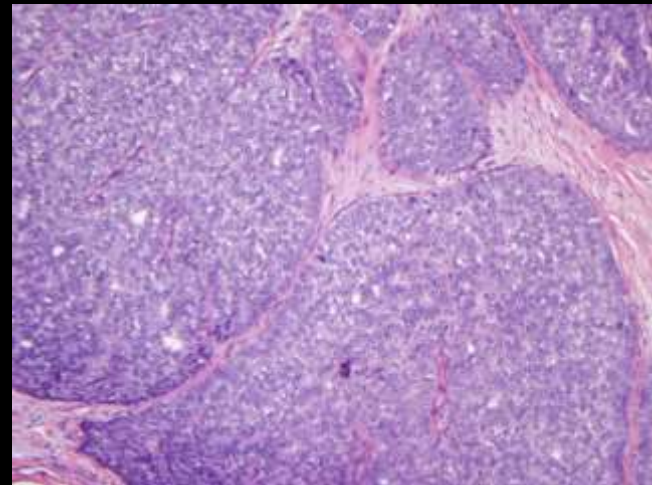
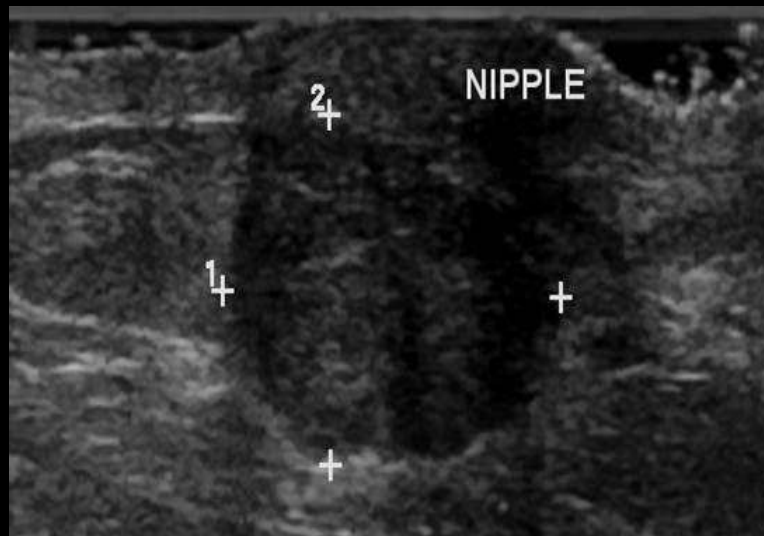


Breast Masses in the Distinctive Patient: Men, Transgender, Pregnant & Post-Partum



Breast Masses in the Distinctive Patient: Men, Transgender, Pregnant & Post-Partum



NC ACR 22nd Annual Breast Imaging Course
Cherie Kuzmiak DO FSBI FACR Sheri Jordan MD RCC
Associate Professors UNC SOM Dept Radiology

Disclosures and Lecture Outline

- Disclosures: None

- Lecture Outline:

