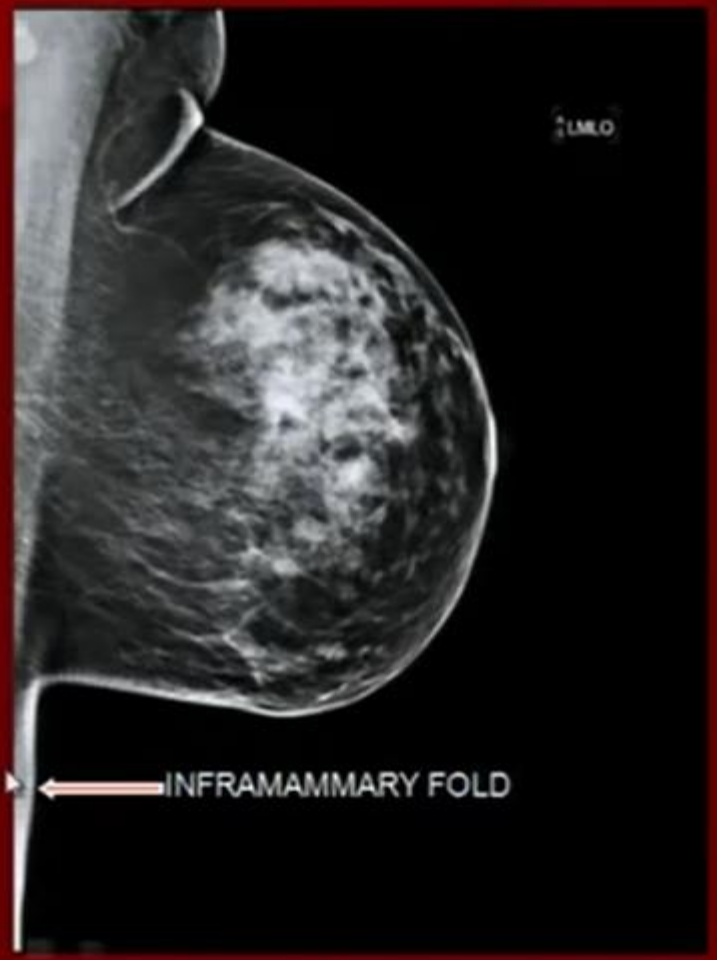


CC

MLO

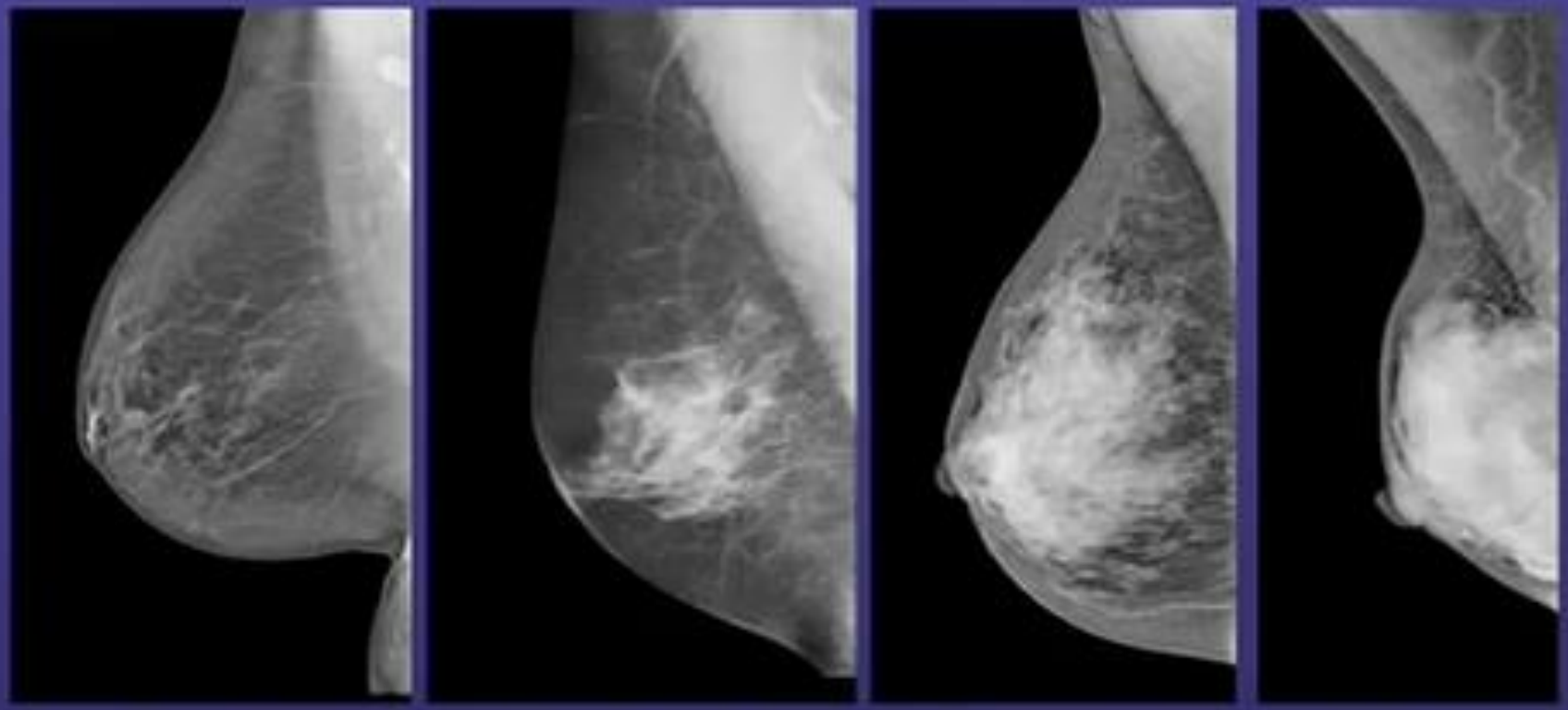
MUSCLES OF THE CHEST WALL

RETROMAMMARY SPACE & INFRAMAMMARY FOLD

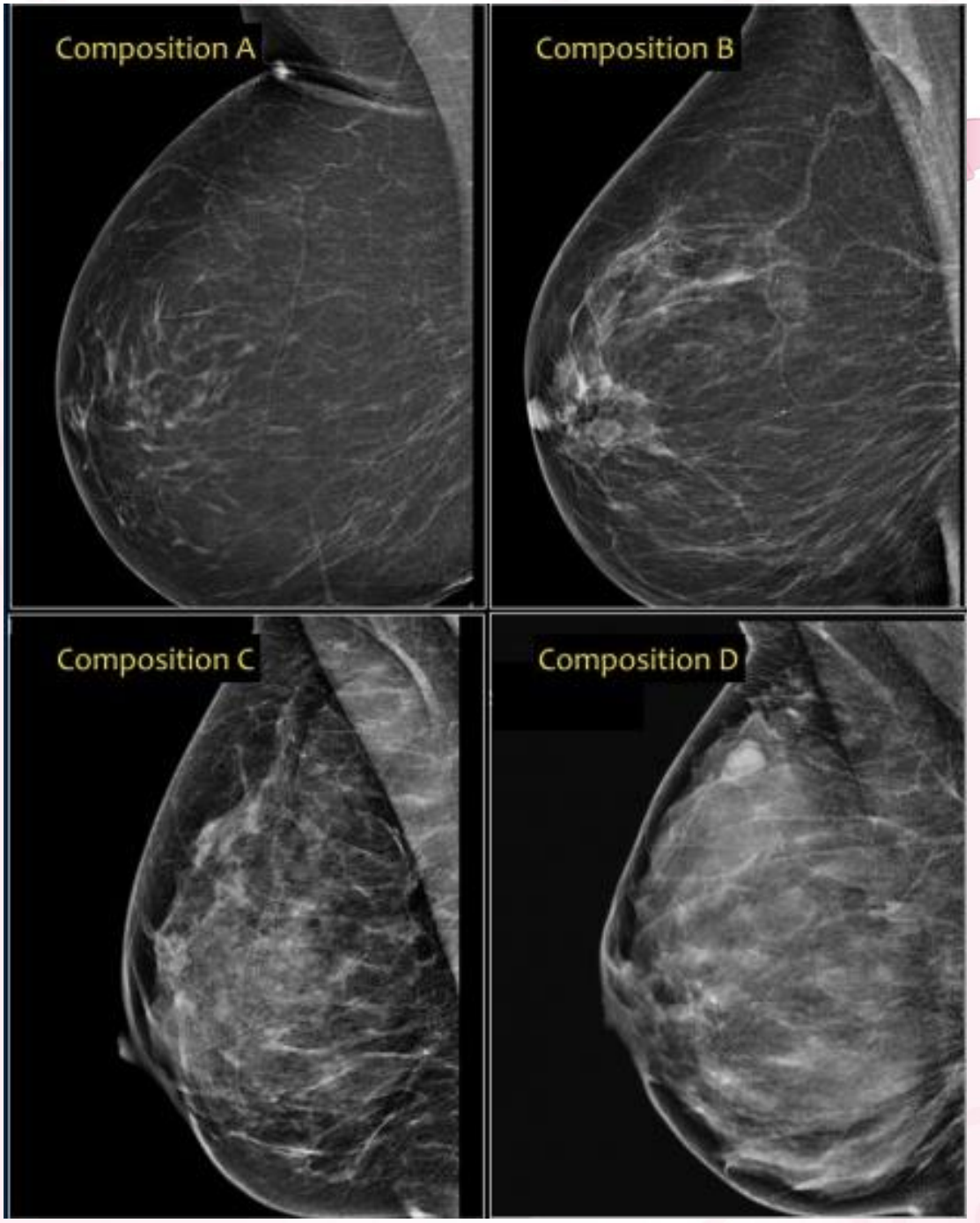


11/19/2018

Breast Density



Fatty Scattered Heterogenous Dense


Composition A
Composition B
Composition C
Composition D

EVALUATION OF THE MAMMOGRAM

تقييم الماموغرافي

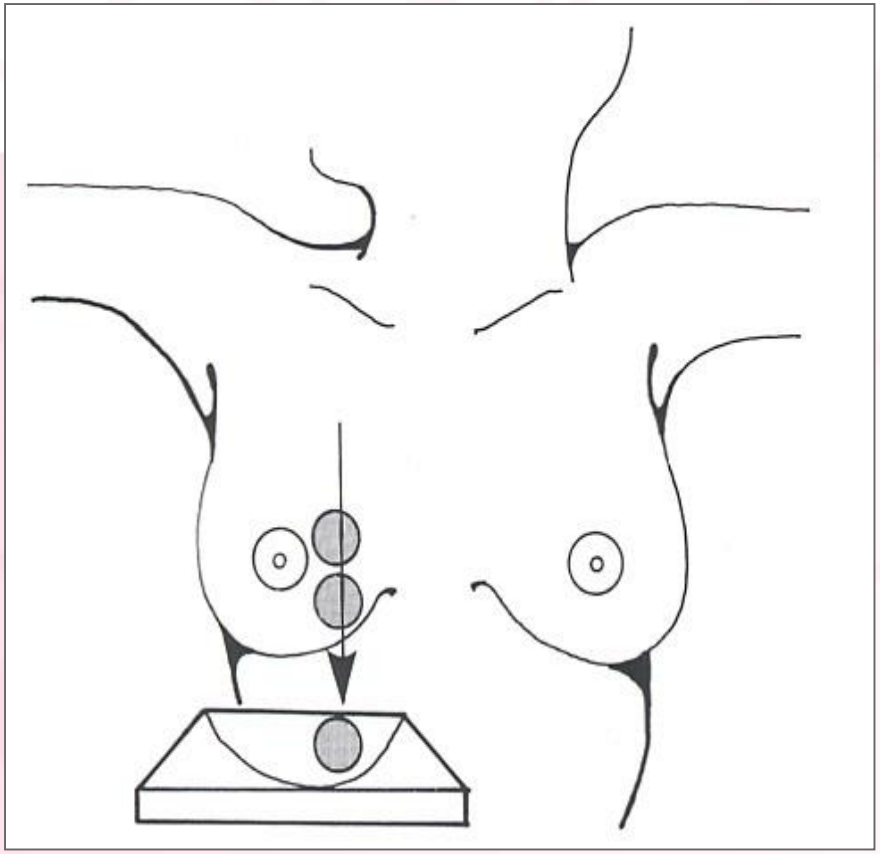
- كل صورة ماموغراف يجب أن تقيم من حيث:
  - جودة الصورة للدراسة والحاجة لصورة إضافية.
  - اختراق جيد للنسيج الليفي الضام.
  - تبدلات الحلمة – الجلد
  - بنية (هندسة الثدي).
  - التكلسات
  - العقد اللمفاوية.
  - التناظر.
  - المقارنة مع صورة قديمة (إن وجدت).
  - يجب تحديد كل الكتل المشاهدة وقد نحتاج لصورة إضافية .

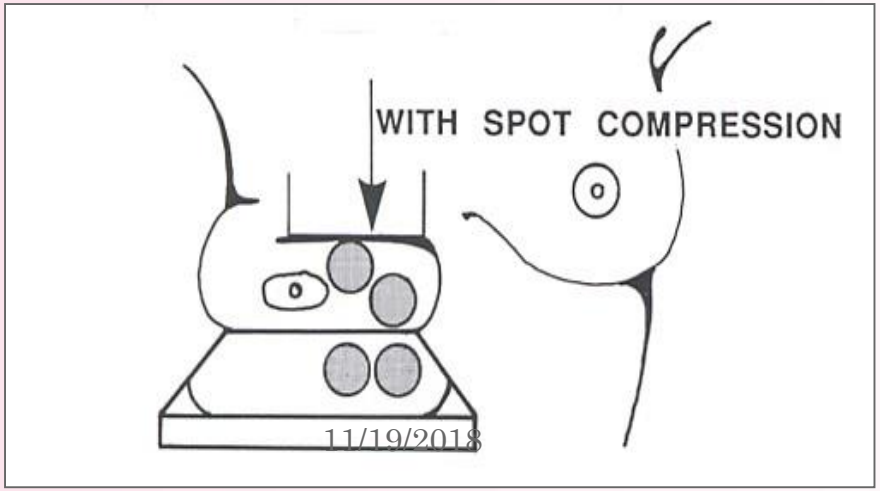
ADDITIONAL MAMMOGRAPHIC VIEWS
الوضعيات الإضافية

- تستخدم لـ :
  - تحديد أو استبعاد وجود آفة حقيقية (وضعية إضافية واحدة).
  - تمييز ووصف أكثر لآفة مشاهدة.
  - دراسة ثلاثية البعد لآفة موجودة.

ADDITIONAL MAMMOGRAPHIC VIEWS
الوضعيات الإضافية

- الضغط الموضعي.
- الضغط الموضعي مع التكبير.
- الوضعيات الجانبية.
- وضعيات إضافية مع دوران:
  - دوران الثدي للوحشي: الآفات العلوية تتجه للوحشي.
  - دوران الثدي للأنسي: الآفات العلوية تتجه للأنسي.

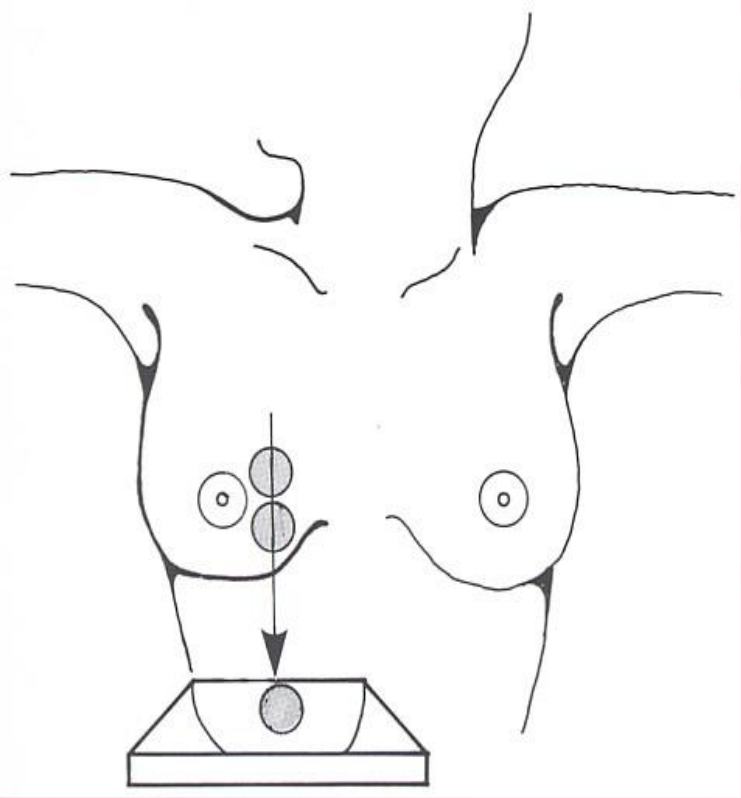


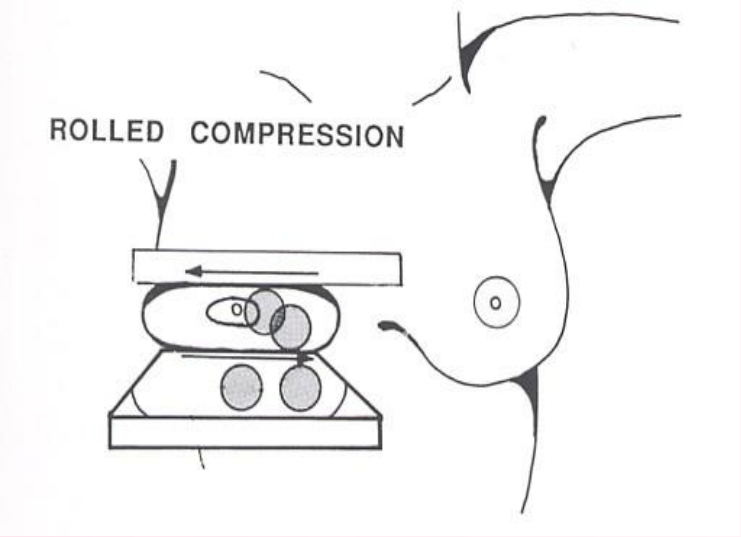


ADDITIONAL VIEWS

Spot compression:

A coned-down « spot compression » view can resolve overlapped tissue. Localized compression over the area of interest spreads overlapped structures.





Additional views

Rolled view:

A « rolled » view can solve the dilemna of overlapped structures. Rolling the top half of the breast in one direction and the bottom half in the other moves the structures away from one another.

EVALUATION OF THE MAMMOGRAM

- **Each mammogram should be evaluated for:**
  - Adequate quality of study, additional views required.
  - *Asymmetry التناظر* .
  - Skin, nipple changes الجلد تغيرات الحلمة .
  - Architectural distortion تشويه البنية الهندسية .
  - lymph nodes الضخامات العقدية .
  - Calcification التكلسات .
  - Masses present الكتل .

Asymmetry Of Breast Tissue
عدم التناظر

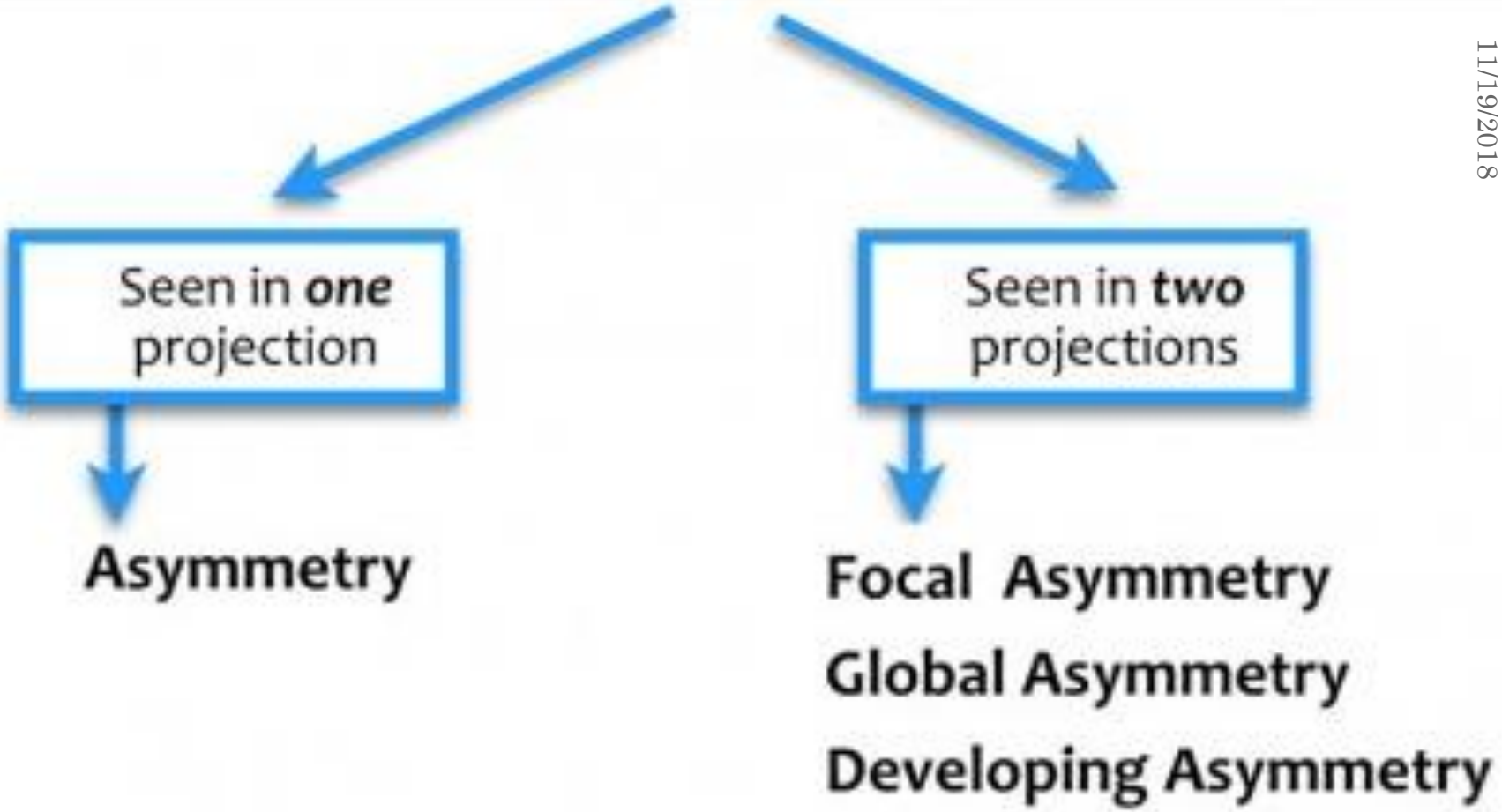
- يشاهد عدم التناظر في ٣% من الحالات.
- عادة بالربع العلوي الوحشي.
- وعادة (تبدل طبيعي) سببه تليف.
- من الضروري إجراء وضعيات إضافية (وخاصة وضعية الضغط الموضعي) لاستبعاد وجود كتلة.
- نعيرها اهتمام فقط إذا ترافقت مع:
  - كتل – تكلسات – تخرب هندسي.
- - وحتى في حال عدم مشاهدة كتل محددة يفضل إعادة الدراسة بعد ستة أشهر.

Asymmetry Of Breast Tissue
عدم التناظر

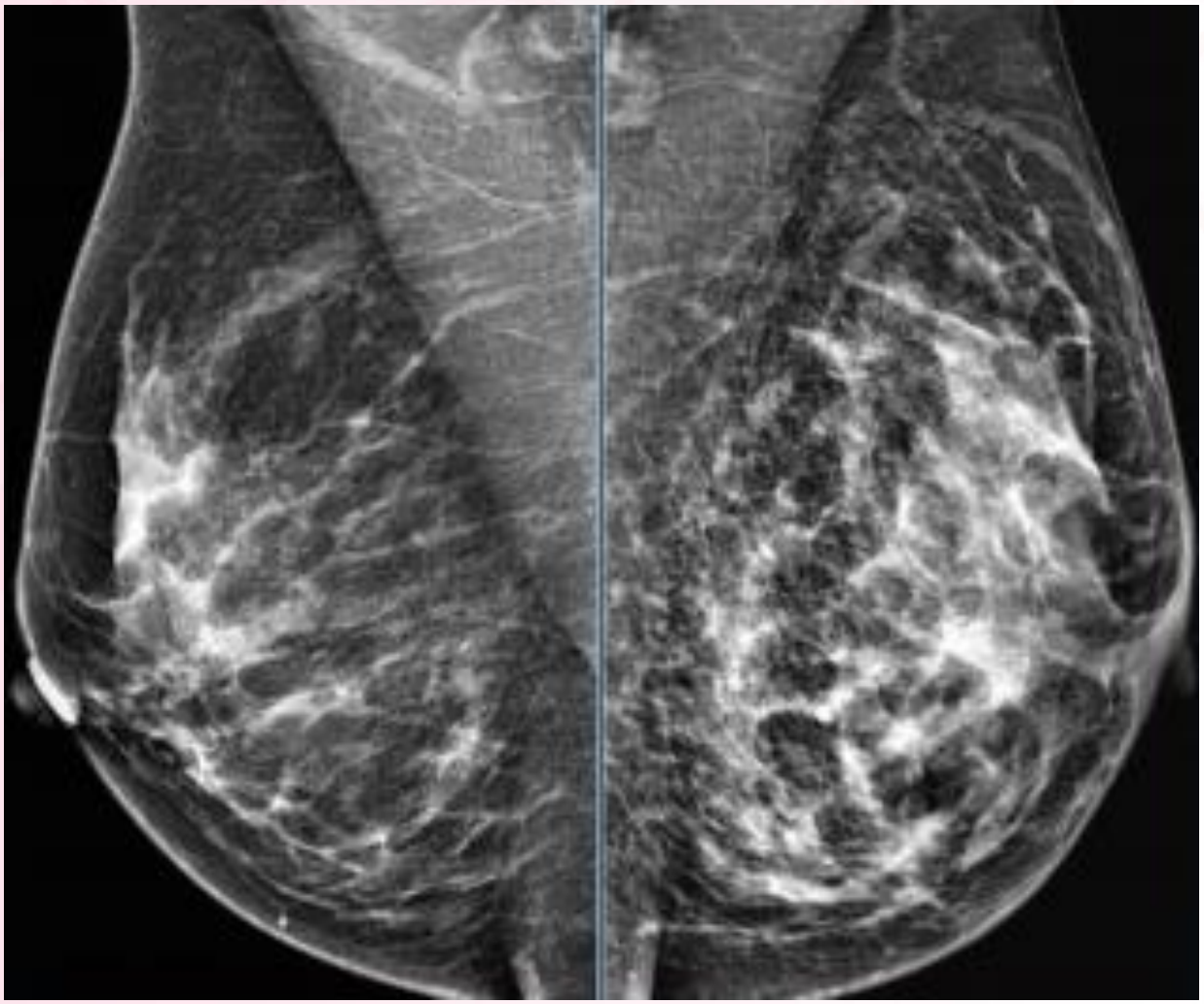
يعتبر عدم التناظر مشكوك به :

- **إذا كان مجسوس.**
- **هناك تبدلات مشاهدة: مثل (كتلة، تكلسات، تخريب في البنية الهندسية..)**
- **إذا تطور مع مرور الزمن.**
- **إذا كان هناك منطقة تبدي كثافة في المركز.**

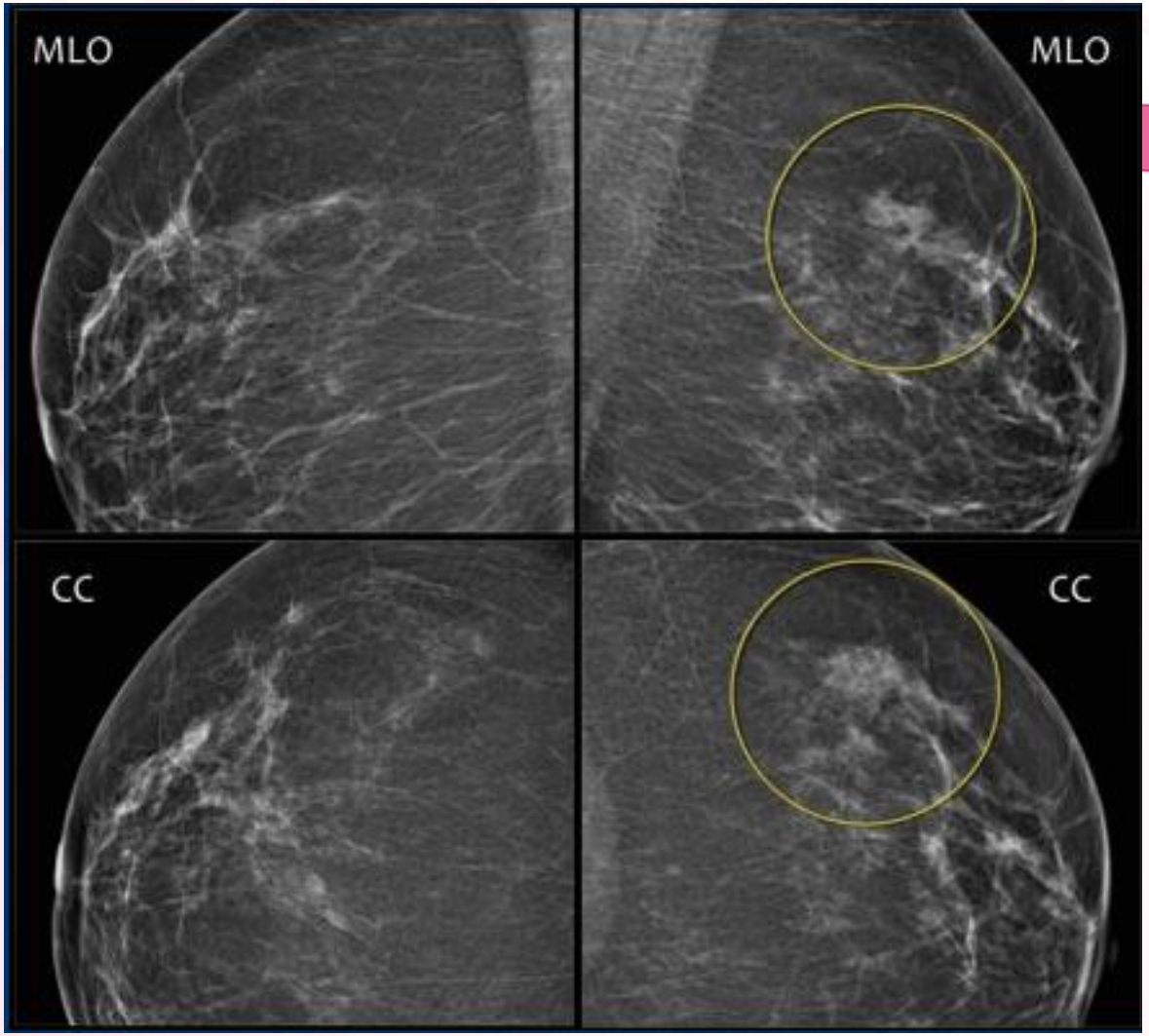
Asymmetries



Asymmetries



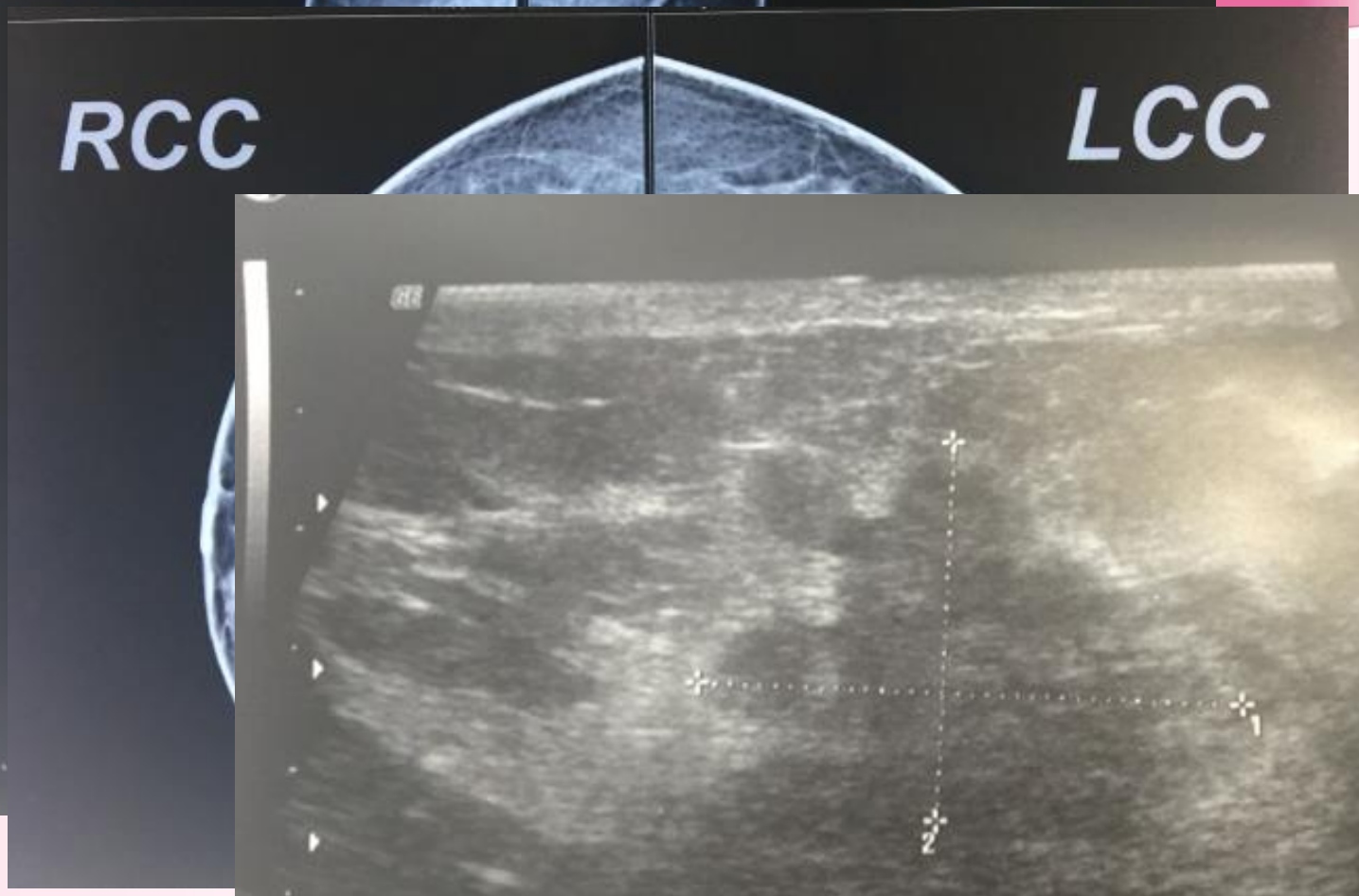
The PET-CT shows diffuse infiltrating carcinoma.



Here an example of a focal asymmetry seen on MLO and CC-view.

Local compression views and ultrasound did not show any mass.


R MLO
L MLO


RCC
LCC

12.00
Pwr 91
C6 / M7
P2 / E1
1
2
L

EVALUATION OF THE MAMMOGRAM

- **Each mammogram should be evaluated for:**
  - Adequate quality of study, additional views required.
  - *Asymmetry* التناظر .
  - Skin, nipple changes الجلد تغيرات الحلمة .
  - Architectural distortion تشويه البنية الهندسية .
  - lymph nodes الضخامات العقدية .
  - Calcification التكلسات .
  - Masses present الكتل .

SKIN, NIPPLE CHANGES
تبدلات الحلمة والجلد

Nipple retraction:

جذب الحلمة :

- الحلمة يجب أن تكون مرتفعة للخارج.
- يجب مشاهدتها على الماموغرافي بوضعية واحدة على الأقل.
- يمكن أن يكون جذب الحلمة للداخل خلقي (تبدل طبيعي).
- جذب الحلمة الحديث غالباً يخفي ورم خلف الحلمة.
- انكماش الحلمة هام إذا كانت حادة أو أحادي الجانب.

SKIN, NIPPLE CHANGES
تبدلات الحلمة والجلد

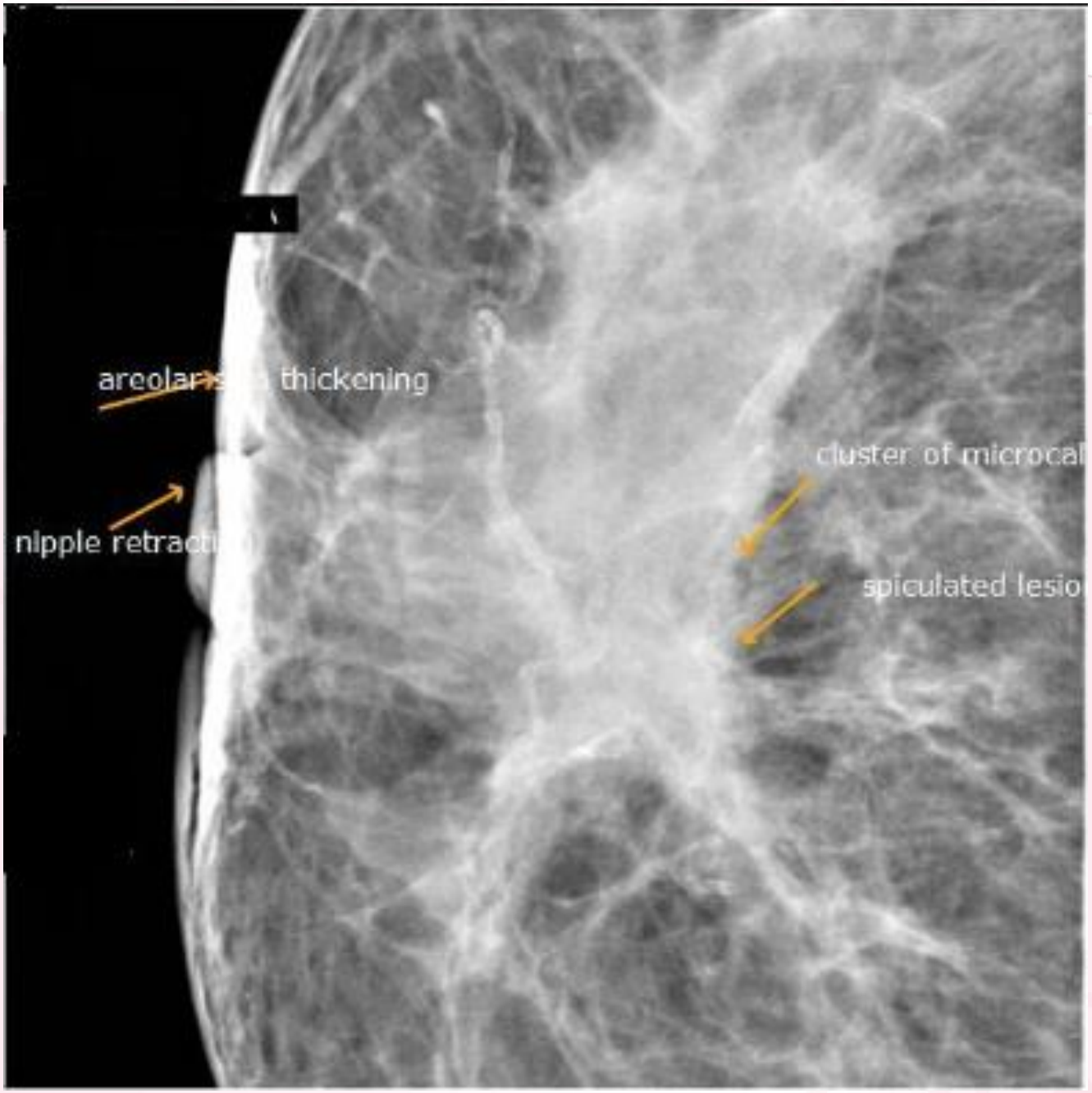
تسمك الجلد:

- تسمك الجلد أكثر من ٣ ملم ممكن أن يكون علامة خباثة.
- يمكن أن يكون تسمك الجلد:
  - ✓ **موضع:** أورام موضعية.
  - ✓ **منتشر:** علامة وذمة بسبب التهاب ثدي أو سرطان التهابي.
- تكلسات الحلمة الخطية عادة سببه مرض باجت Paget`s.

SKIN, NIPPLE CHANGES
تبدلات الحلمة والجلد

Skin retraction (انكماش الجلد):

- انكماش الجلد بسب التليف وقصر أربطة كوبر
- دائماً وأبداً ستكون الكتلة مجسوسة مع انكماش الجلد.


thickening
cluster of microcal
nipple retracti
spiculated lesio

SKIN, NIPPLE CHANGES
تبدلات الحلمة والجلد

وذمة الثدي:

أحادية الجانب: - التهاب ثدي.

- تشعيع الثدي.

- سرطان التهابي.

ثنائية الجانب: - أمراض الكبد.

- القصور الكلوي.

- قصور القلب الاحتقاني.

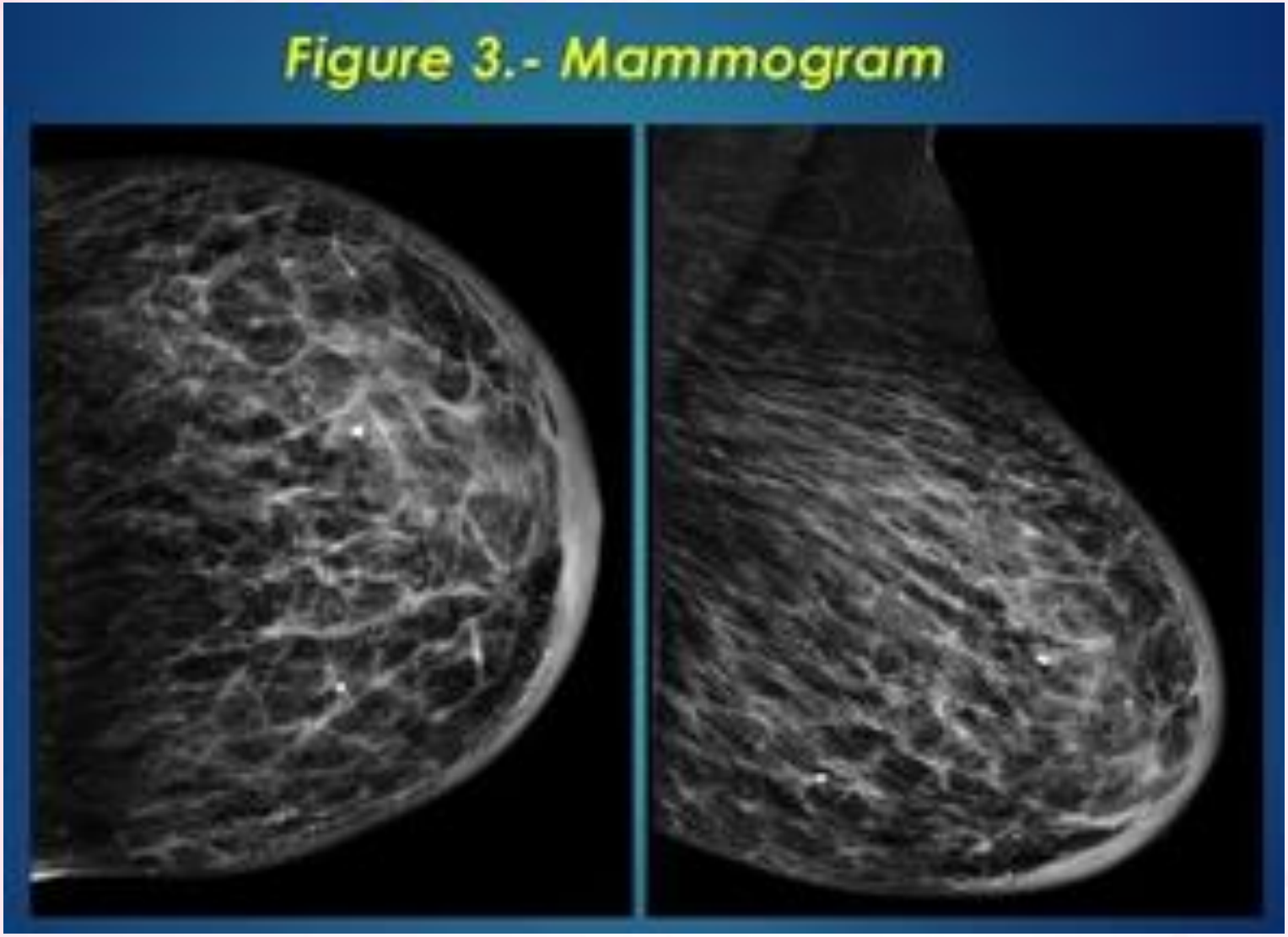
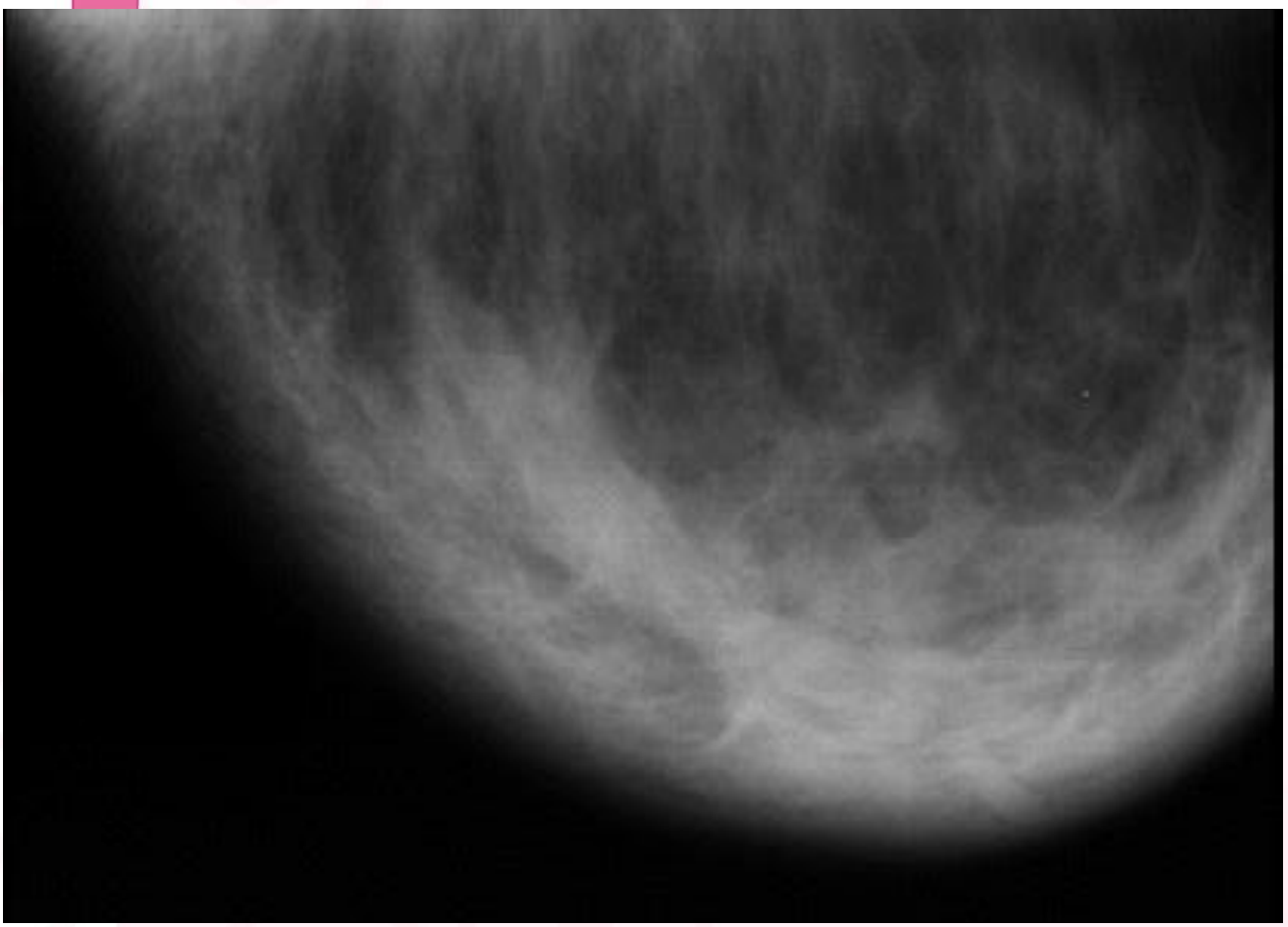


Figure 3.- Mammogram



Evaluation of the mammogram

- **Each mammogram should be evaluated for:**
- Adequate quality of study, additional views required.
- Asymmetry.
- Skin, nipple changes.
- *Architectural distortion.*
- Calcification.
- Axillary nods.
- Masses present.

ARCHITECTURAL DISTORTION

- سببه منطقة متليفة مع تشويه Distortion في بنية الثدي بدون مشاهدة كثافة مركزية.
- يجب ان نرى الثدي بوضعيتين على الأقل.
- تظهر هذه التبدلات بالماموغرافي:

١- جذب للداخل للبنى السطحية.

٢- تليف قنوي وحول قنوي.

٣- تبدلات برباط Cooper`s.

ARCHITECTURAL DISTORTION

- تخريب البنية الهندسية للثدي يمكن أن يترافق مع cancer في 50% من الحالات.
- تخريب البنية الهندسية الغير ندبي يجب دراسته نسيجيا.

ARCHITECTURAL DISTORTION

آفات سليمة تسبب تخريب فى البنية الهندسية للثدي

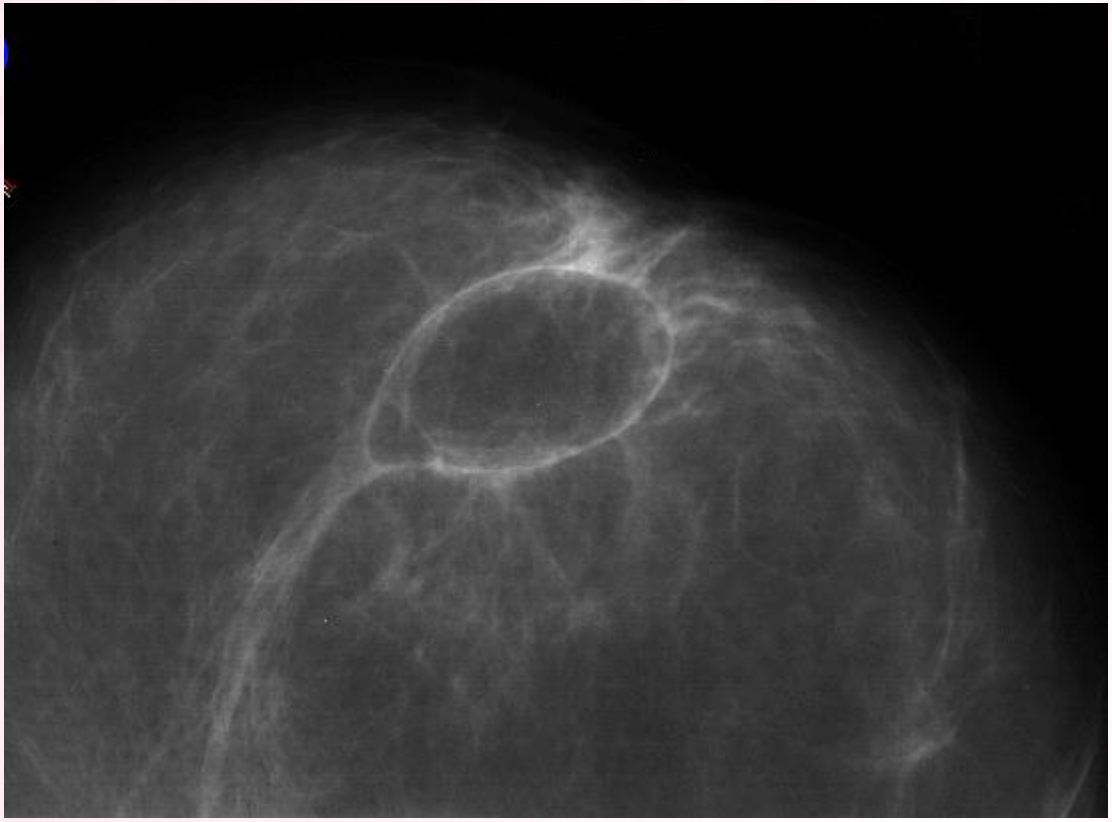
Benign lesions give architectural distortion:

- **ندبات جراحية.**
- **تنخر شحمي**
- **آفات تليفية سليمة: ندبات شعاعية.**

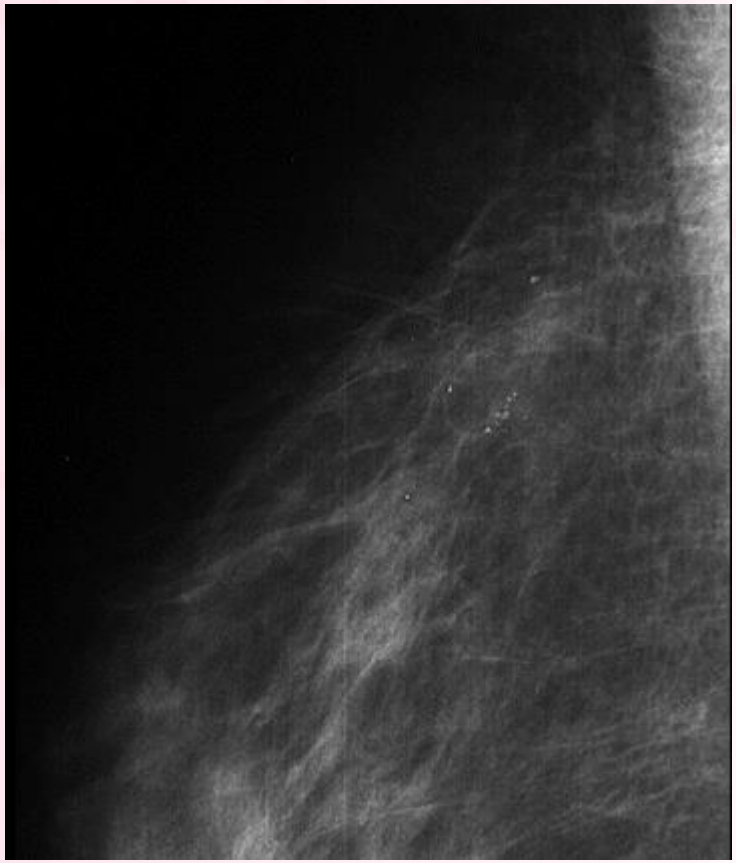
FAT NECROSIS التنخر الشحمي

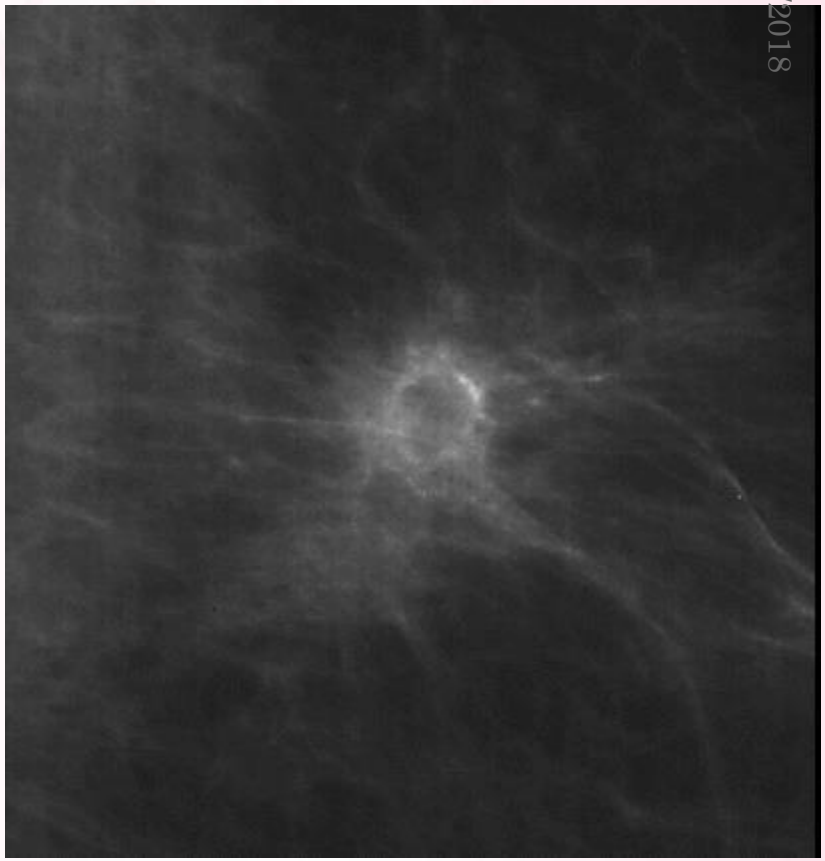
- ينتج عن عملية التصبن الناتج عن: جراحة سابقة، رضوض، معالجة شعاعية.
- بشكل نموذجي يحوي مركز شحمي دائري الشكل، ومحيط عالي الكثافة.
- أحياناً يمكن أن يظهر عالي الكثافة، أو يمكن أن يكون نجمي الشكل.
- التنخر الشحمي ينقص بالحجم مع مرور الوقت.
- يمكن أن نجد أحيانا تكلسات ناعمة وتكون مصطفة بشكل منتظم على محيط الآفة.

Fat necrosis



Fat necrosis

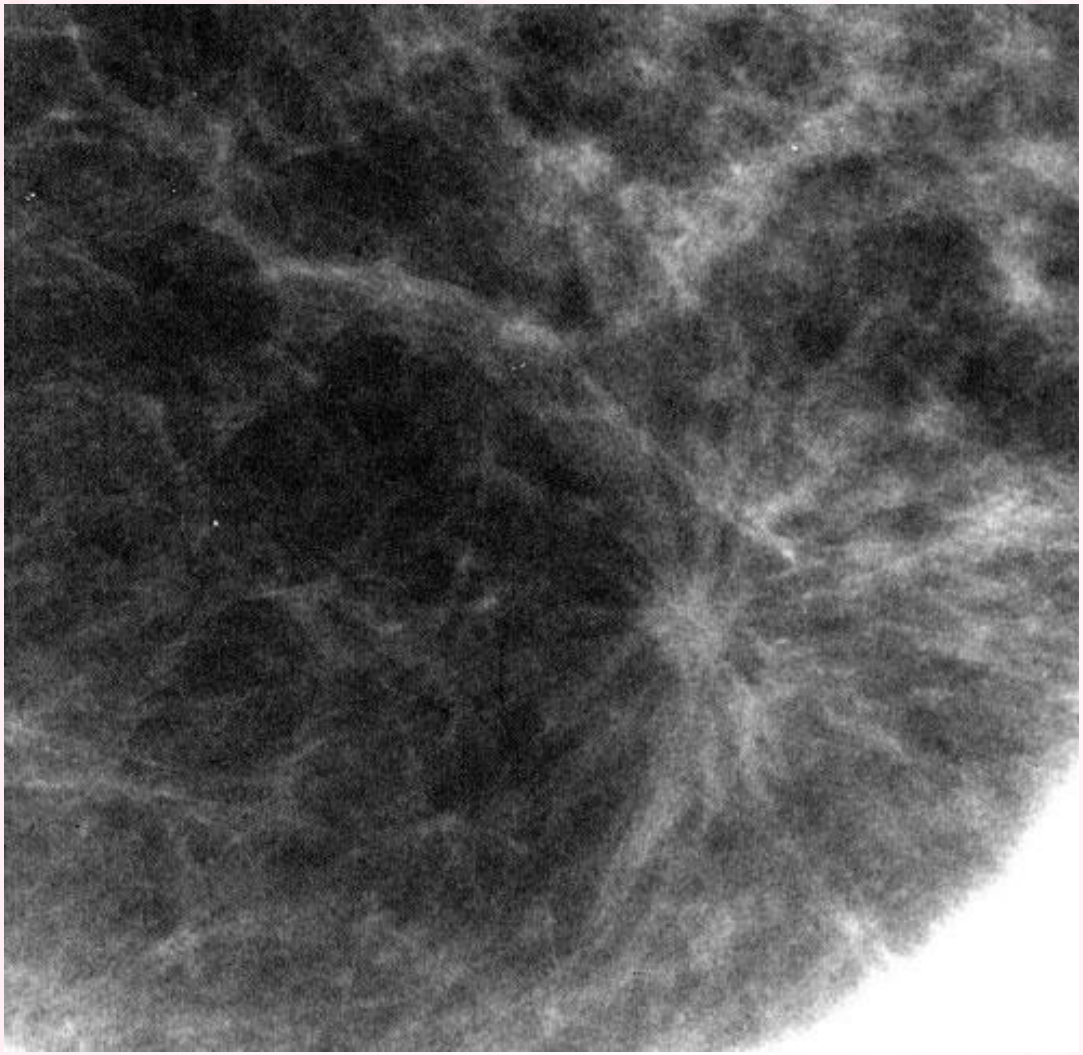




RADIAL SCAR

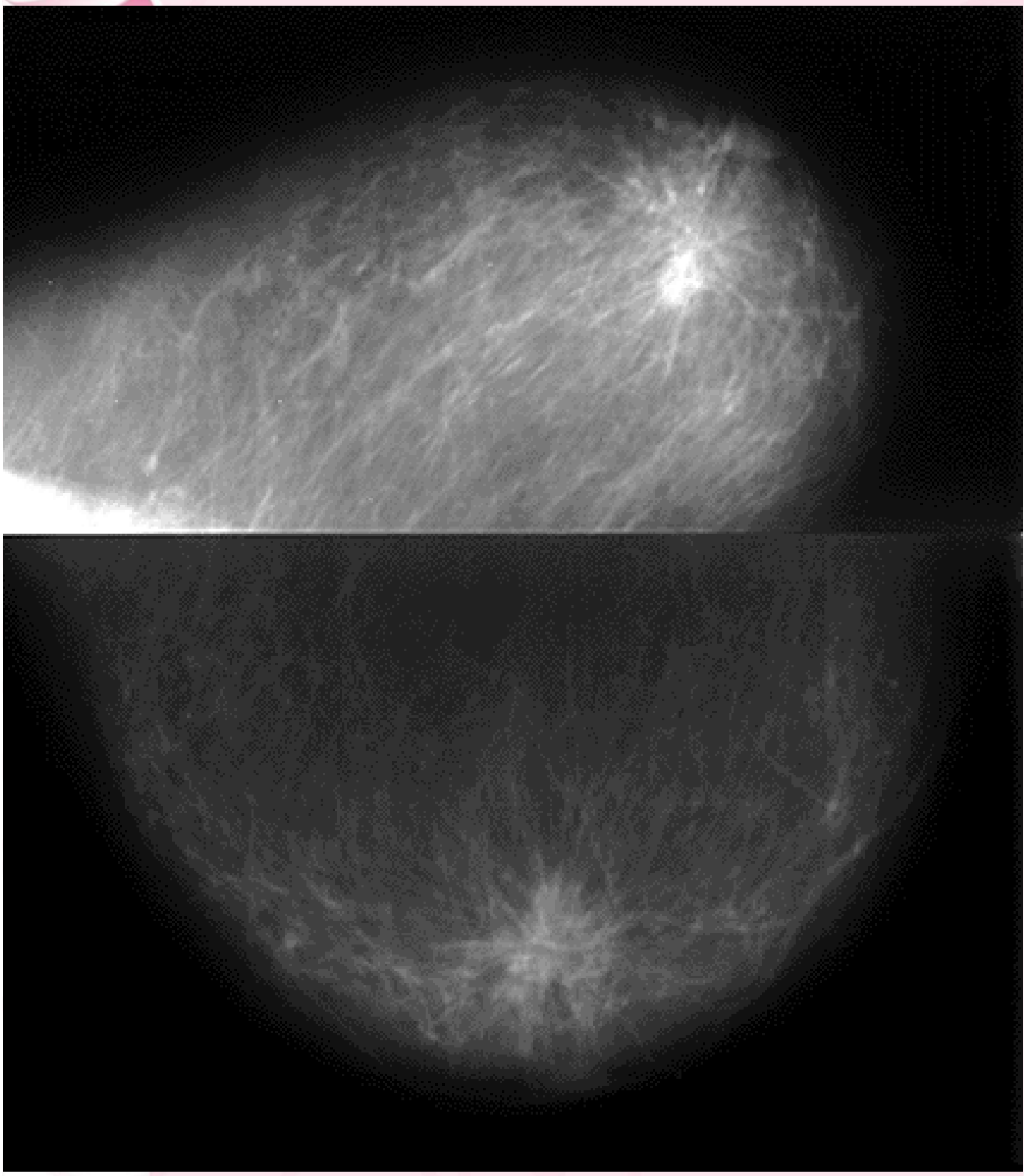
- عملية التندب مجهولة السبب تنتج غالبا عن فرط تنسج قنوي مصلب.
- عادة الآفة: مشوكة الحواف، صغيرة: ذات مركز ناقص أو عالي الكثافة، يمكن أن نشاهد ضمنها تكلسات ناعمة.
- لايمكن تمييزها عن السرطان بالماموغرافي.
- الجراحة هامة وضرورية.

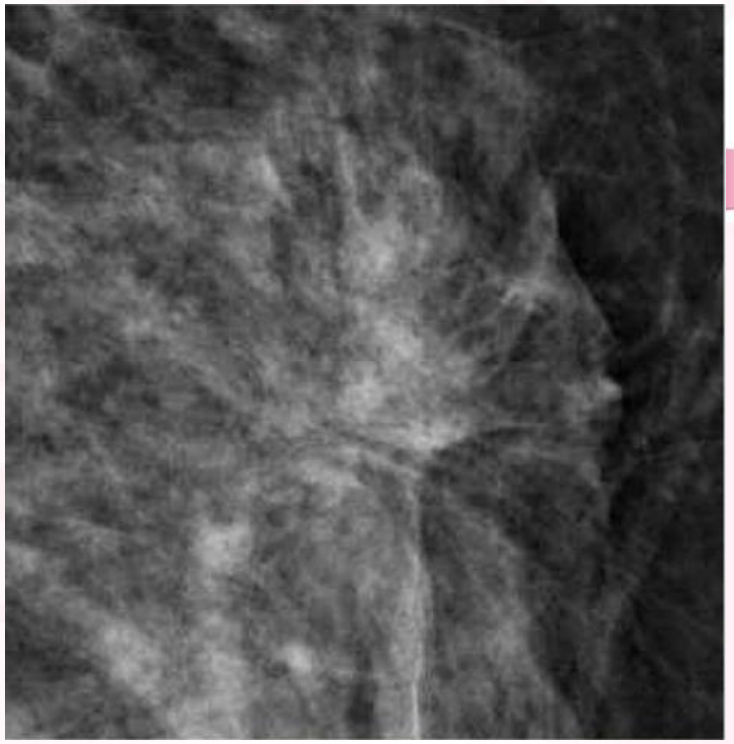
Radial scar

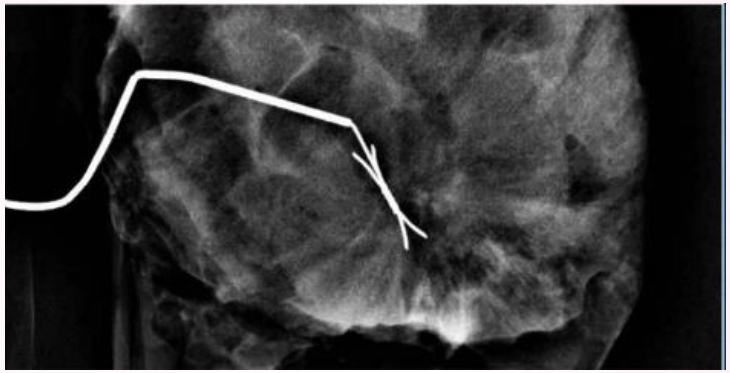


SURGICAL SCARS
الندبات الجراحية

- تختفي بعد عدة أسابيع أو أشهر بدون أن تسبب تخريب في البنية الهندسية.
- في بعض الحالات يمكن أن تسبب ندبات.
- بشكل نموذجي:
  - ✓ لانشاهد مركز كثيف.
  - ✓ تبدو بشكل مختلف بوضعيتين مختلفتين بالتصوير.





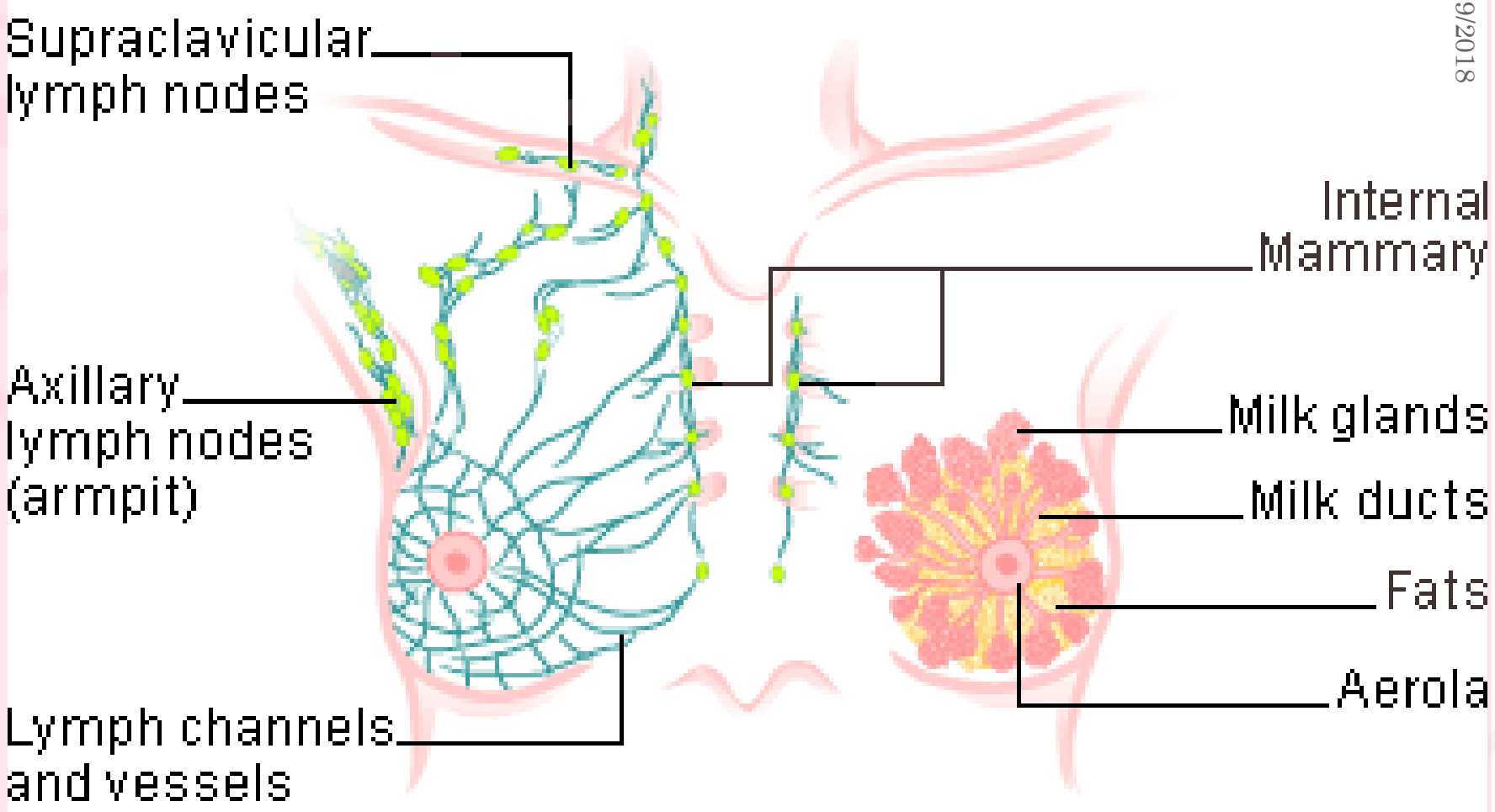


Notice the distortion of the normal breast architecture on oblique view (yellow circle) and magnification view.
A resection was performed and only scar tissue was found in the specimen.

EVALUATION OF THE MAMMOGRAM

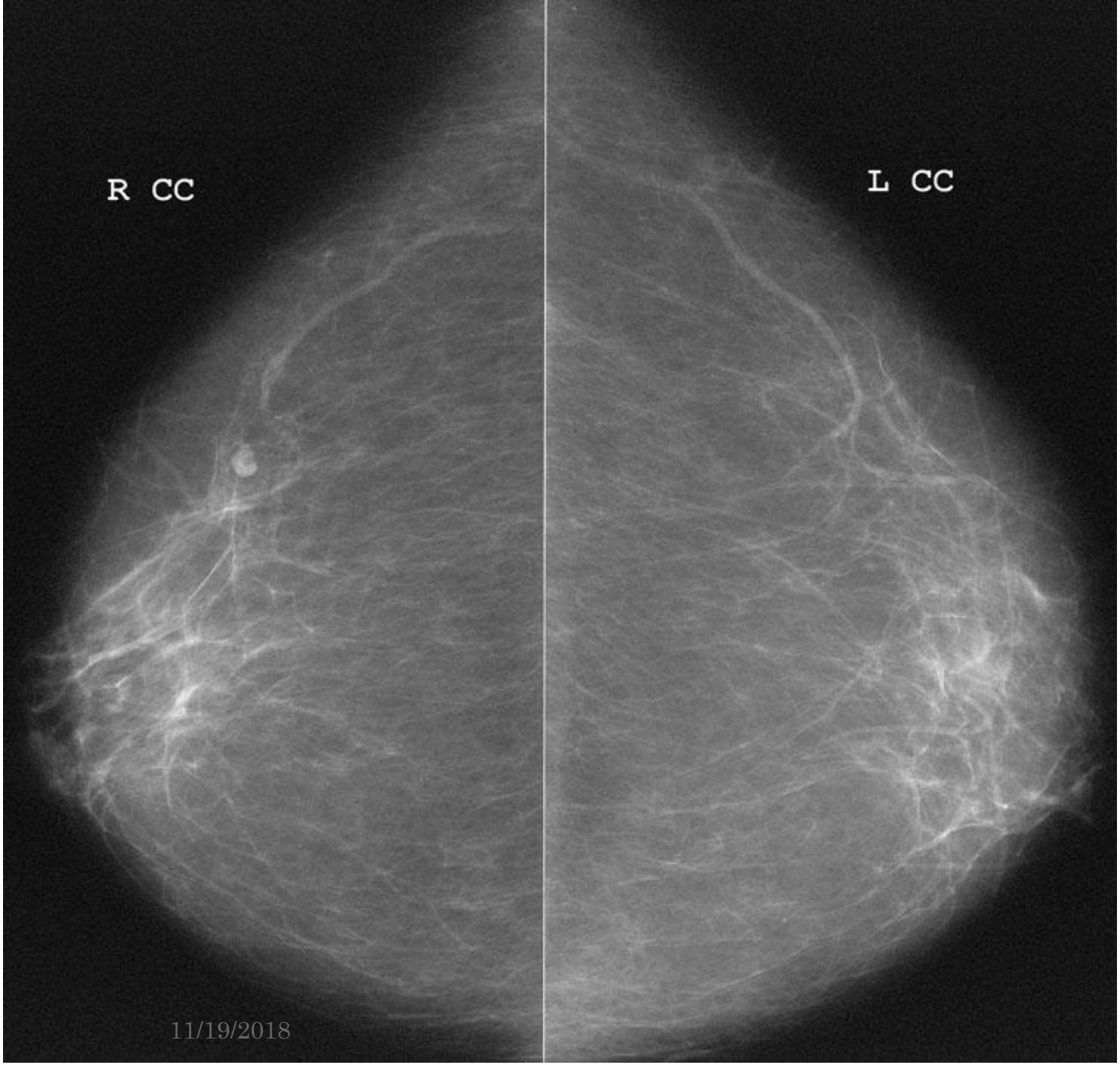
- **Each mammogram should be evaluated for:**
- Adequate quality of study, additional views required.
- Asymmetry.
- Skin, nipple changes.
- Architectural distortion.
- *Lymph nods.*
- Calcification.
- Masses present.

ANATOMY of the BREAST



Lymph Node العقد اللمفية

- العقد اللمفية النموذجية تكون صغيرة بيضوية الشكل مسررة تشبه الكلية وتحوي مركز شحمي.
- العقد اللمفية داخل الثدي:
  - عادة أقل من ١سم.
  - عادة تشاهد في الربع العلوي الوحشي من الثدي.
  -


R CC
L CC

Lymph Node

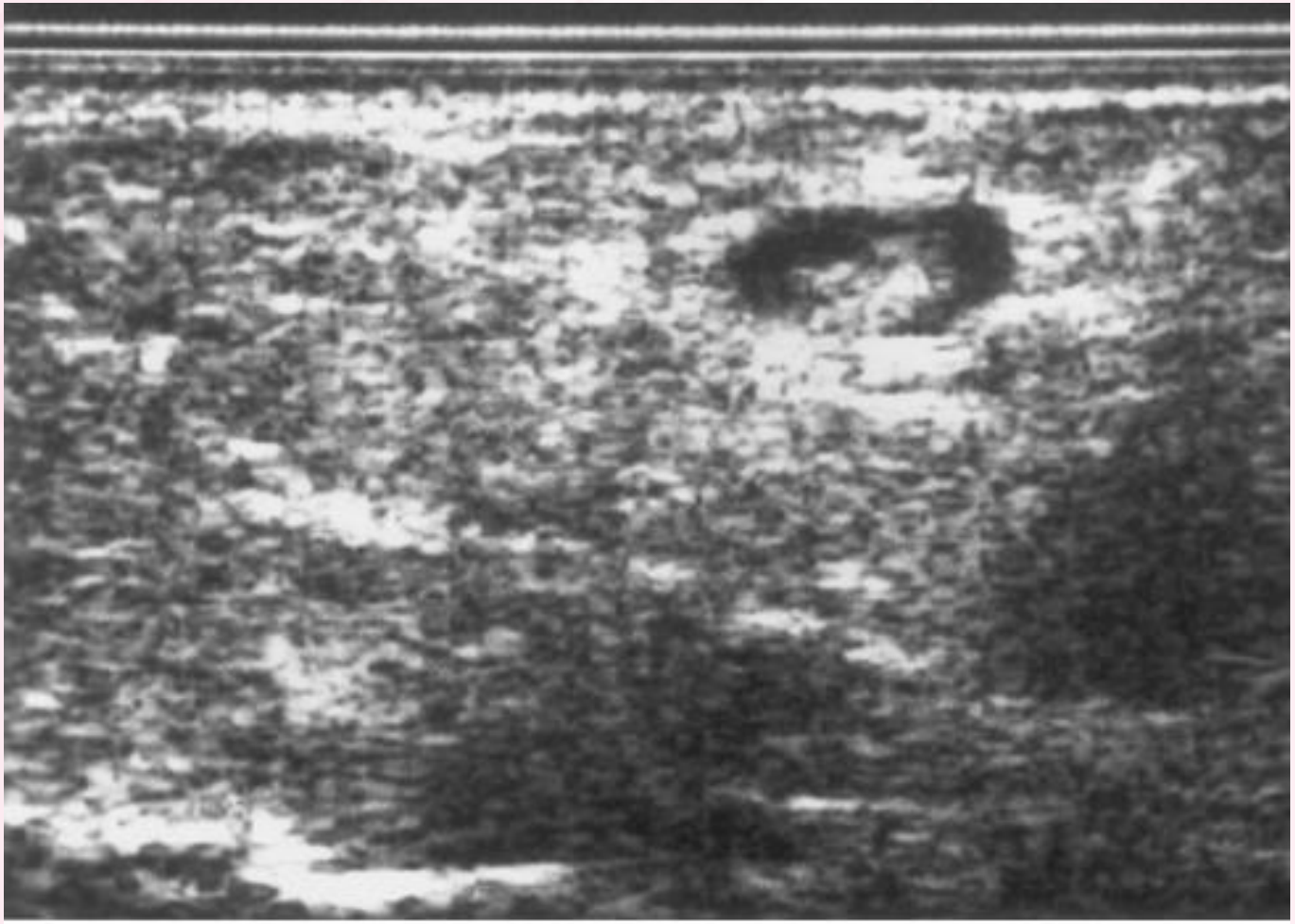


Figure 13. US scan of normal intramammary lymph node. Node appears as a well-circumscribed hypoechoic mass with central hyperechogenicity.

LYMPH NODE
الضخامات العقدية

اعتلال العقد اللمفية (ضمن الثدي أو تحت الابط):

- **أكثر كثافة.**
- **كروية (مدورة).**
- **ضياع وتنخر في المركز الشحمي والسرة.**
- **زيادة في الحجم.**
- **يمكن أن تحوي تكلسات:**

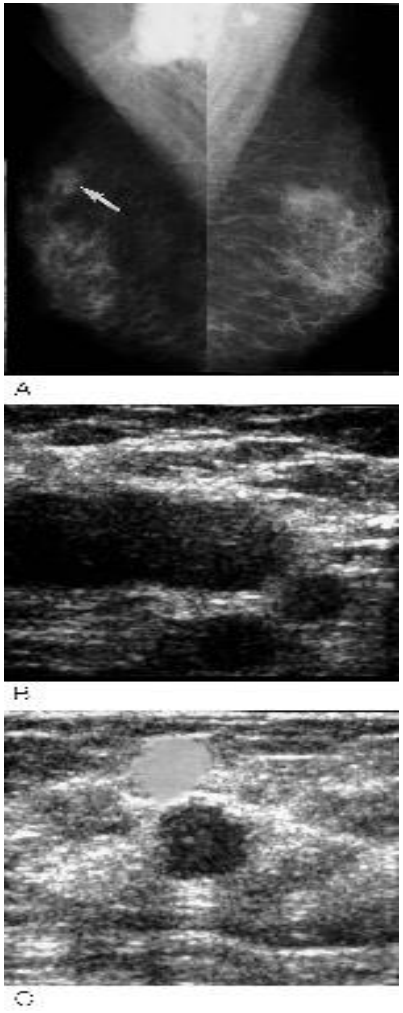
✓ **نقائل.**

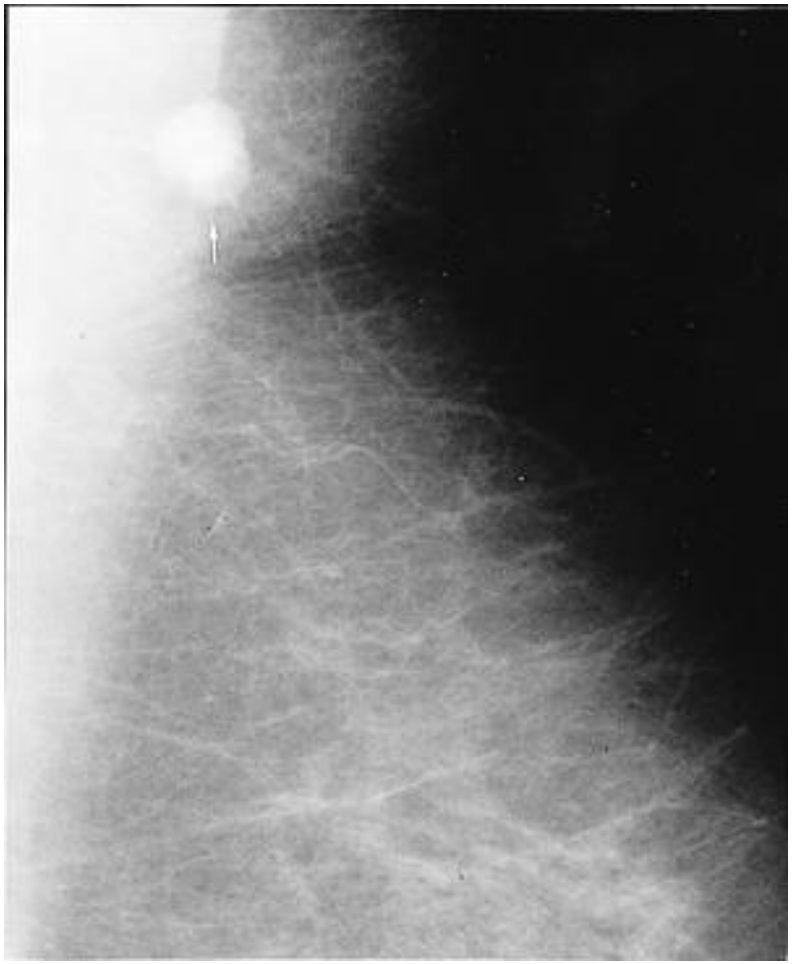
✓ **لمفوما.**

LYMPH NODE

- **axillary adenopathy اعتلال العقد اللمفية الابطية:**
  - أحادي الجانب Unilateral:
    - التهاب الثدي mastitis
    - سرطان الثدي cancer
  - Bilateral ثنائي الجانب:
    - widespread infection الانتان
    - rheumatoid arthritis التهاب المفاصل الرثياني
    - collagen vascular disease أمراض الكولاجين
    - Lymphoma اللمفوما
    - Leukemia الليوكيميا
    - metastatic cancer النقائل

Axillary Lymphadenopathy





Axillary Lymphadenopathy

Axillary Lymphadenopathy

LYMPHADENOPATHY

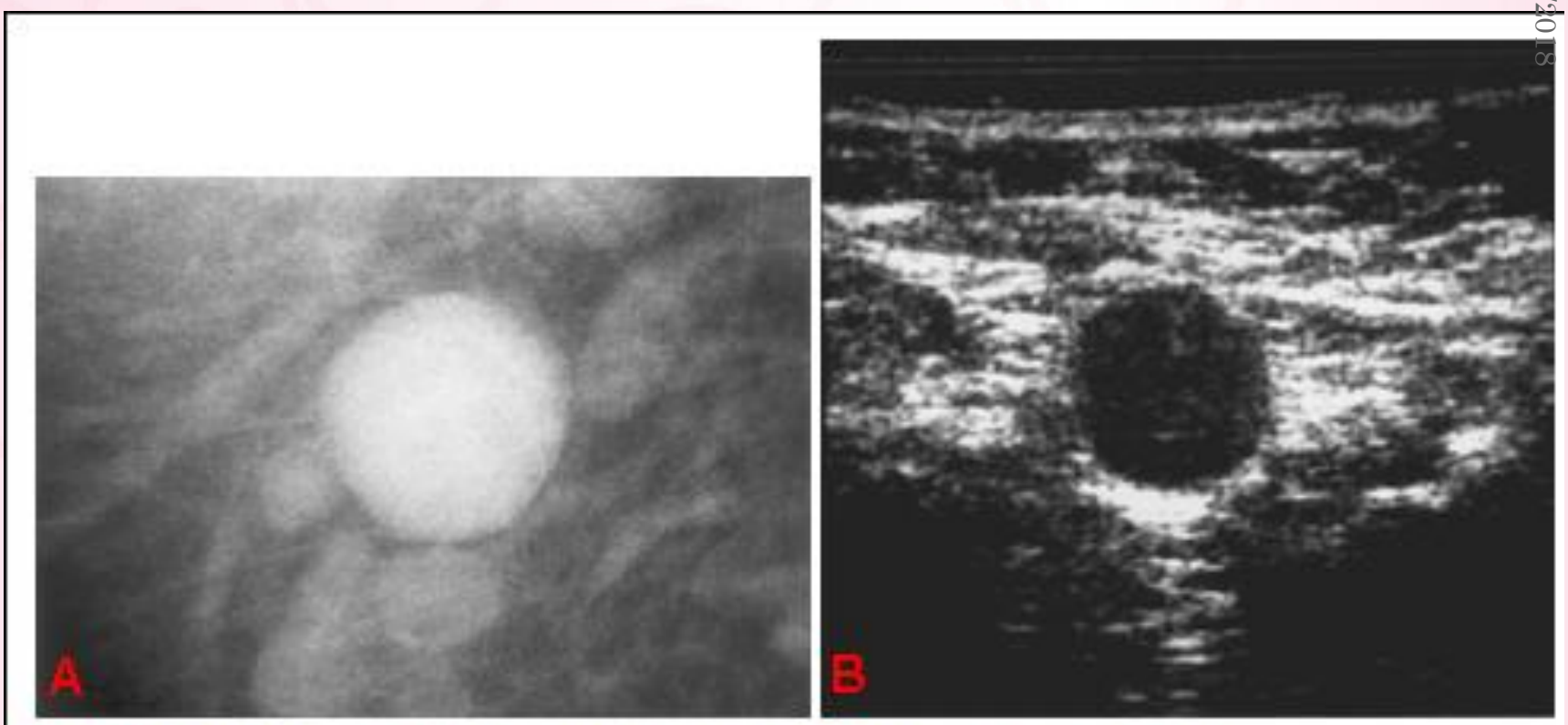
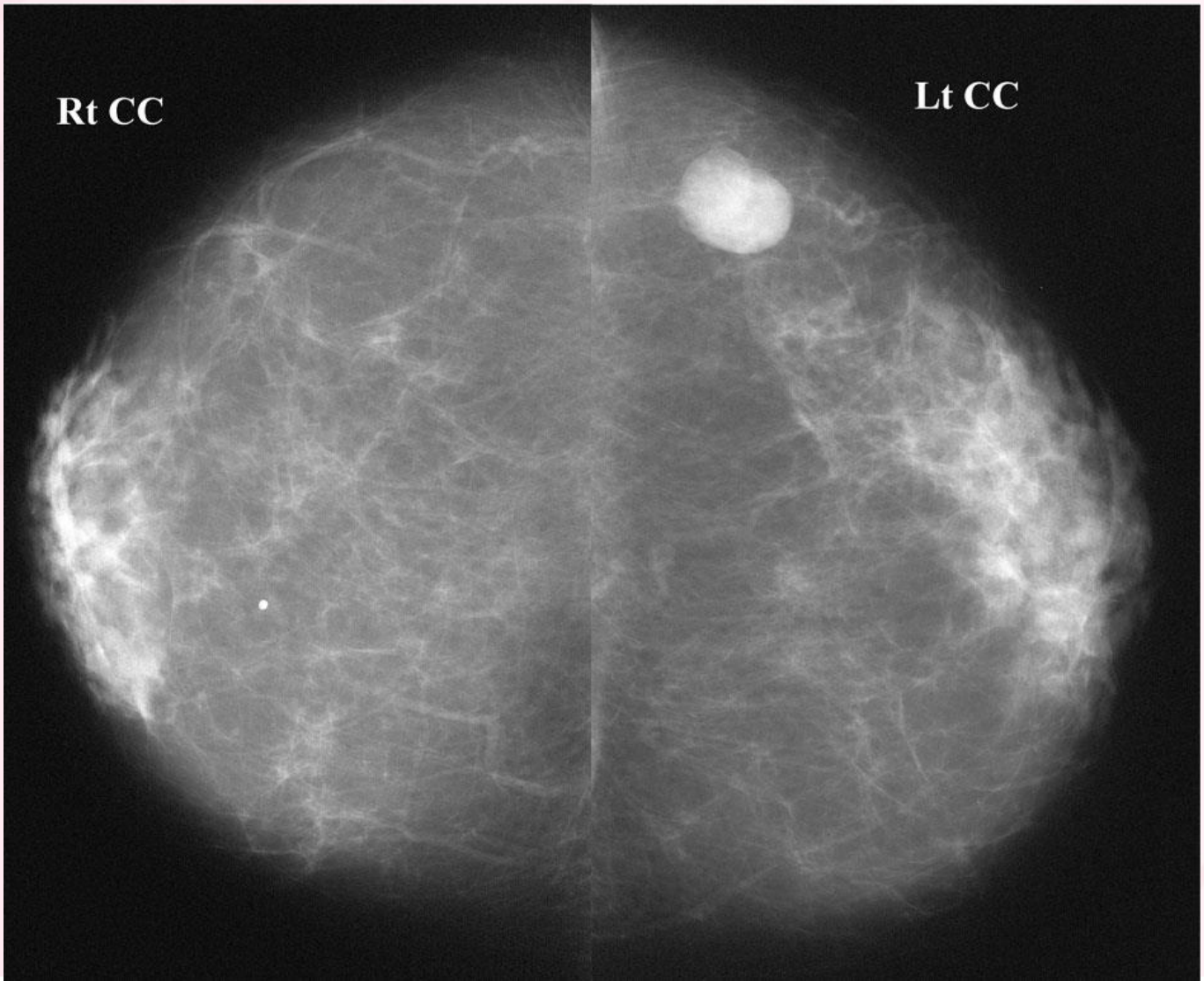
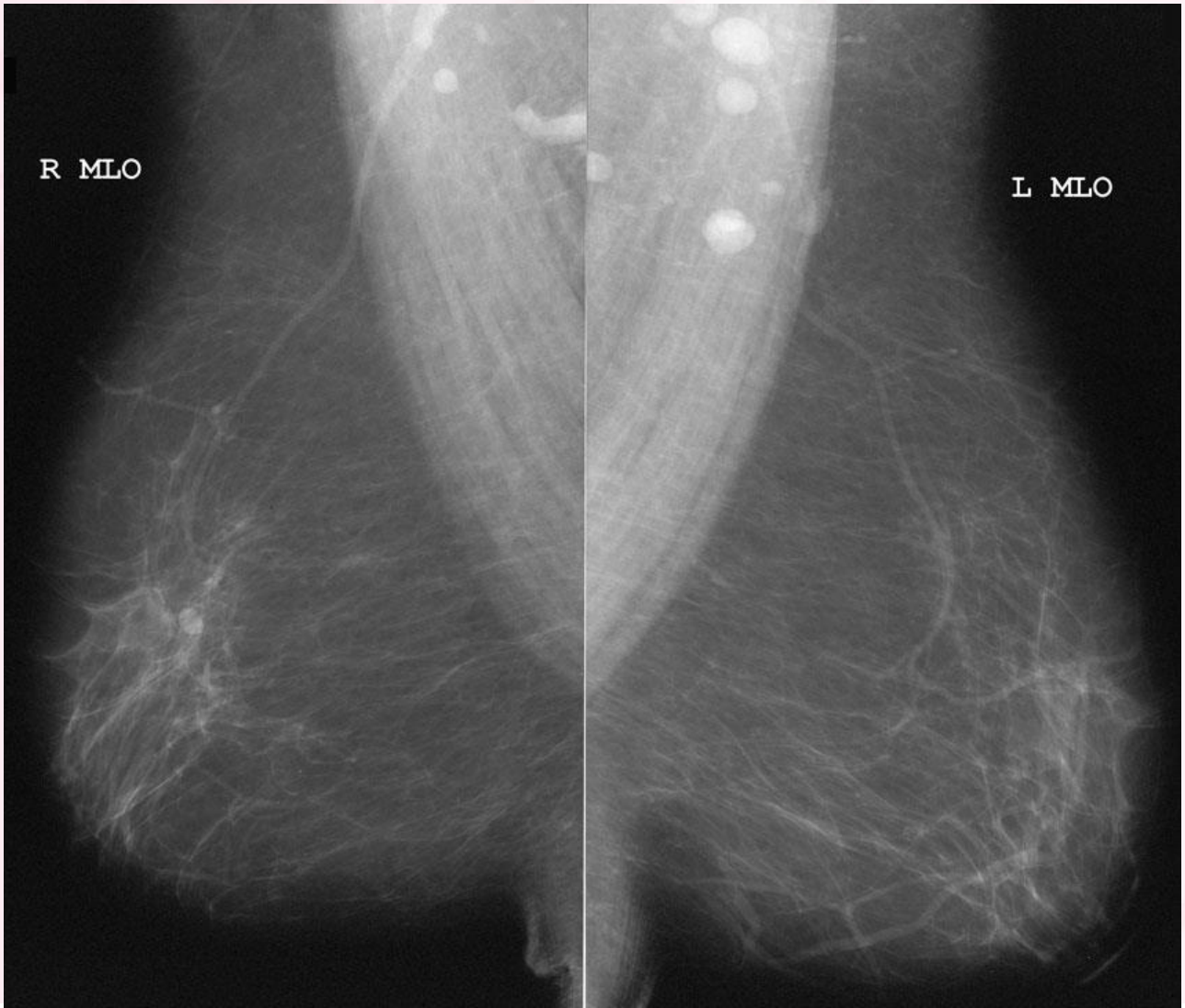


Figure 14. Lymph node. **(a)** On mammogram image, lymph node appears as a well-circumscribed, dense mass, with no fatty hilum. **(b)** On US image, lymph node appears as hypoechoic mass with no central hyperechogenicity. Histologic diagnosis was lymph node with reactive hyperplasia.

INTRAMAMMARY (ADENOPATHY LYMPHOMA)



Axillary Adenopathy (lymphoma)

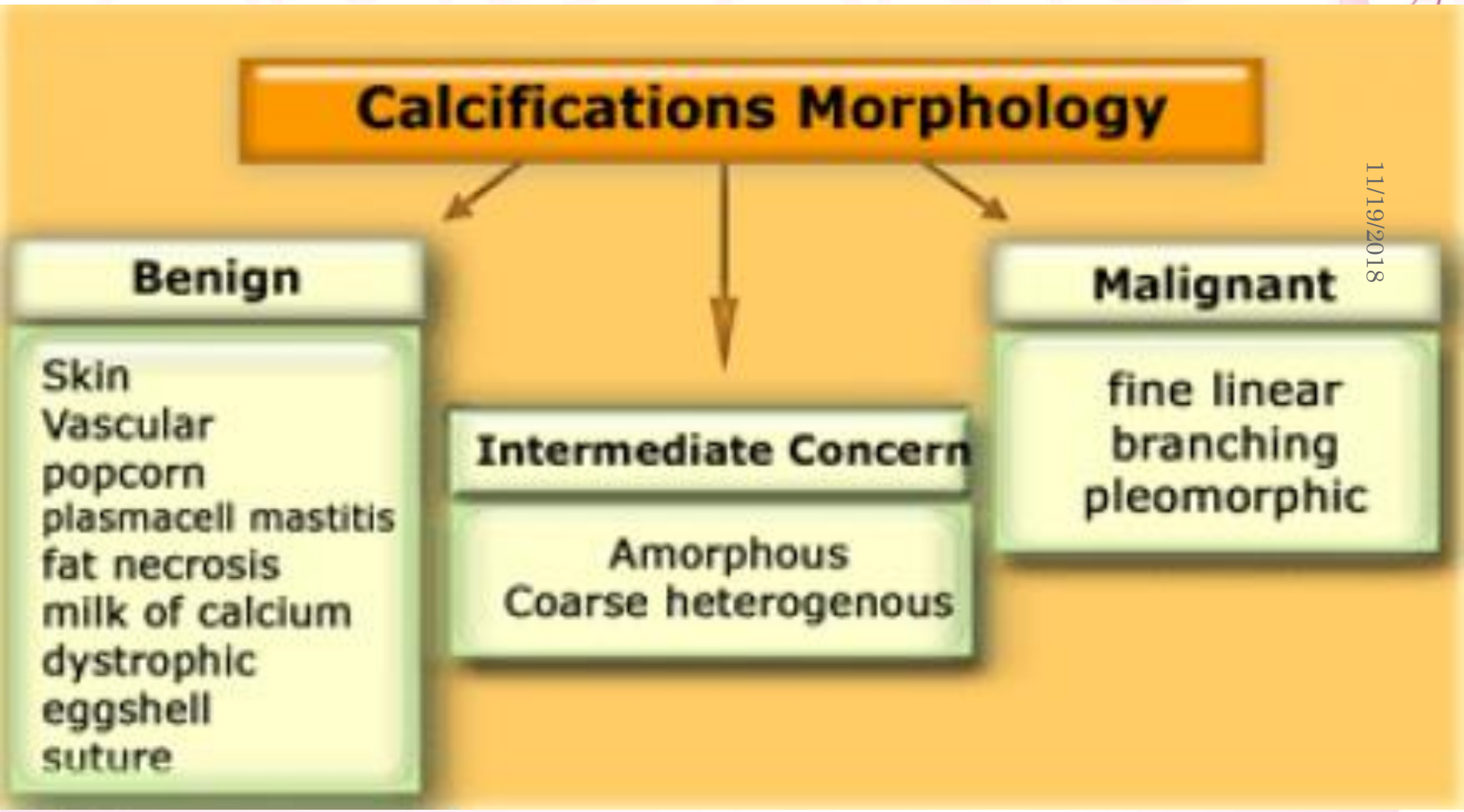


Evaluation of the mammogram

- **Each mammogram should be evaluated for:**
- Adequate quality of study, additional views required.
- Asymmetry.
- Skin, nipple changes.
- Architectural distortion.
- Lymph nods.
- *Calcification.*
- Masses present.

Evaluation Of Calcifications

- عند تقييم التكلسات على الماموغرافي يجب تحديد :
  - شكل التكلسات.
  - الحواف.
  - الحجم.
  - الموقع.
  - العدد.
  - الكثافة.
  - الموجودات المرافقة.
  - التبدلات مع مرور الوقت.