Male Patient

- Distinguishing Gynecomastia, Breast Cancer
- Other Male Breast Masses

Transgender Patient

Pregnant & Lactating (PostPartum) Patient

- Benign Masses and PABC
- Puerperal Mastitis and Abscess

DDx Breast Masses

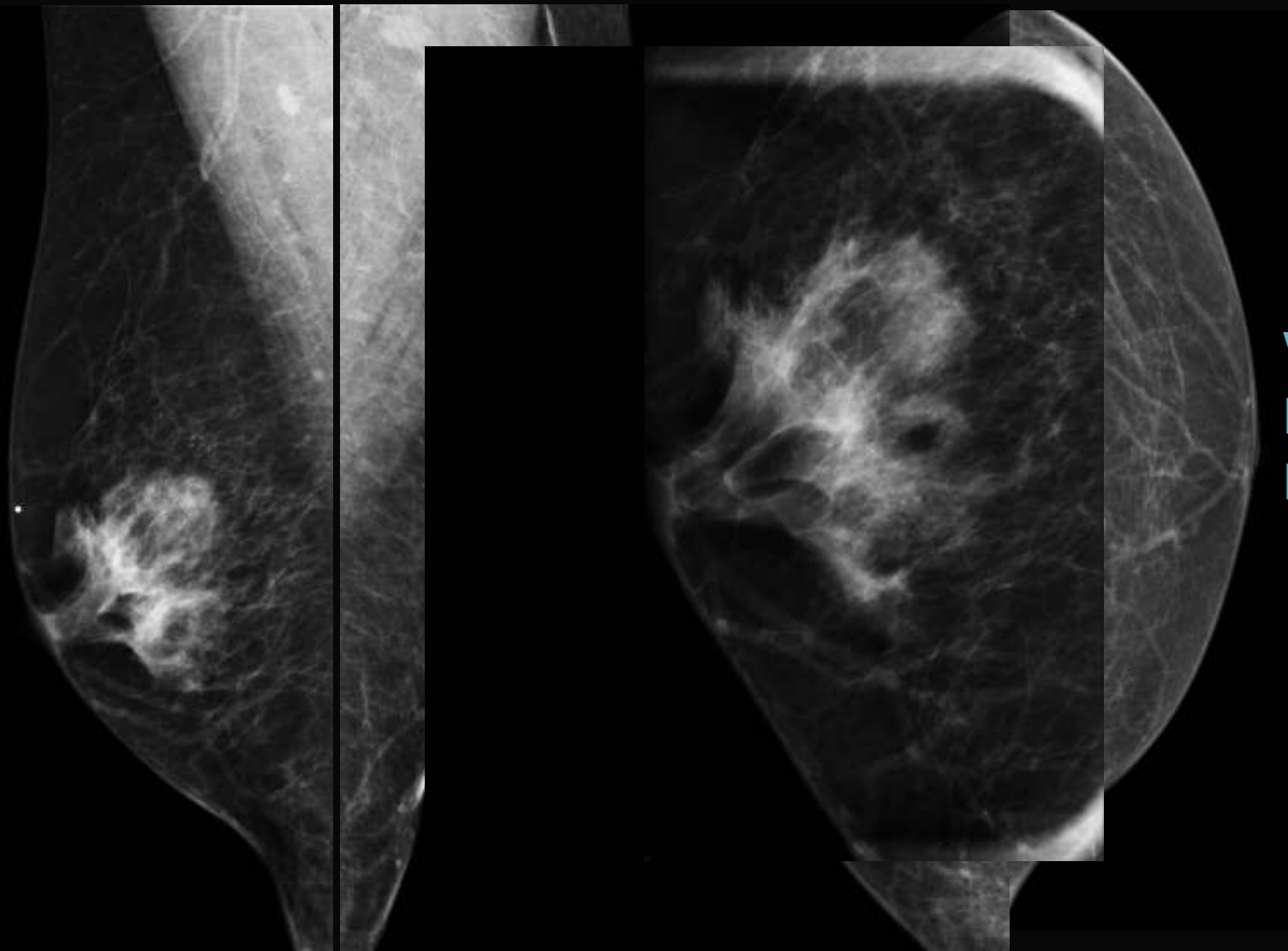
MALE BREAST

1. Gynecomastia
2. Male breast cancer
3. Lipoma and other mesenchymal tumors
4. Epidermal inclusion cyst
5. Hematoma
6. Abscess

PREGNANT & LACTATING

1. (FA)
2. (Cyst)
3. Lactating adenoma
4. Galactocele
5. Puerperal mastitis / abscess
6. Pregnancy-associated breast cancer (PABC)

Unknown Case #1 71yo male right breast mass



WORKUP?
FINDINGS?
DDx?

Male Breast

- Men are referred for breast imaging when they have a palpable mass or breast enlargement that may or may not be associated with pain and tenderness.
- The differential diagnosis for male breast symptomatology is not broad . . . Gynecomastia is by far the most common culprit.
- However, it is important to be able to differentiate benign from malignant in order to avoid unnecessary imaging and intervention.

Male Breast

Diagnostic Evaluation

- < 1% of mammographic studies performed in breast imaging centers
- Because men present with breast symptoms . . . they should be scheduled as a **diagnostic exam**
- **Both breasts should be imaged** with mammographic standard views (MLO & CC) The risk factors for breast cancer affect both breasts! Spot compression magnification views when needed
- Although there are no significant data supporting screening mammography in men, annual mammography of male patients with documented gene mutation or who have a personal history of breast cancer (status post mastectomy) is something to consider

Male Breast

Diagnostic Evaluation

- After the mammogram is reviewed, **ultrasound only if:**
 - a. Suspicious finding not characteristic of gynecomastia
 - b. Palpable area is not definitely explained by mammo
- Male breast cancers have the same mammographic and sonographic appearance as in women
- Magnetic resonance imaging is not typically performed
 - a. the cancers are readily visible with more traditional breast imaging
 - b. men are not candidates for breast conserving surgery

Two images of a normal male breast. The image on the left shows normal skin, a nipple and a small amount of connective tissue behind the nipple. Image on right shows less connective tissue.

Anatomy

- Composed of subcutaneous fat retroareolar ducts with no significant branching
- Cooper ligaments are not present
- Lobular units are rare in men

- All lesions seen in female patients can be seen in the male patient!
- Significantly **lower** incidence of lobular-derived lesions

Cyst • Fibroadenoma • ILC

Male Breast

- Differential Dx for Male Breast Mass
 - Gynecomastia (most common abnormality overall)
 - Pseudogynecomastia
 - Breast Cancer (most commonly IDC, DCIS, Papillary)
 - Papilloma
 - Mesenchymal tumors
 - Metastases
 - Abscess / EIC
 - Hematoma

Gynecomastia

- Gynecomastia is simultaneous proliferation of ducts and stroma without encapsulation, so it must blend into the surrounding fat tissue.
- **Three types are *nodular, dendritic, diffuse*:**
 - Nodular (acute florid phase)
 - Dendritic (chronic fibrotic phase)
 - Diffuse glandular

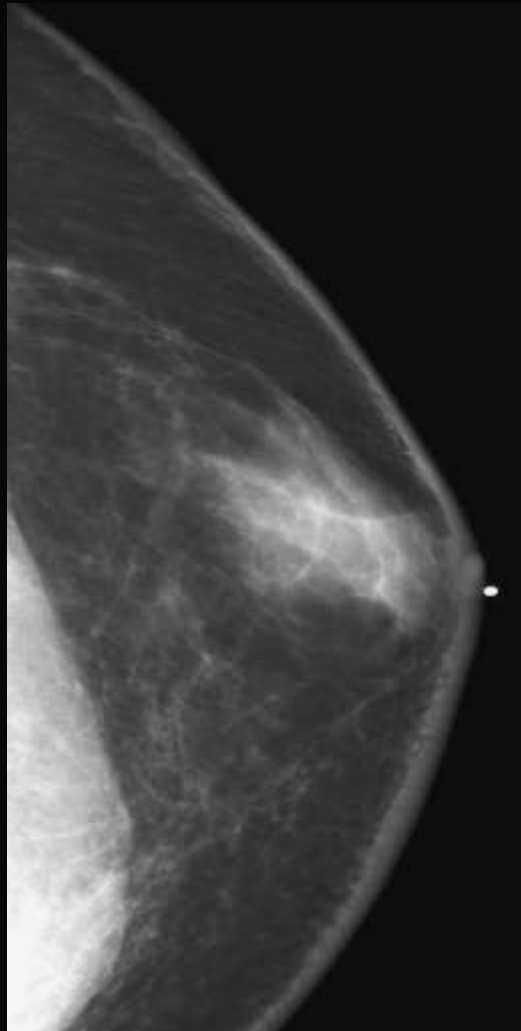
Gynecomastia

Nodular Glandular Pattern:

- Most common type
- Appears as “fan/flame-shape” dense tissue radiating from the nipple blending into the surrounding fat.
- It also may be seen as increased dense tissue focally with a more spherical appearance
- Mammogram is usually diagnostic and US is not necessary for workup.

In fact gynecomastia on US usually has an irregular spiculated appearance and may actually confuse the workup

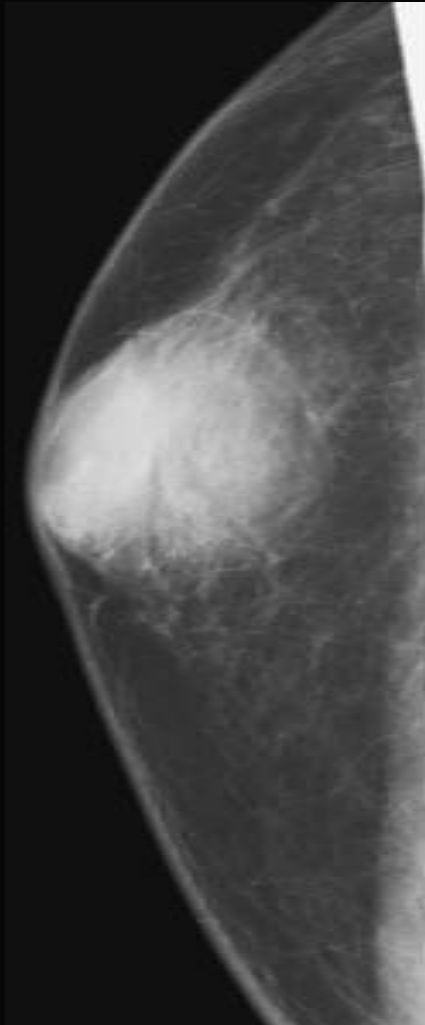
Gynecomastia: Nodular flame



Gynecomastia: Nodular discoid

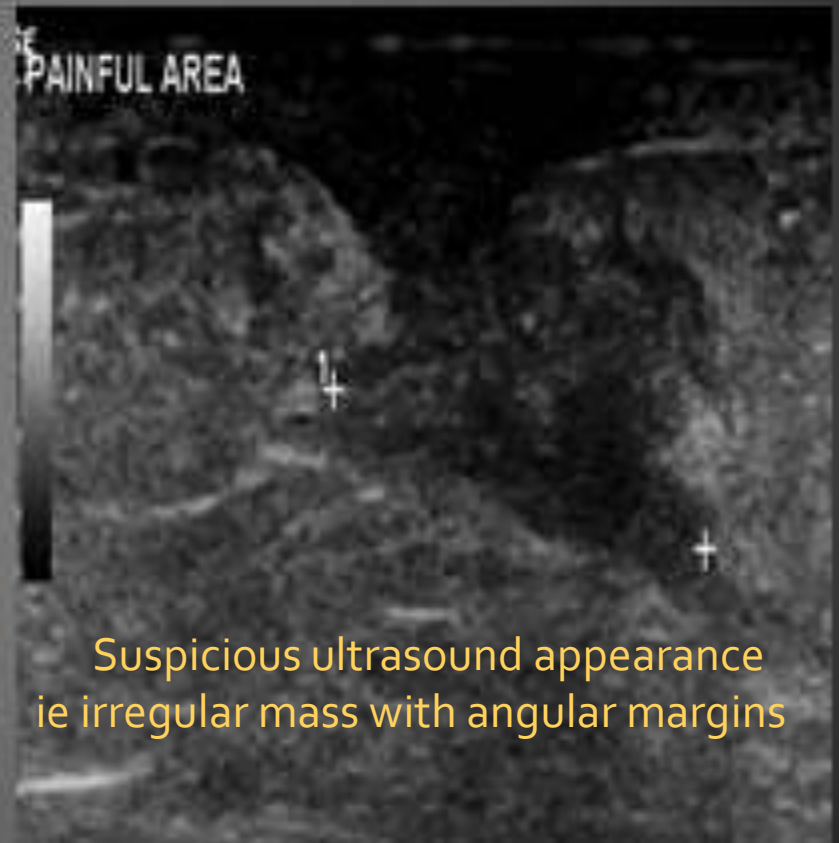
(still blends into fat)