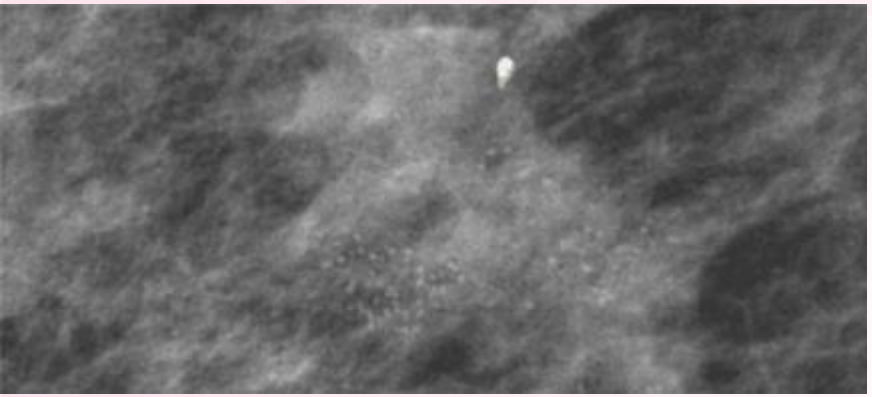

Calcifications Morphology
Benign
Skin
Vascular
popcorn
plasmacell mastitis
fat necrosis
milk of calcium
dystrophic
eggshell
suture
Intermediate Concern
Amorphous
Coarse heterogenous
Malignant
fine linear
branching
pleomorphic

Amorphous calcifications

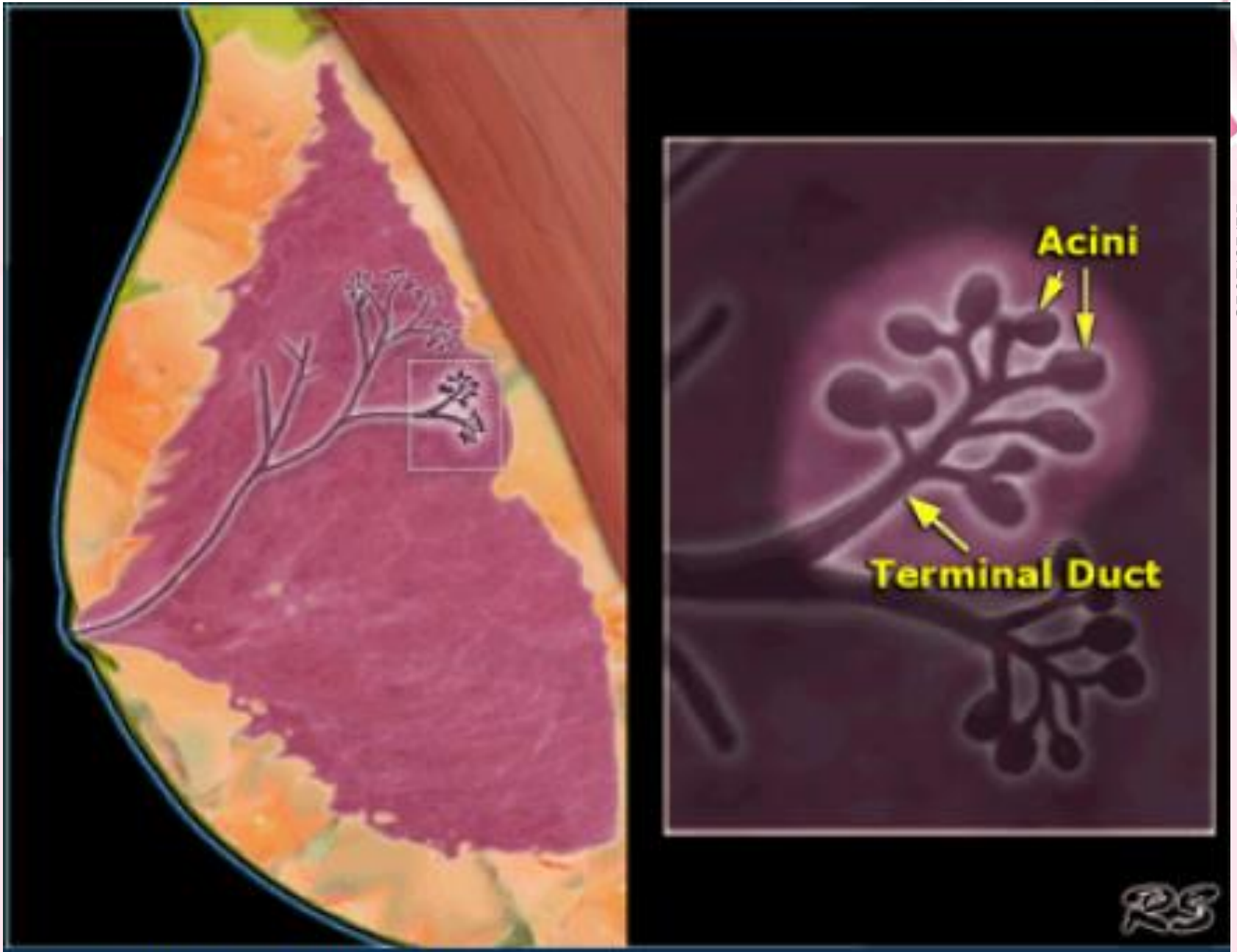
60% benign	especially when diffuse and bilateral or multiple bilateral clustered - usually FCC (fibrocystic changes) - associated mass suggests papilloma, fibroadenoma or sclerosing adenosis
20% high risk	Atypical duct hyperplasia Atypical lobular dysplasia Lobular carcinoma in situ
20% malignant	Low grade DCIS 10% IDC (invasive ductal carcinoma) usually with associated mass

Amorphous calcifications (3)

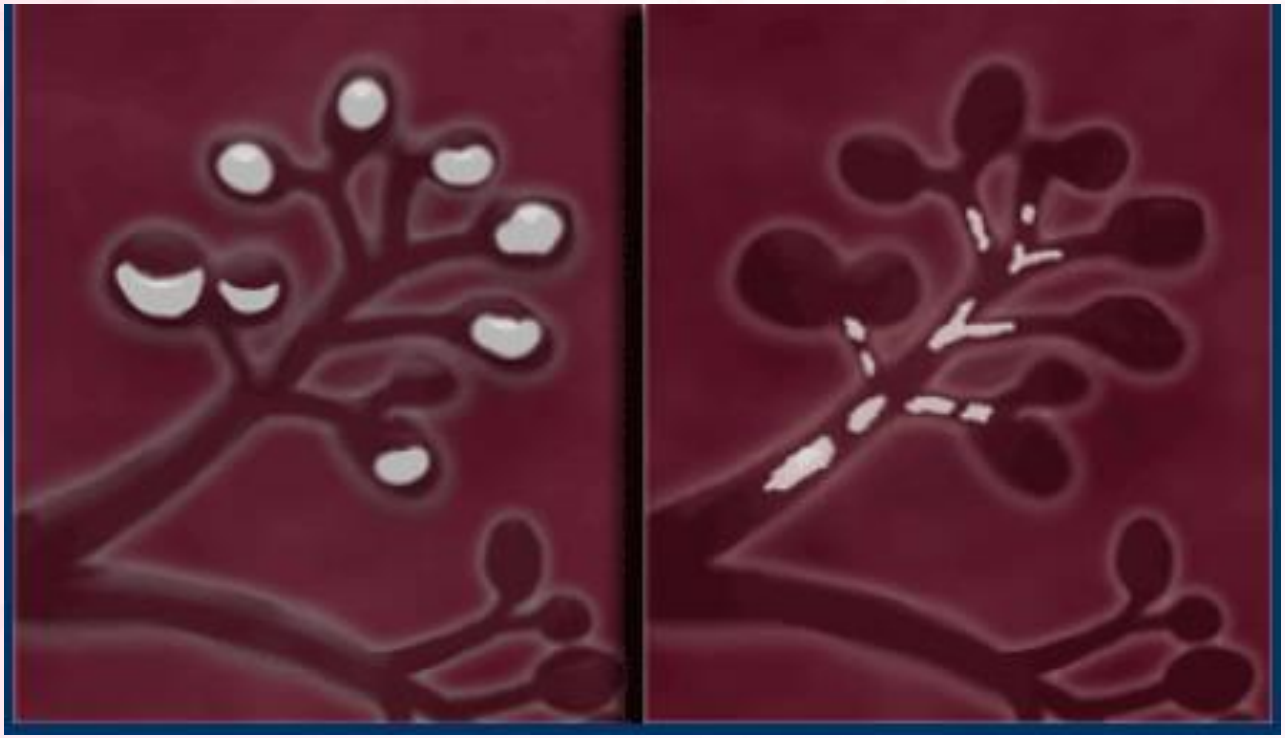
- BI-RADS 2: when diffuse and bilateral
- BI-RADS 3: when multiple bilateral clustered
- BI-RADS 4: when unilateral clustered or new on follow up or in a patient with a cancer in the contralateral breast



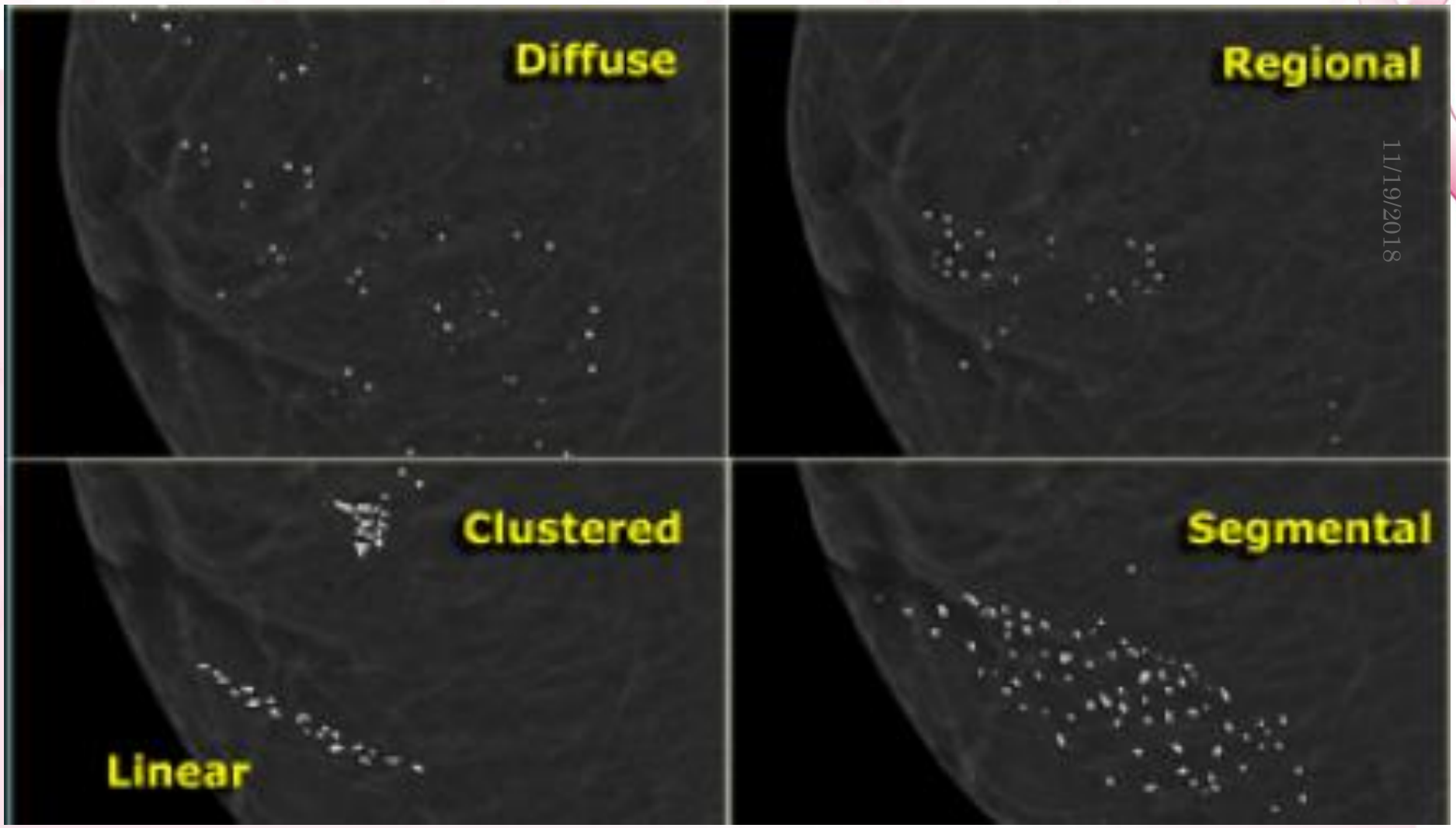
On the left amorphous calcifications within a denser area of the breast.
This was classified as Bi-RADS 4 (3-95% chance of malignancy).
Biopsy revealed DCIS with invasive ductal carcinoma.

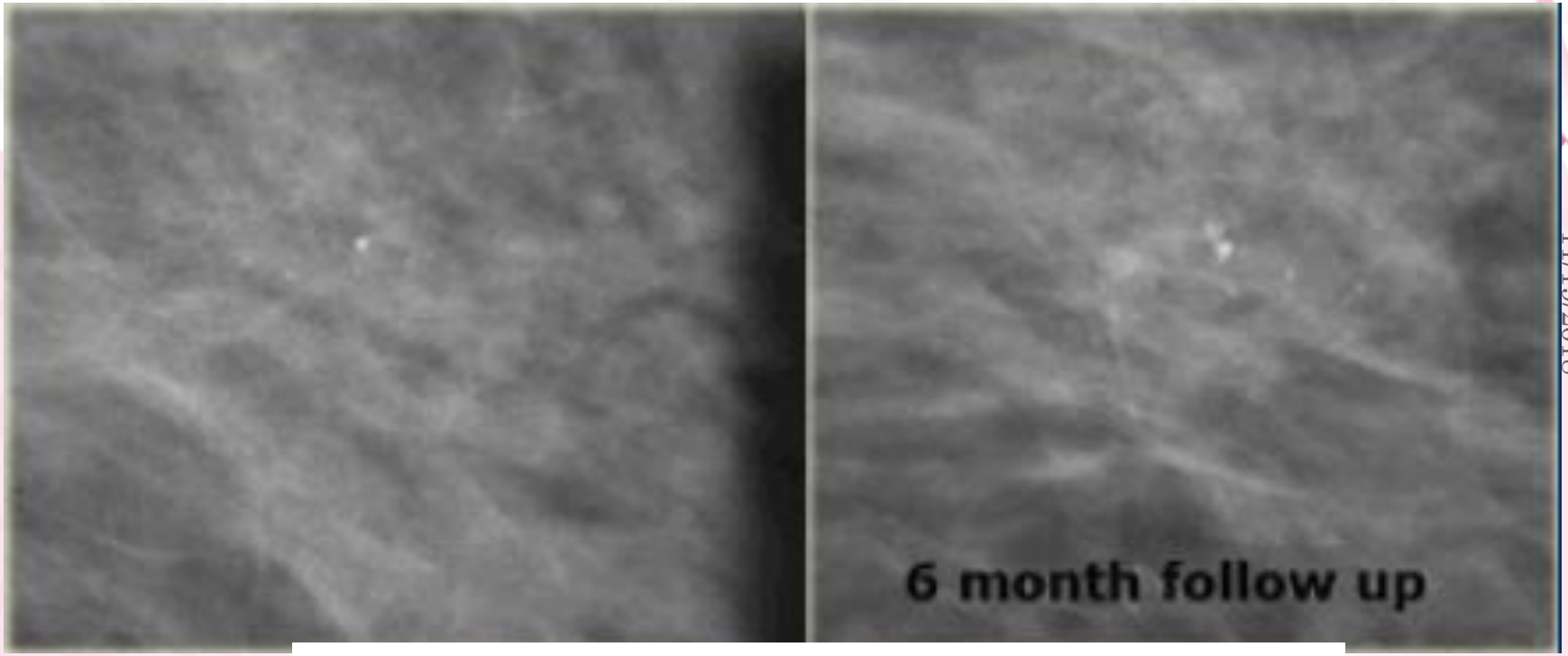


Terminal Ductal Lobular Unit



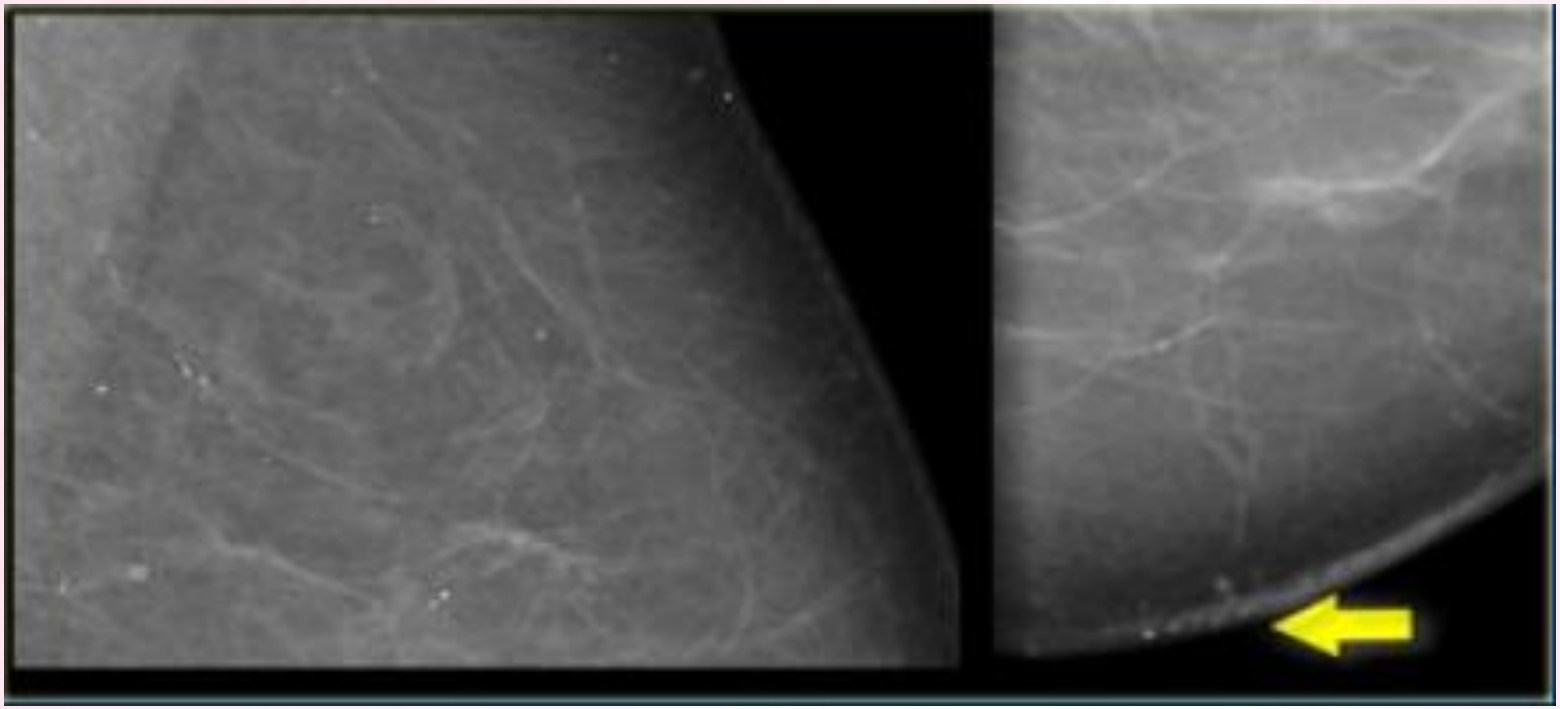
LEFT: Lobular calcifications: punctate, round or 'milk of calcium' RIGHT: Intraductal calcifications: pleomorph and form casts in a linear or branching distribution.


Diffuse
Regional
Clustered
Linear
Segmental

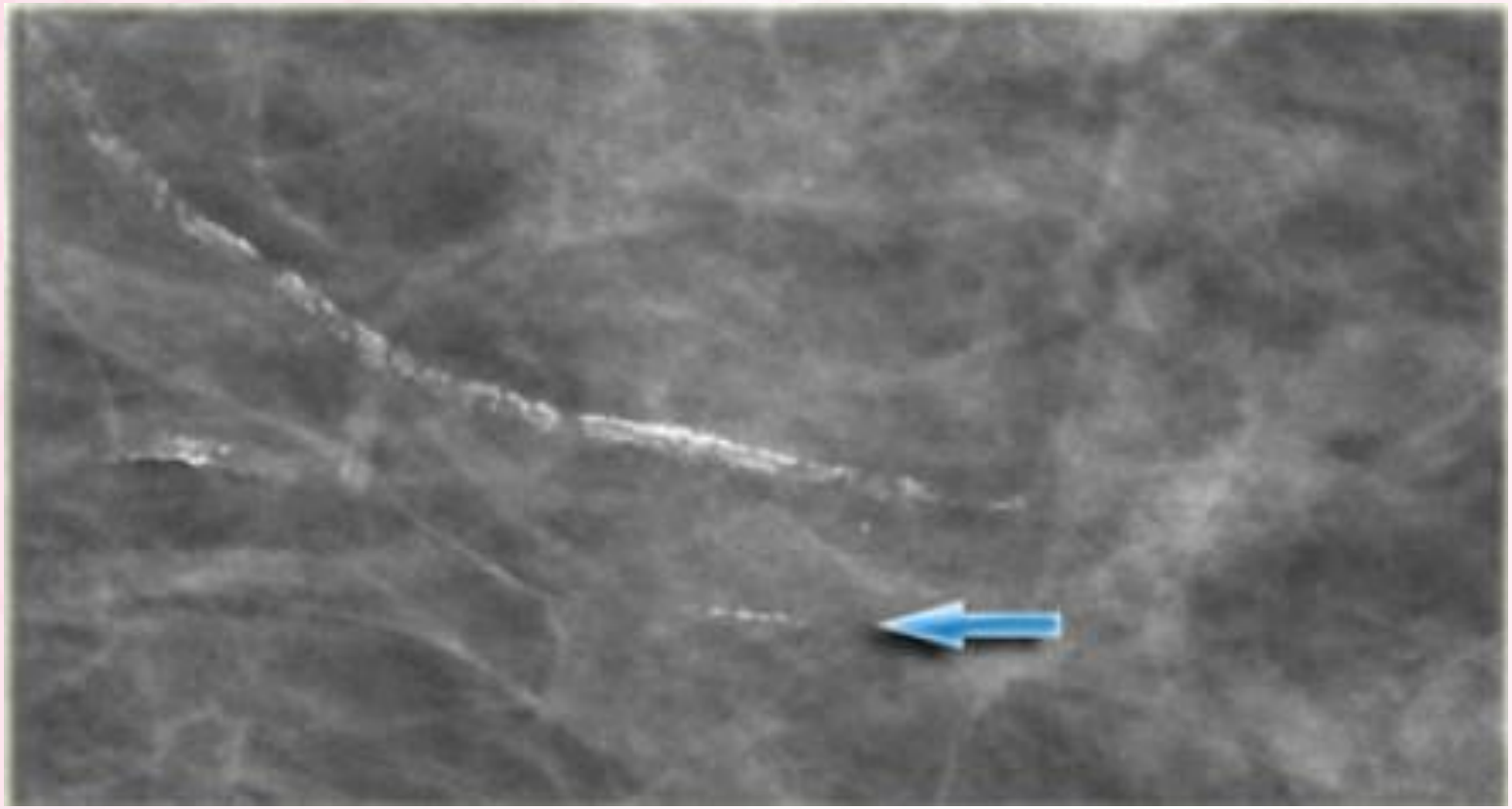


In the same study it was shown that the odds for invasive carcinoma versus DCIS are statistically significantly higher among patients with increasing or new microcalcifications. The likelihood that carcinoma will be invasive increases significantly when a suspicious or indeterminate cluster of calcifications is new or increasing.

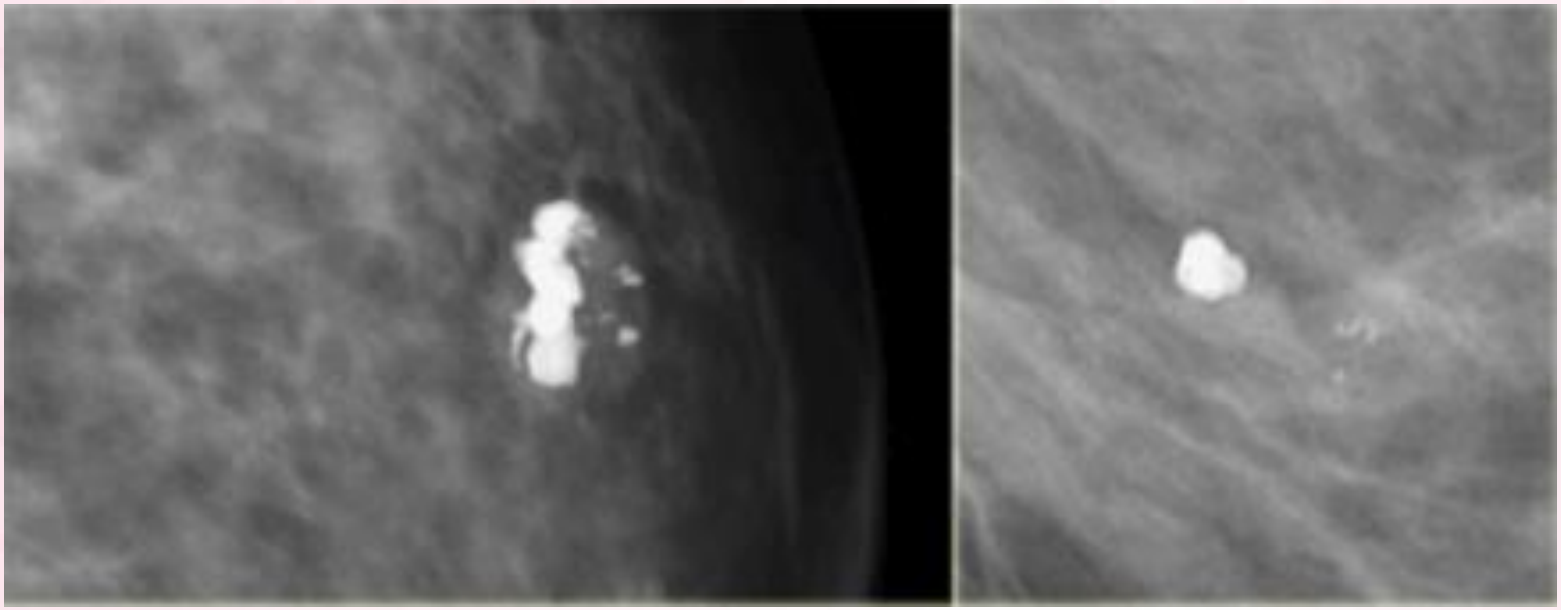
On the left a patient with a few heterogeneous coarse calcifications.
They were classified as BIRADS 3 (probably benign with a likelihood of malignancy less than 3%).
At six month follow up they had increased in number and DCIS was found at biopsy.



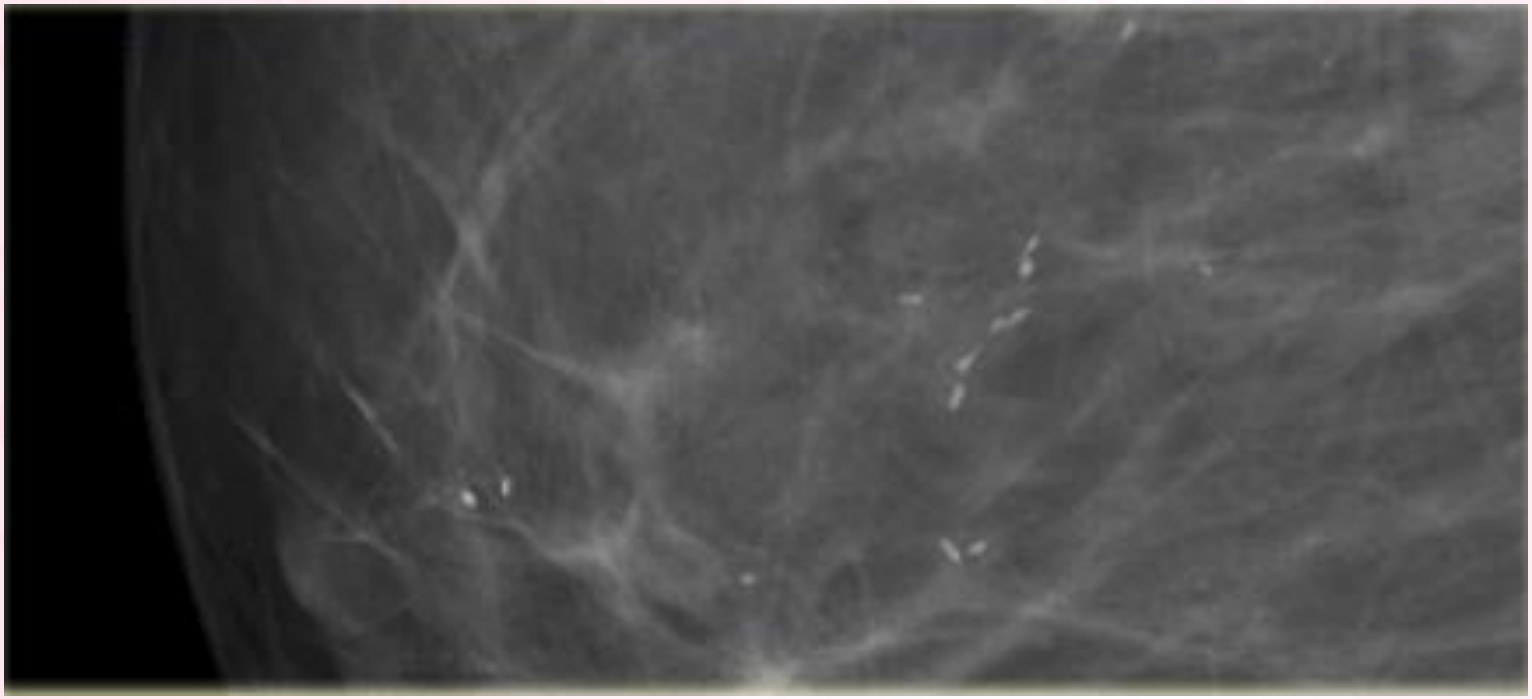
Skin Calcifications – Tatoo sign



Vascular Calcifications

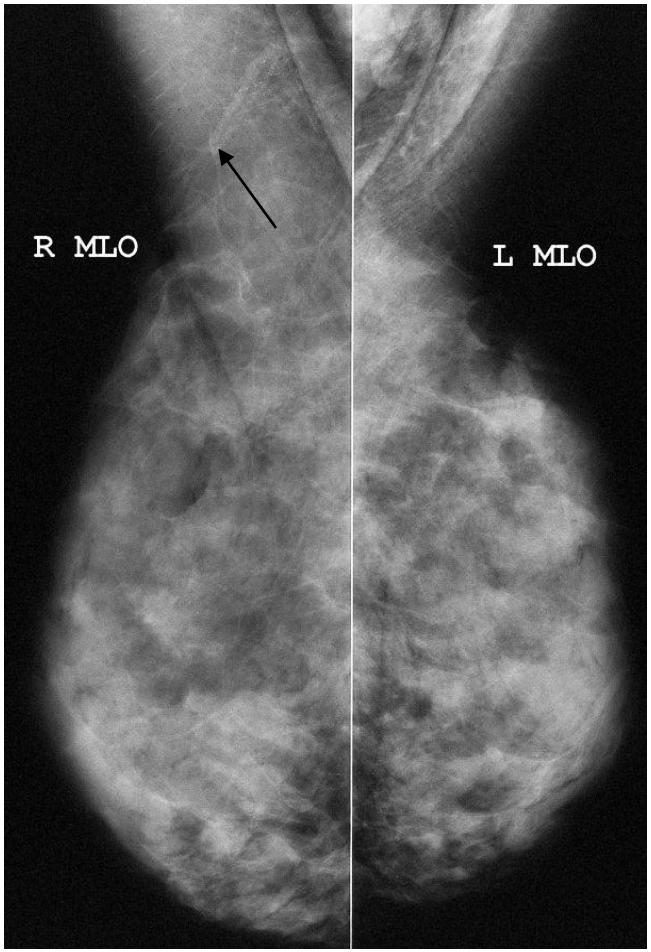


Coarse or 'Popcorn-like'

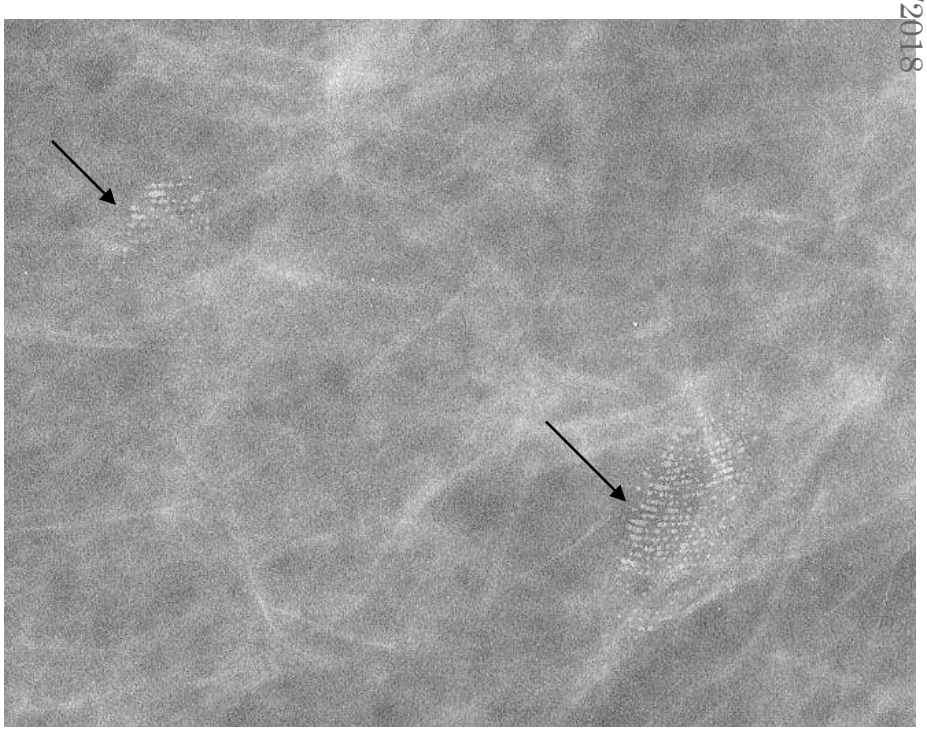


Large Rod-like, Plasma cell mastitis

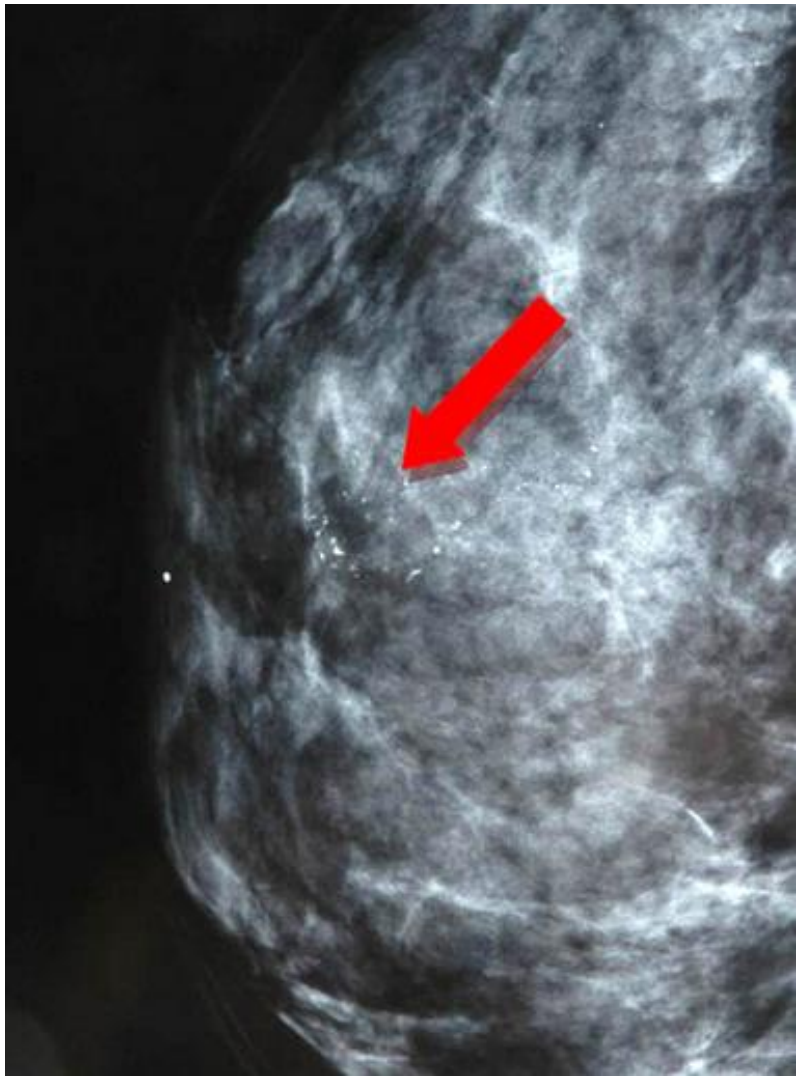
Artifacts Simulatin Calcifications



Deodorant artifact

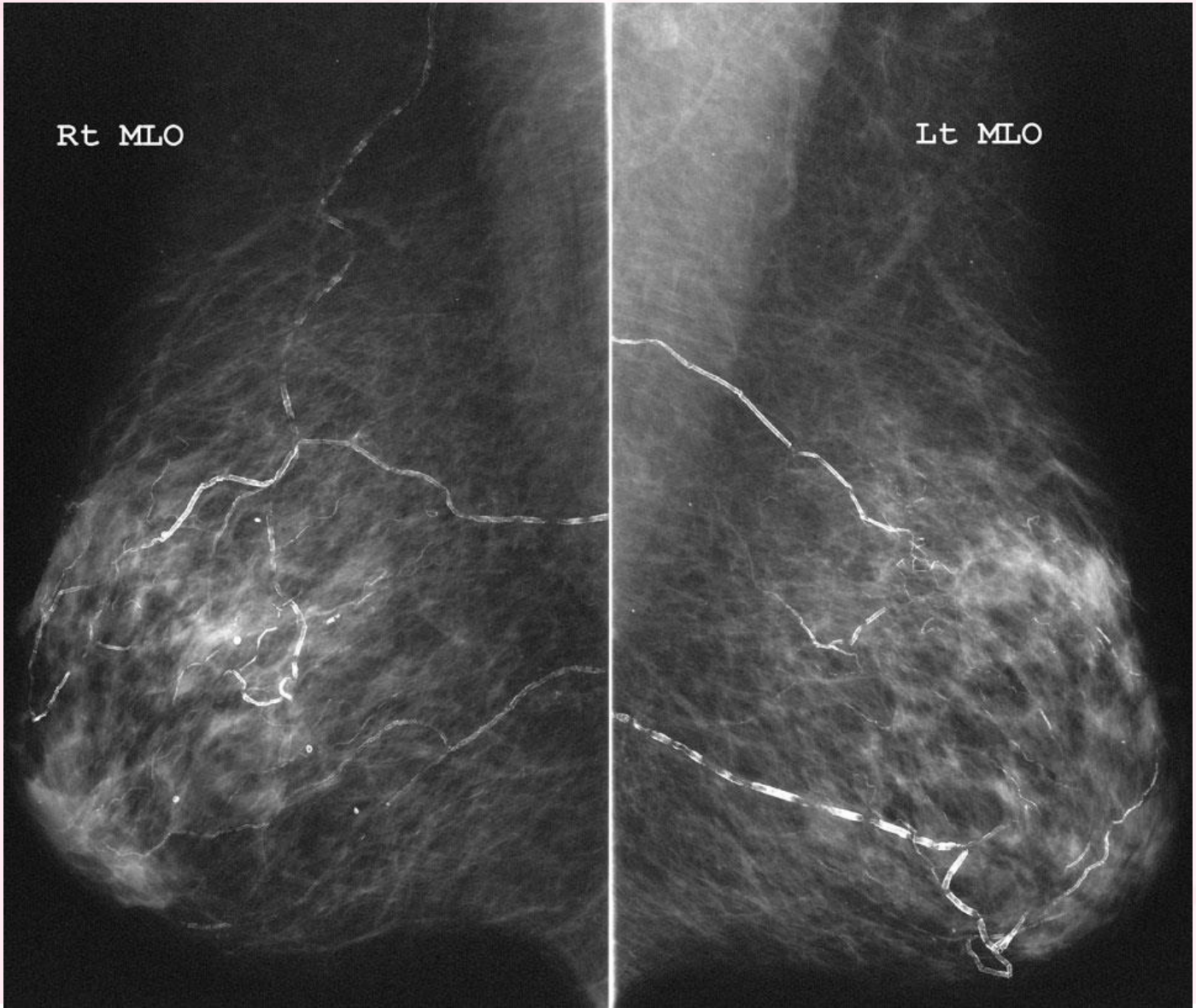


Fingerprints artifact

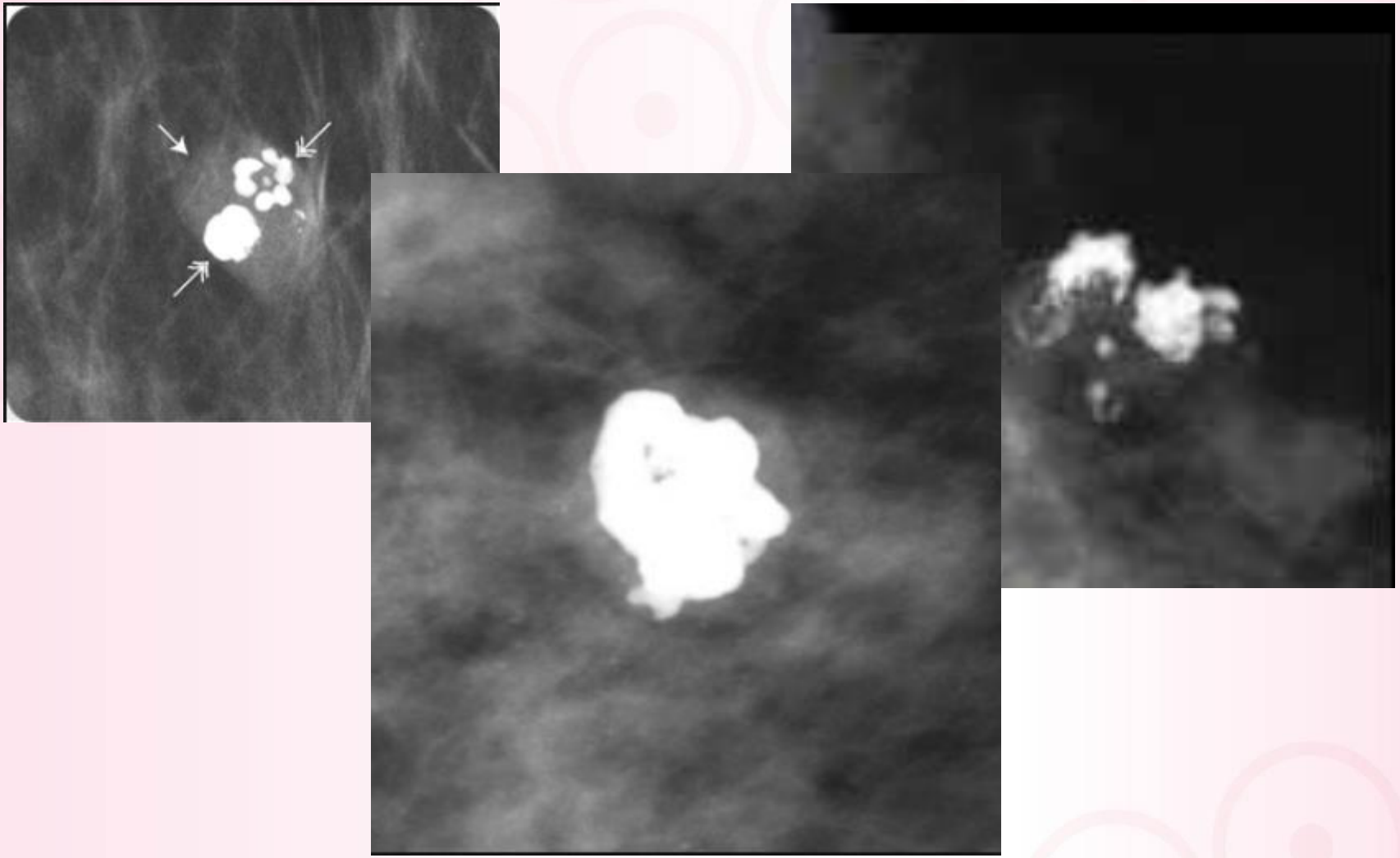


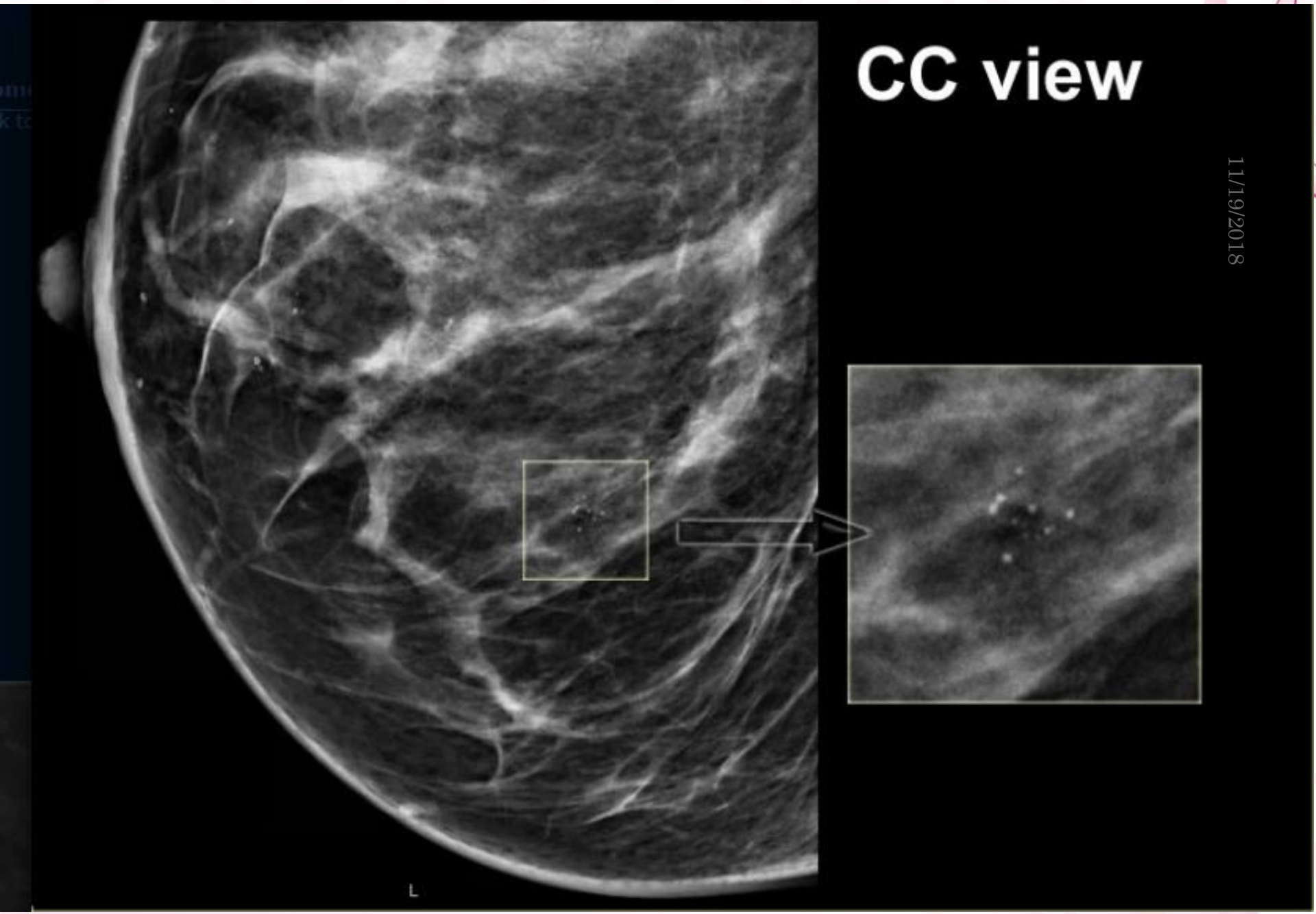
صورة شعاعية للثدي تظهر تكلسات
صغيرة جداً وغير متجانسة سرطانية
لا يمكن تحسسها بالفحص اليدوي