Nodular type mimics mass



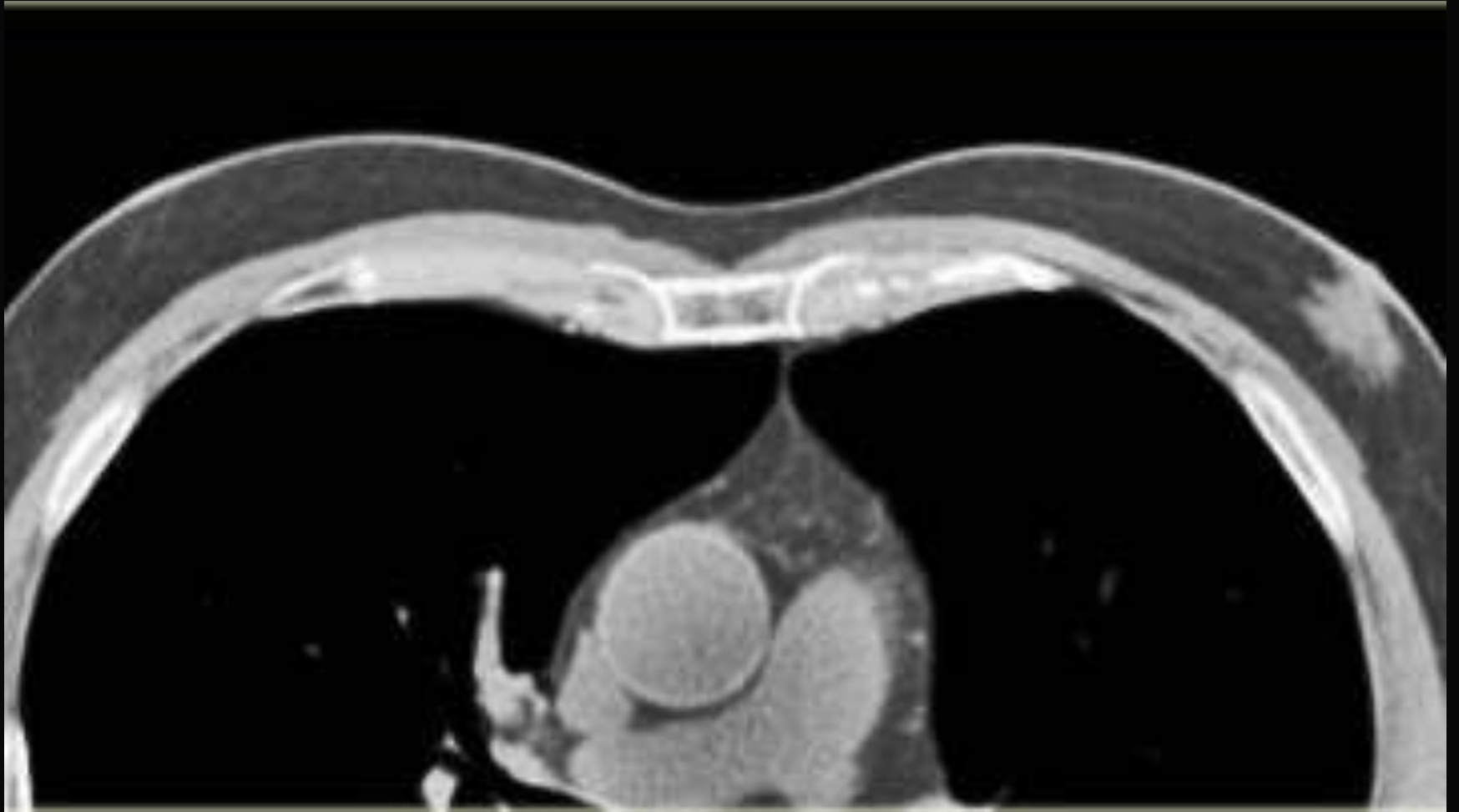
Gynecomastia

26yoM painful left breast mass

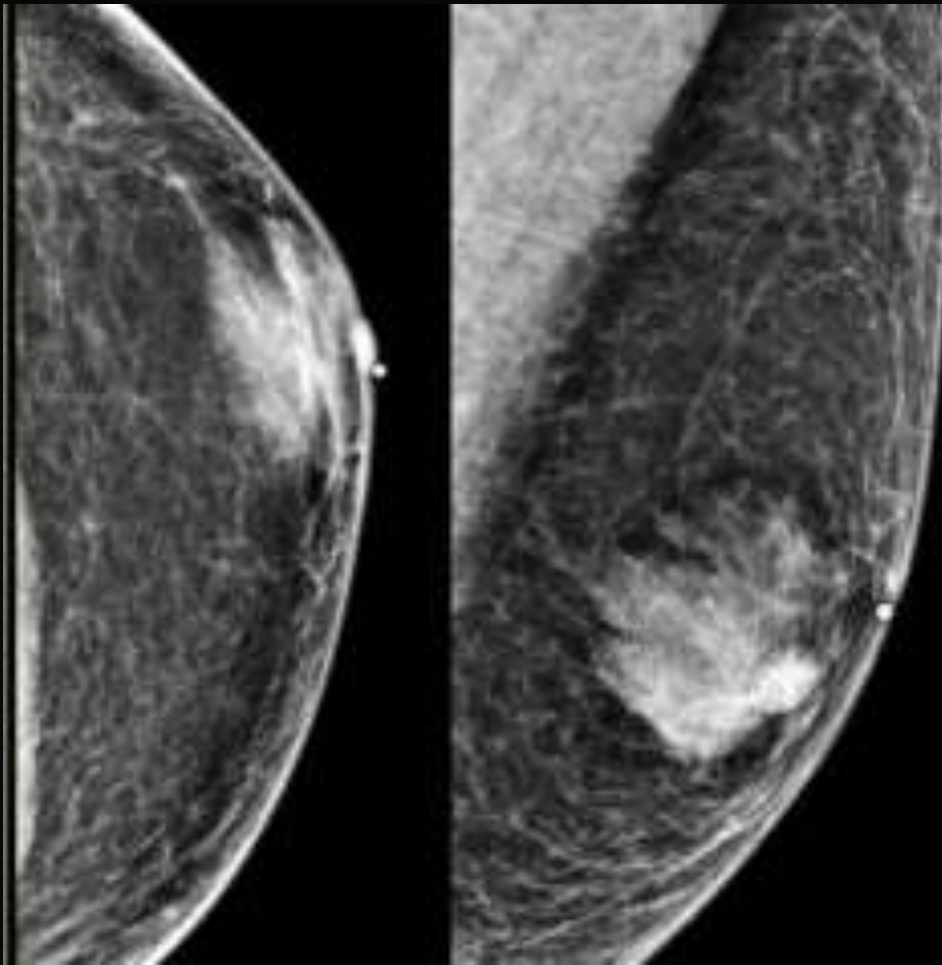


Suspicious ultrasound appearance
ie irregular mass with angular margins

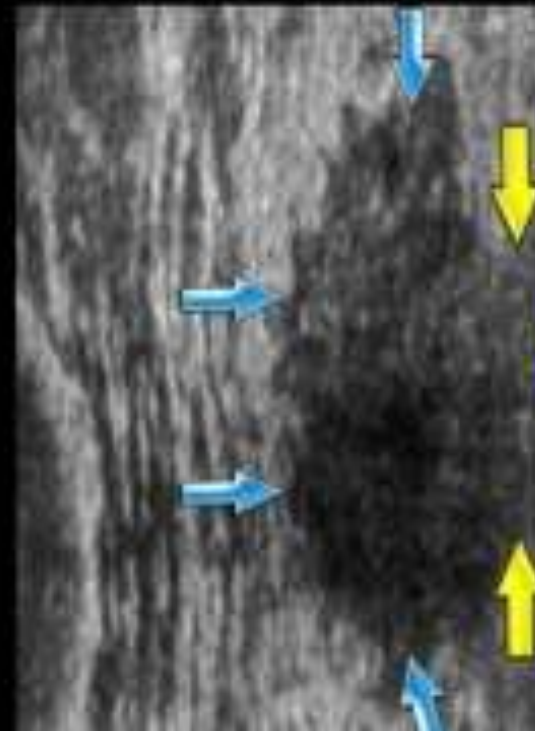
Gynecomastia: Unilateral breast mass on CT



Gynecomastia



Suspicious ultrasound appearance
ie irregular mass with
spiculated and microlobulated margins



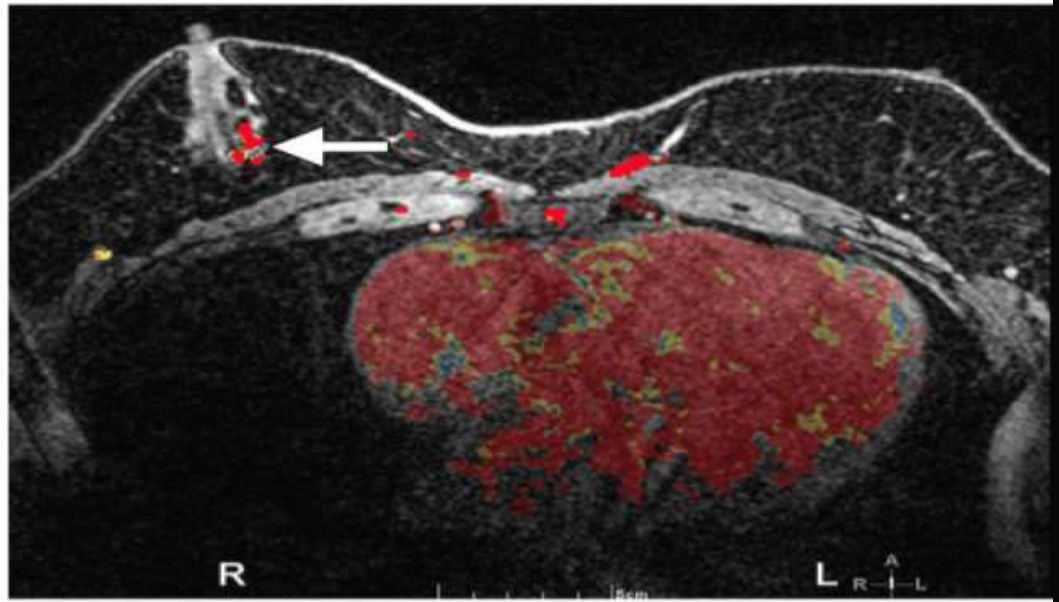
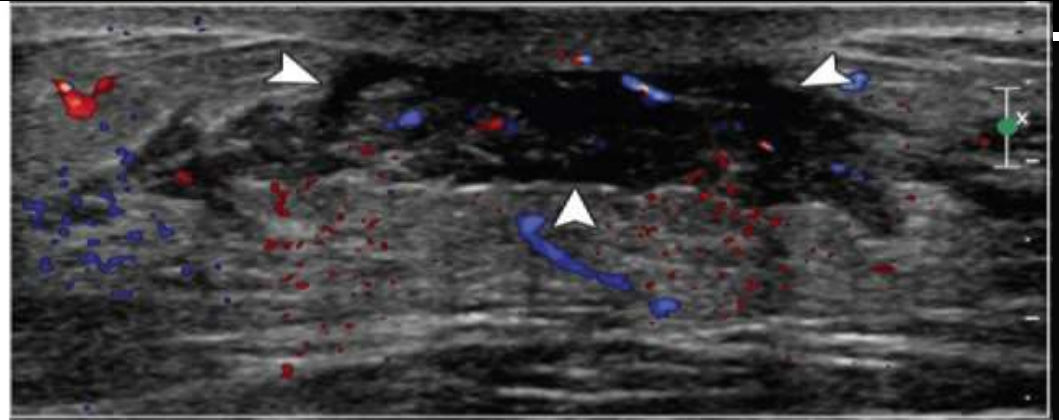
Nipple

Gynecomastia

Chronic Dendritic Pattern (chronic phase):

- Seen in patients with gynecomastia >1 year
- Pathologic rather than imaging diagnosis
- “Flame-shape” and may extend to upper outer quadrant
- Fibrosis is dominant process, usually irreversible
- Mammograms typically show a dendritic retroareolar density with posterior linear projections radiating into the surrounding tissue toward the upper-outer quadrant