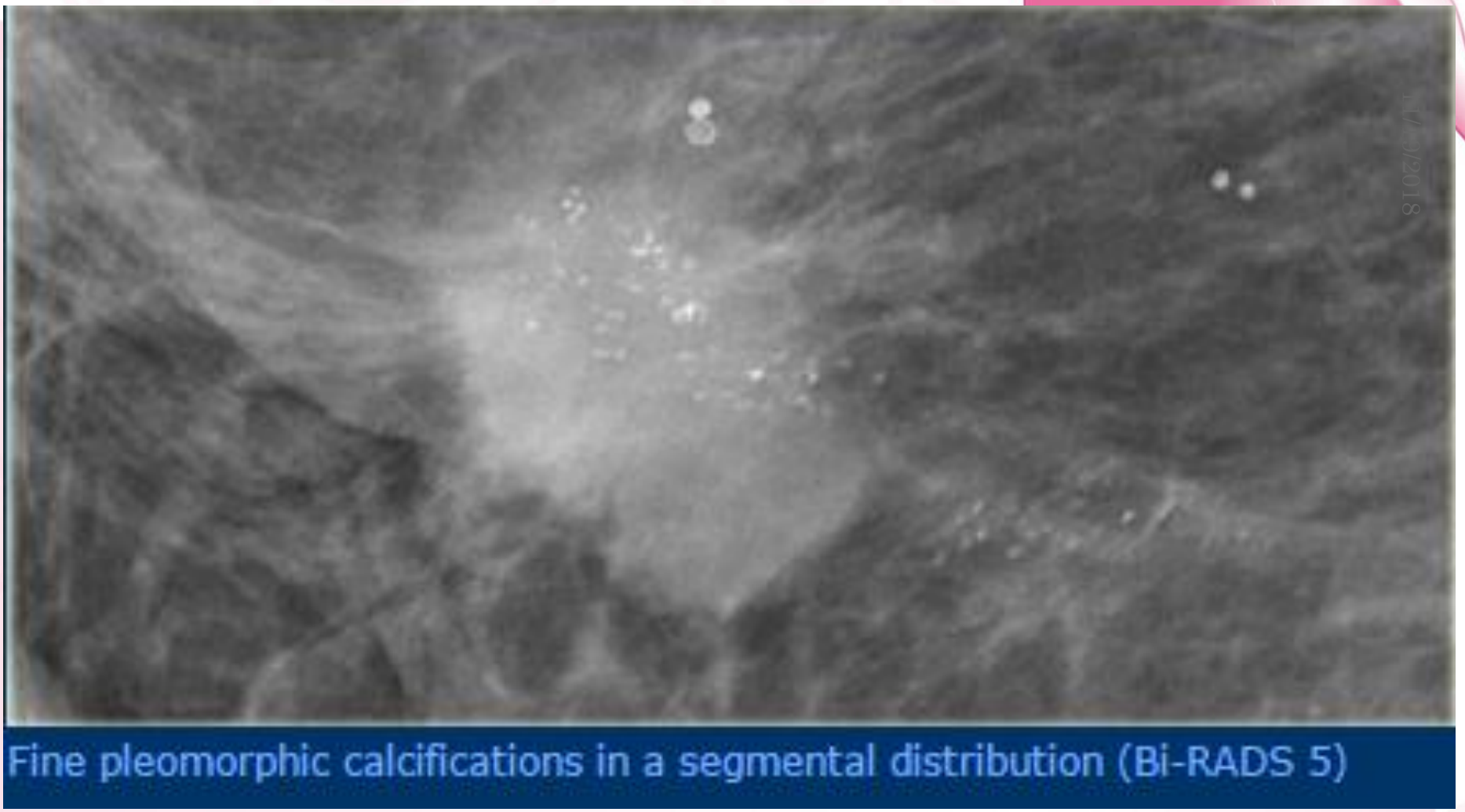
Arterial calcifications



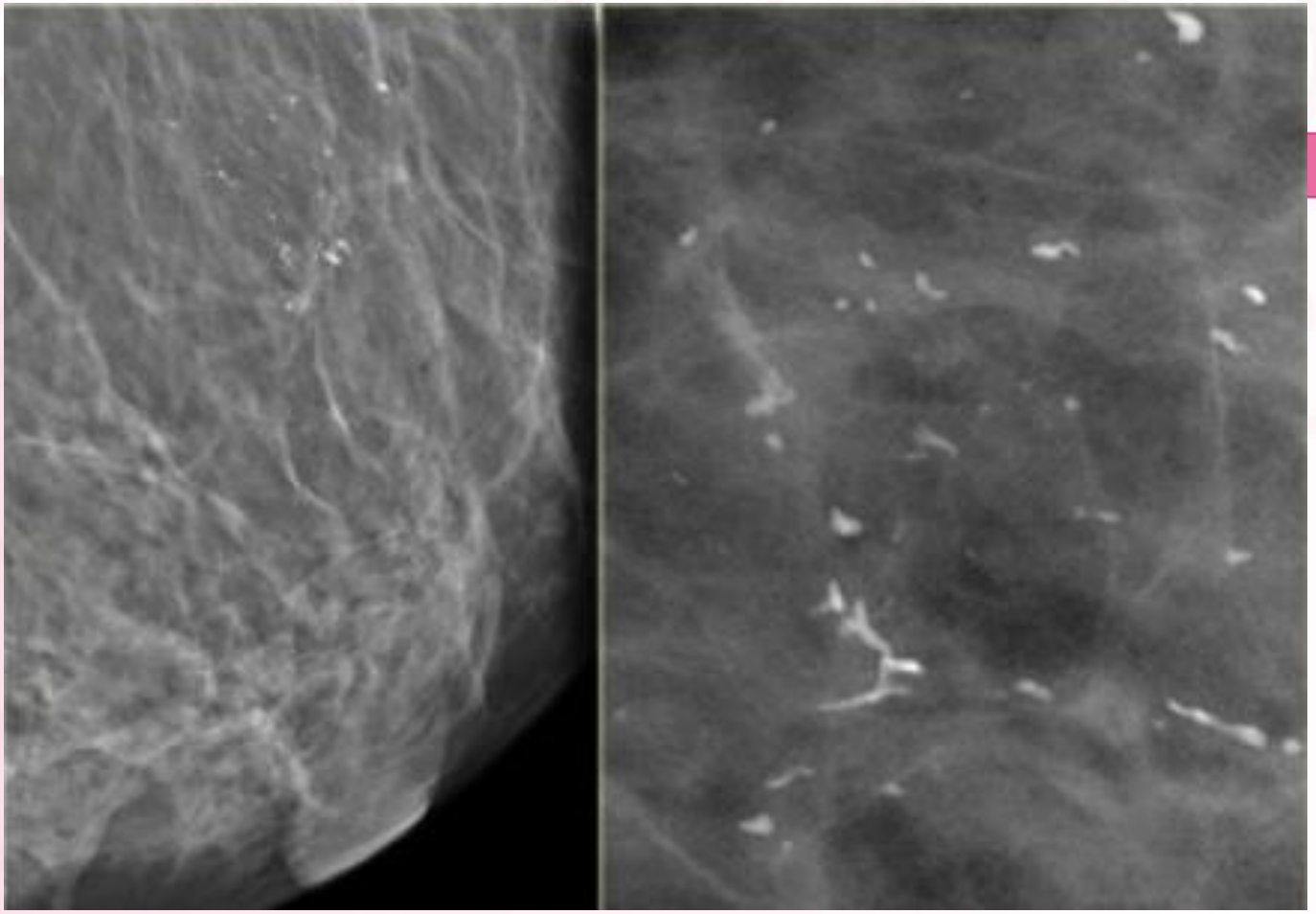
Pop-Corn Calcifications (Coarse)



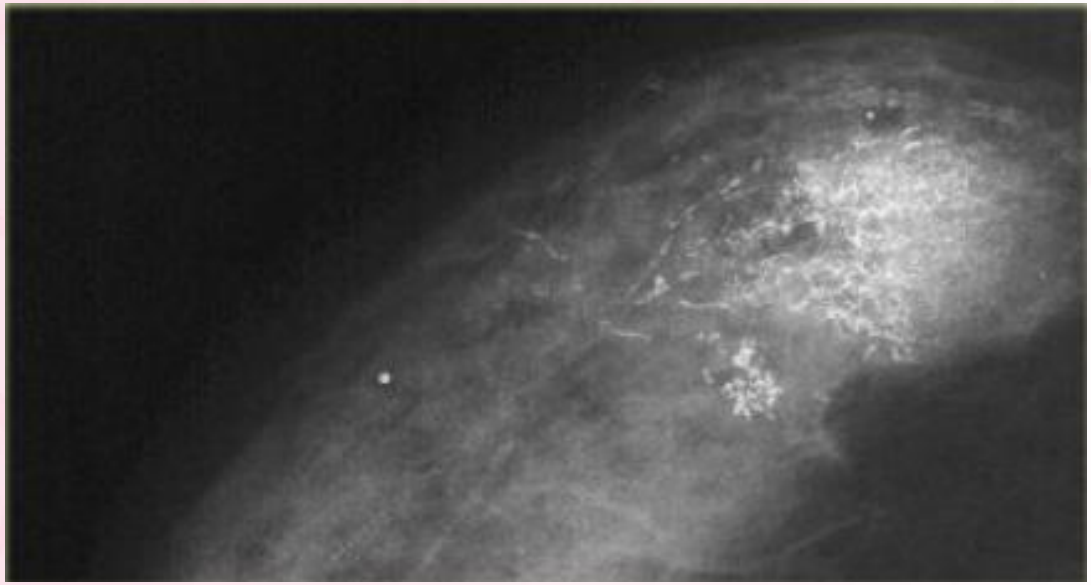

CC view
11/19/2018
L



Fine pleomorphic calcifications in a segmental distribution (Bi-RADS 5)

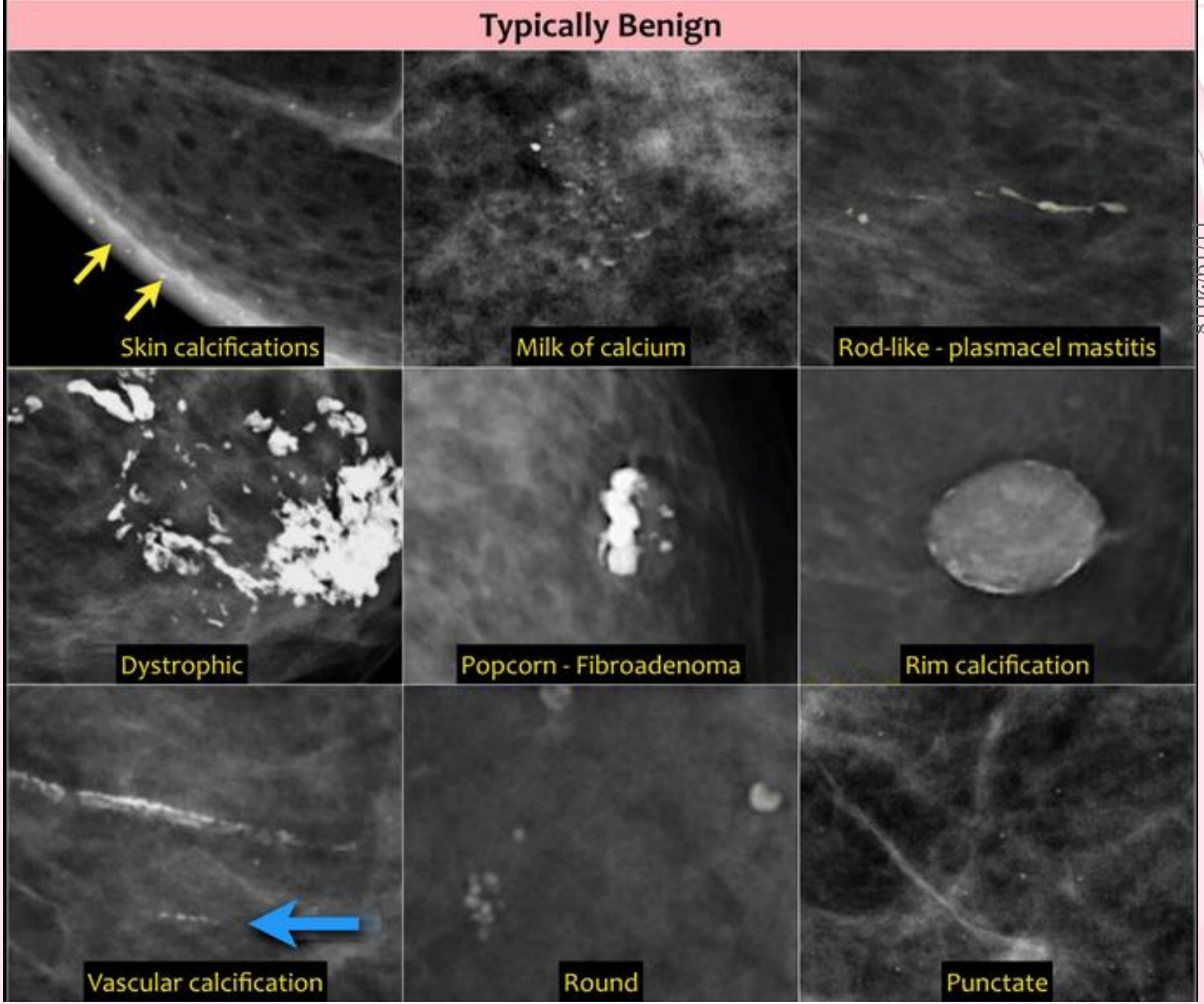


On the left a patient in whom new calcifications were detected during follow up for breastcancer in the contralateral breast.
There are coarse heterogeneous calcifications in a segmented distribution.
These calcifications were classified as Bi-RADS 4.
Biopsy showed calcifications within fibrous stroma.
There was no sign of malignancy.

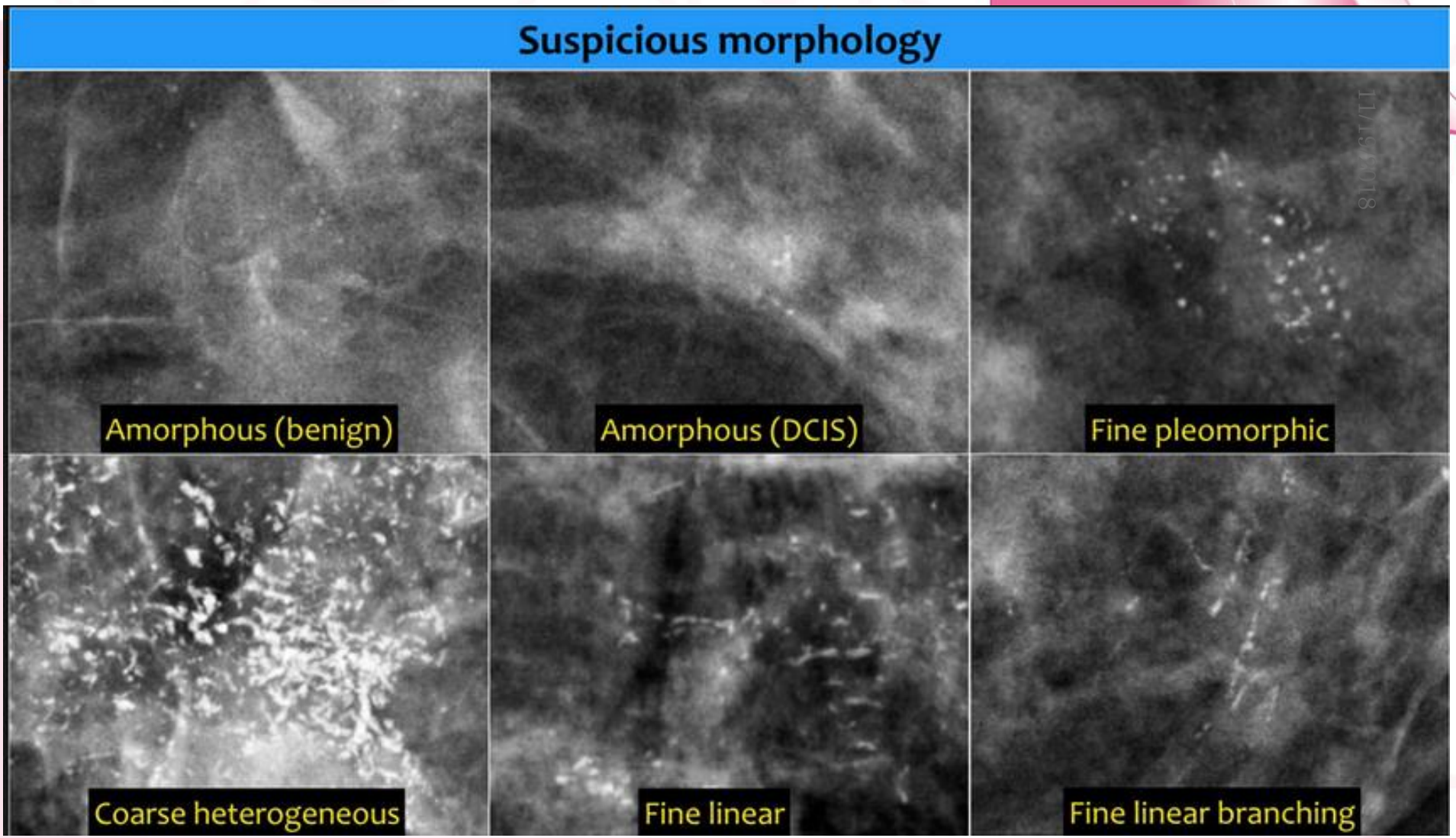


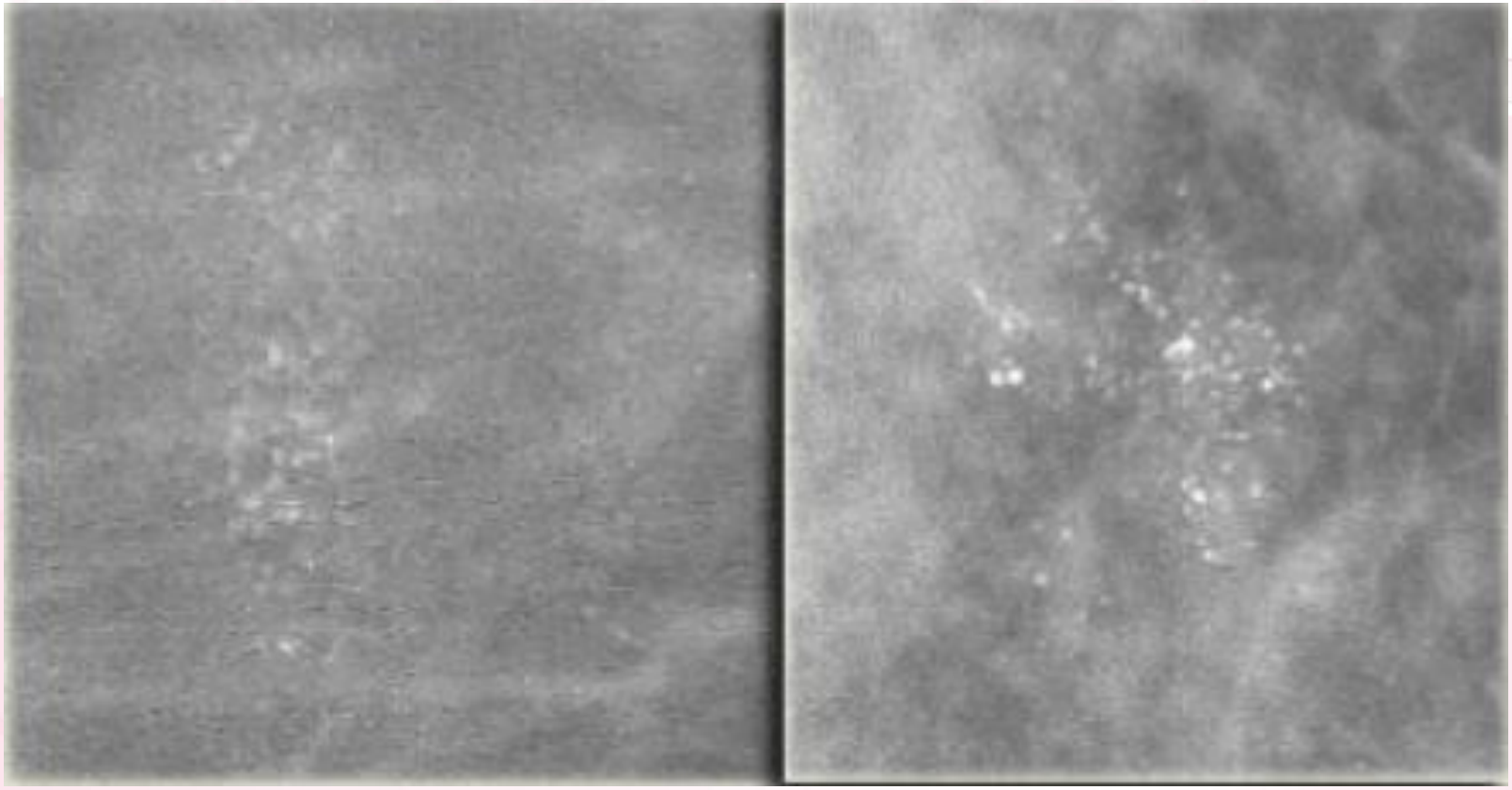
High grade DCIS

On the left fine linear and branching calcifications in a segmental distribution highly suggestive of malignancy (Bi-RADS 5). Extensive high grade DCIS was found at biopsy.


Typically Benign
Skin calcifications
Milk of calcium
Rod-like - plasmacel mastitis
Dystrophic
Popcorn - Fibroadenoma
Rim calcification
Vascular calcification
Round
Punctate

Suspicious morphology





The image on the left shows the same artifacts.
On the image on the right DCIS.

Powdery Calcifications

Evaluation of the mammogram

- **Each mammogram should be evaluated for:**
- Adequate quality of study, additional views required.
- Asymmetry.
- Skin, nipple changes.
- Architectural distortion.
- lymph nods.
- Calcifications.
- *Masses present.*

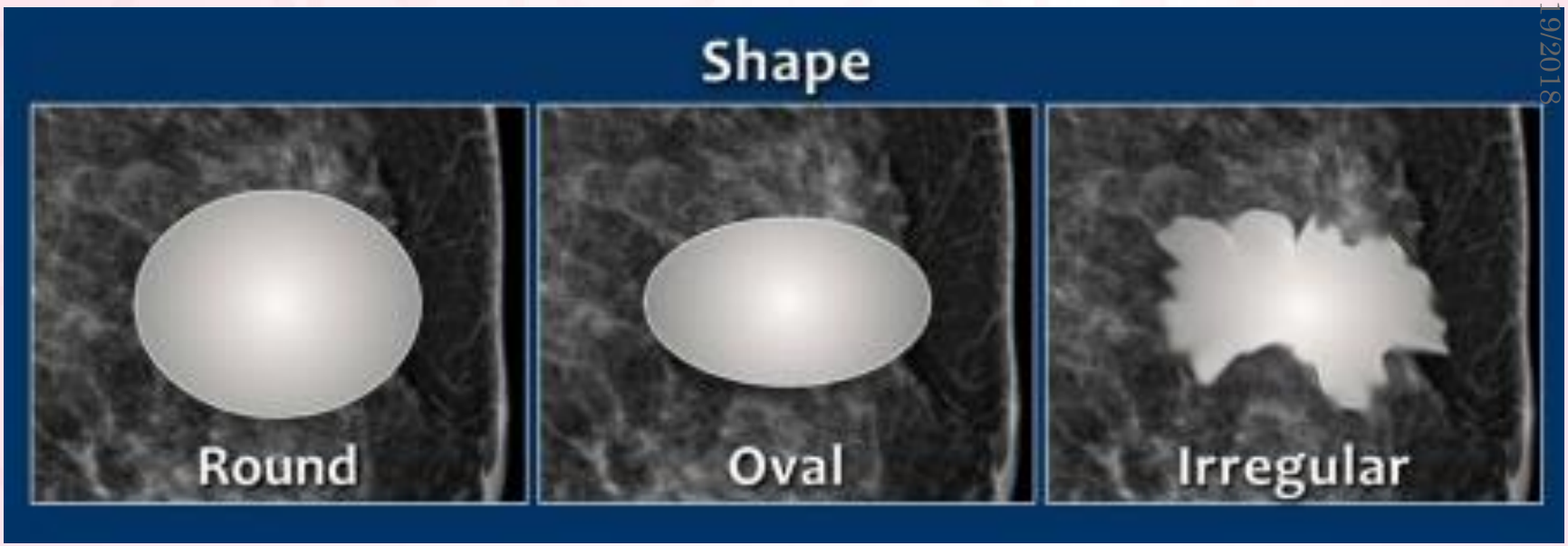
Mammographic Technique and Analysis

- **ACR BI-RDS masses description:**
  - **الشكل.**
  - الحواف.
  - الكثافة.
  - الموجودات المرافقة.

Mammographic Technique and Analysis

الشكل:

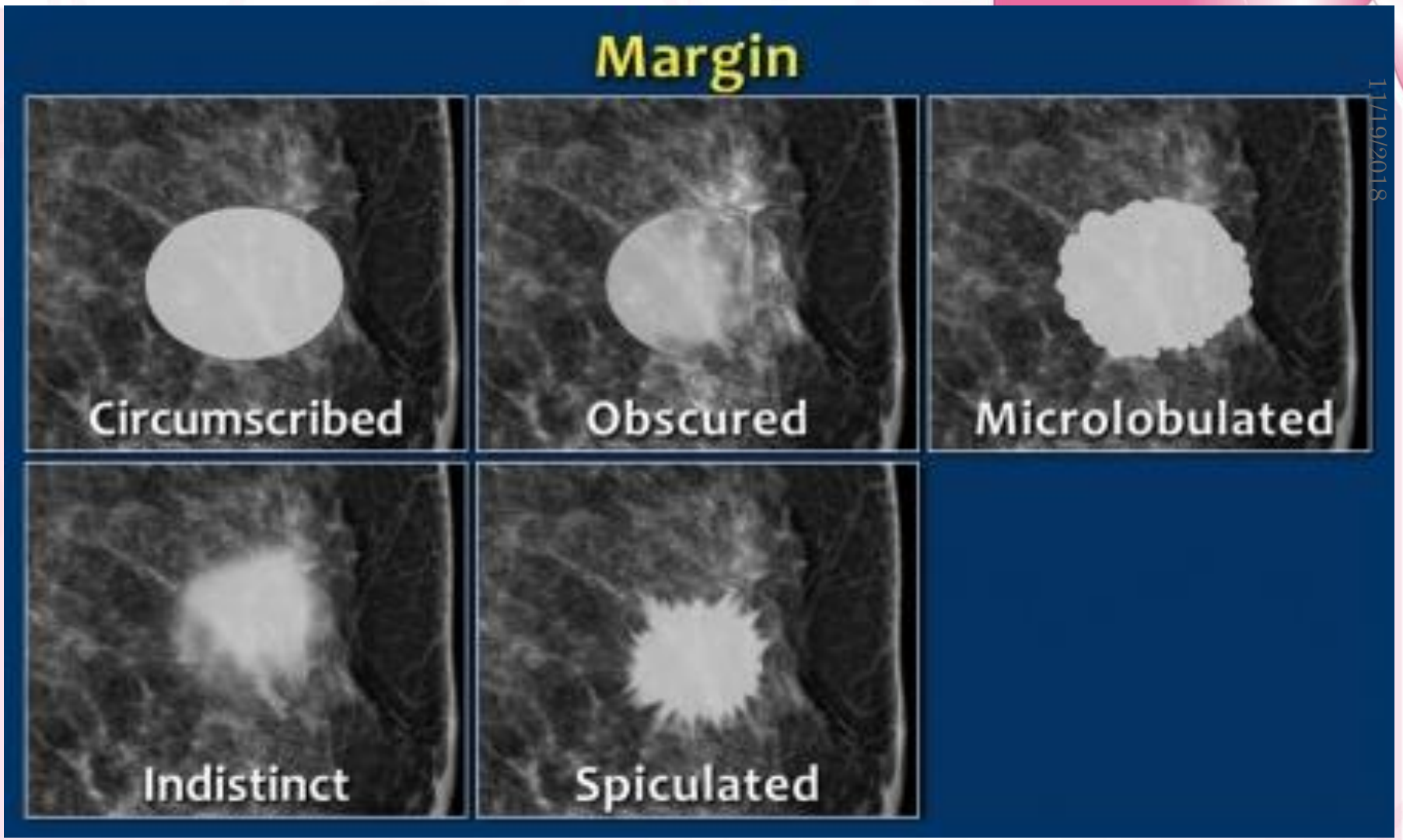
- دائري.
- بيضوي.
- مفصص.
- غير منتظم.


Shape
Round
Oval
Irregular

Mammographic Technique and Analysis

Margins (الحواف):

- غير محددة
- مفصصة.
- غير واضحة.
- مشوكة.


Margin
Circumscribed
Obscured
Microlobulated
Indistinct
Spiculated

Masses with Spiculated Borders

A stallate mass is the most typical mammographic image of breast cancer

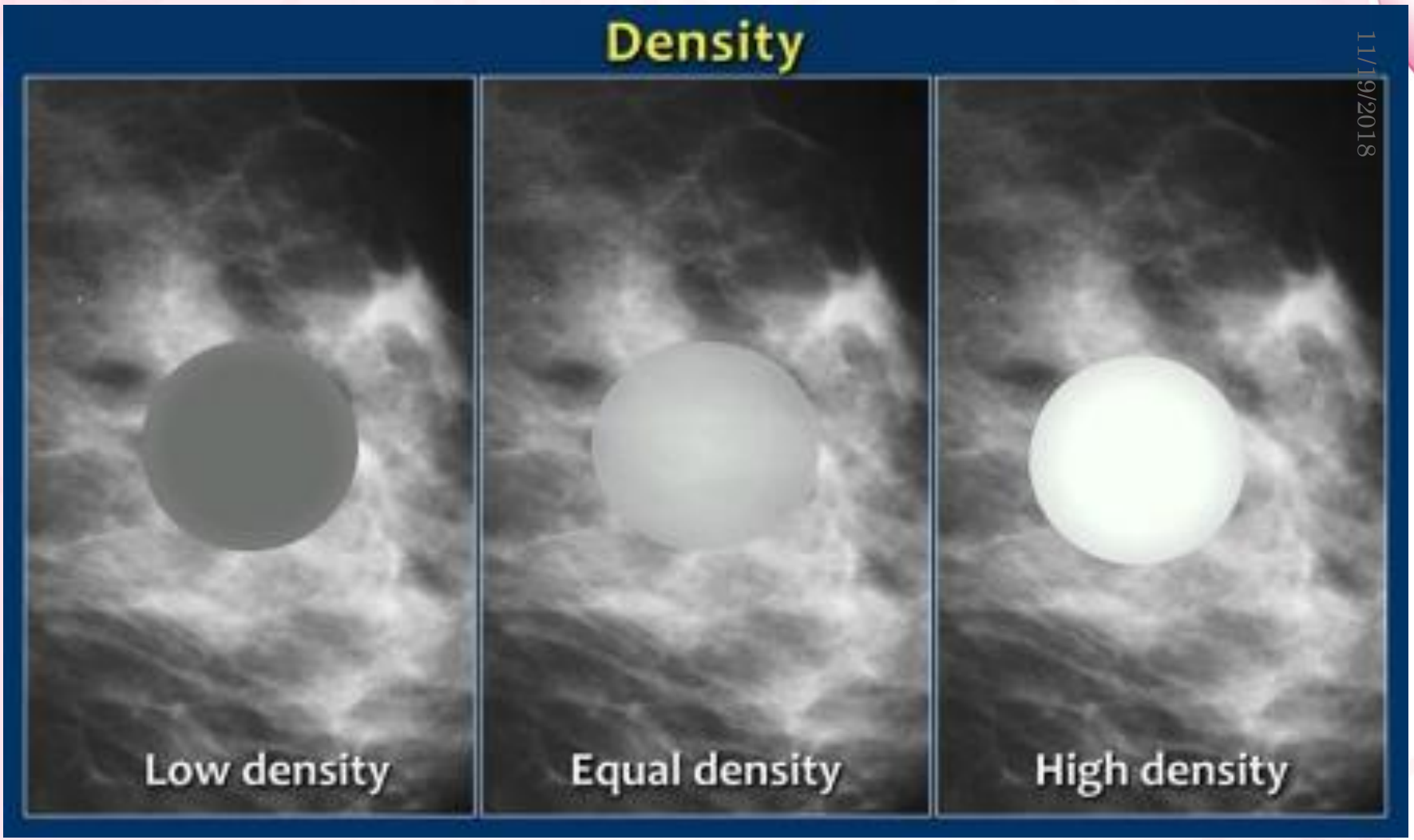
Mammographic Technique and Analysis

- **ACR BI-RDS masses description:**

- Shape.
- Margin.
- *Density.*
- Associated findings.

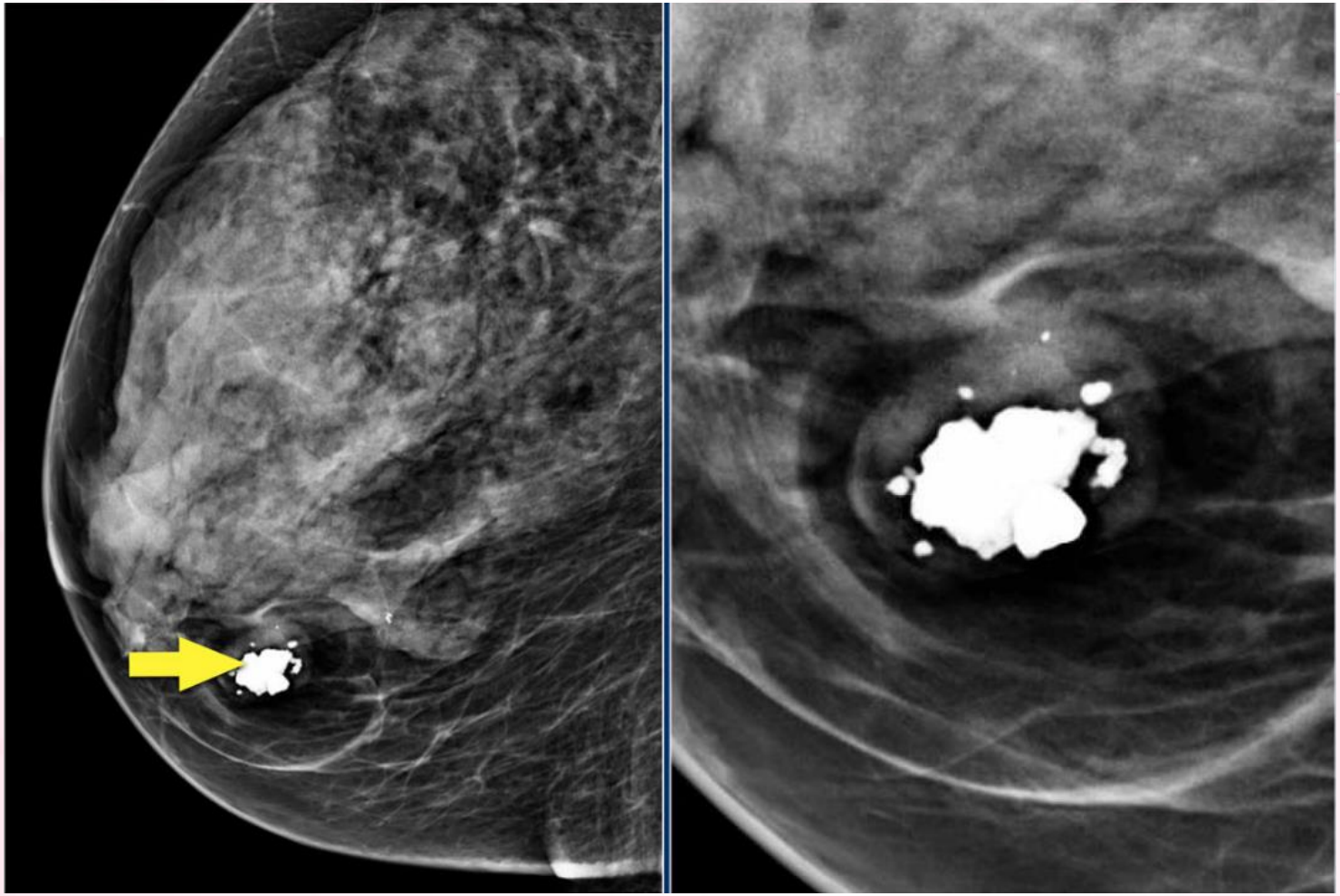
Mammographic Technique and Analysis

- Density الكثافة:
  - عالية
  - ناقصة
  - موازية
  - محتوى شحمي


Density
Low density
Equal density
High density

Mammographic Technique and Analysis

- الكتل عالية الكثافة تتوافق غالبا مع الخباثات.
- الكتل ناقصة الكثافة أو الموازية لكثافة النسيج الغدي غالبا تتوافق مع السلامة.
- الكتل ذات المحتوى الشحمي غالبا سليمة.



The images show a fat-containing lesion with a popcorn-like calcification.
All fat-containing lesions are typically benign.
These image-findings are diagnostic for a hamartoma - also known as fibroadenolipoma.

Mammographic Technique and Analysis

- **ACR BI-RDS masses description:**

- Shape.
- Margin.
- Density.
- *Associated findings.*

Mammographic Technique and Analysis

Associated findings (الموجودات المرافقة):

- انكماش الجلد.
- تسمك الجلد.
- جذب الحلمة للداخل.
- اعتلالات عقد لمفية.
- تخريب في البنية الهندسية.
- تكلسات.

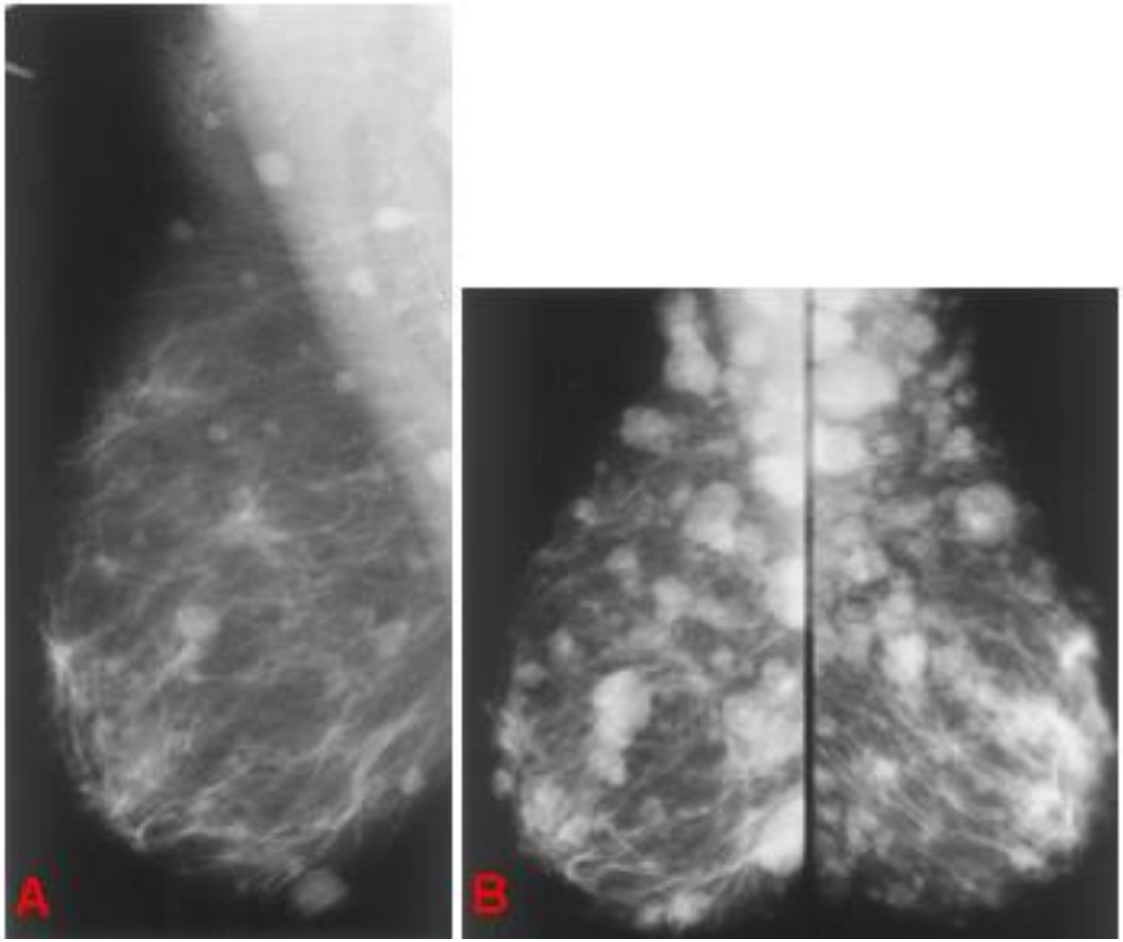


Figure 4. **(a)** Right mediolateral oblique view shows multiple round and oval circumscribed masses throughout breast of 45-year-old woman with malignant melanoma. **(b)** Bilateral mediolateral oblique views obtained 2 months later show rapid increase in size and number of metastatic masses.

Metastases

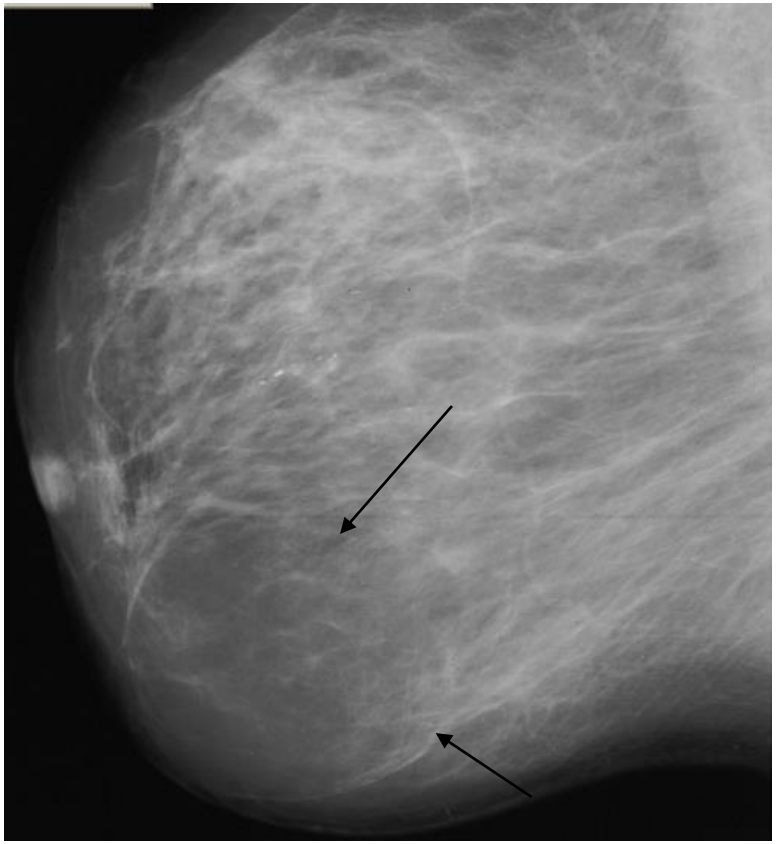
Masses Containing Fat

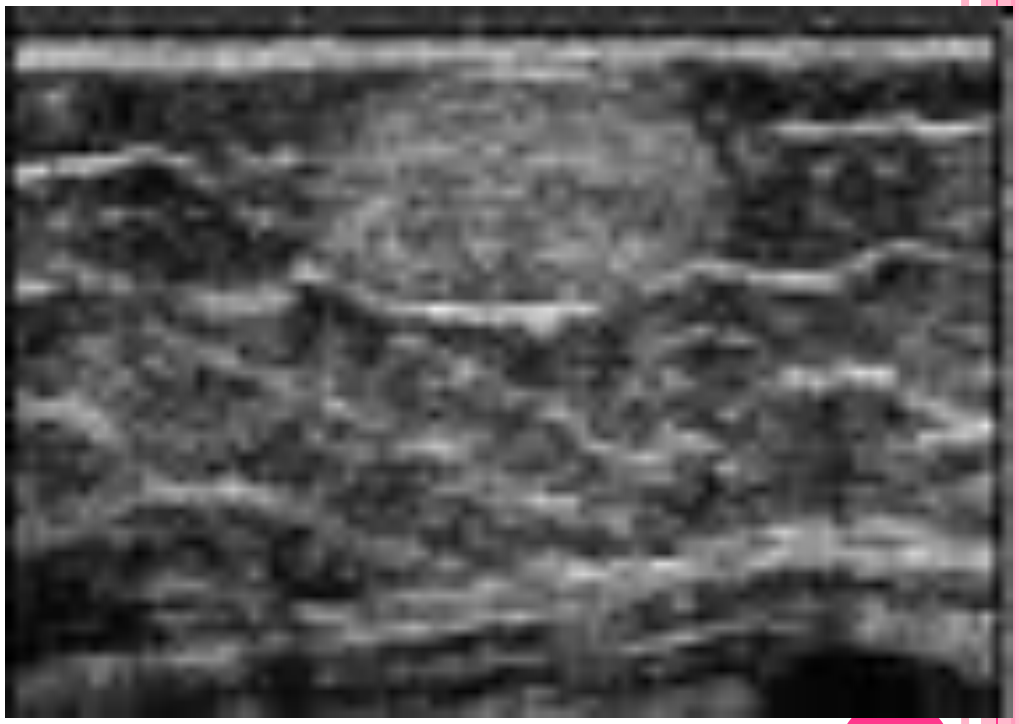
MASSES CONTAINING FAT

الكتل التي تحوي على شحم

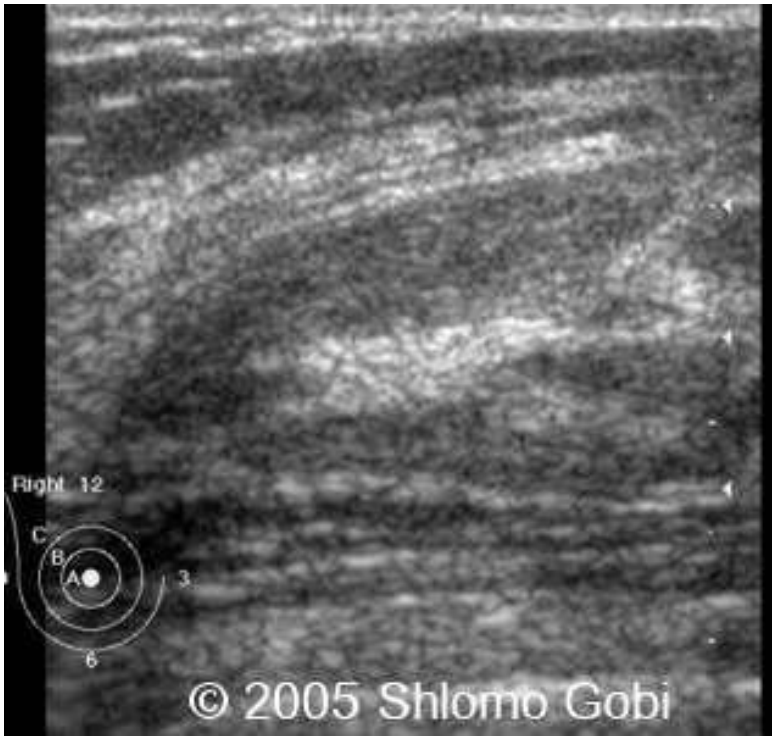
- Lymph node الضخامات العقدية .
- Hamartoma الأورام العابية .
- Oil cyst الكيسات الزيتية .
- Lipoma الأورام الشحمية .
- Liposarcoma الساركوما الشحمية .

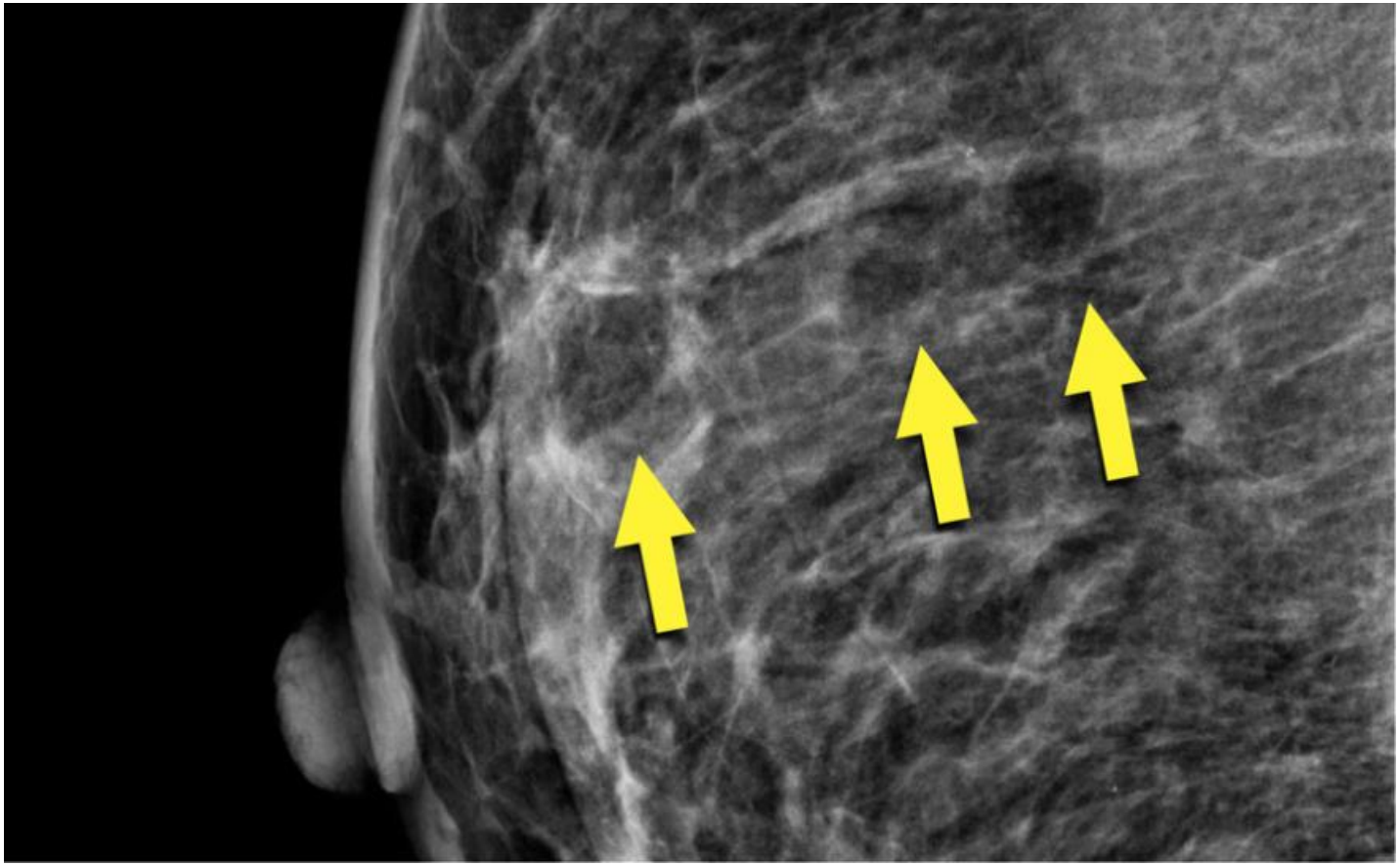
Lipoma



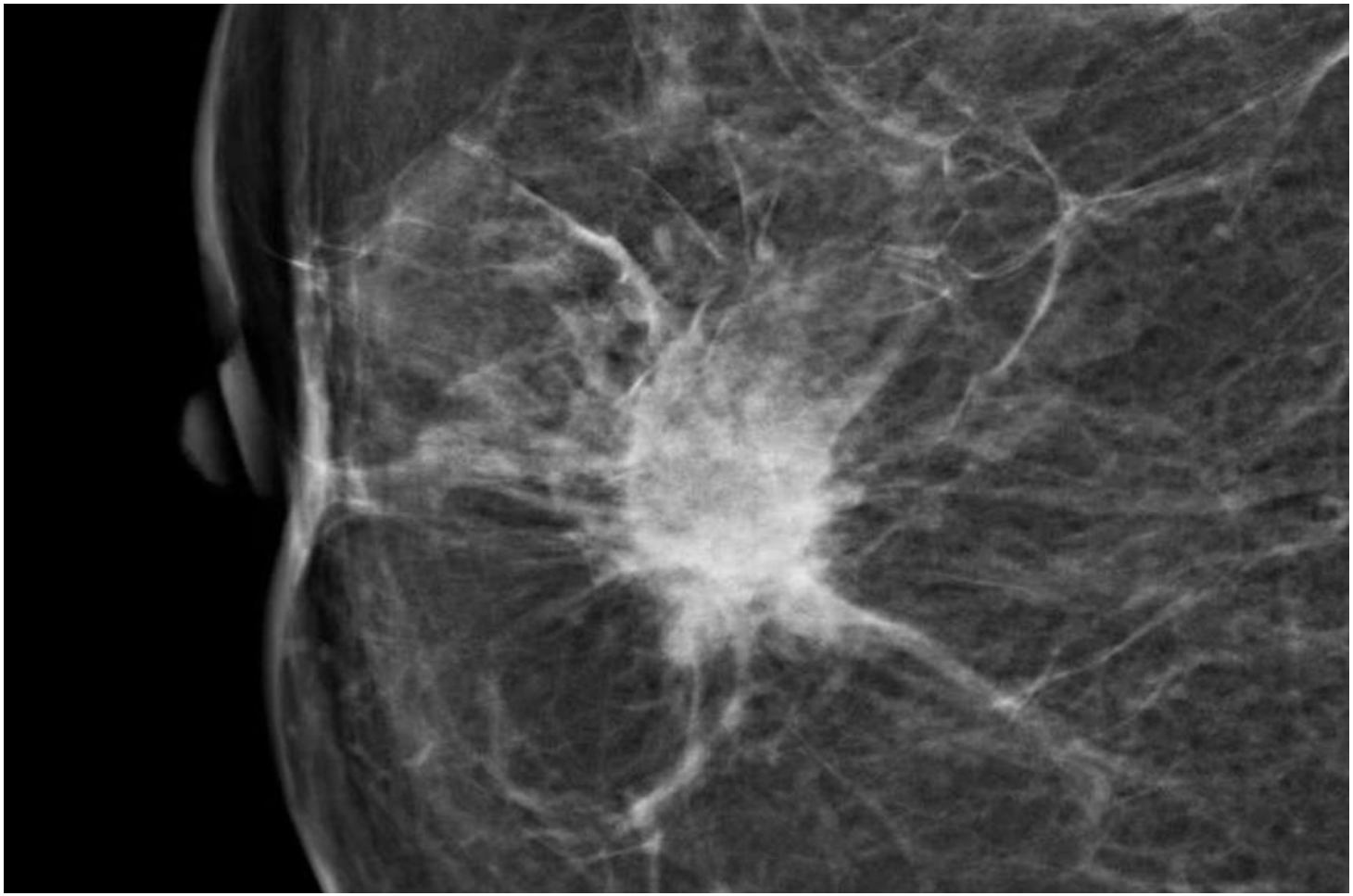


Hamartoma





Here multiple round circumscribed low density masses in the right breast.
These were the result of lipofilling, which is transplantation of body fat to the breast.