Gynecomastia: Unilateral on US, MR

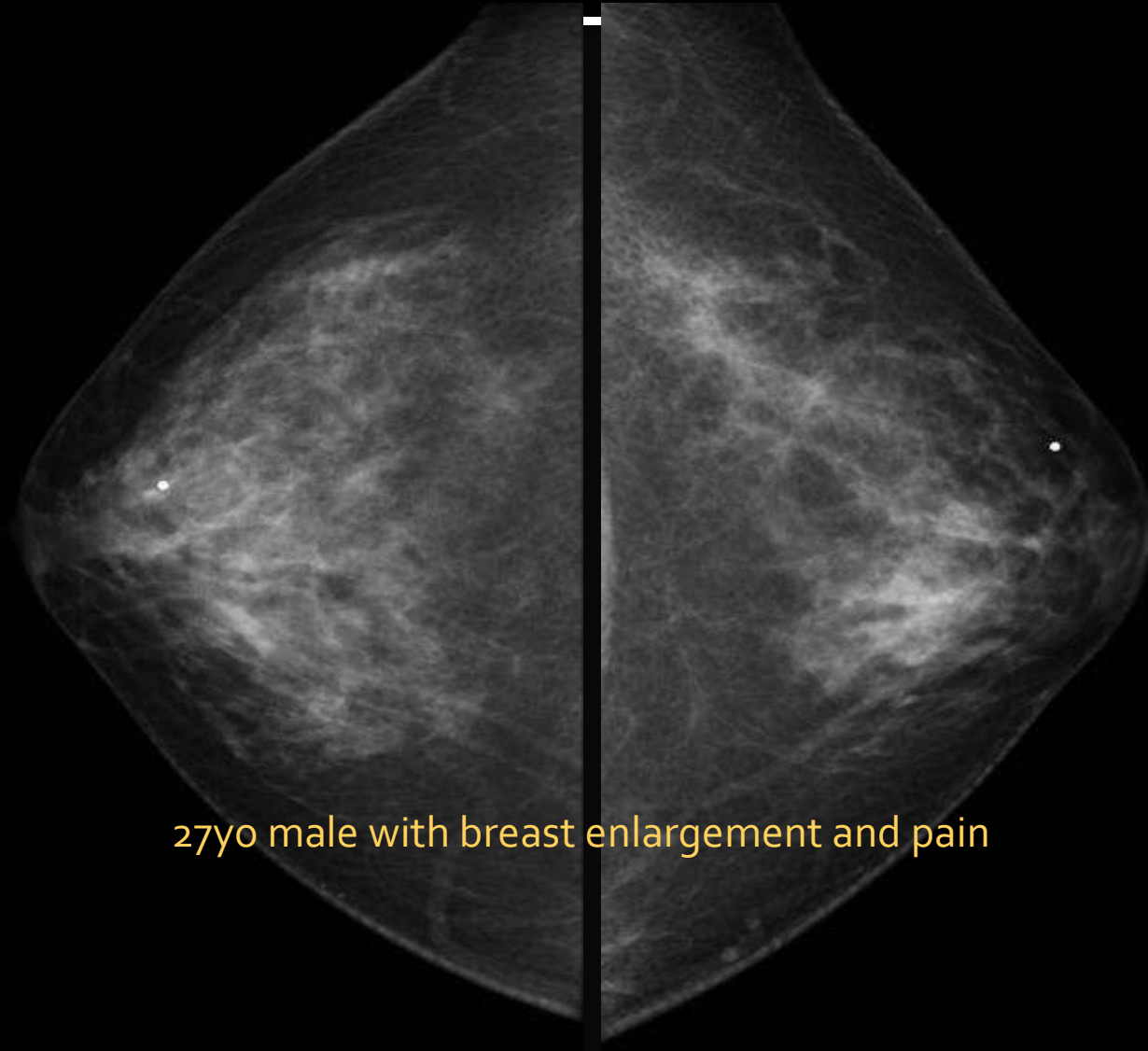


Gynecomastia

Diffuse Glandular Pattern:

- Most often seen in patients receiving exogenous estrogen
- Mammography demonstrates large breasts w/ diffuse density containing both dendritic and nodular features

Gynecomastia: Diffuse

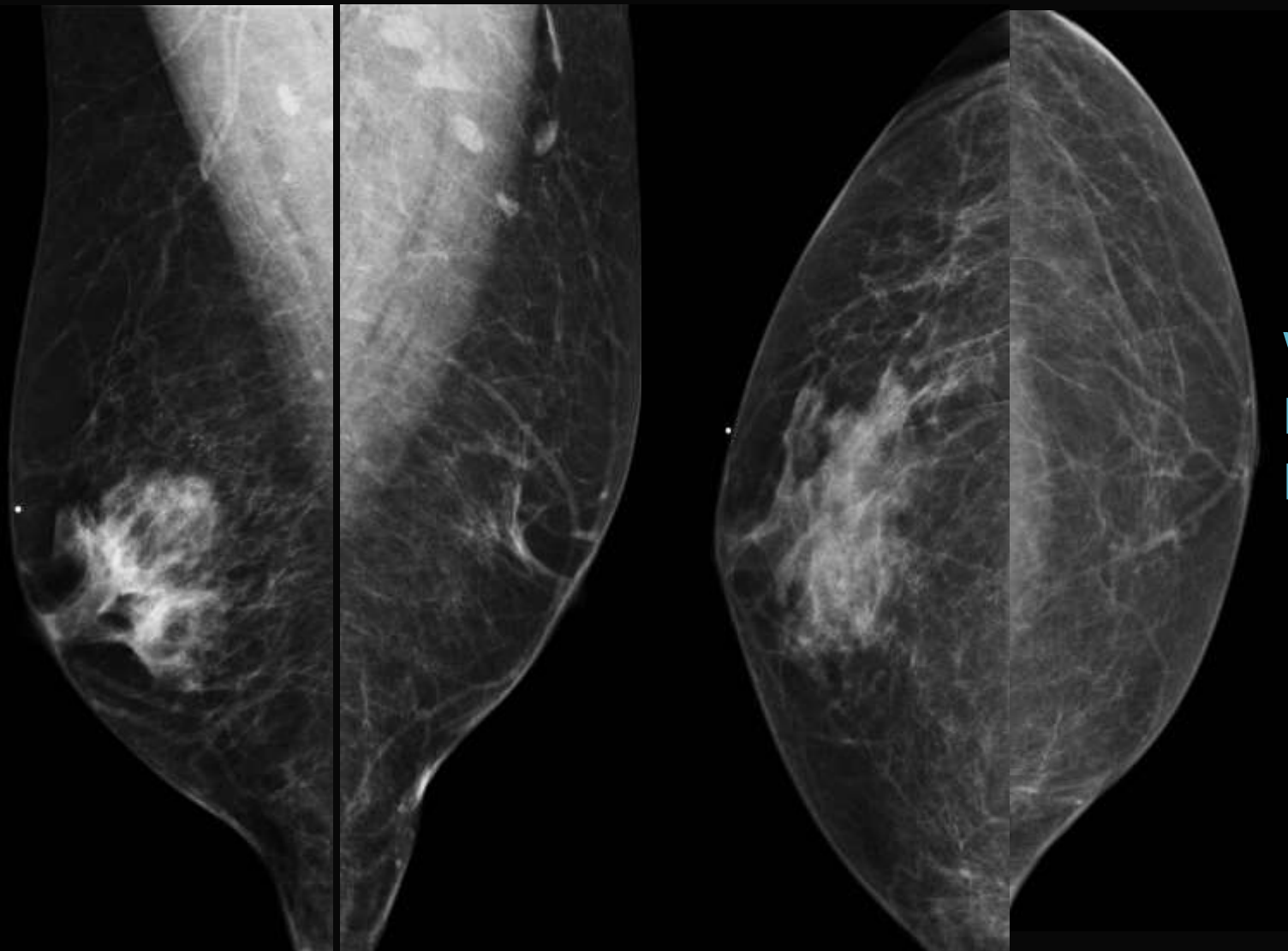


27yo male with breast enlargement and pain

Gynecomastia

- Most common abnormality in the male breast
- Bi-modal: pre or peri-pubertal, and >50yrs (tri-modal if you want to include neonate)
- Central to nipple, unilateral or bilateral, symmetric or asymmetric, and truthfully, it can occur at any age
- Unilateral or asymmetric in majority
- No secondary features such as axillary LN
- Associated with increased levels of estrogen (seen in puberty, elderly males, cirrhosis, testicular tumors or other hormone producing tumors, gender reassignment), androgen deficiency, renal failure, HIV, nonprescription meds heavy marijuana use, and prescription meds anti-depressants, B-blockers

Unknown Case #1 71yo male right breast mass



WORKUP?
FINDINGS?
DDx?

Gynecomastia Rule of 3s



- * 3 times for gynecomastia: neonate, puberty, senescence
- * 3 types gynecomastia: nodular, dendritic, diffuse
- * 3+ etiologies
gynecomastia: physiologic, drugs, hyperestrogen, systemic (cirrhosis, CRF)
- * Gynecomastia: soft tender mass, mobile, bilateral, central to nipple, typical mammogram flame-shaped appearance with no secondary features, no axillary LN

Gynecomastia Rule of 3s



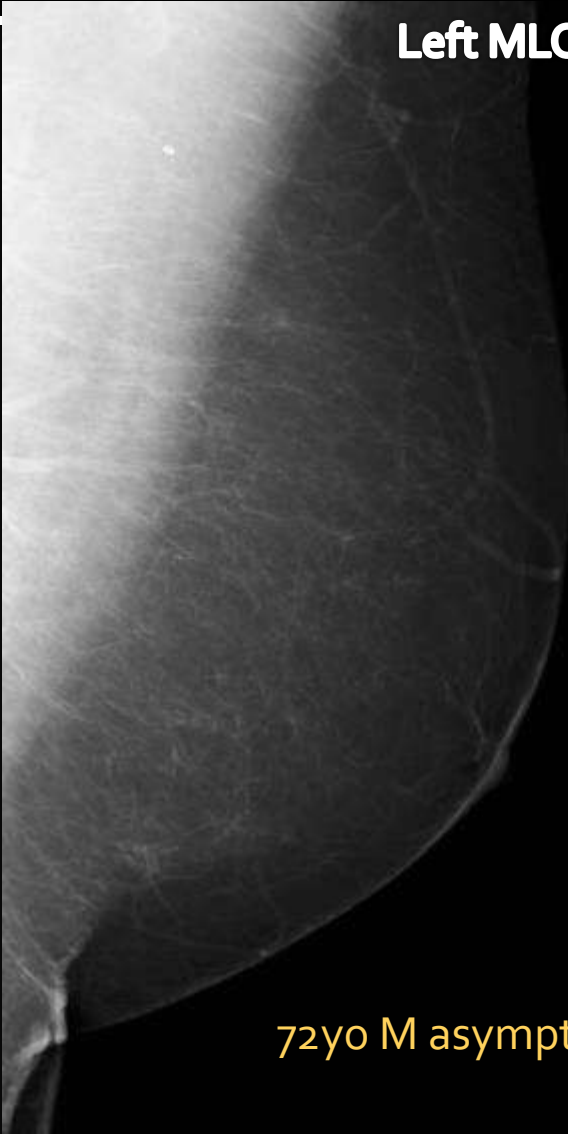
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Pseudogynecomastia