Here a hyperdense mass with an irregular shape and a spiculated margin.
Notice the focal skin retraction.

This was reported as BI-RADS 5 and proved to be an invasive ductal carcinoma.

FLUID-CONTAINING MASSES

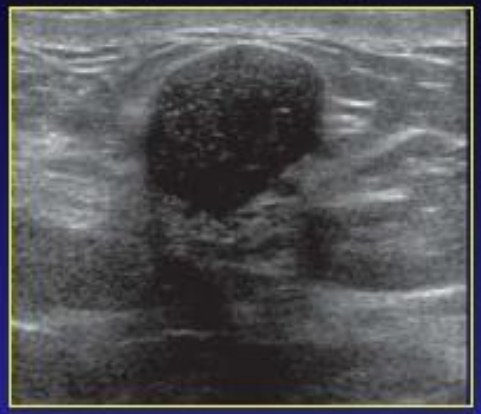
الكتل التي تحوي على سائل

- Cystالكيسات .
- Hematoma/Seromaالنزوف .
- Necrotic cancer السرطان المتنخر .
- Intracystic papillomaالأورام الحليمية الكيسية .
- Abscessالخراجات .
- Sebaceous and epidermal inclusion cystsالكيسات تحت الجلد .
- Galactoceleالقيلات الحليبية .

Simple cyst

- Simple cyst
- Galactocele
- Hematoma
- Oil cyst.

Complicated cyst

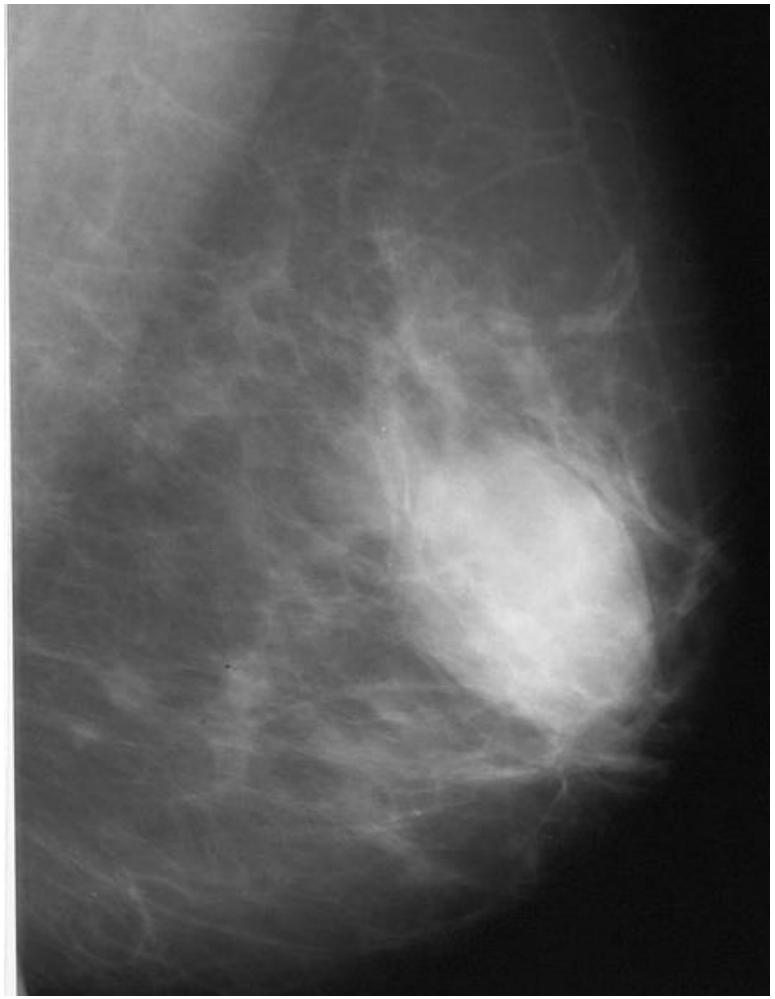


- Galactocele
- Hematoma
- Oil cyst.
- Abscess.

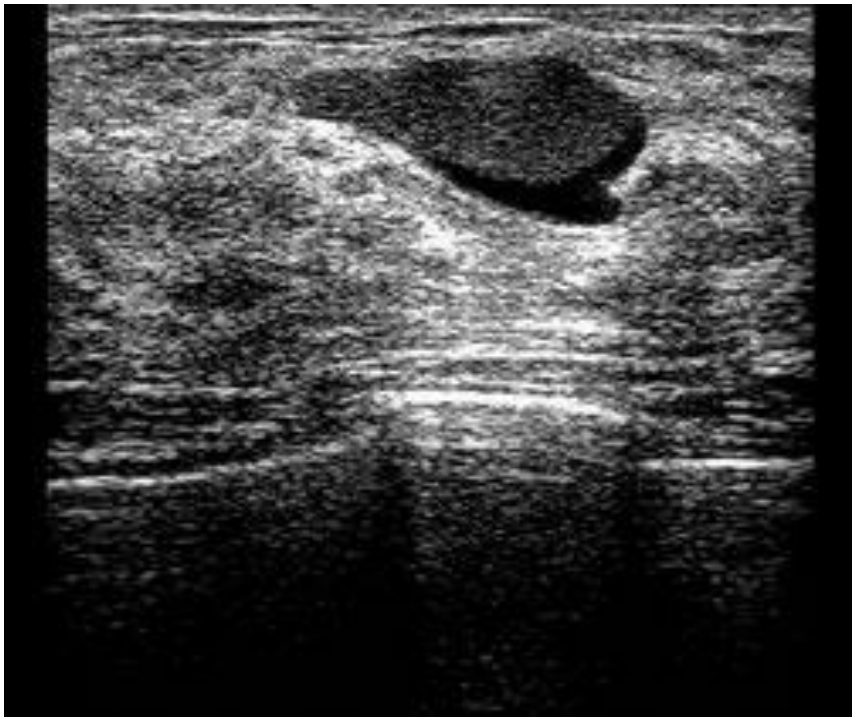
Complex cyst

- Galactocele
- Hematoma
- Fat necrosis.
- Abscess.
- Necrotic tumor.
- Papillary tumor.
- Atypical ductal hyperplasia.
- DCIS

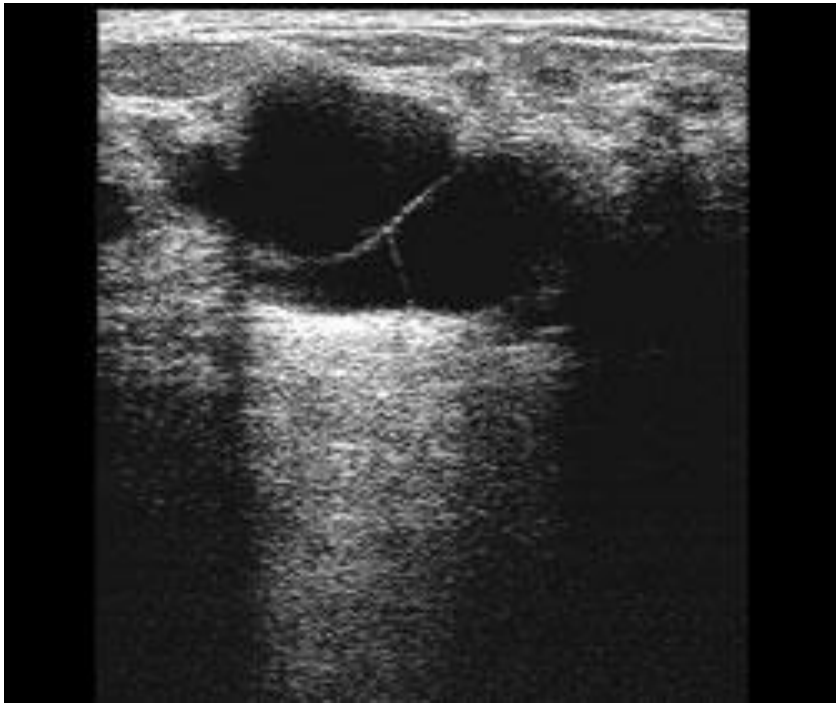
Simple Cyst



Complex Cysts

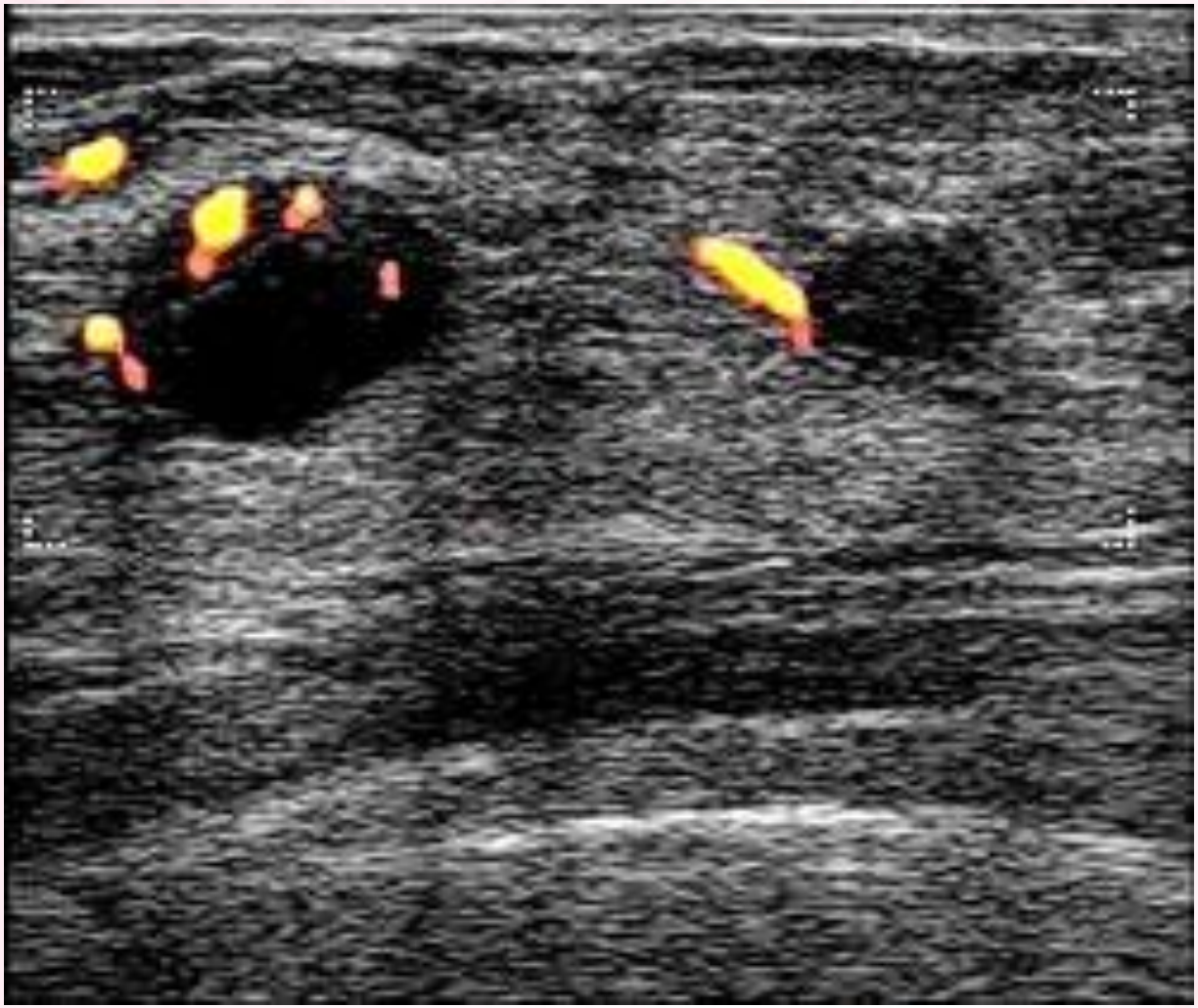


Fluid-debris level



Thin septation

Suspicious Cysts



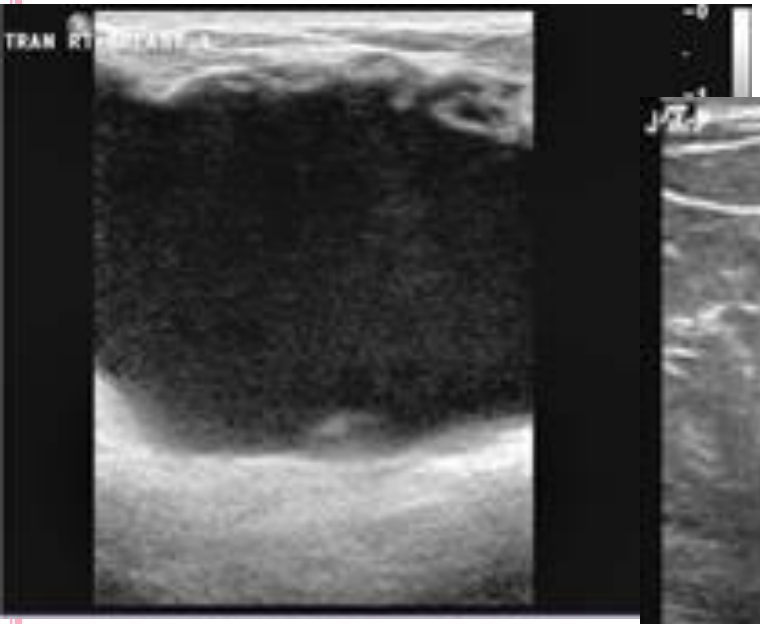
acute

Figure 1 - Craniocaudal (a) and mediolateral (b) mammograms reveal a partially defined dense node.

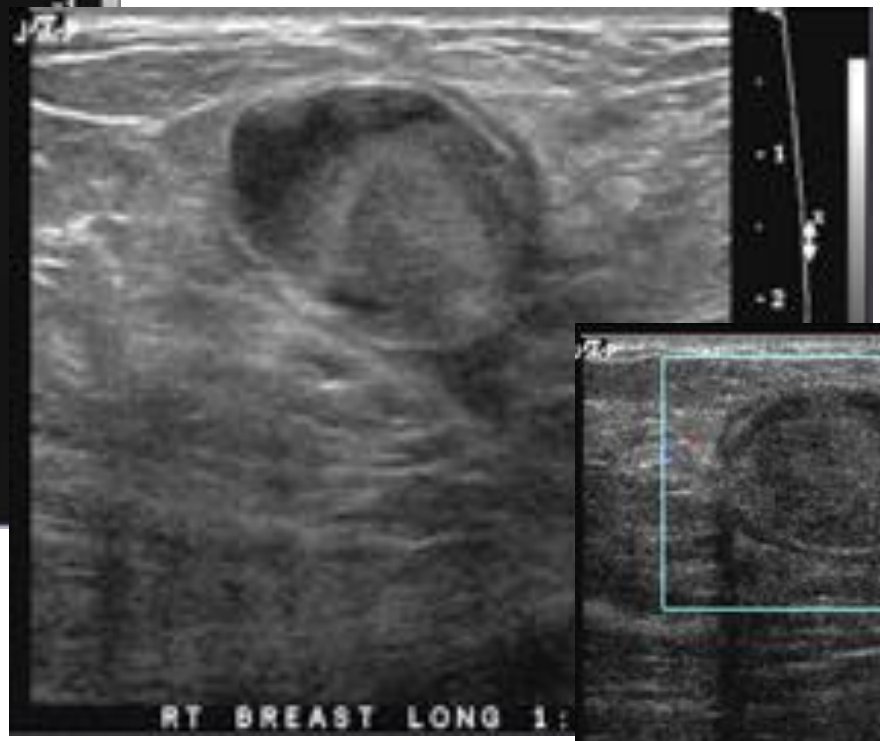
60day

HEMATOMA

Hematoma



Acute

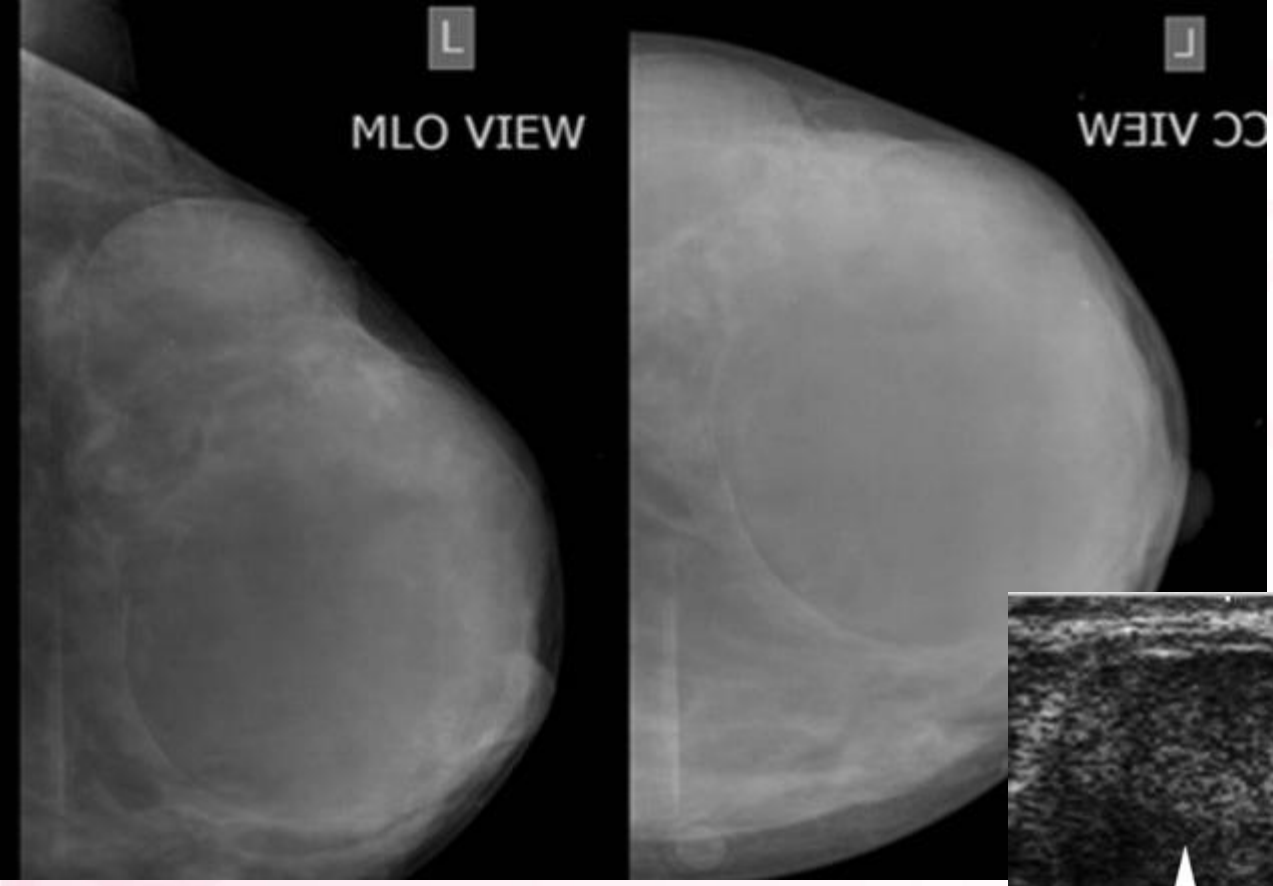


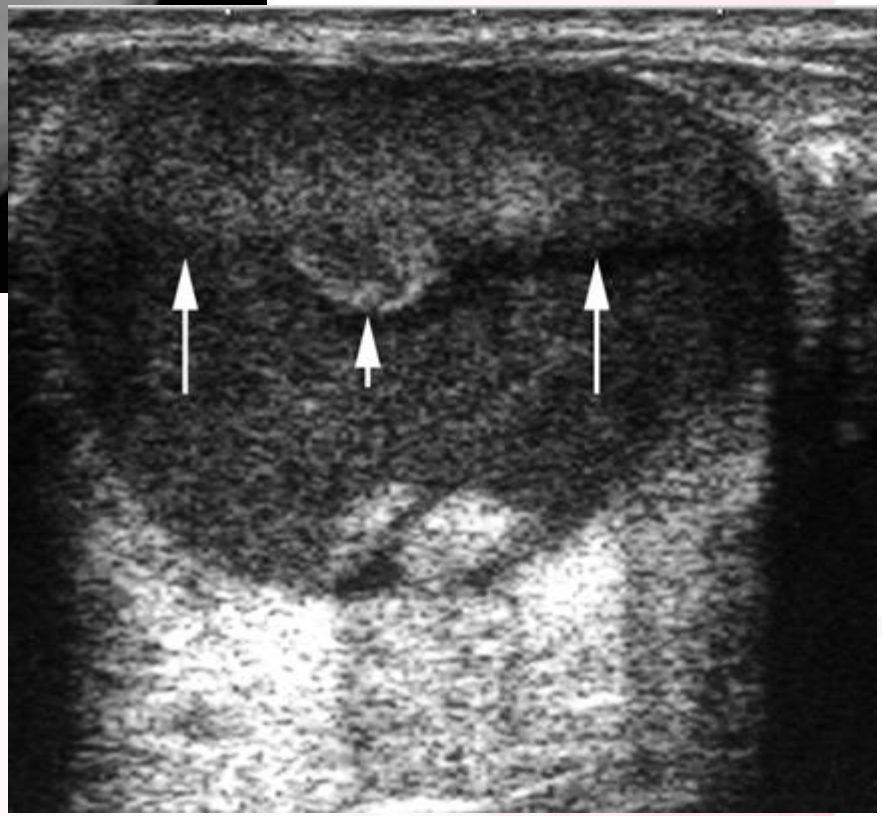
Subacute

Chronic

Abscess

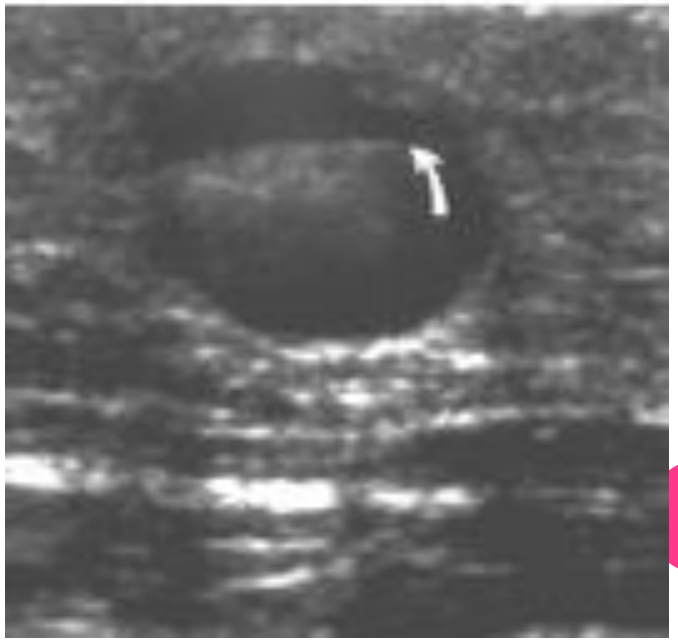
Sebaceous and Epidermal Inclusion Cyst



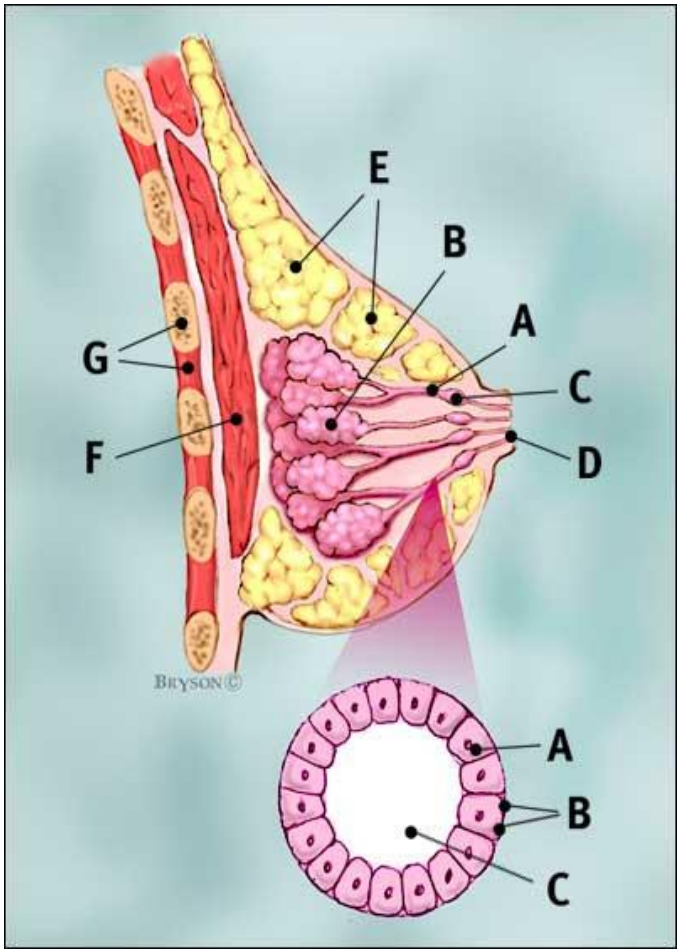


GALACTOCELE

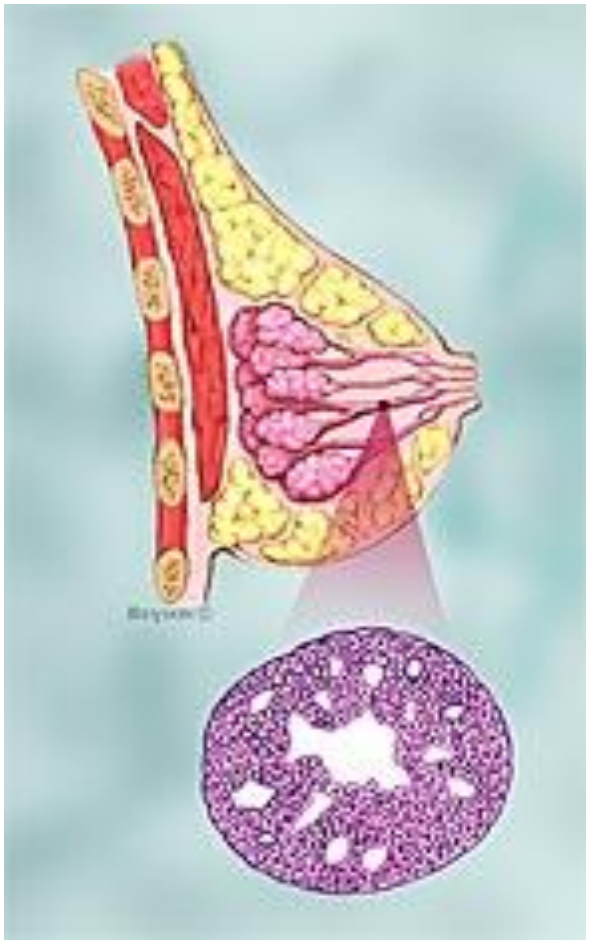
GALACTOCELE



Breast Carcinoma



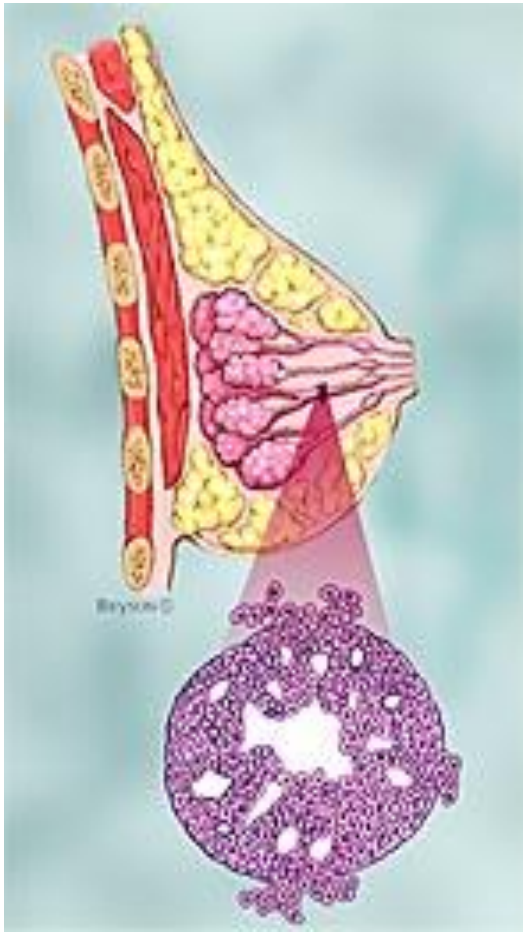
Normal



DCIS

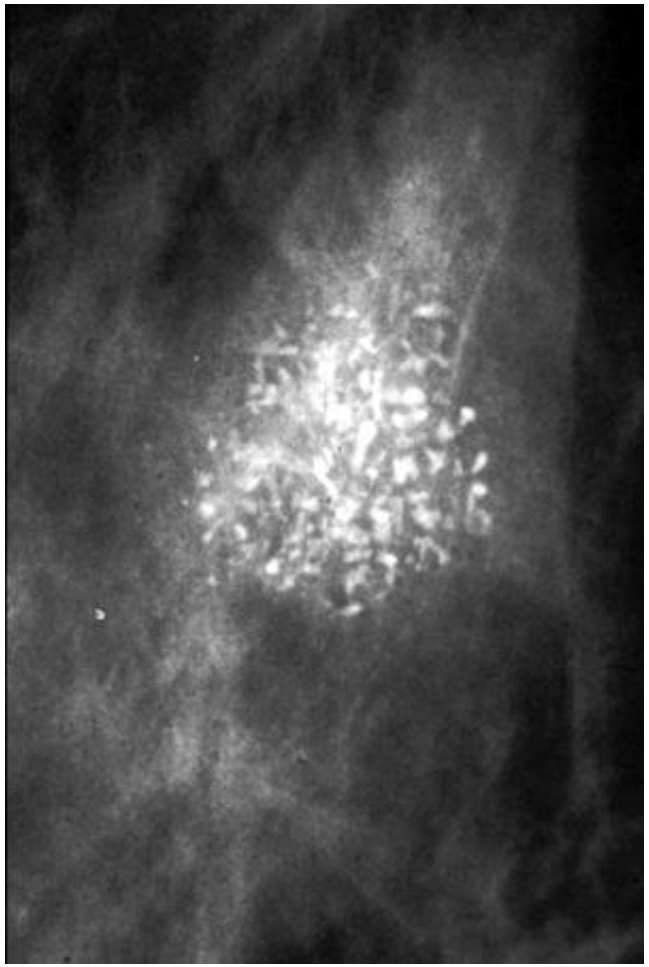
Breast Carcinoma

ILC



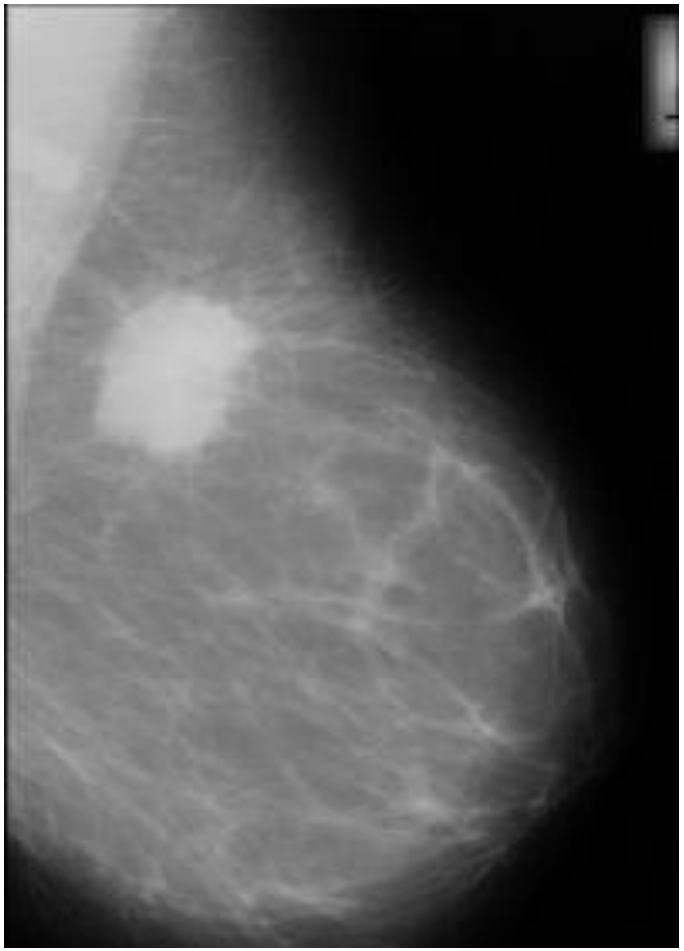
IDC

Breast Carcinoma

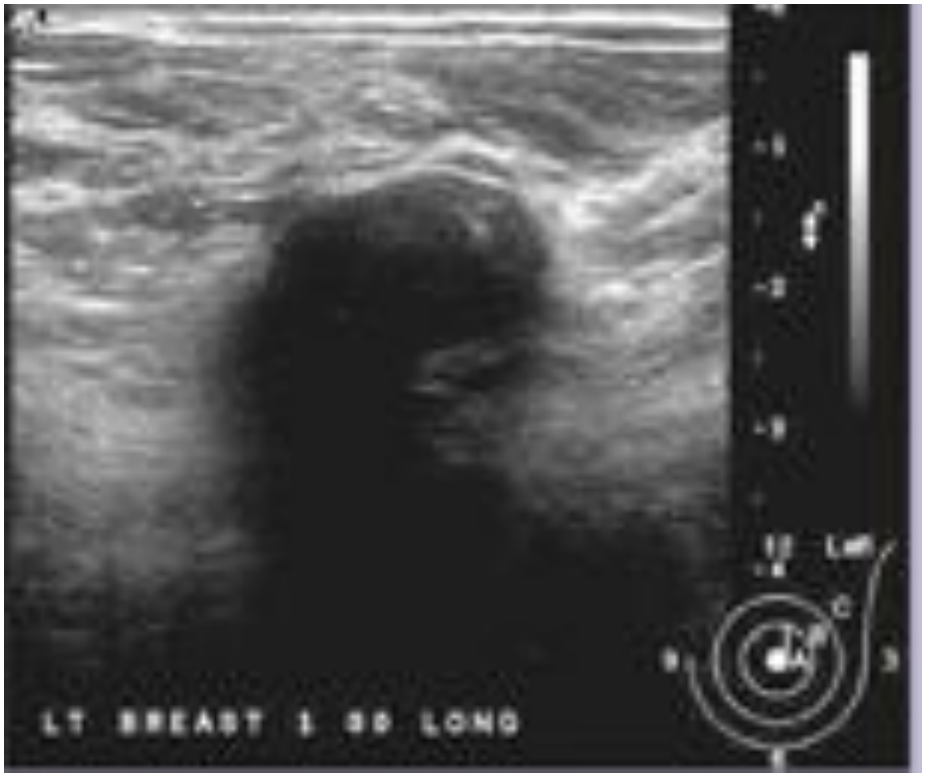


Ductal carcinoma in situ

Invasive Ductal Cancer



Invasive Ductal Cancer



Ultrasound: Performance

- Studies only done in high risk women with dense breasts as an adjunct to mammography

- Sensitivity:
  - Mammography alone: 78%
  - Ultrasound alone: 49%
  - Both: 91%

Uses of ultrasound in breast imaging

- Palpable masses
- Mammographically detected masses
- Dense breasts
- Young patients
- Pregnant/ lactating woman
- Breast implants
- Guided aspiration/ biopsy/ localisation

ULTRASOUND TECHNIQUE AND ANALYSIS

- **ACR BI-RDS ultrasound masses description:**
  - Shape الشكل .
  - Margin الحواف .
  - Echo patternالنموذج الصدوي .
  - Posterior acoustic featuresالتعزيز الصدوي الخلفي .
  - Effect on surrounding tissueالتأثير على الأنسجة المجاورة .
  - Calcificationsالتكلسات .

Ultrasound Technique and Analysis

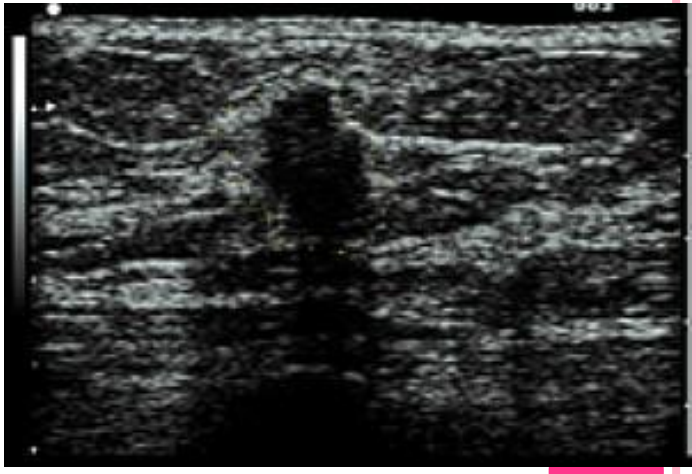
Shape الشكل :

- Oval بيضوي .
- Round دائري .
- Irregular غير منتظم .
- *Usually malignant masses are taller than wider*
  عادة الكتل الخبيثة يكون قياسها الطولي أكثر من المعترض .

Masses Shape

Oval fibroadenoma

Round simple cyst



Irregular ductal carcinoma

Ultrasound Technique and Analysis

- **ACR BI-RDS ultrasound masses description:**
  - Shape.
  - *Margin.*
  - Echo pattern.
  - Posterior acoustic features.
  - Effect on surrounding tissue.
  - Calcifications.

Ultrasound Technique and Analysis

***Margin* الحواف:**

- الحواف بين الكتلة والأنسجة المجاورة.
- يجب وصفها اذا كانت محددة وواضحة أو غير منتظمة وغير واضحة الحدود.

Ultrasound Technique and Analysis

- *Circumscribed Margin:*

- Smooth and distinct.
- May have thick, thin, or no definable rim.
- Thick rim is ≥1mm.

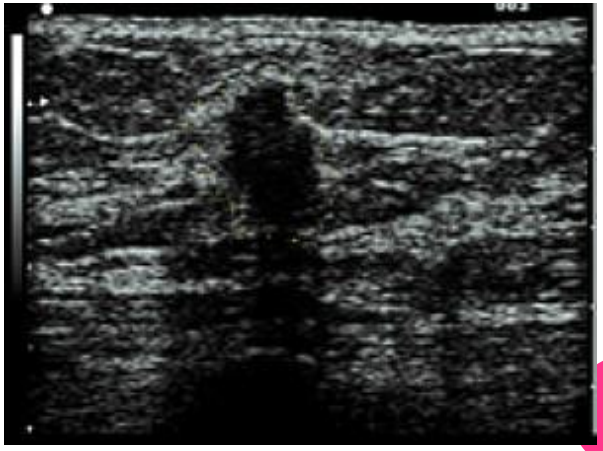
A well-circumscribed fibroadenoma

Masses Margins

indistinct

spiculated

angulated



microlobulate

Ultrasound Technique and Analysis

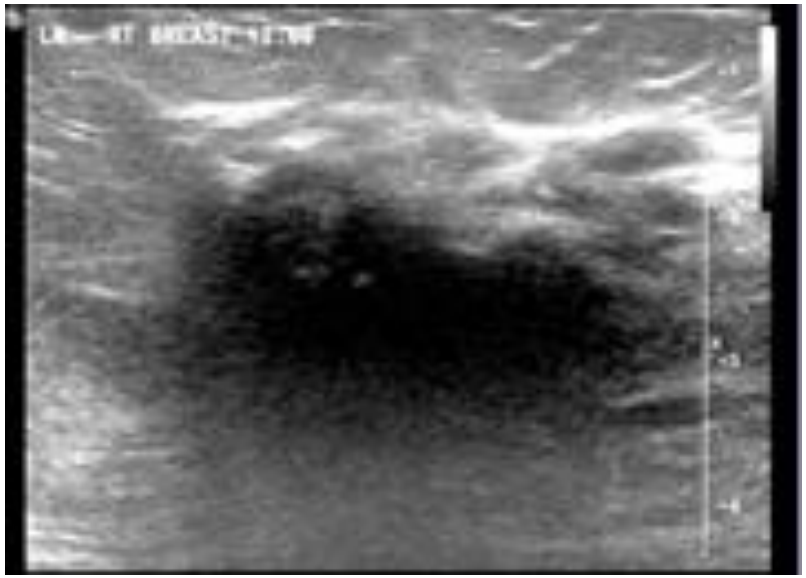
- **ACR BI-RDS ultrasound masses description:**
  - Shape.
  - Margin.
  - *Echo pattern.*
  - Posterior acoustic features.
  - Effect on surrounding tissue.
  - Calcifications.

Ultrasound Technique and Analysis

Echo pattern:

- Anechoic عديمة الصدى .
- Isoechoic موازية الصدى .
- Hyperechoic عالية الصدى .
- Hypoechoic ناقصة الصدى .
- Complex مختلطة الصدى .

Echo Patterns



↓carcinoma

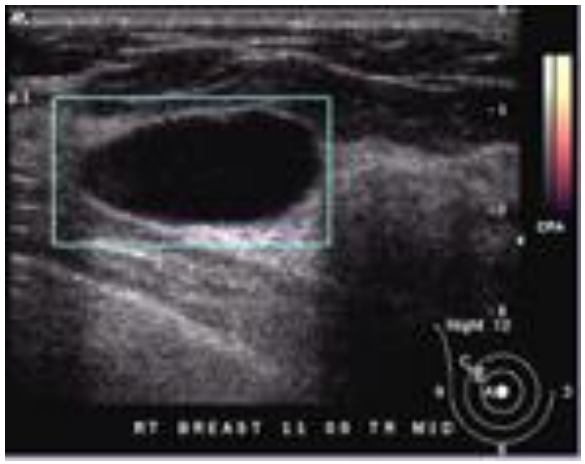
Unechoic cyst

fibroadenom ↑

Ultrasound Technique and Analysis

- **ACR BI-RDS ultrasound masses description:**
  - Shape.
  - Margin.
  - Echo pattern.
  - *Posterior acoustic features.*
  - Effect on surrounding tissue.
  - Calcifications.

Posterior Acoustic Features



Cyst, enhancement

Fibroadenoma with no posterior acoustic shadowing

Carcinoma,shadowing

Ultrasound Technique and Analysis

- **ACR BI-RDS ultrasound masses description:**
  - Shape.
  - Margin.
  - Echo pattern.
  - Posterior acoustic features.
  - *Effect on surrounding tissue.*
  - Calcifications.

Ultrasound Technique and Analysis

Effect on surrounding tissue:

- لايشاهد تأثيرات مجاورة.
- تبدلات في الأقنية اللبنية.
- تبدلات في أربطة كوبر.
- وذمة مرافقة.
- تبدلات هندسية.
- تبدلات في الجلد.

Ultrasound Technique and Analysis

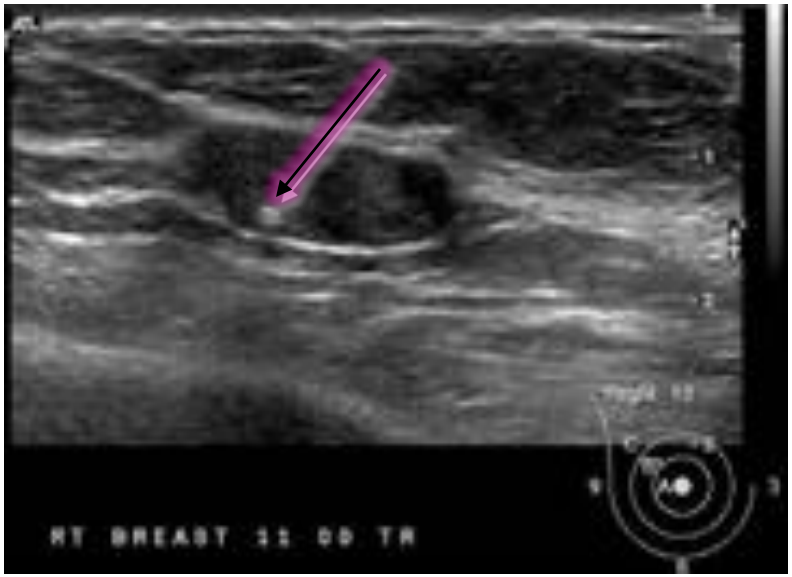
- **ACR BI-RDS ultrasound masses description:**
  - Shape.
  - Margin.
  - Echo pattern.
  - Posterior acoustic features.
  - Effect on surrounding tissue.
  - *Calcifications.*

Ultrasound Technique and Analysis

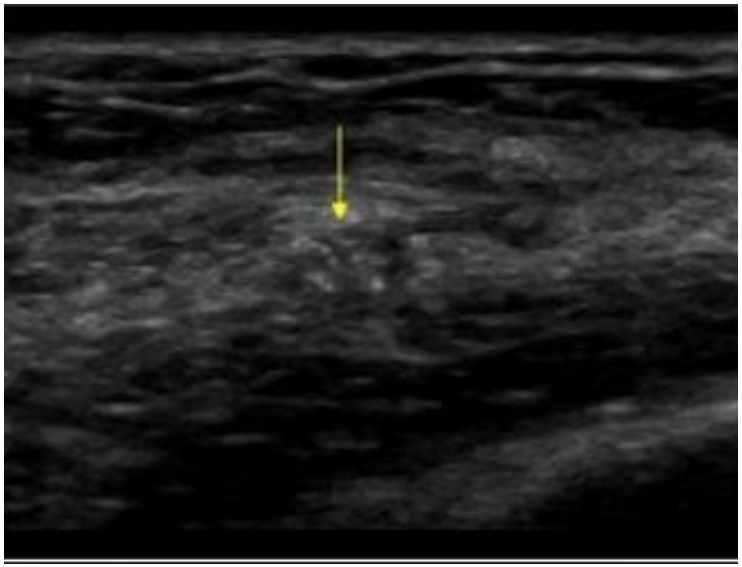
Calcifications:

- No calcification.
- Macrocalcifications (> 0,5mm).
- Microcalcifications “in or out of mass”.

Calcifications



Macrocalcification



Microcalcifications

ACR BI-RADS

Category 0,or "need additional imaging evaluation“
Category 1, or "negative“
Category 2, or "benign finding“
Category 3, or "probably benign finding”
Category 4, "suspicious abnormality”
Category 5, or "highly suggestive of malignancy”
Category 6, or known biopcy proven

Final Assessment Categories

Category		Management	Likelihood of cancer
0	Need additional imaging or prior examinations	Recall for additional imaging and/or await prior examinations	n/a
1	Negative	Routine screening	Essentially 0%
2	Benign	Routine screening	Essentially 0%
3	Probably Benign	Short interval-follow-up (6 month) or continued	>0 % but ≤ 2%
4	Suspicious	Tissue diagnosis	4a. low suspicion for malignancy (>2% to ≤ 10%) 4b. moderate suspicion for malignancy (>10% to ≤ 50%) 4c. high suspicion for malignancy (>50% to <95%)
5	Highly suggestive of malignancy	Tissue diagnosis	≥95%
6	Known biopsy-proven	Surgical excision when clinical appropriate	n/a

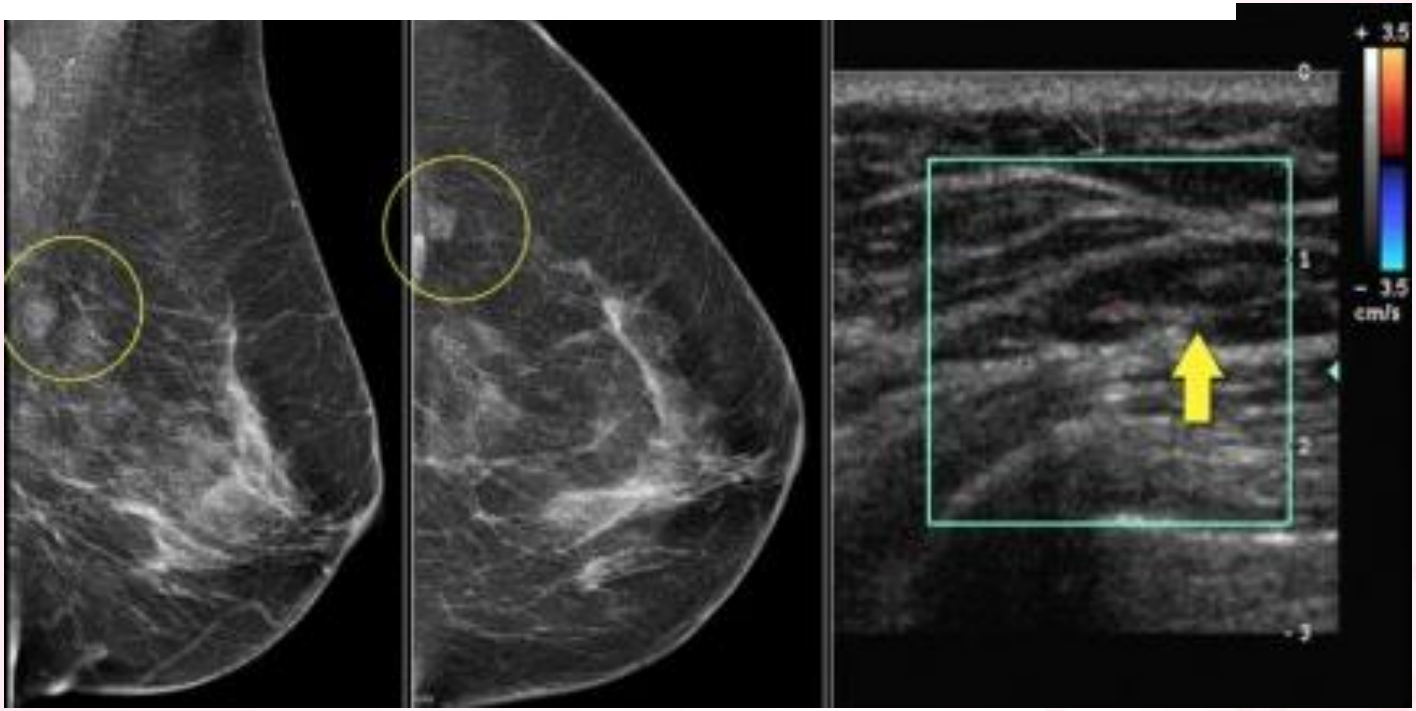
BI-RADS 0

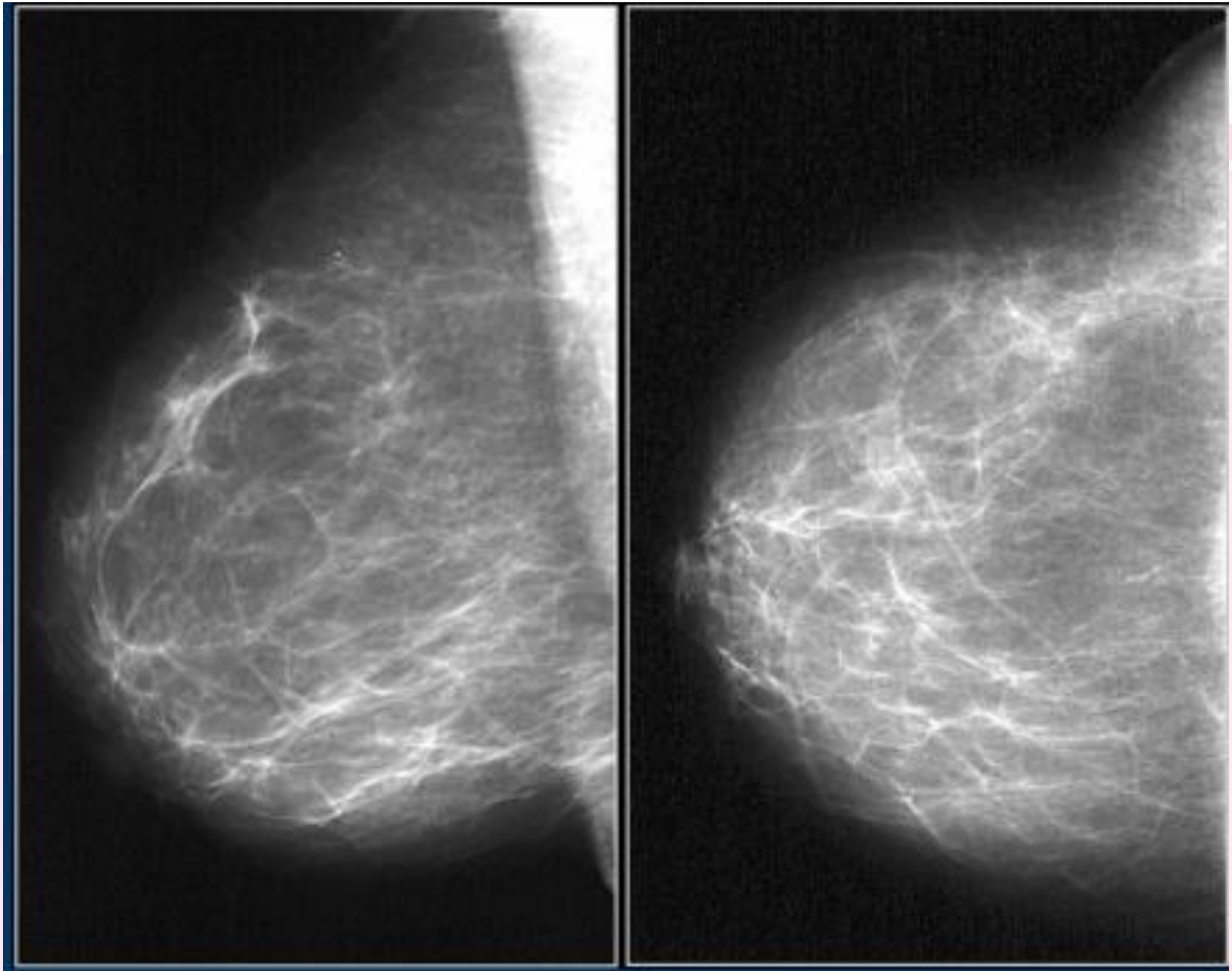
Need Additional Imaging Evaluation and/or Prior Mammograms For Comparison:

Category 0 or BI-RADS 0 is utilized when further imaging evaluation (e.g. additional views or ultrasound) or retrieval of prior examinations is required.

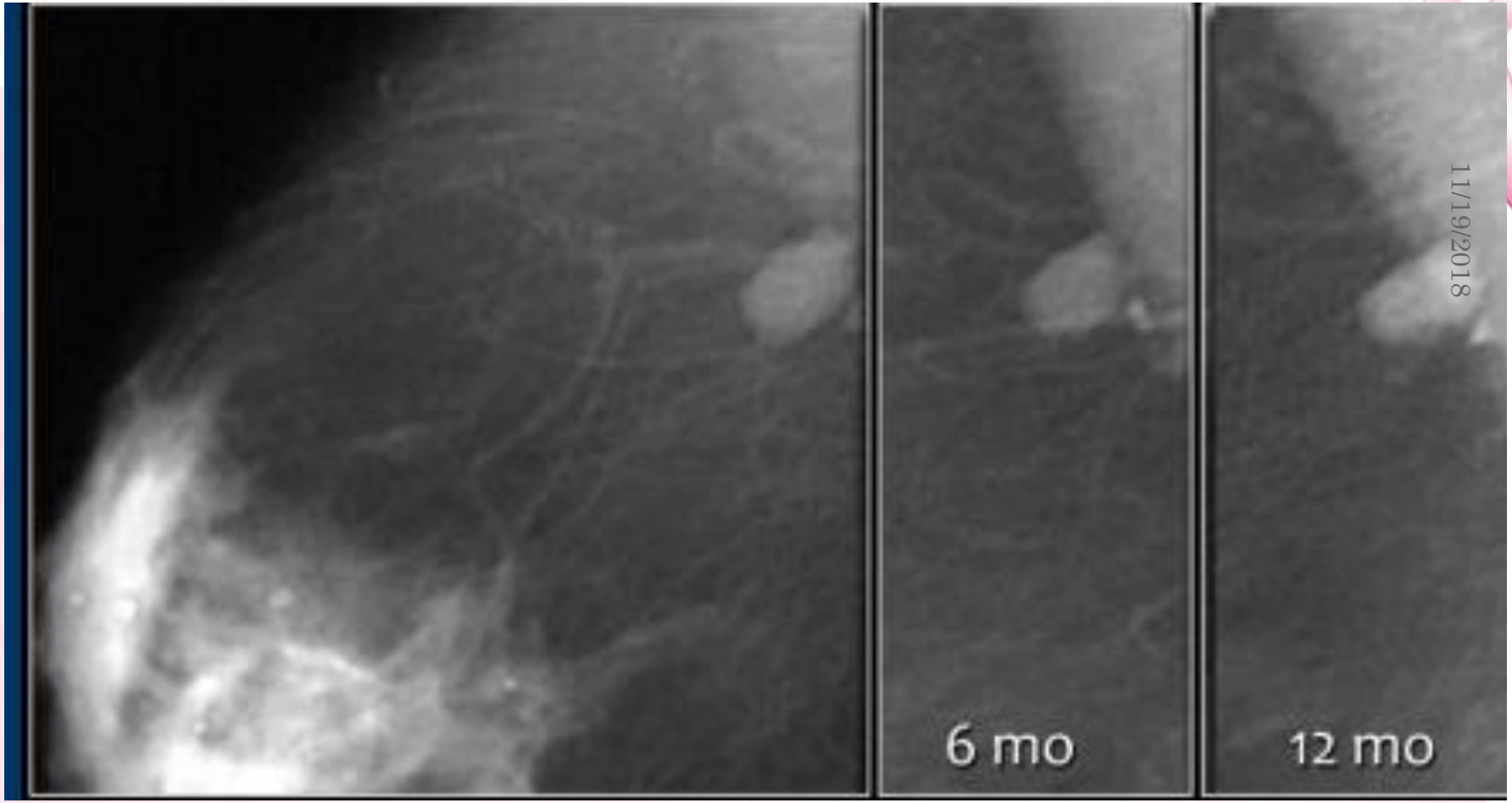
When additional imaging studies are completed, a final assessment is made.

Always try to avoid this category by immediately doing additional imaging or retrieving old films before reporting. Even better to have the old examinations before starting the examination.

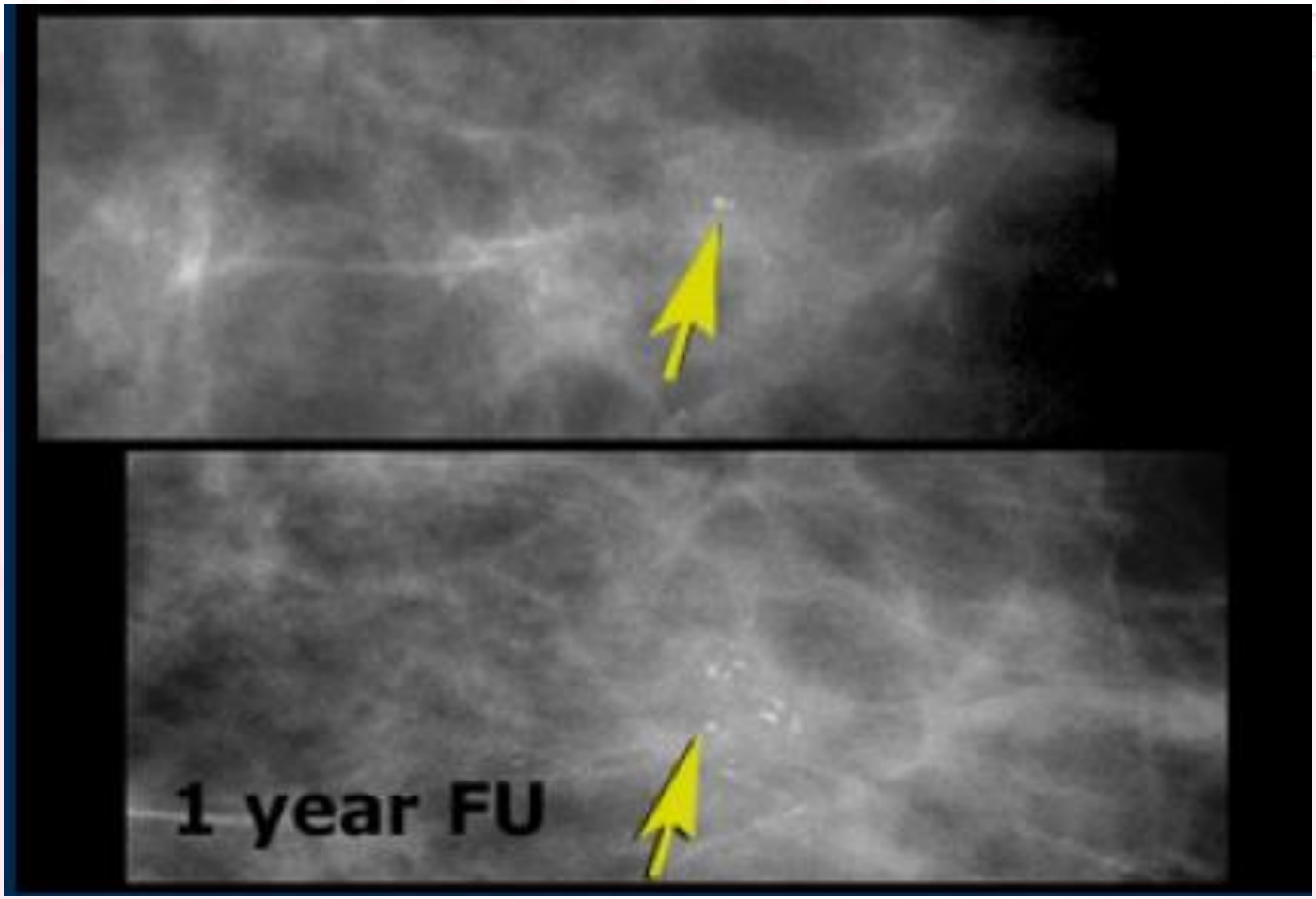




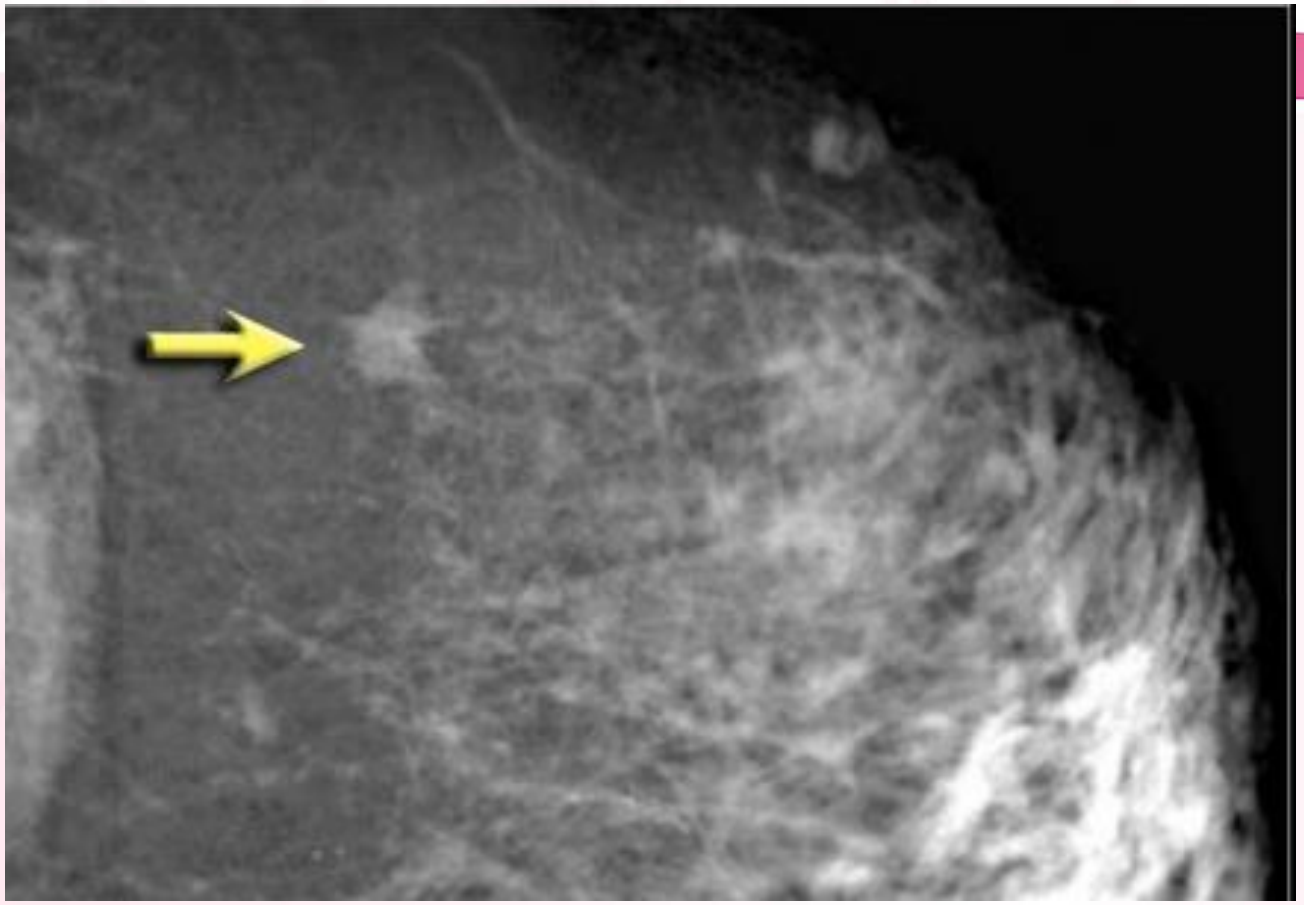
BI-RADS 1 (normal). There is nothing to comment on.



Final assessment was changed to a Category 2

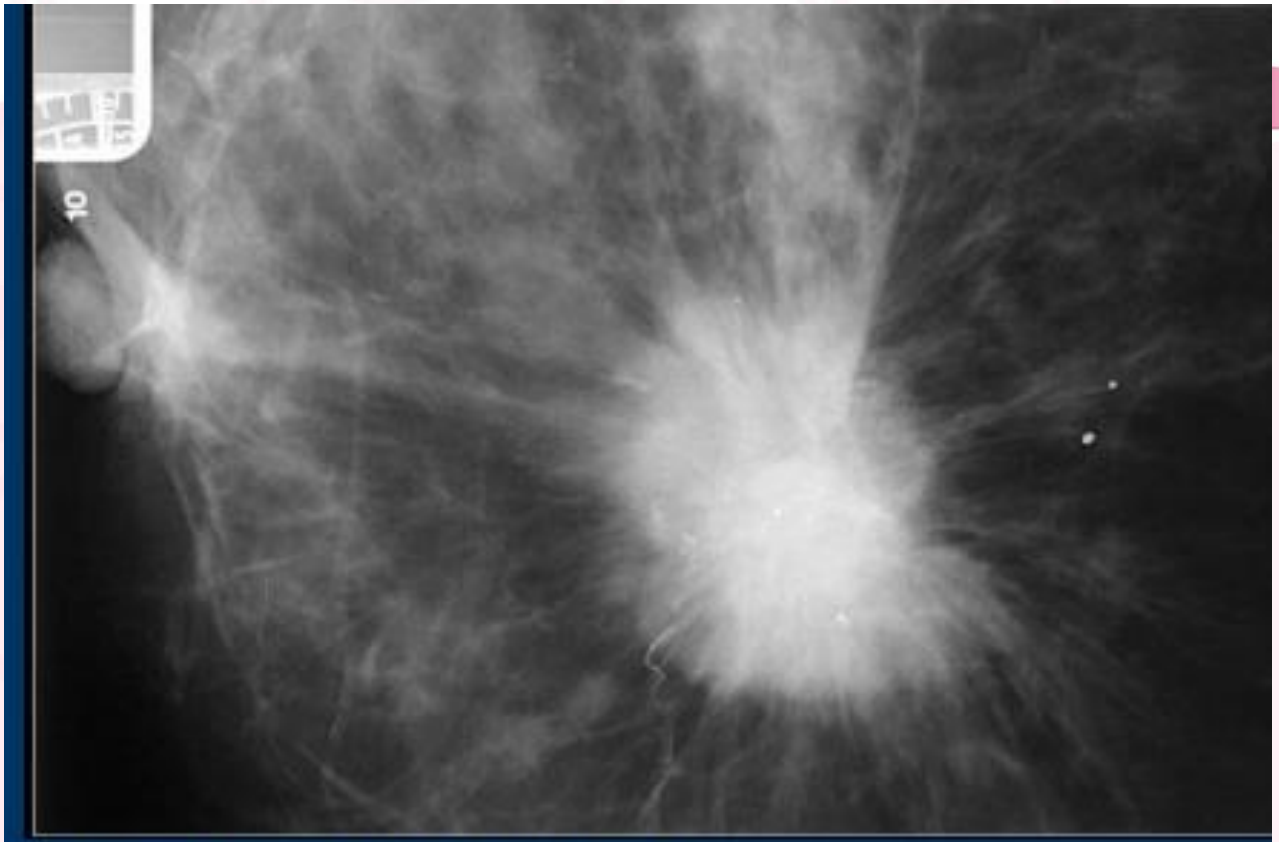


This lesion is categorized as BI-RADS 4.



The CC mammographic image shows a finding, not reproducible on the MLO view.

This finding is sufficiently suspicious to justify biopsy.
A benign lesion, although unlikely, is a possibility.
This could be for instance ectopic glandular tissue within a heterogeneously dense breast.
This lesion is categorized as BI-RADS 4.



High density mass with spiculated margin

- Mass with irregular shape.
- Spiculated margin.
- High density.
- Ultrasound also shows irregular shape with indistinct margin.

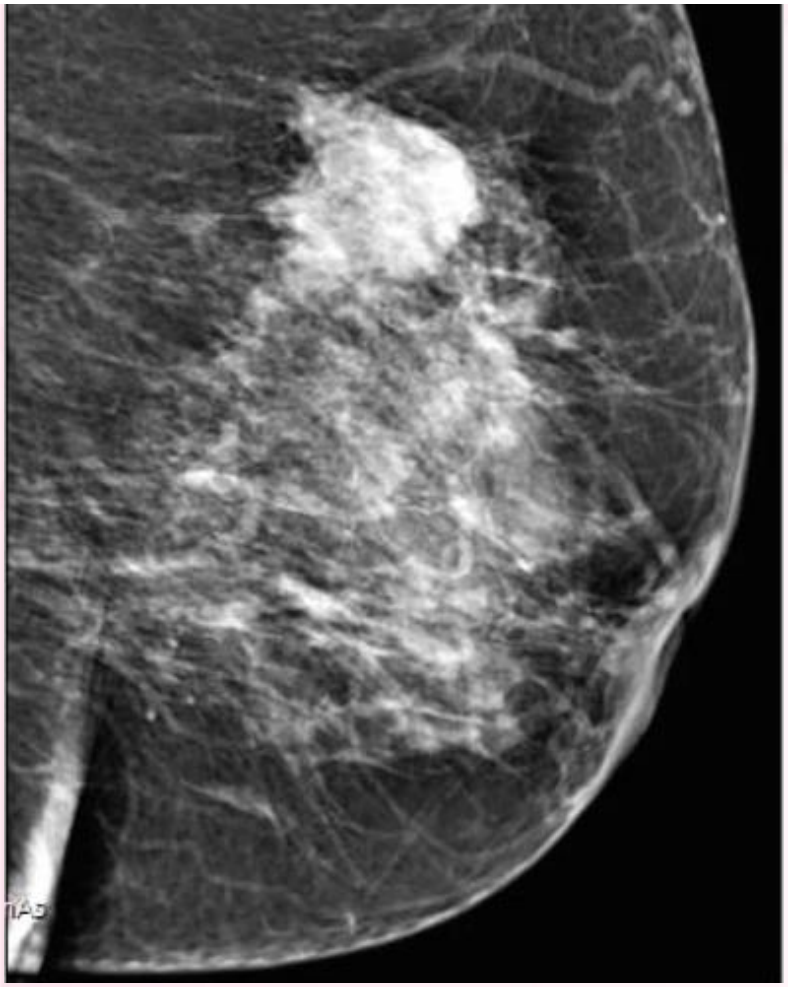
This mass is categorized as BI-RADS 5.

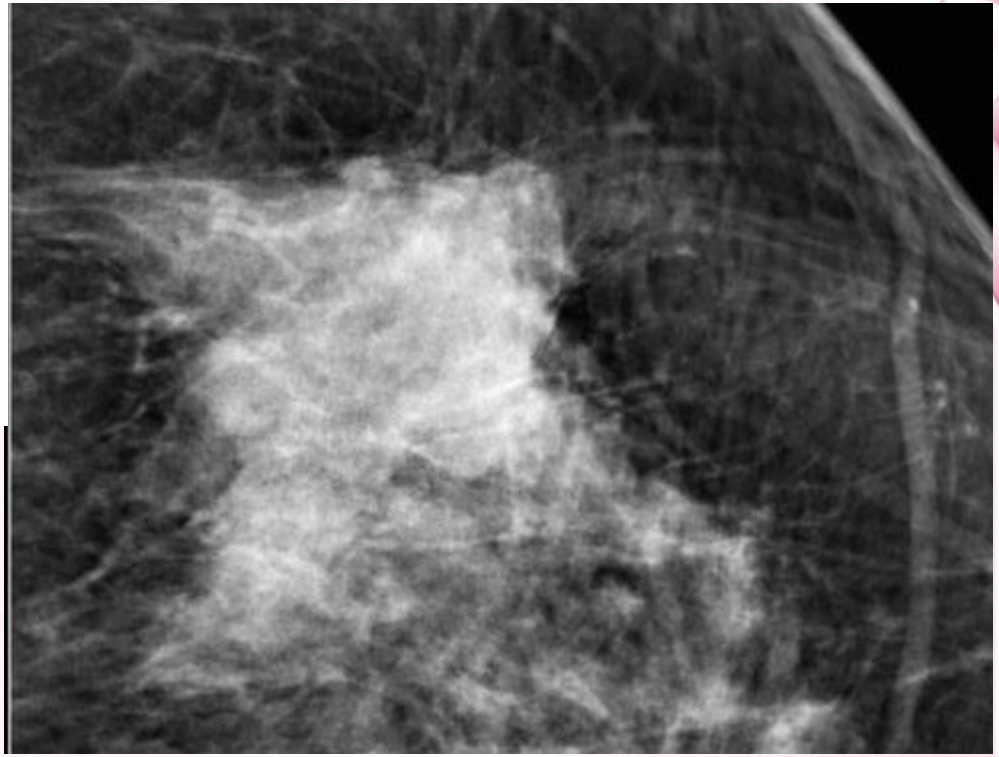
First study the images and describe the findings.
Then continue reading.

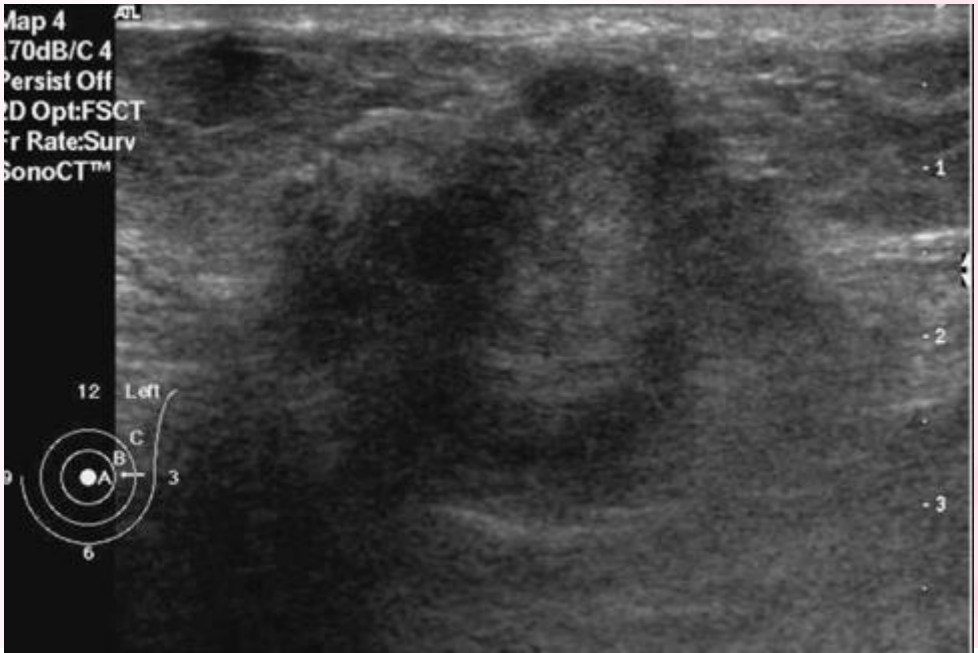
The findings are:

- Mass with irregular shape.
- Spiculated margin.
- High density.
- Ultrasound also shows irregular shape with indistinct margin.

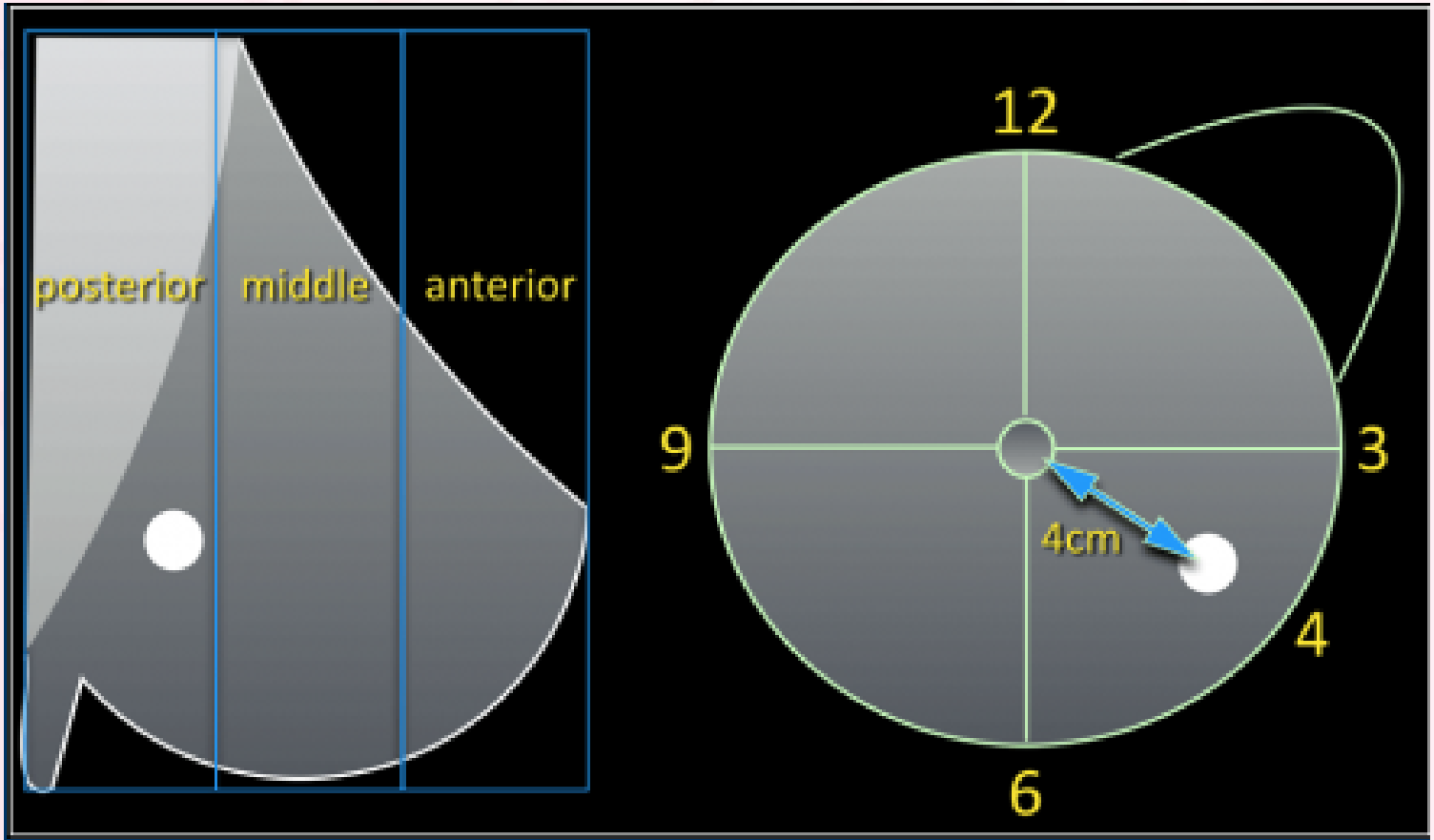
This mass is categorized as BI-RADS 5.



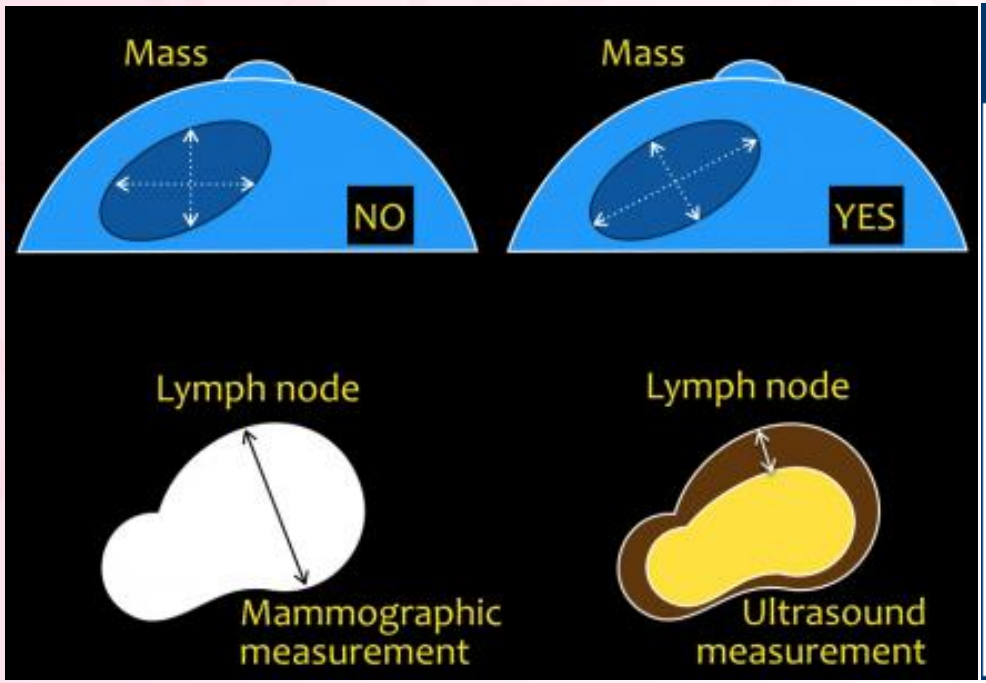




Location in Mammography and US



A mass is seen in the outer lower quadrant of the left breast at 4 o' clock in the posterior portion of the breast at 4cm distance from the nipple.



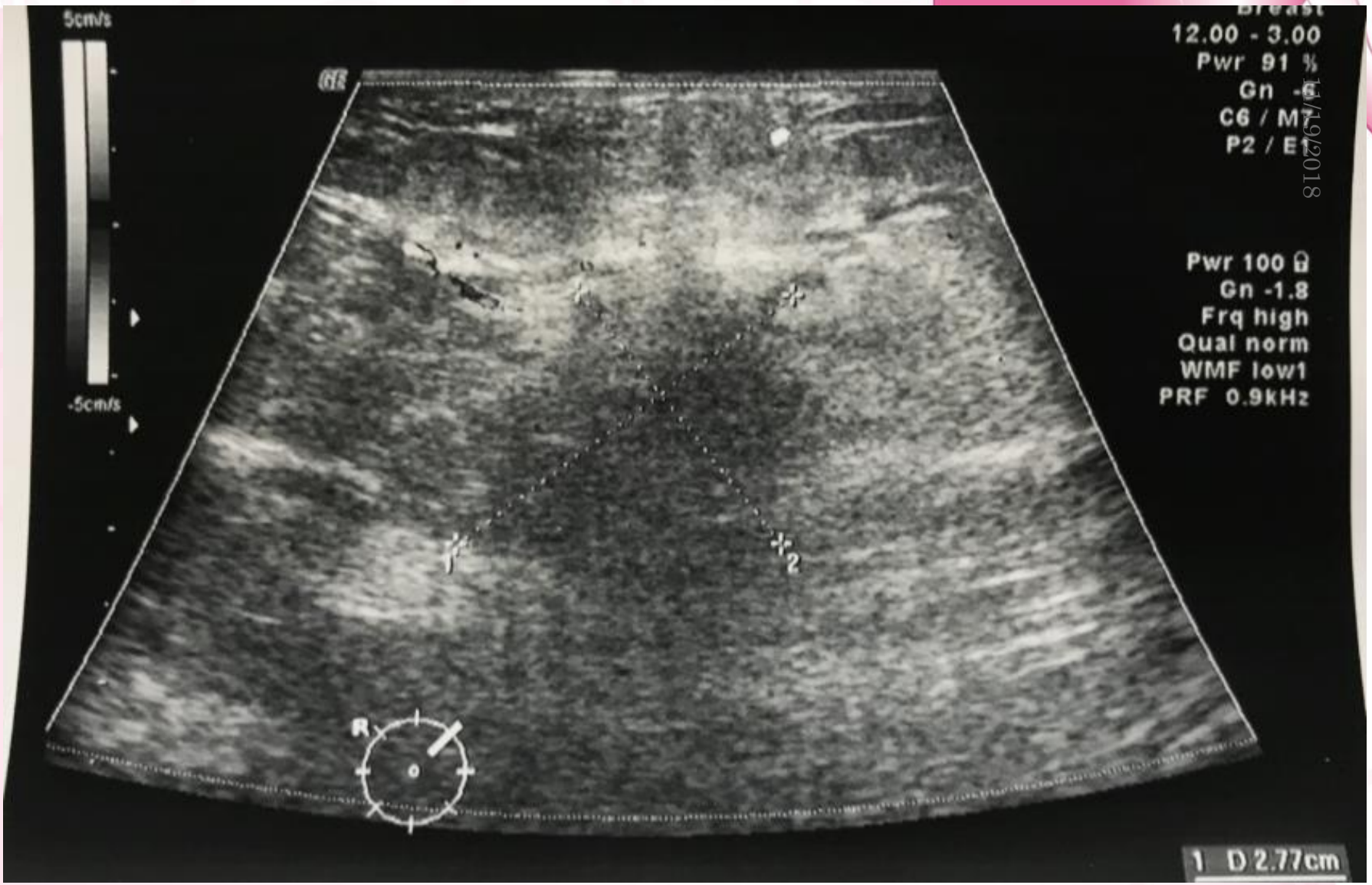
Size measurement

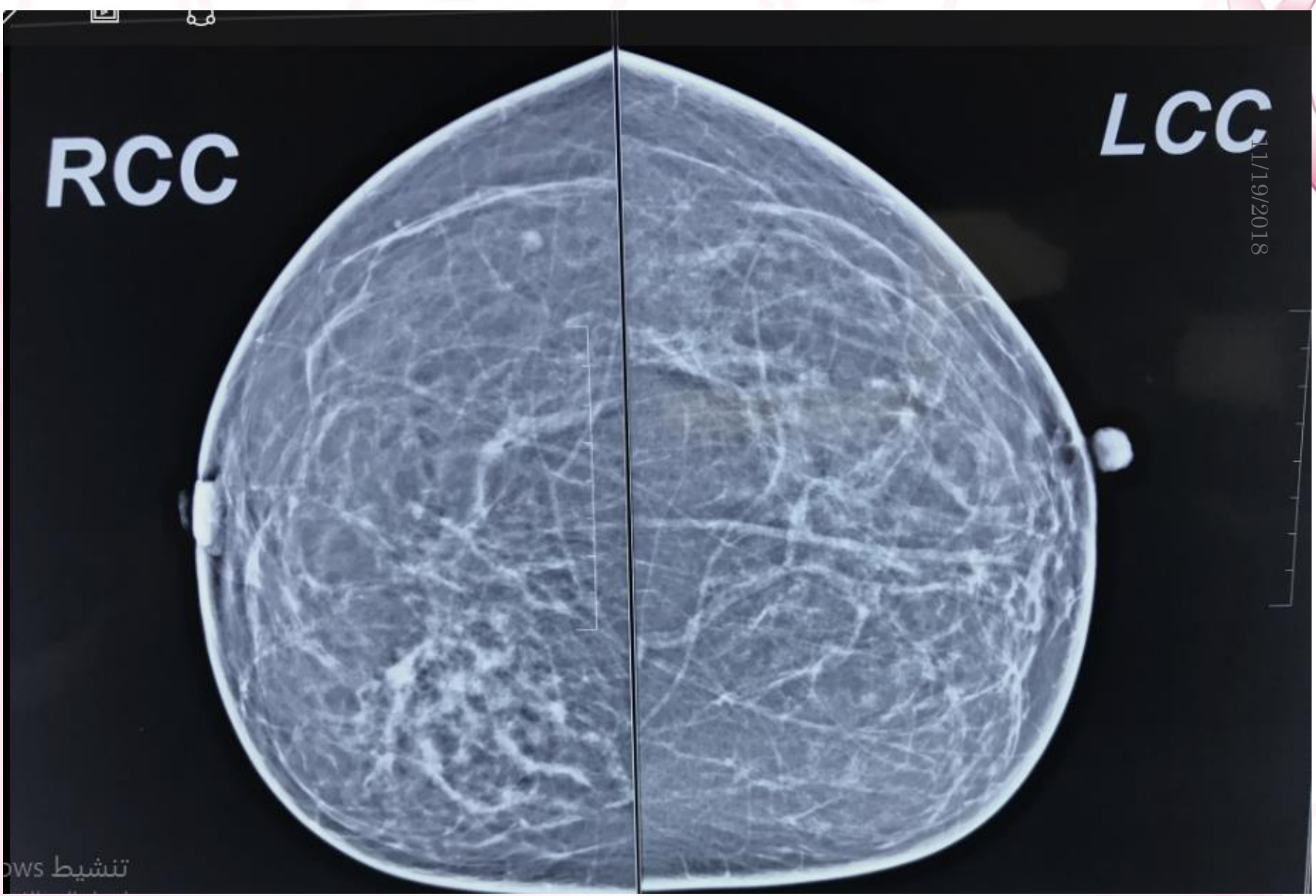
Mass
Longest axis of a lesion and a second measurement at right angles.
In a spiculated mass the spiculations should not be included.

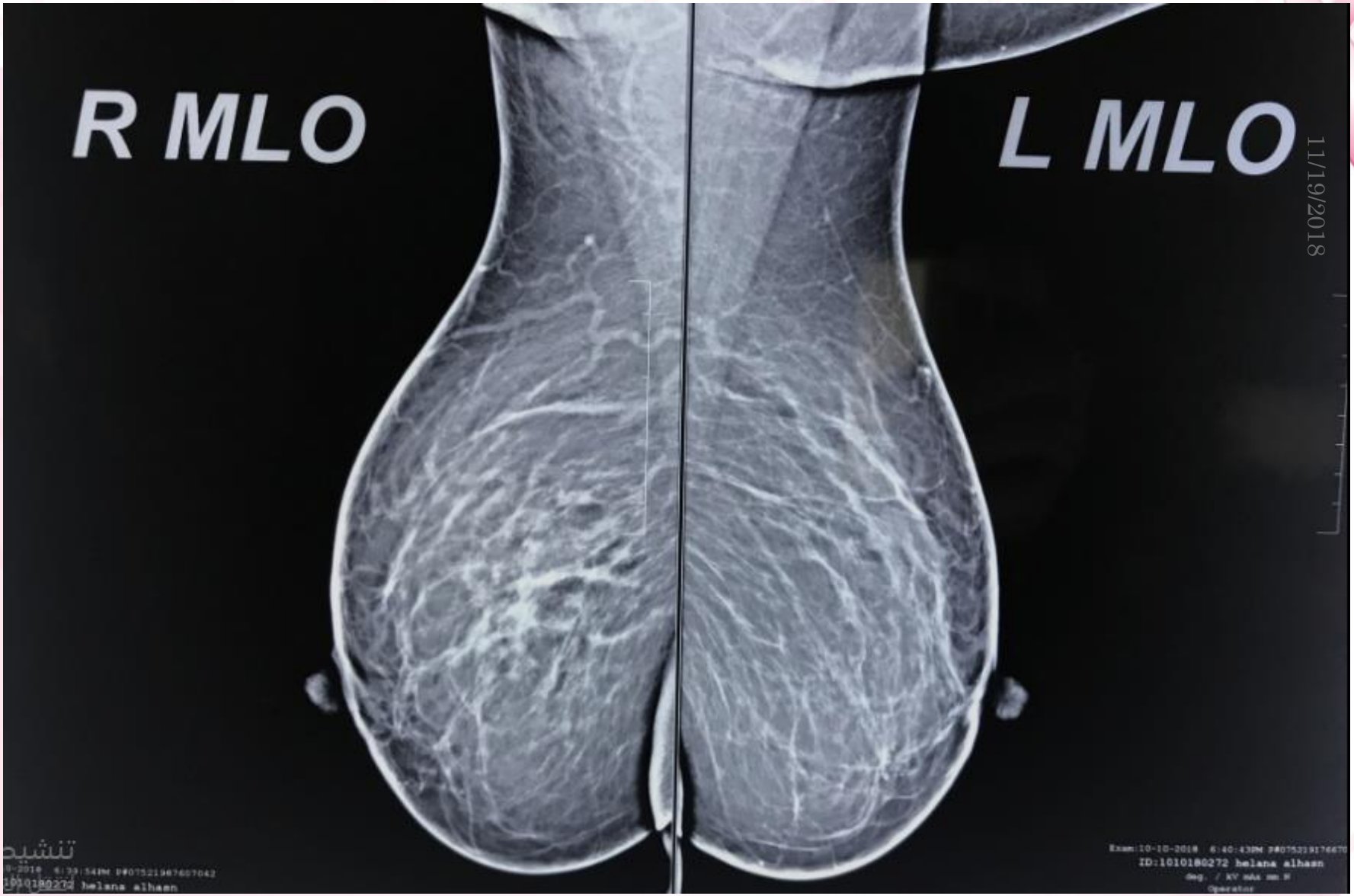
Architectural distortion and Asymmetries
Approximation of its greatest linear dimension.

Calcifications
The distribution should be measured by approximation of its greatest linear dimension.

Lymphnode
Mammography: short axis.
Ultrasound: cortical thickness.


5cm/s
-5cm/s
12.00 - 3.00
Pwr 91 %
Gn -6
C6 / M
P2 / E
Pwr 100
Gn -1.8
Frq high
Qual norm
WMF low1
PRF 0.9kHz
1 D 2.77cm


RCC
LCC
11/19/2018


R MLO
L MLO
11/19/2018
ID:1010180272 helana alhasn

MRI

الإيجابيات

- يعطي معلومات جيدة بالأنداء الكثيفة.
- اختلاطات Implant يعطي ٩٤% حساسية و ٩٧% نوعية.
- آفات السرطان تعزز المادة أسرع من الآفات السليمة.
- السرطان داخل القنوي تعزز أبطئ من السرطان الغازي.

السلبيات

١- تتداخل الموجودات بحال فرط التصنع Hyperplasia.
٢- لا تقيم التكلسات الناعمة Microcalcification .

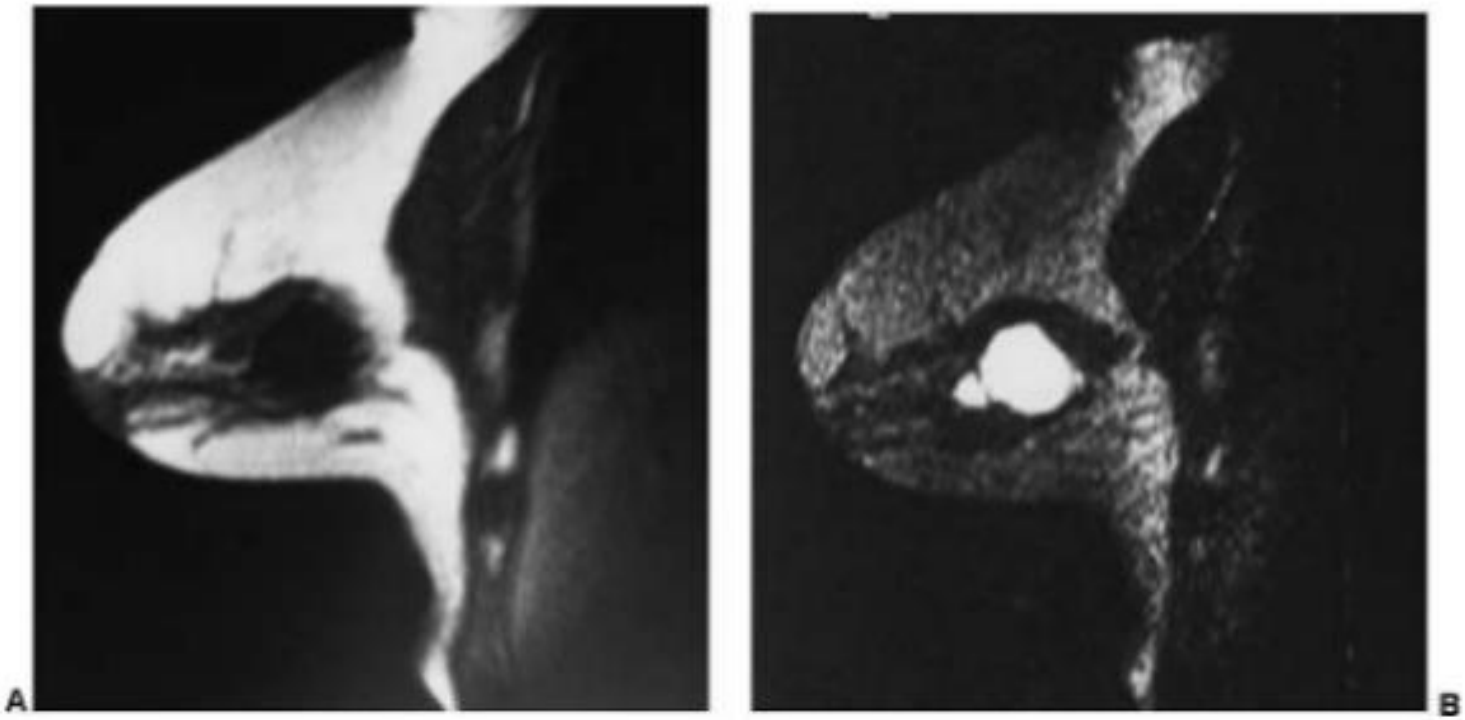
MRI of Breast

Standards for the performance of breast MRI

Field strength	Minimum 1.5-T
Resolution	3 mm slice thickness
Contrast	Gadolinium, 0.1 mmol/kg
Scan time	Dynamic contrast enhancement
Coil	Dedicated breast

MRI of Breast

- Signals from Water: tissues with a long T2 are presented as bright signals on T2-weighted images. Thus, cysts (that contain fluid) with long T1 are dark on T1-weighted images and those with long T2 are bright on T2-weighted images.



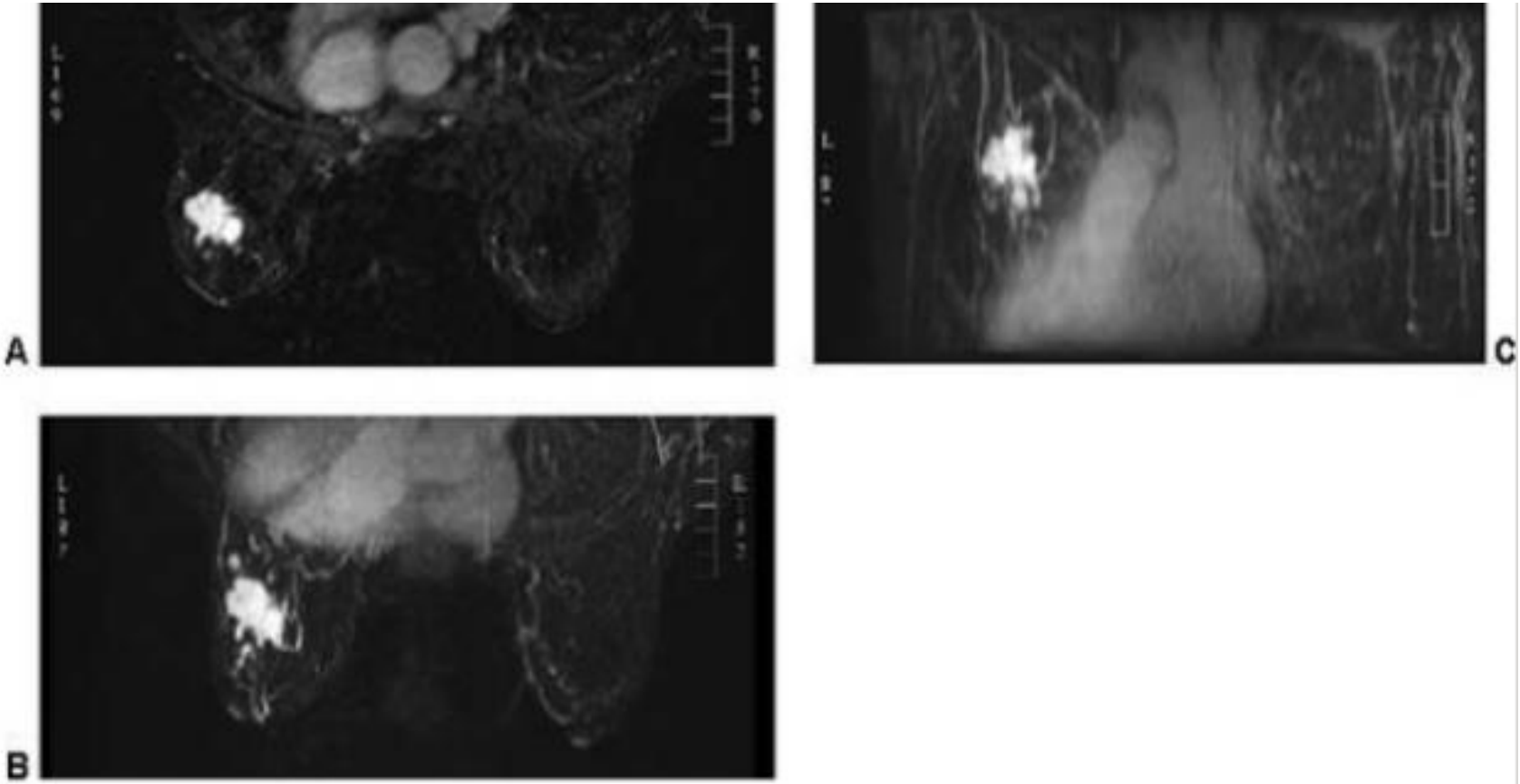
On MRI this cyst had a characteristically low signal intensity (black) on this T1-weighted image (A) and a high signal intensity (white) on the T2-weighted image (B).

Breast MRI indications

- 1-Preoperative evaluation of patients with newly diagnosed breast cancer:
- when combined with mammography and clinical breast exam, has been shown to provide sensitivity of 99% for the preoperative assessment of the local extent of disease in patients with newly diagnosed breast cancer.

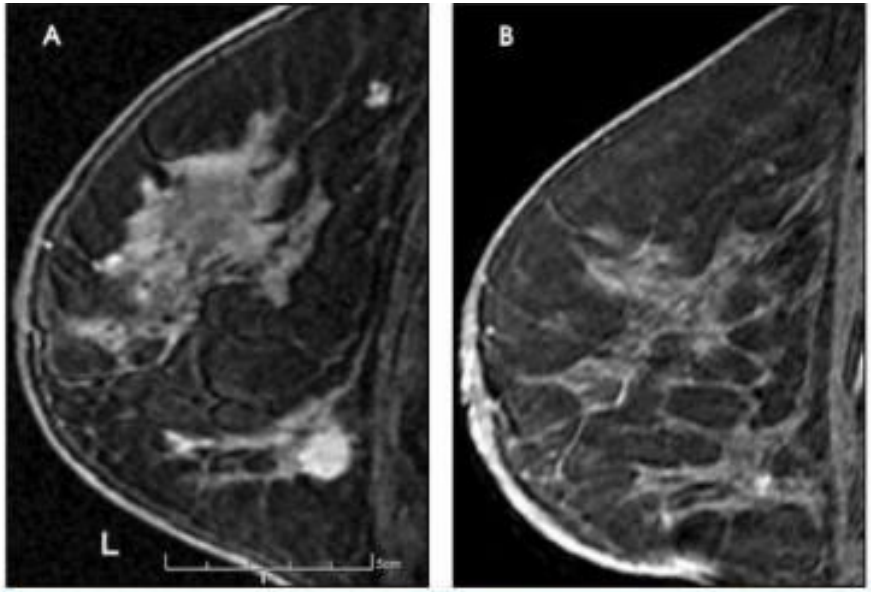
- The purpose of MRI is to detect the presence of multifocal and multicentric disease as well as to detect bulky residual disease at the lumpectomy site in order to allow directed re-excision.
- malignancies may enhance at much more rapid initial rates than benign lesions.

- Breast cancer staging is based on the extent of local-regional disease in the breast and axilla, which has predictive value regarding the patient's prognosis and dictates treatment options.
- MRI sensitivity rates for the detection of invasive breast cancer are estimated to be as high as 95-100%.



Breast cancers are usually irregular in shape and heterogeneous in their enhancement on MRI.

- 2- evaluation of breast cancer patients treated with neoadjuvant chemotherapy. MRI has been used to monitor treatment response to neoadjuvant chemotherapy in patients with locally advanced cancer.
- Change in tumor vascularity/enhancement appear to explain changes in functional dynamic contrast assessment and can be seen after only one cycle of chemotherapy.

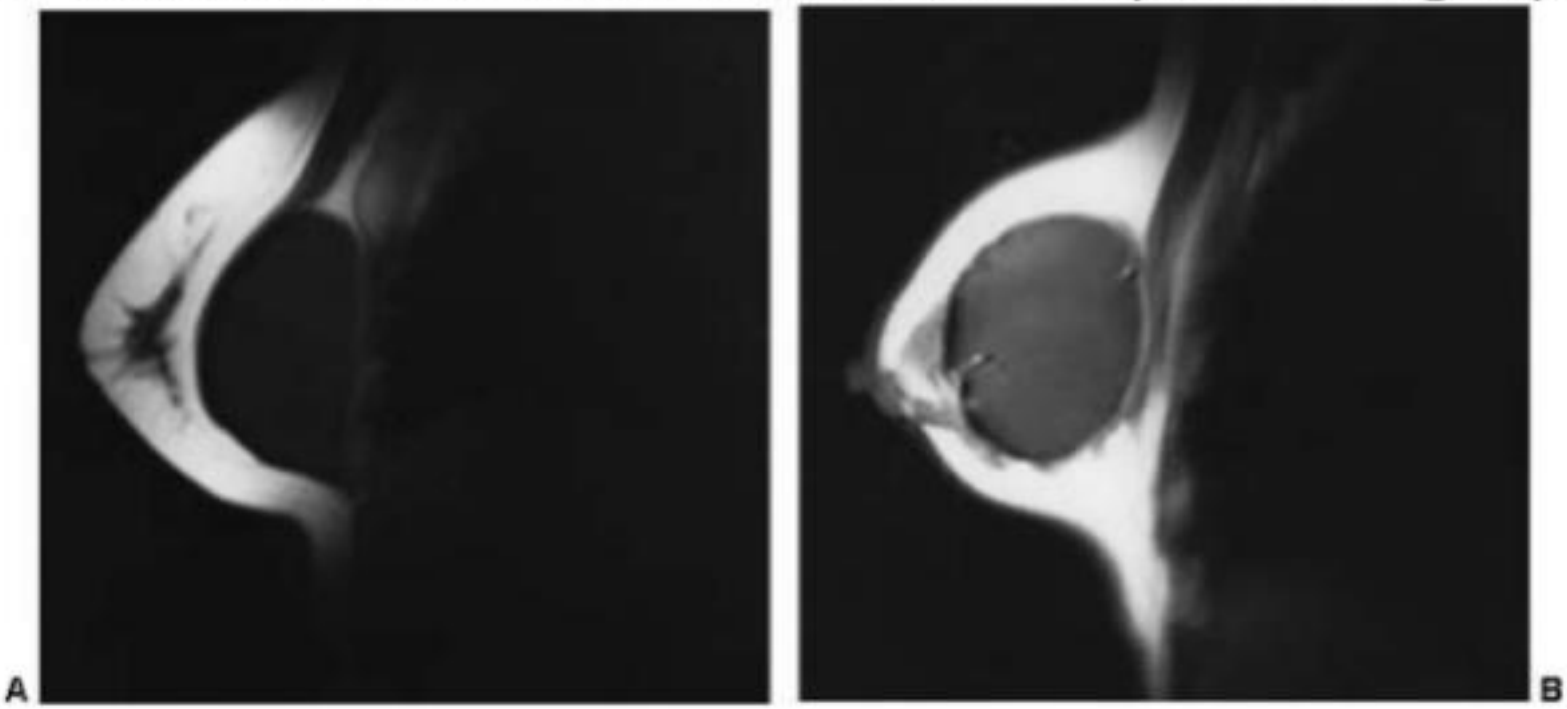


Neoadjuvant chemotherapy. Sagittal post contrast fa suppressed T1W image prior to chemotherapy show an enhancing mass correlating to a biopsy-proven invasive ductal carcinoma (A). Following chemotherapy, a comparable image shows only a small area of residual enhancement (B)

- 3- evaluation of patients with metastatic axillary lymphadenopathy and an unknown primary malignancy.

- 4- evaluation of breast cancer patients with positive surgical margins following breast conservation therapy.
- MRI can be useful in determining the extent of residual disease when margins are positive and the mammogram is not helpful.

- 5- determination of silicone breast implant integrity.



(A) Retropectoral and (B) retroglandular placement of implants on MRI. Sagittal T1-weighted images of two different patients with silicone implants.

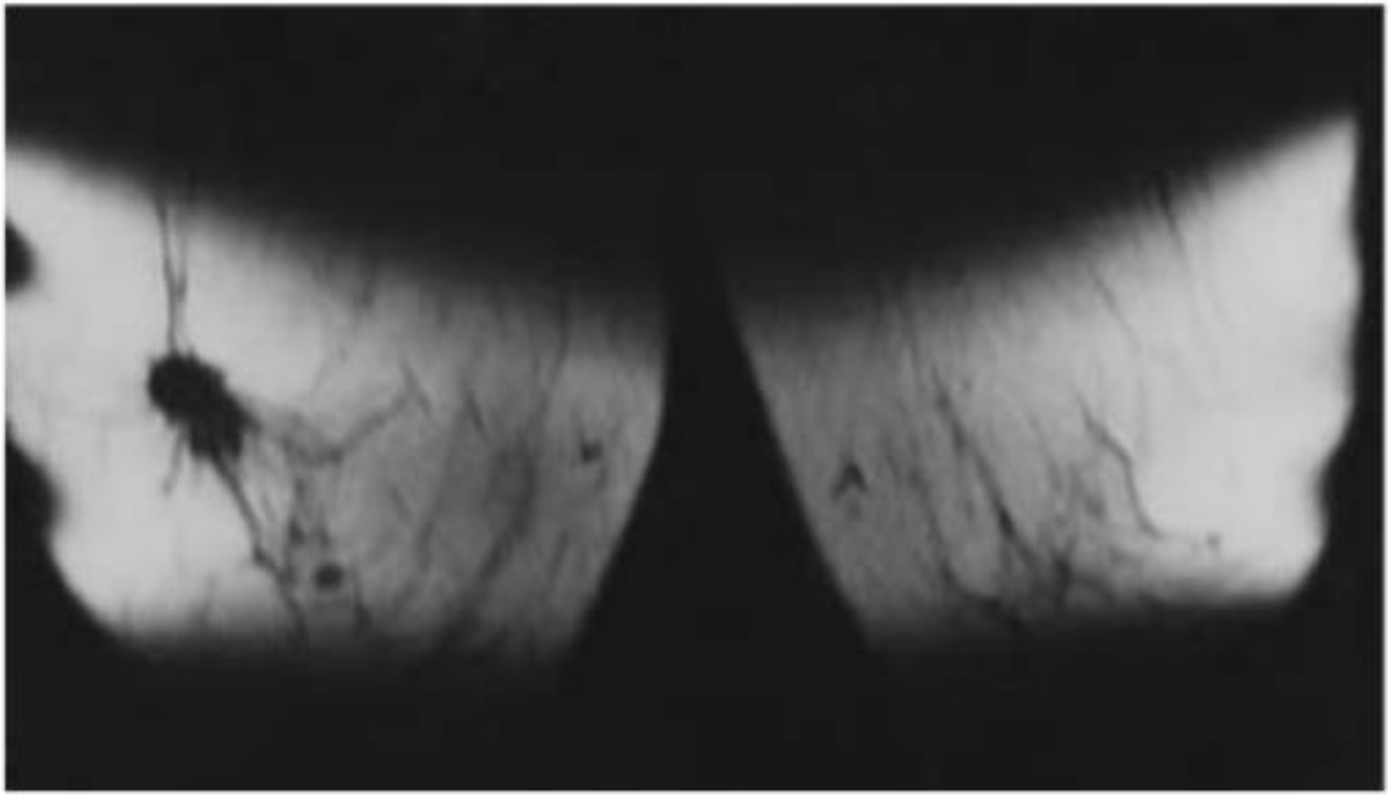
- 6-breast cancer screening in high risk women.

- 7- use of breast MRI as a problem-solving tool for equivocal mammographic findings and for 3-dimensional localization of a lesion seen.

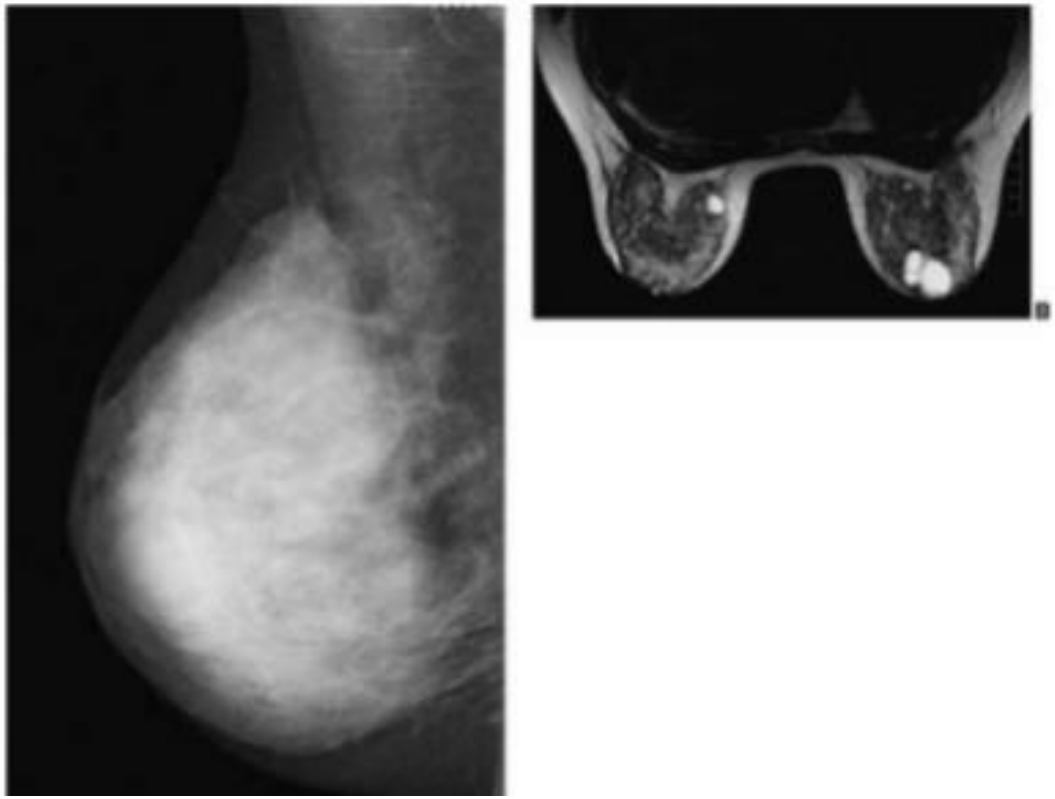
- **8- Evaluation of occult breast cancer**
- In patients with an occult primary presenting with axillary lymphadenopathy or Paget's disease, MRI has been shown to identify the primary in many patients, thus allowing for conservative surgery rather than mastectomy.

- 9-small breast (MRI) is well suited to the investigation of breast cancer by virtue of its noninvasive nature and its multiplanar imaging abilities.
- 10-**Post surgical scar vs. recurrent tumor**
- In cases where mammography and ultrasound are inconclusive in patient suspected of recurrent disease, MRI can be helpful.
- Breast tissue can show enhancement for up to 18 months following radiation therapy.

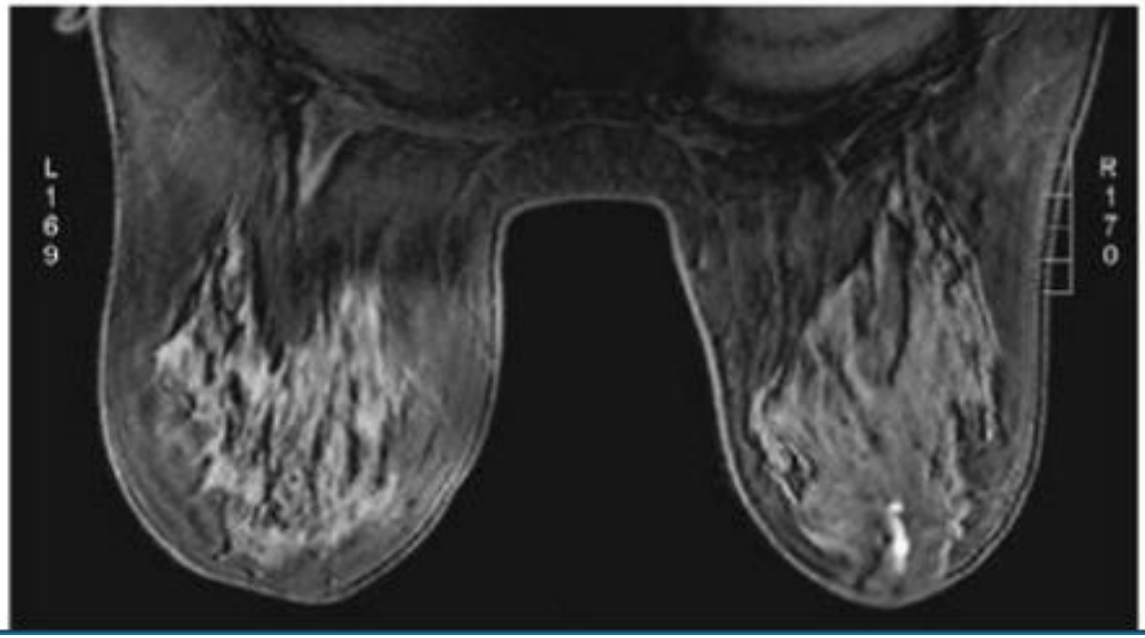
Invasive breast cancer visible on T1-weighted image because of the surrounding fat.



Cysts are bright on T2. In this mammogram of the right breast (A), the dense tissues obscure the cysts that are easily seen on the T2-weighted MRI examination (B).

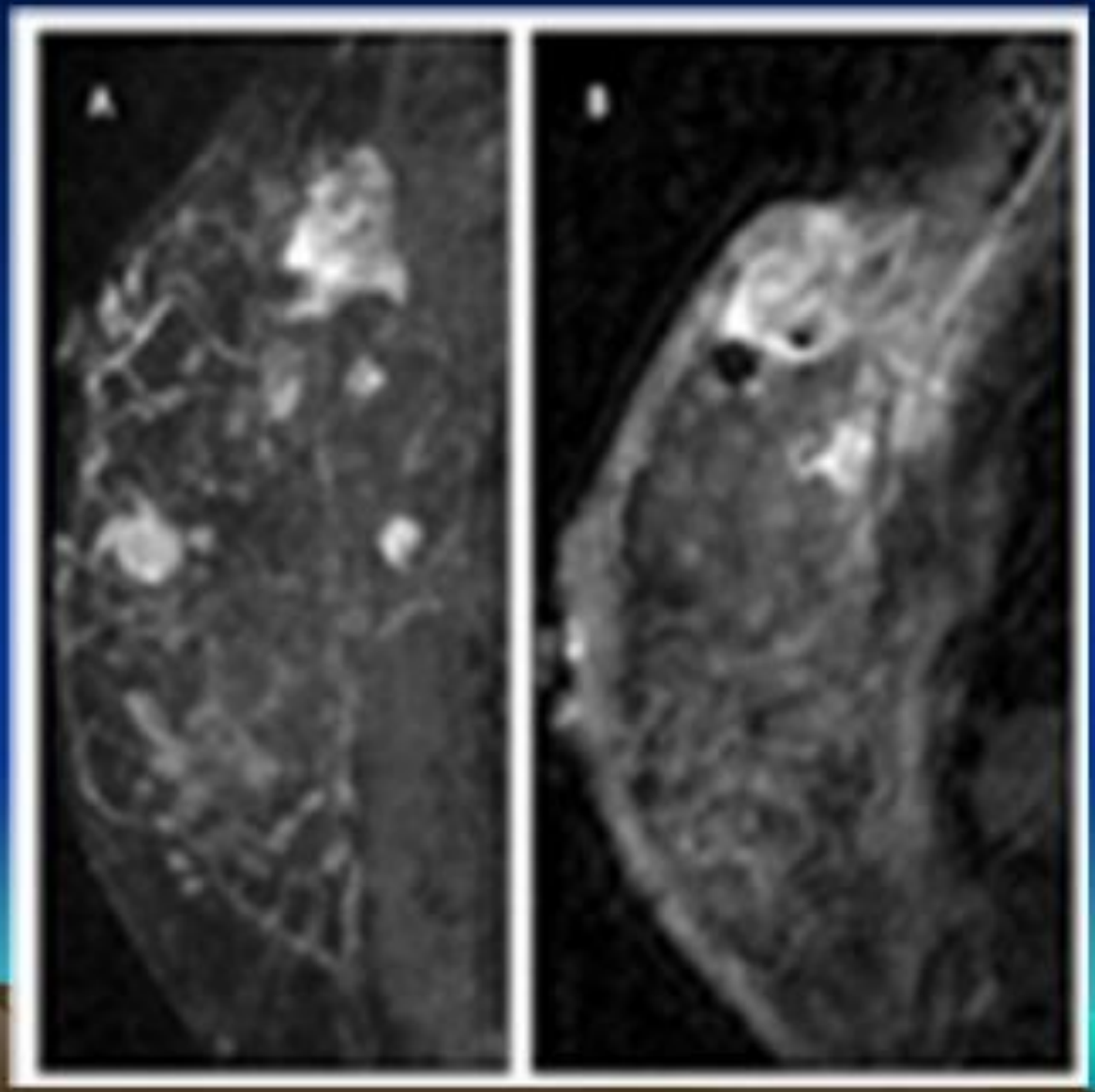


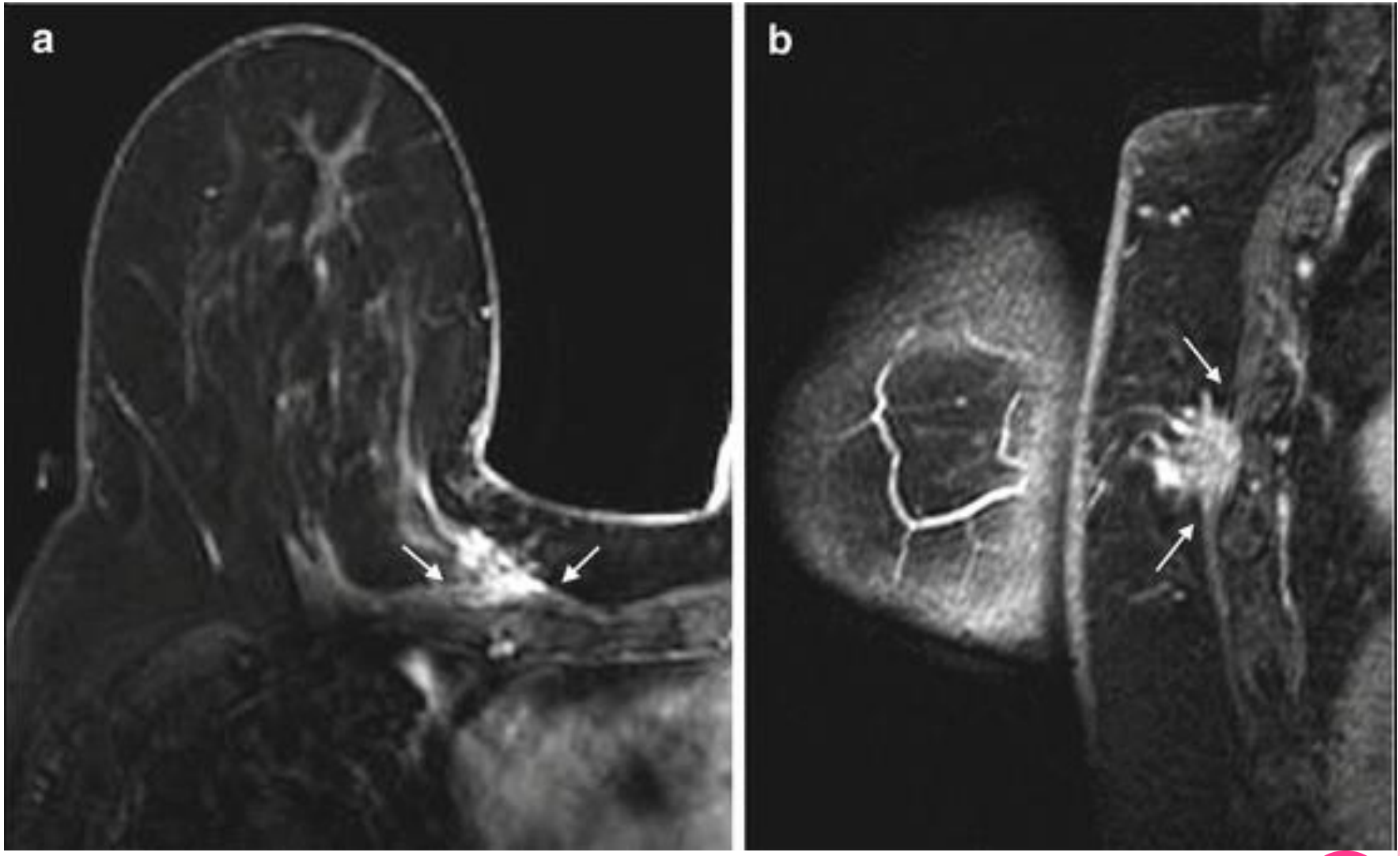
Blood in the ducts can be bright on T1. This patient had a bloody nipple discharge on the right. The blood in the duct is bright on the precontrast T1 image.

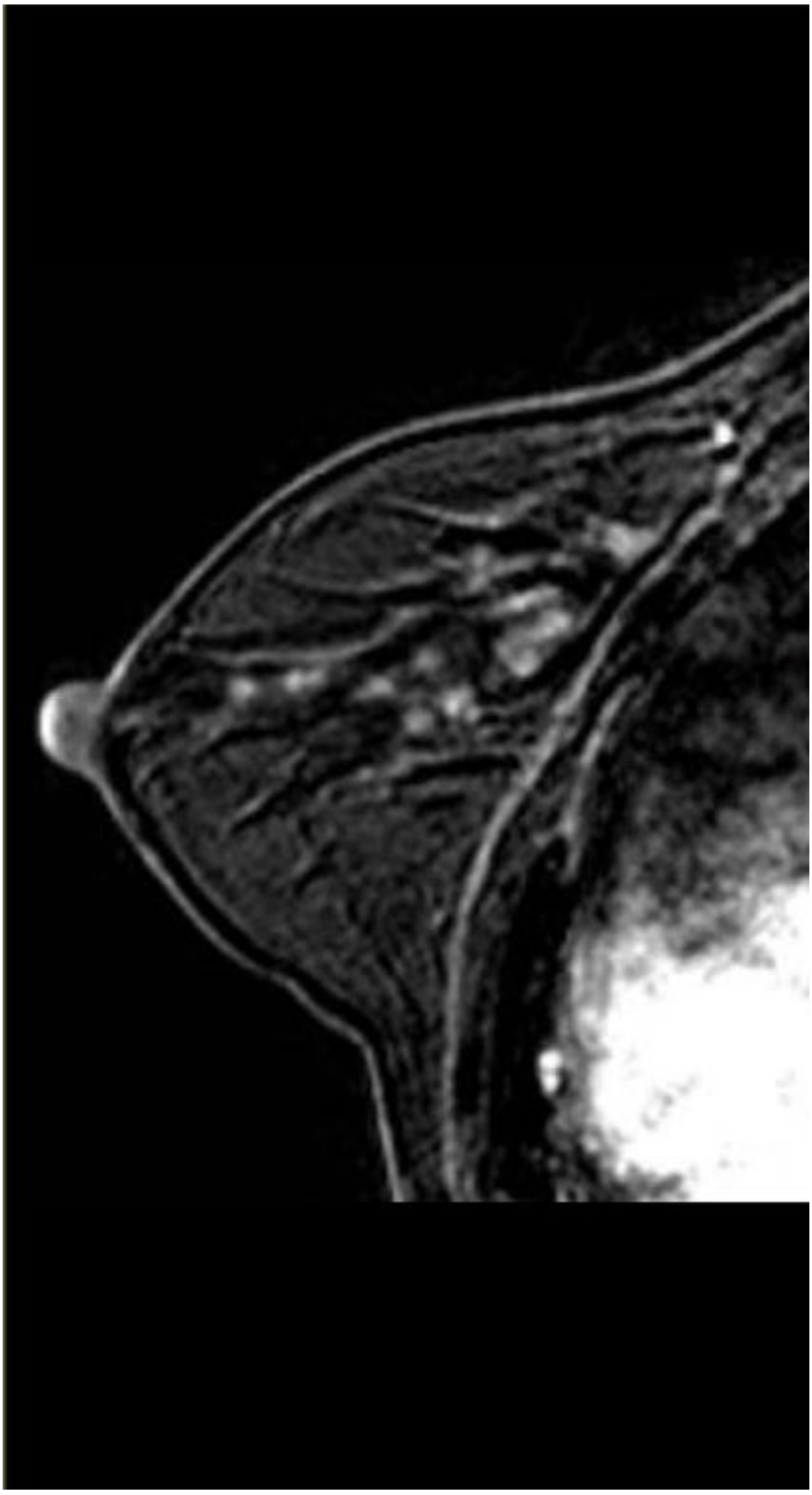


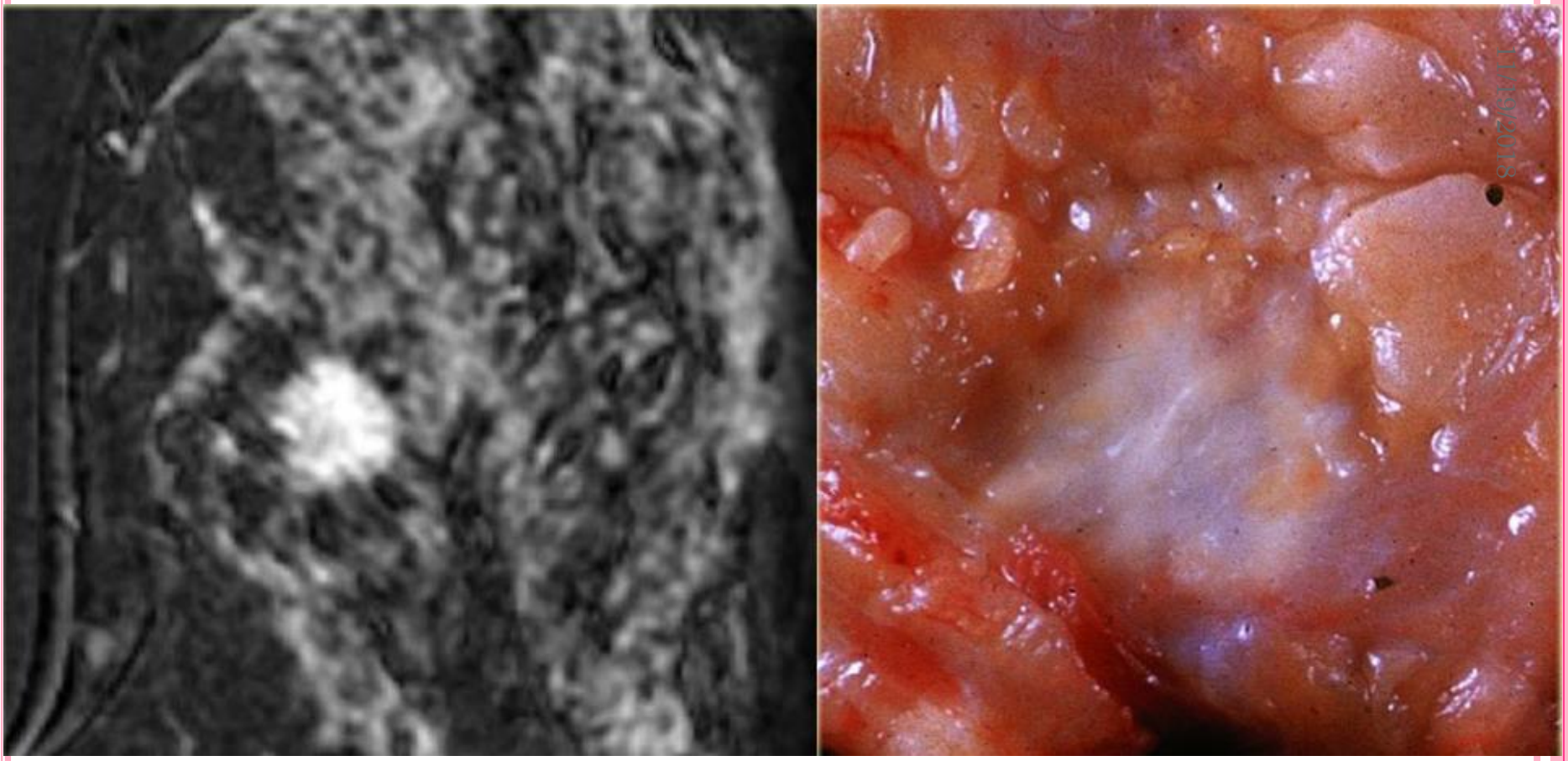
- 11-Breast MRI has consistently been found to detect additional unsuspected malignancy within the ipsilateral breast(in 10% to 27% of patients).

12-Pectoral muscle tumor invasion.



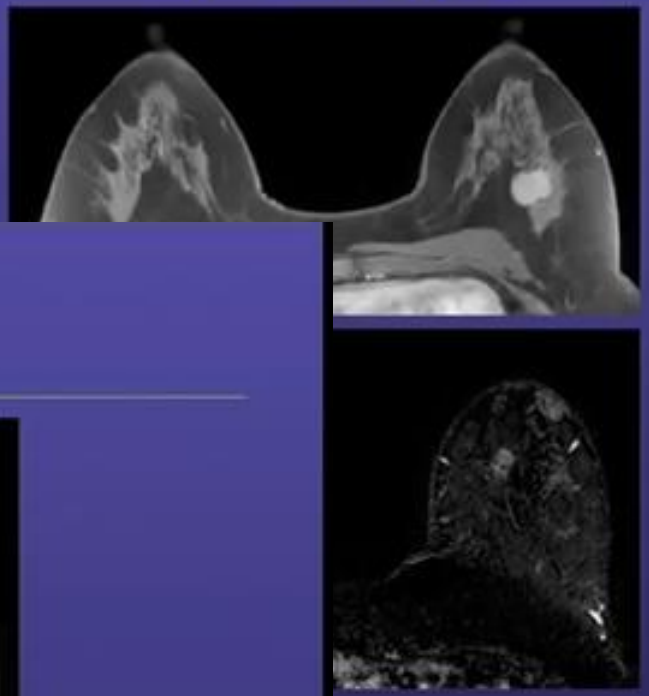

a
b





Invasive ductal carcinoma with spiculated margins

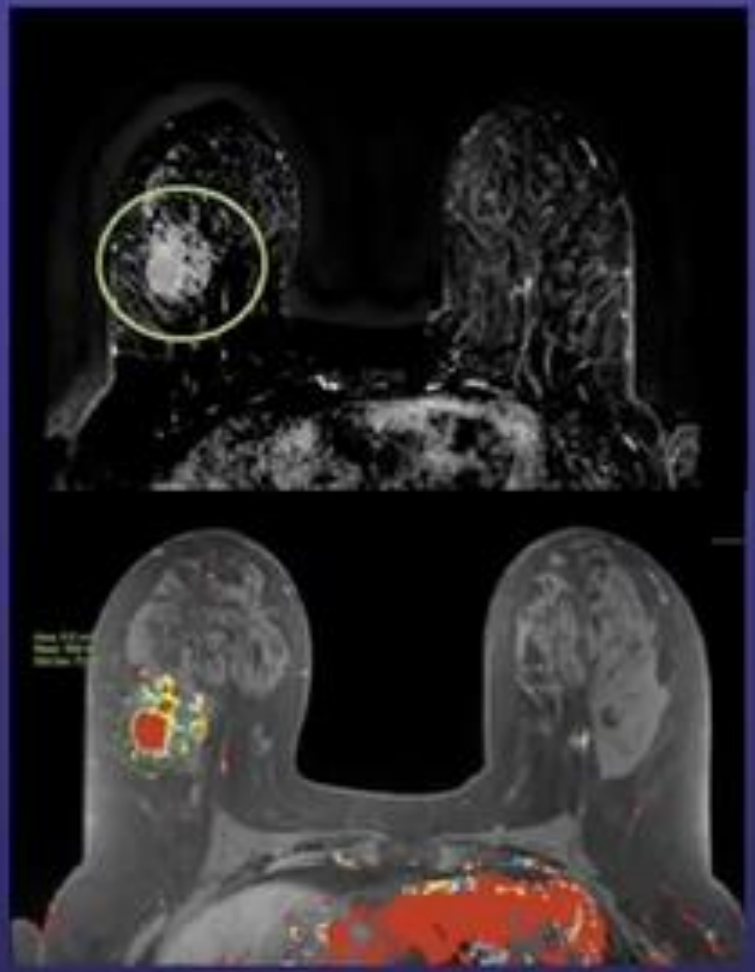
MRI Images

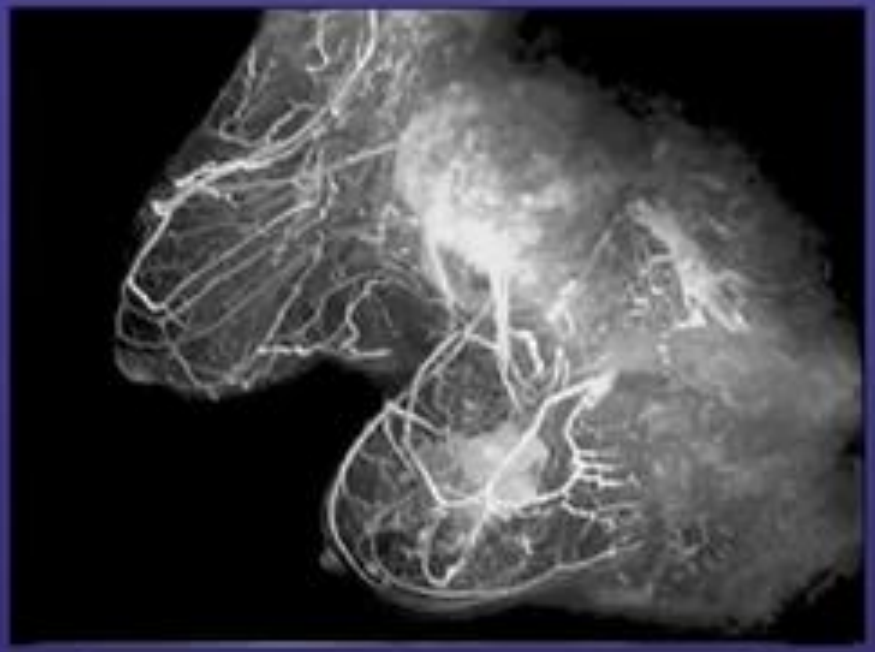


11/19/2018

MRI Images

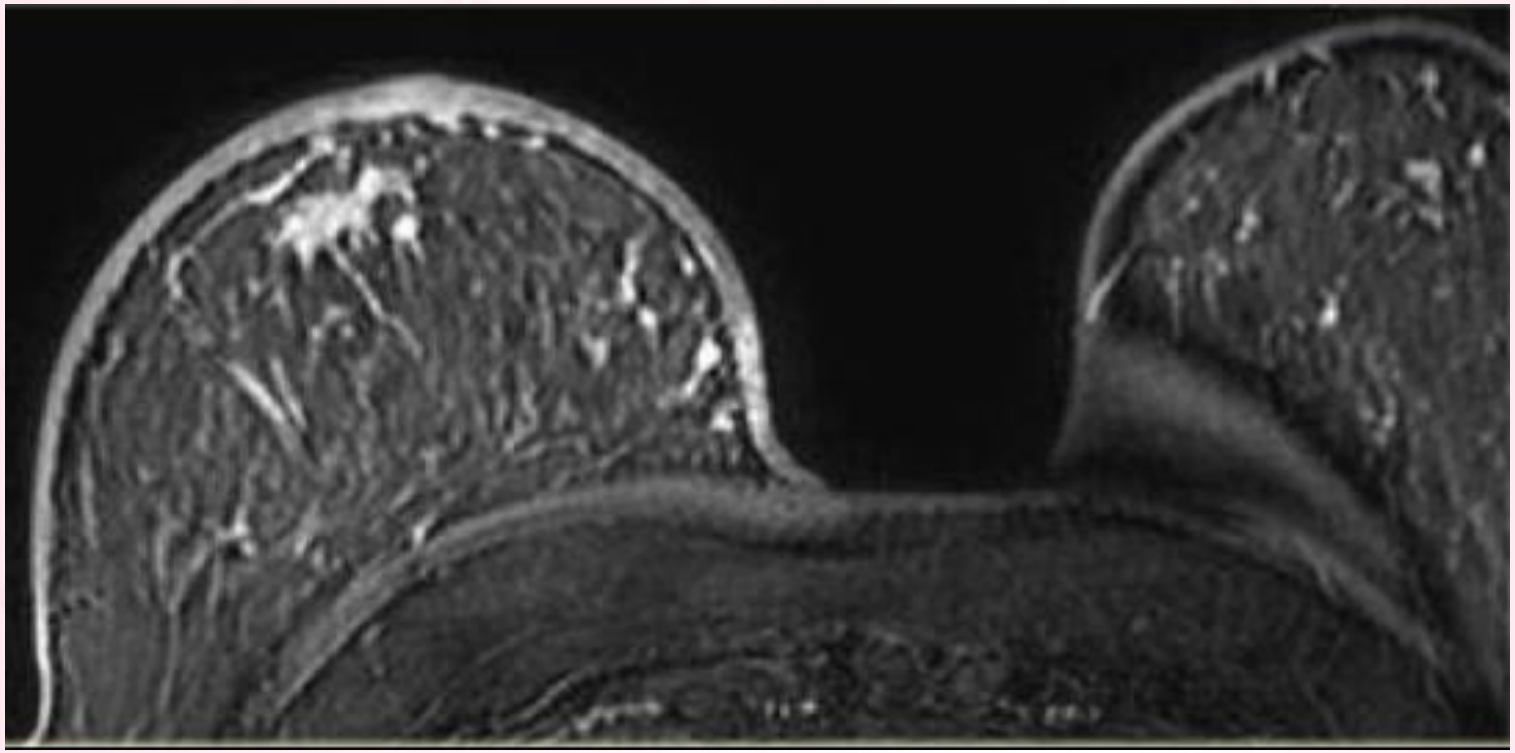
MRI Images





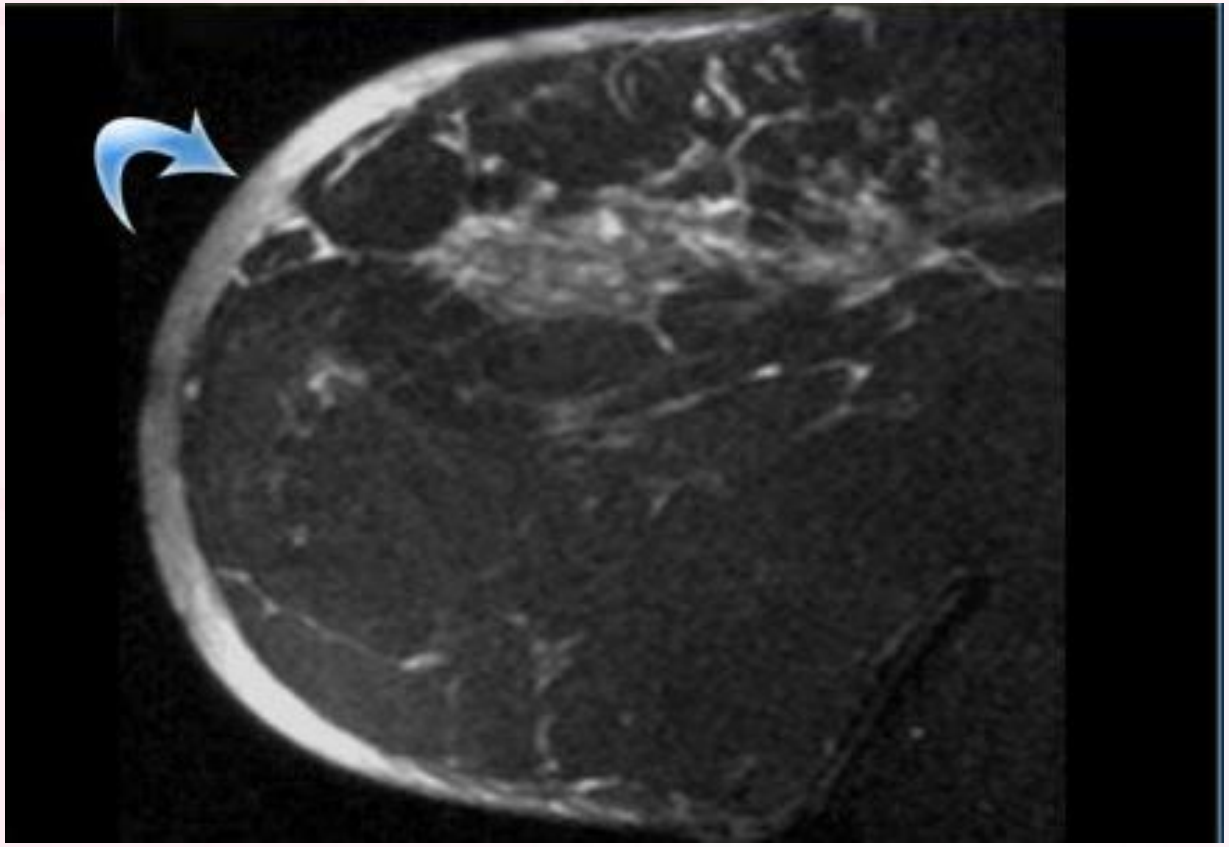
Invasive Ductal Cancer

Breast - MRI



Carcinoma with extensive thickening of the skin

Breast - MRI

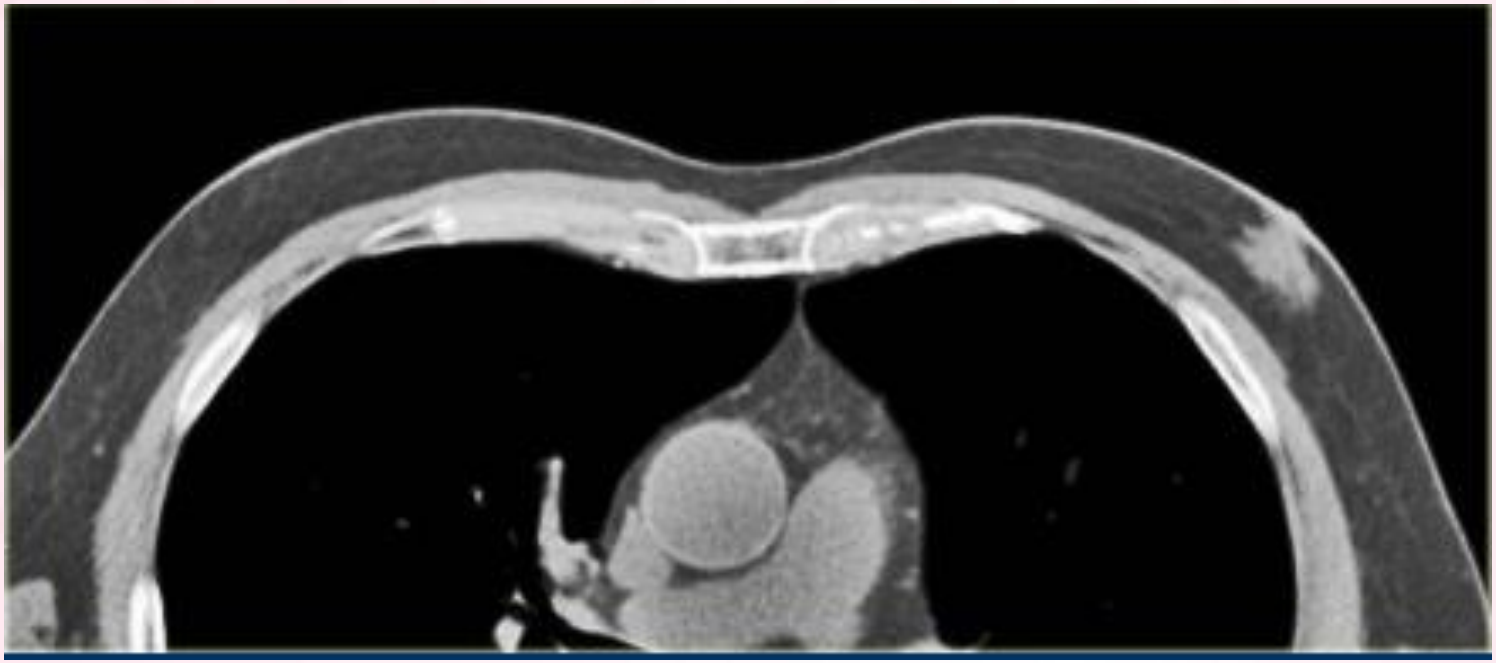


Inflammatory carcinoma with thickening of the skin

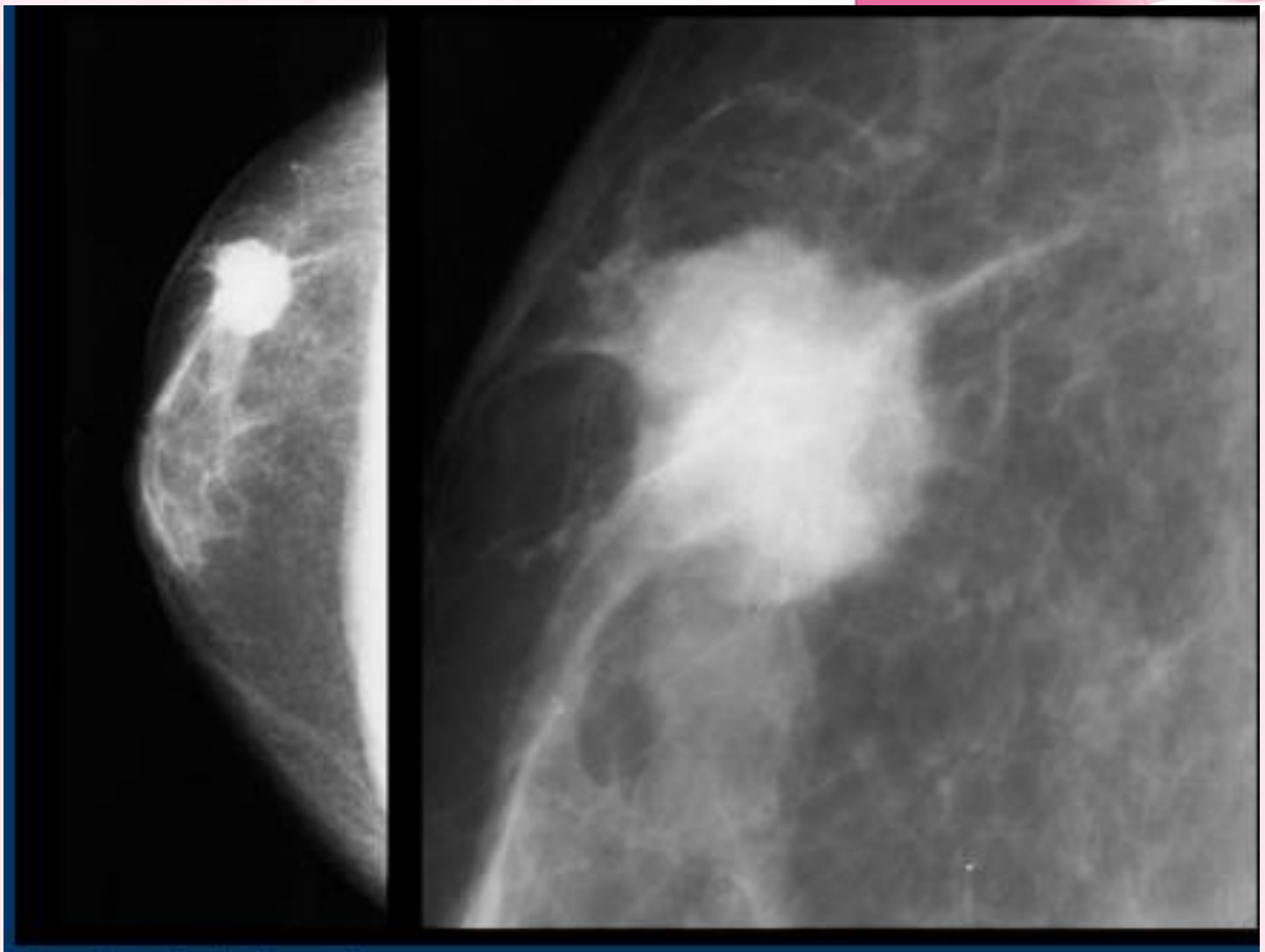
سرطان الثدي يصيب **الرجال** أيضا ولكن بنسبة اقل
مقابل كل امرأة **100** مصابة يقابلها إصابة واحدة لرجل

Normal Male Mammogram

Gynecomastia



Gynecomastia nodular pattern: Incidental finding on CT-scan



Invasive ductal carcinoma

Mammography Lexicon

Breast composition	A. entirely fatty B. scattered areas of fibroglandular density C. heterogeneously dense, which may obscure masses D. extremely dense, which lowers sensitivity		
Mass	**shape**	oval - round - irregular	
	margin	circumscribed - obscured - microlobulated - indistinct - spiculated	
	density	fat - low - equal - high	
Asymmetry	asymmetry - global - focal - developing		
Architectural distortion	distorted parenchyma with no visible mass		
Calcifications	**morpho-logy**	typically benign	
		suspi-cious	1. amorphous 2. coarse heterogeneous 3. fine pleiomorphic 4. fine linear or fine linear branching
	distribu-tion	diffuse - regional - grouped - linear - segmental	
Associated features	skin retraction - nipple retraction - skin thickening - trabecular thickening - axillary adenopathy - architectural distortion - calcifications		

Ultrasound Lexicon

Breast composition	a. homogeneous - fat b. homogeneous - fibroglandular c. heterogeneous	
Mass	**shape**	oval - round - irregular
	margin	Circumscribed **or** Not-circumscribed: indistinct, angular, microlobulated, spiculated
	orienta-tion	parallel - not parallel
	echo pattern	anechoic - hyperechoic - complex cystic/solid hypoechoic - isoechoic - heterogeneous
	posterior features	no features - enhancement - shadowing - combined pattern
Calcifications	in mass - outside mass - intraductal	
Associated features	architectural distortion - duct changes - skin thickening - skin retraction - edema - vascularity (absent, internal, rim) - elasticity	
Special cases *(cases with a unique diagnosis)*	simple cyst - clustered microcysts - complicated cyst - mass in or on skin - foreign body (including implants) - intramammary lymph node - AVM - Mondor disease - postsurgical fluid collection - fat necrosis	

Conclusion

- Screening mammographic views are: MLO, CC views.
- Diagnostic mammography: may need additional views.
- Evaluation of mammogram:

1- Overall searching of the technique (position, contrast, compression).

2- Evaluation of fibroglandular tissue (symmetry, masses, densities, calcifications).

Conclusion

- Invasive ductal cancers account about 90% of all breast cancers.
- Fibroadenomas are the most common breast lesions.
- Invasive lobular cancers are one of the hardest to see on mammography.
- Papilloma is one of the most common sources of a bloody or clear nipple discharge.

Conclusion

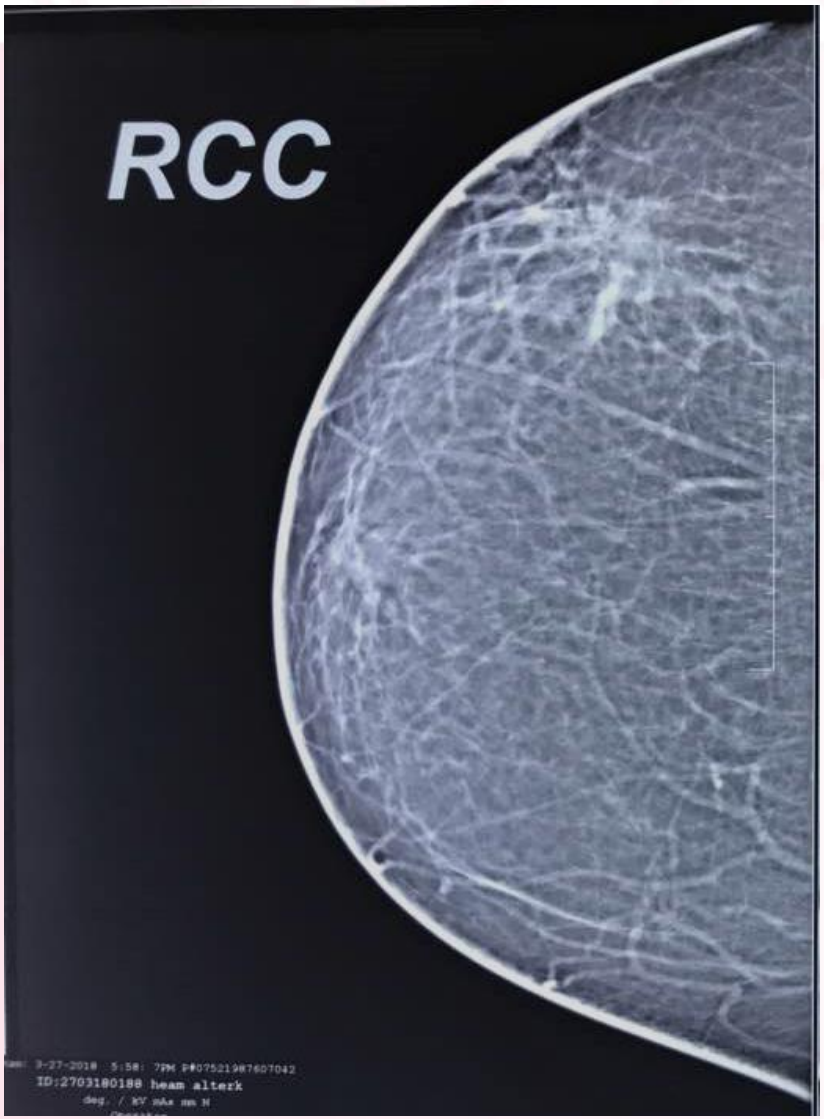
3- Evaluation of skin, nipple, retroareolar region.

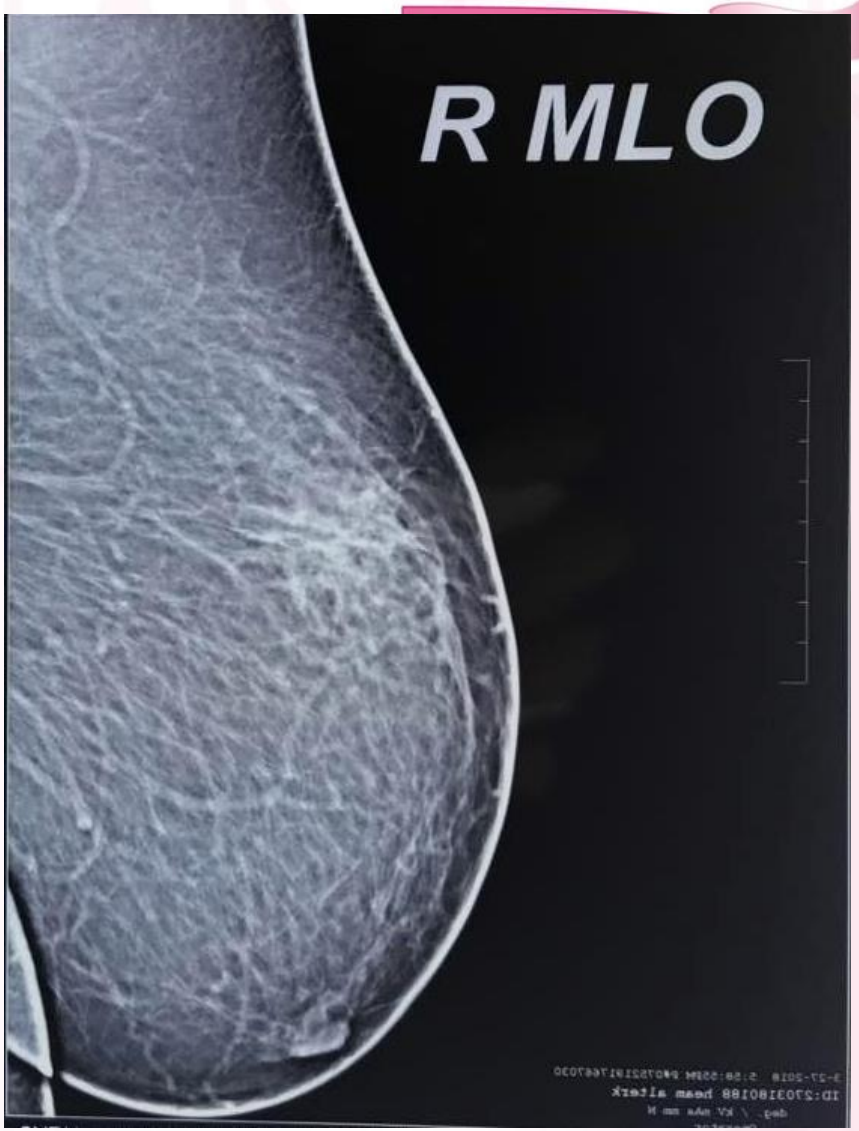
4- Evaluation of lymph nods.

5- compare with old films.

Conclusion

- Round mass that is “taller than wide”, and have a thick echogenic rim is suspicious.
- New round masses on a mammogram that don’t have all specific criteria for a simple cyst on US should be considered for biopsy.
- Spiculated masses that don’t represent post-biopsy scar should undergo biopsy.





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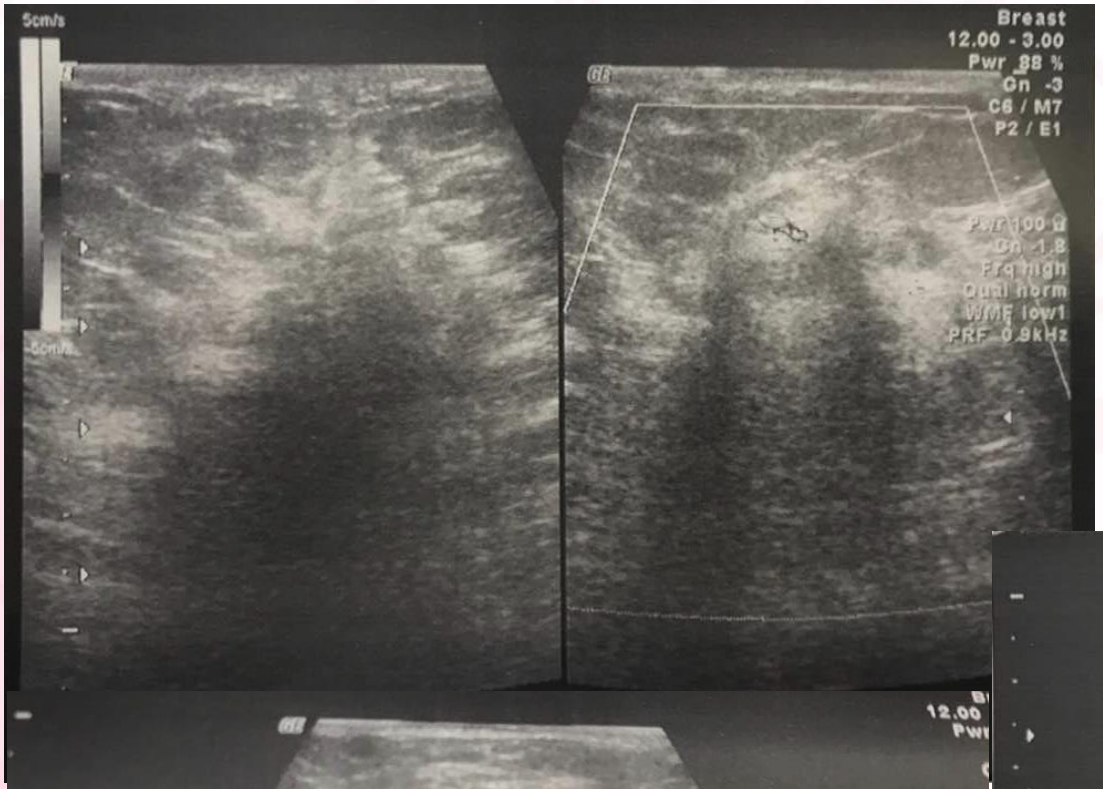
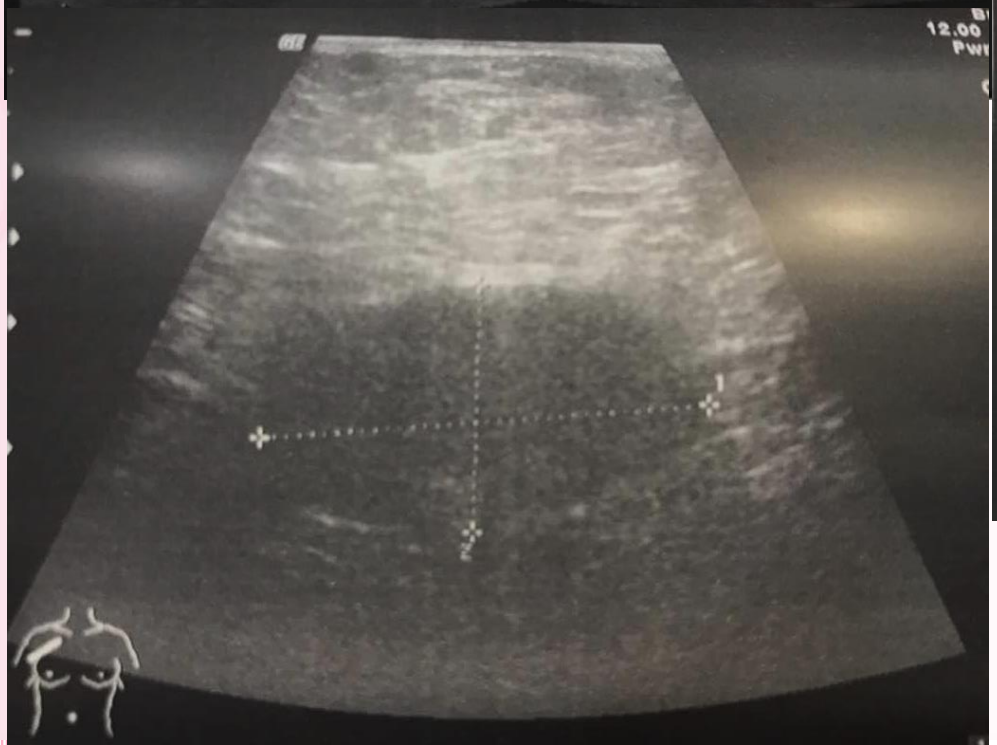
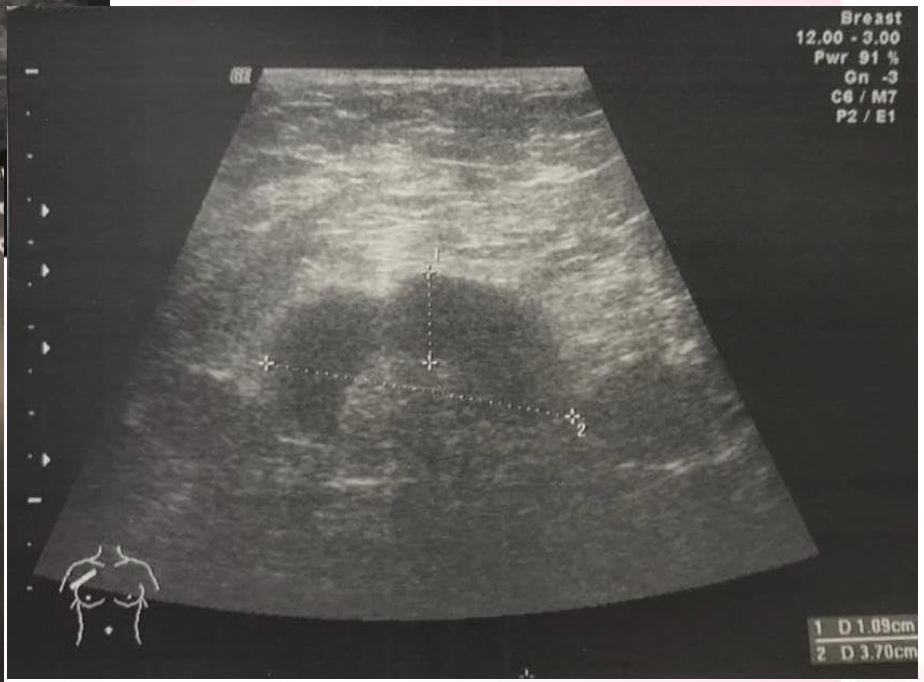

5cm/s
Breast
12.00 - 3.00
Pwr 88 %
Gn -3
C6 / M7
P2 / E1
-5cm/s




Breast
12.00 - 3.00
Pwr 91 %
Gn -3
C6 / M7
P2 / E1
1 D 1.09cm
2 D 3.70cm

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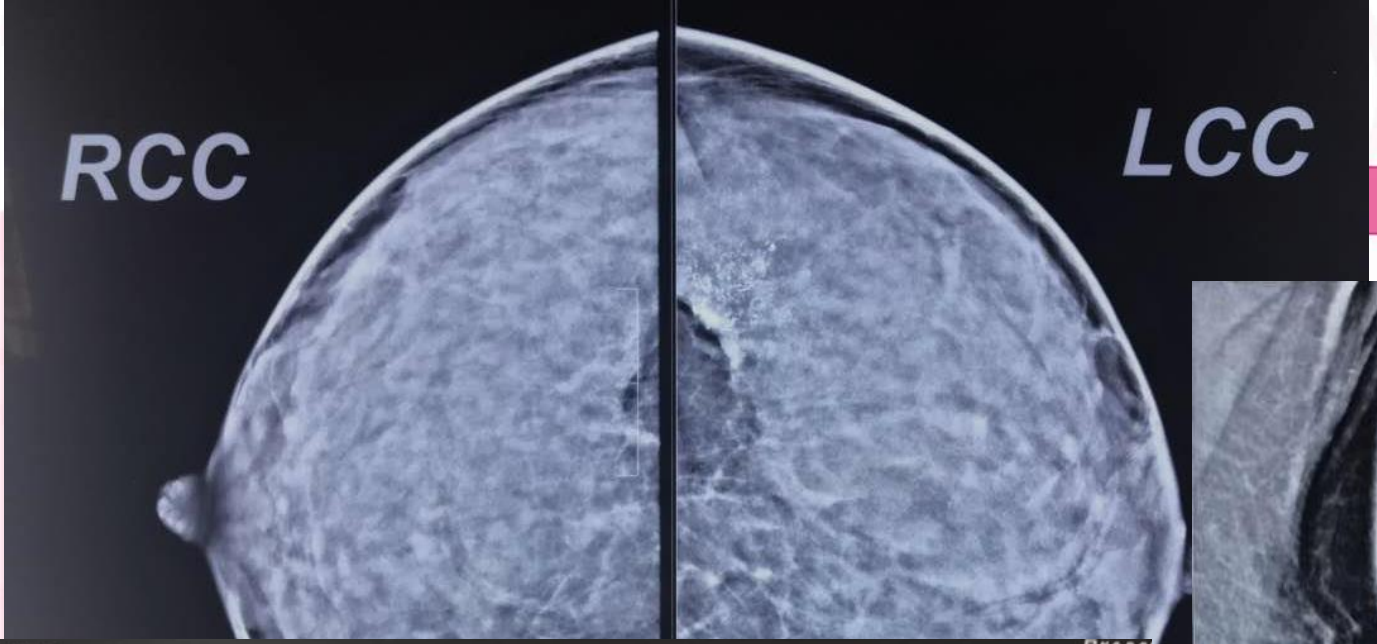
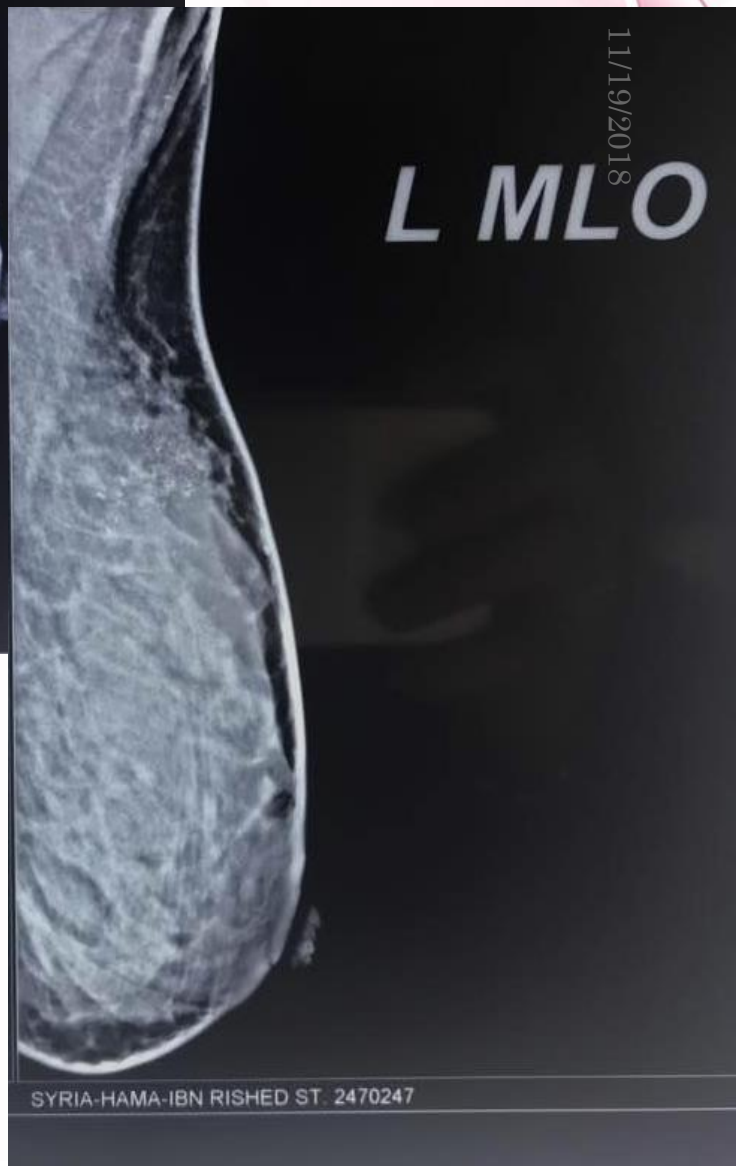
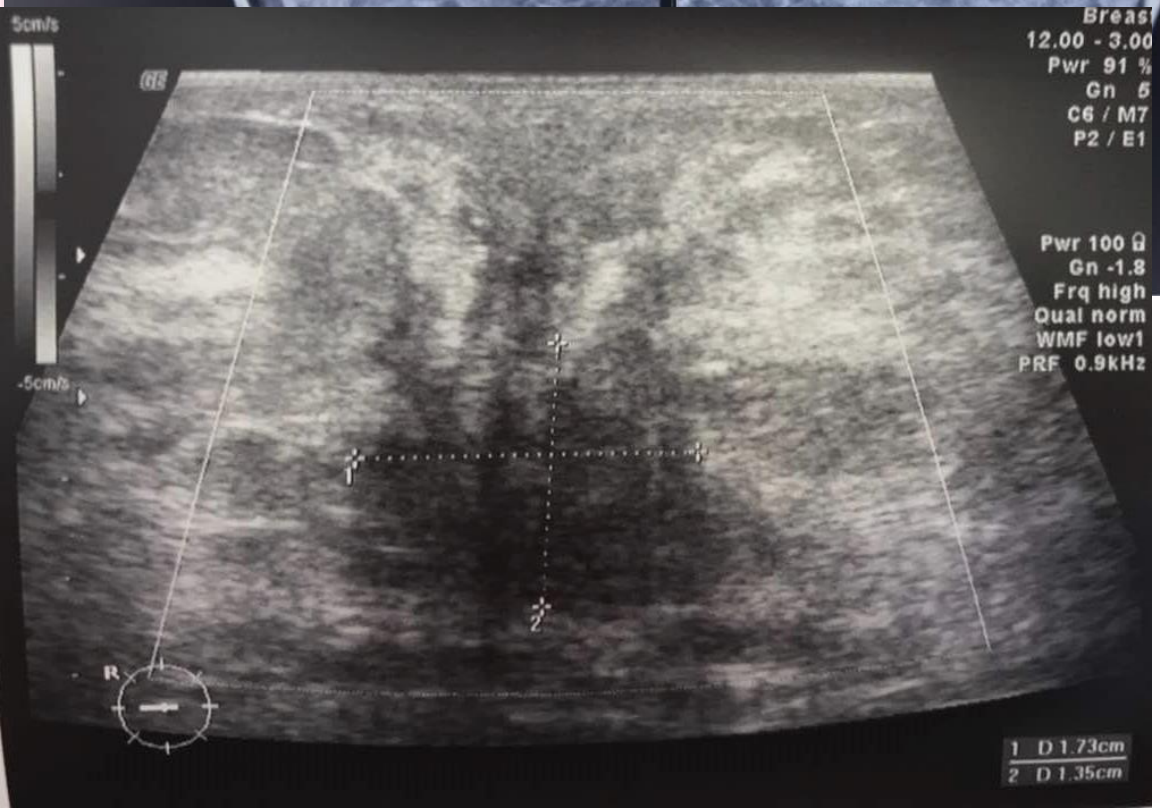
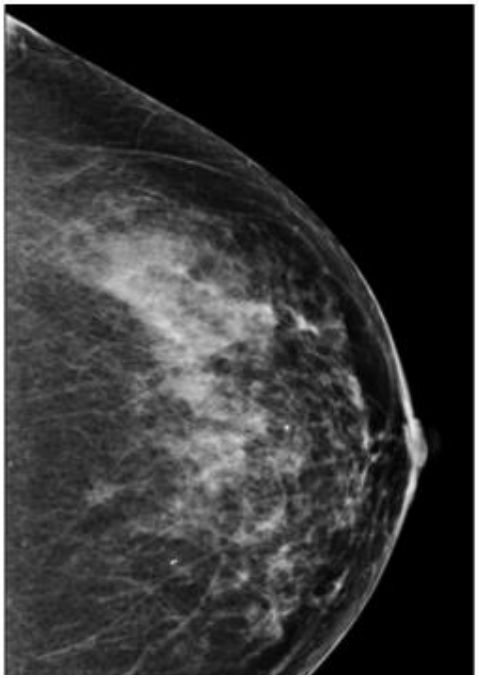

RCC
LCC

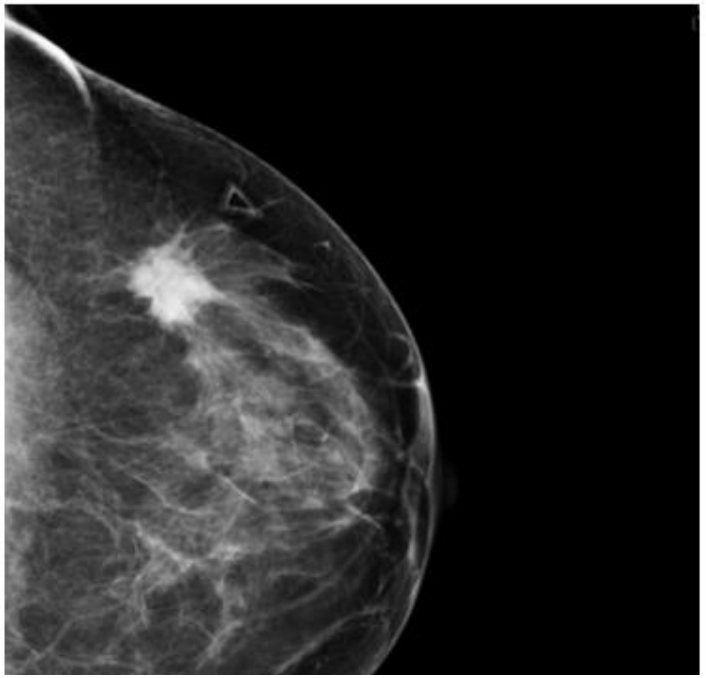

11/19/2018
L MLO
SYRIA-HAMA-IBN RISHED ST. 2470247

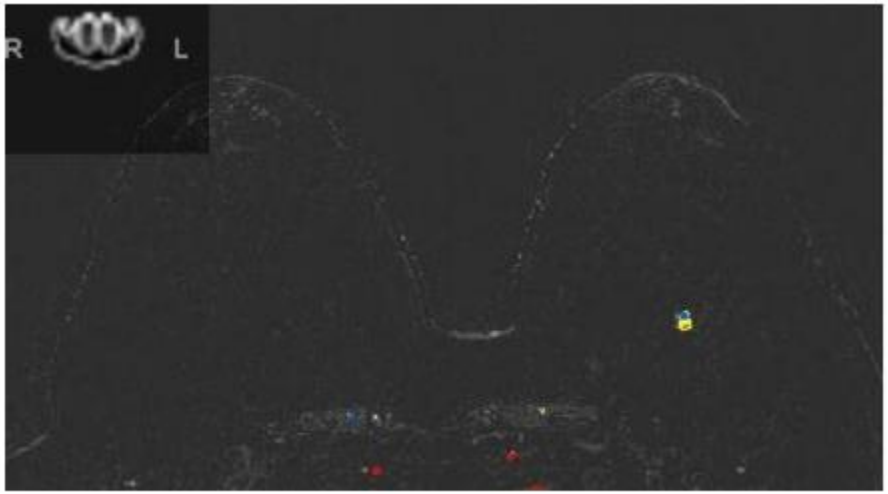

5cm/s
-5cm/s
Breas
12.00 - 3.00
Pwr 91 %
Gn 5
C6 / M7
P2 / E1
Pwr 100
Gn -1.8
Frq high
Qual norm
WMF low1
PRF 0.9kHz
1 D 1.73cm
2 D 1.35cm

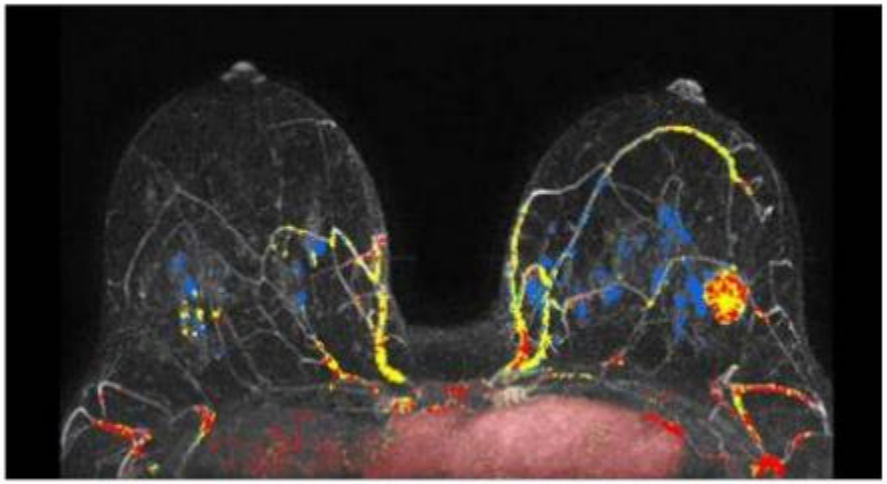
What is the BI-RADS code?

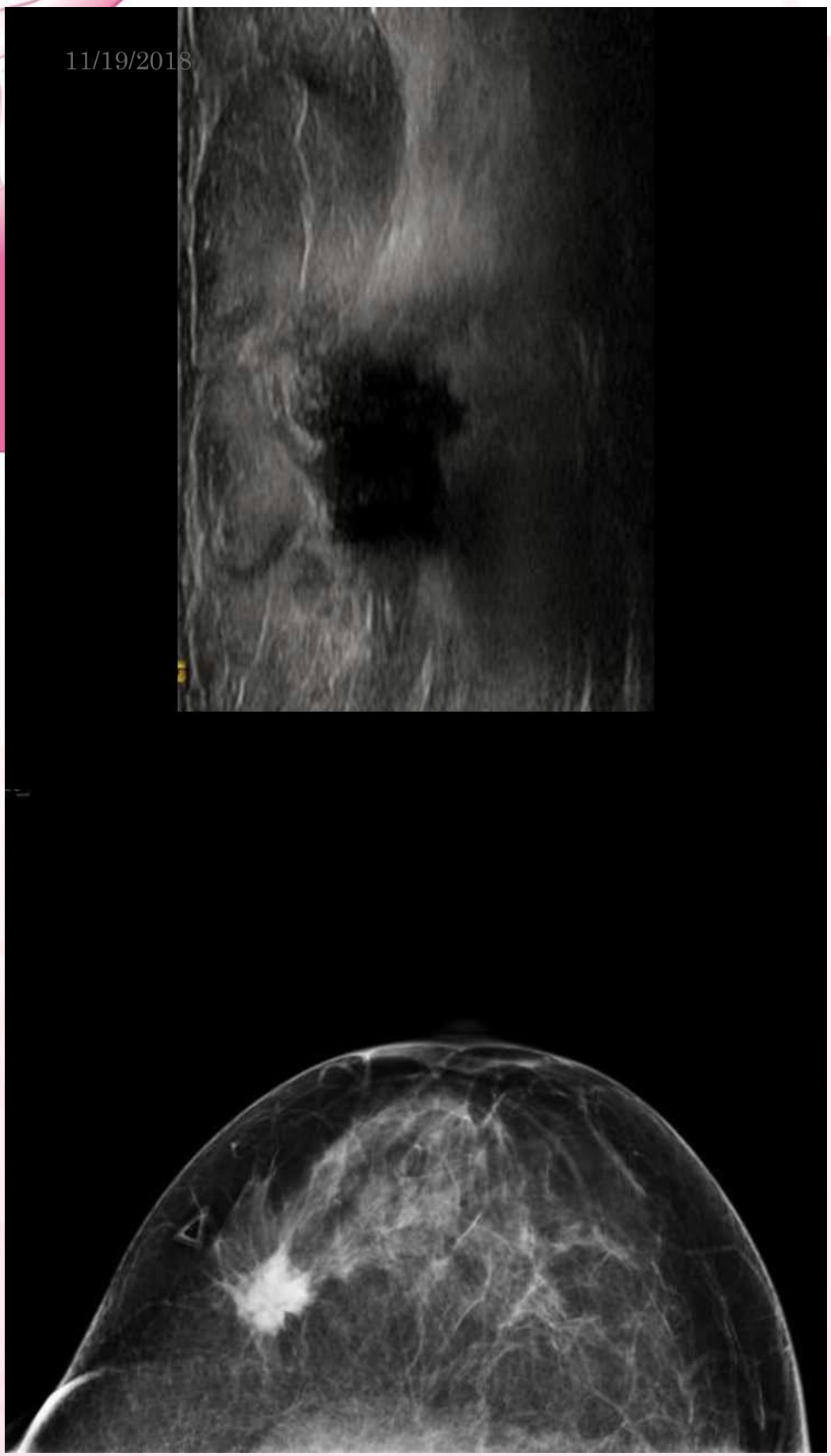
Early detection (mammogram) vs. late (palpable)

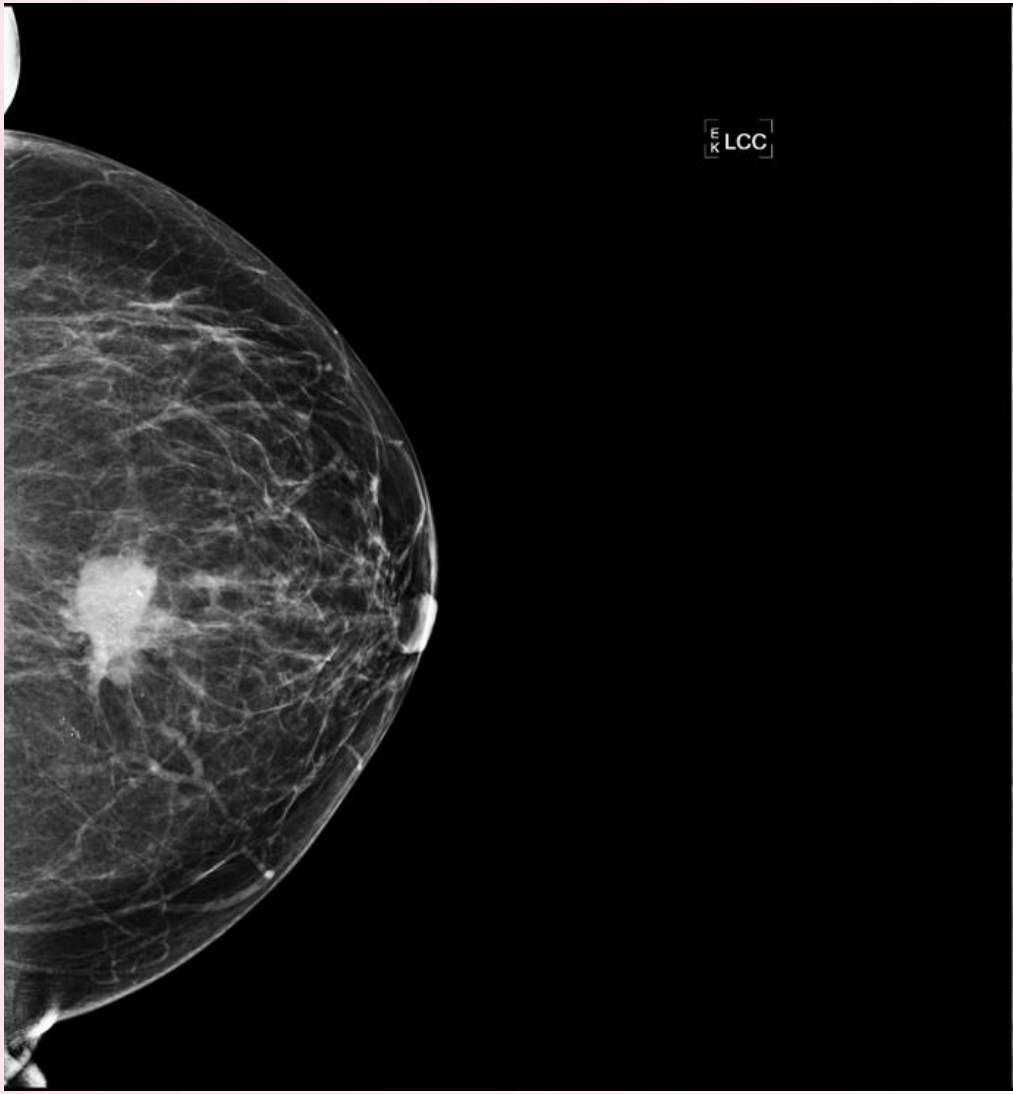






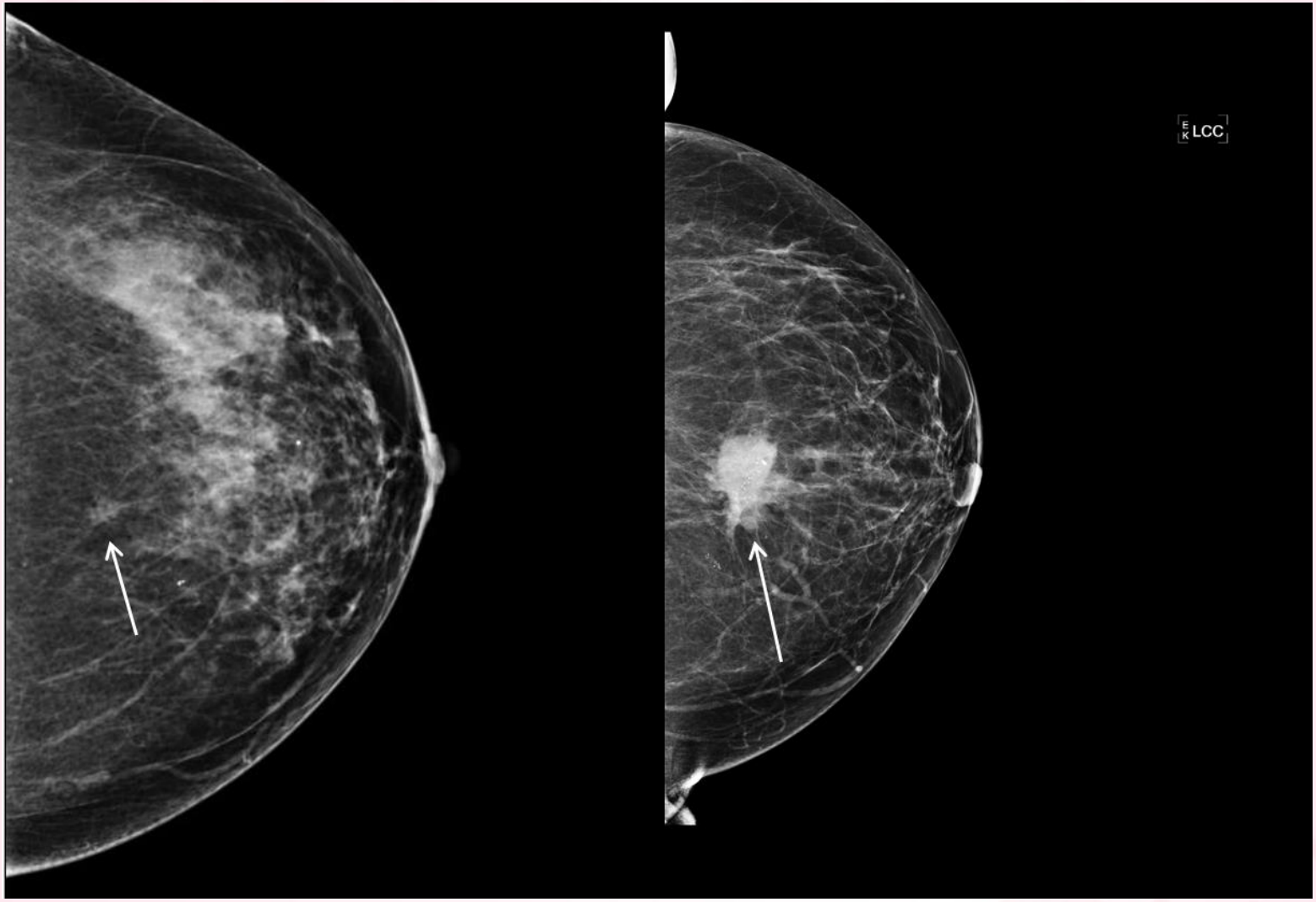


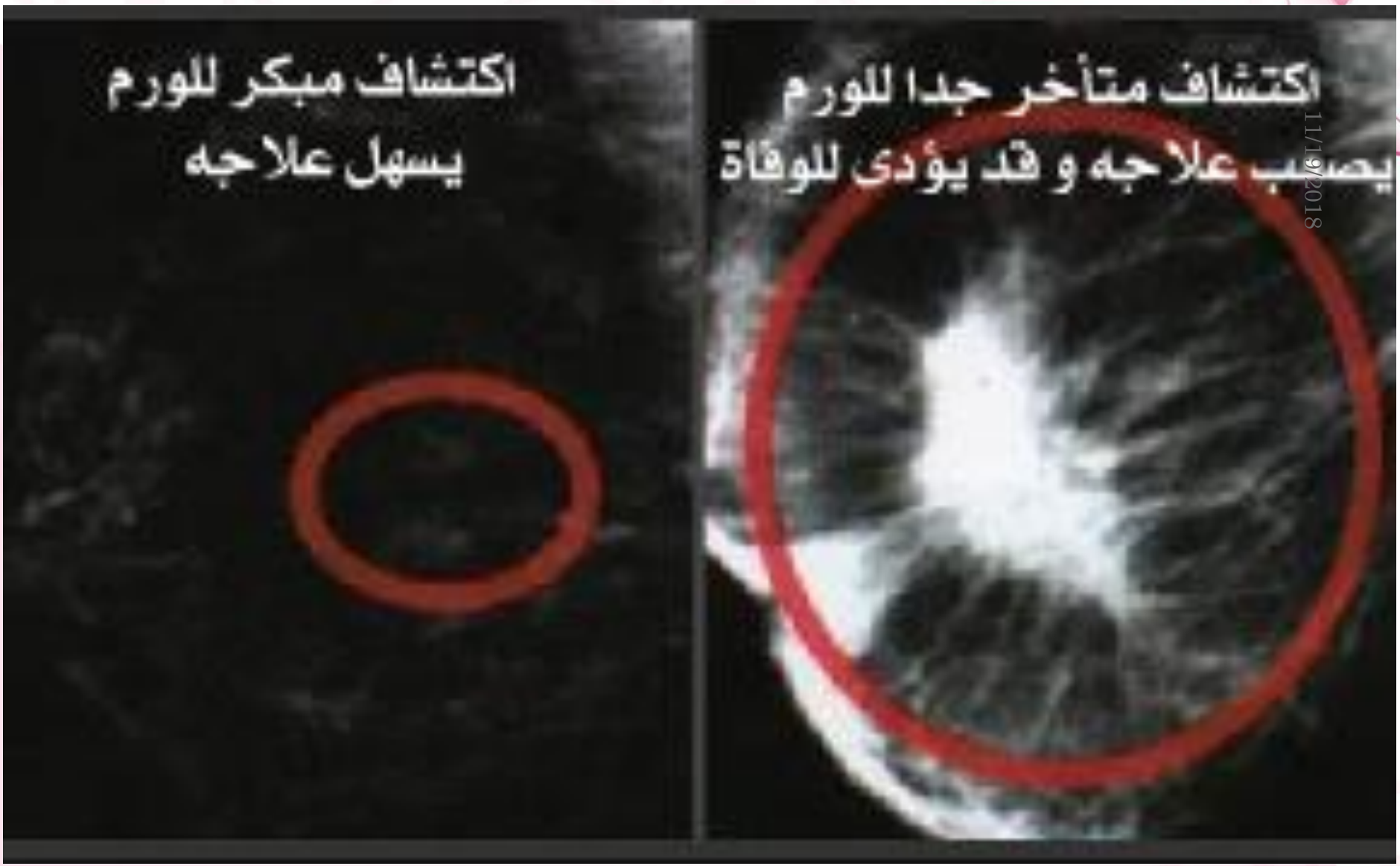



LCC


LMLO
11/19/2018

GOAL UNTIL WE HAVE A CURE IS EARLY DETECTION




اكتشاف مبكر للورم
يسهل علاجه
اكتشاف متأخر جدا للورم
يصعب علاجه و قد يؤدى للوفاة

تذكري أن الفحص الشعاعي الدوري للثدي(الماموجرام) هو الفحص الأهم والوحيد لاكتشاف سرطان الثدي المبكر قبل أن تتمكني أنت أو طبيبتك من اكتشافه

سرطان الثدي ...
الكشف المبكر خيرٌ
من العلاج

Thank you