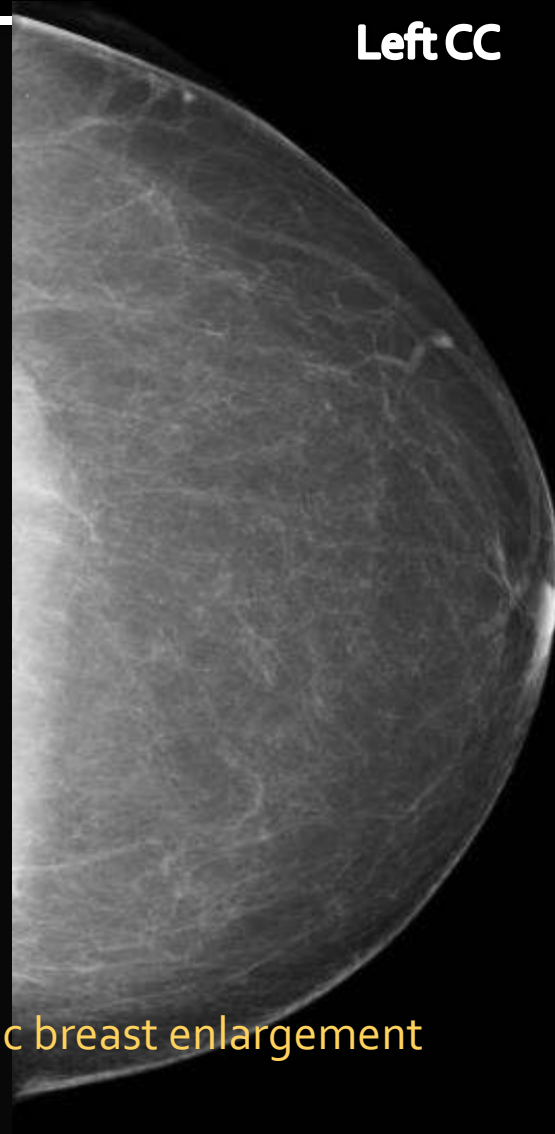
- Usually bilateral
- No palpable mass
- Excessive fat deposition in the breasts
- Results from genetic normal variant, truncal obesity, and occasionally in neurofibromatosis

Pseudogynecomastia

Left MLO



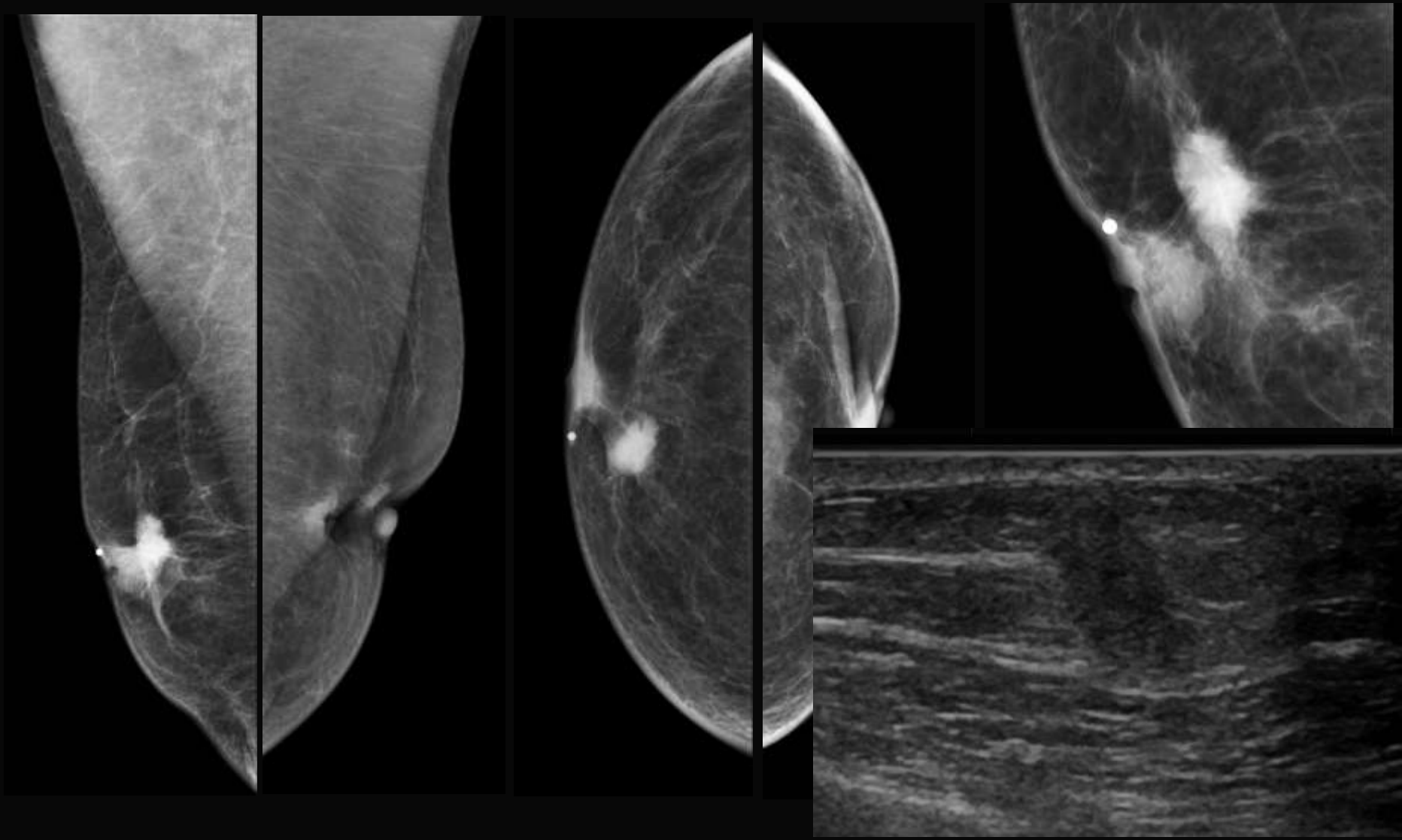
Left CC



72yo M asymptomatic breast enlargement

In Contrast . . .

72yo male right breast mass



Mammo

Irregular shape

Spiculated margins

High density

US

Irregular shape

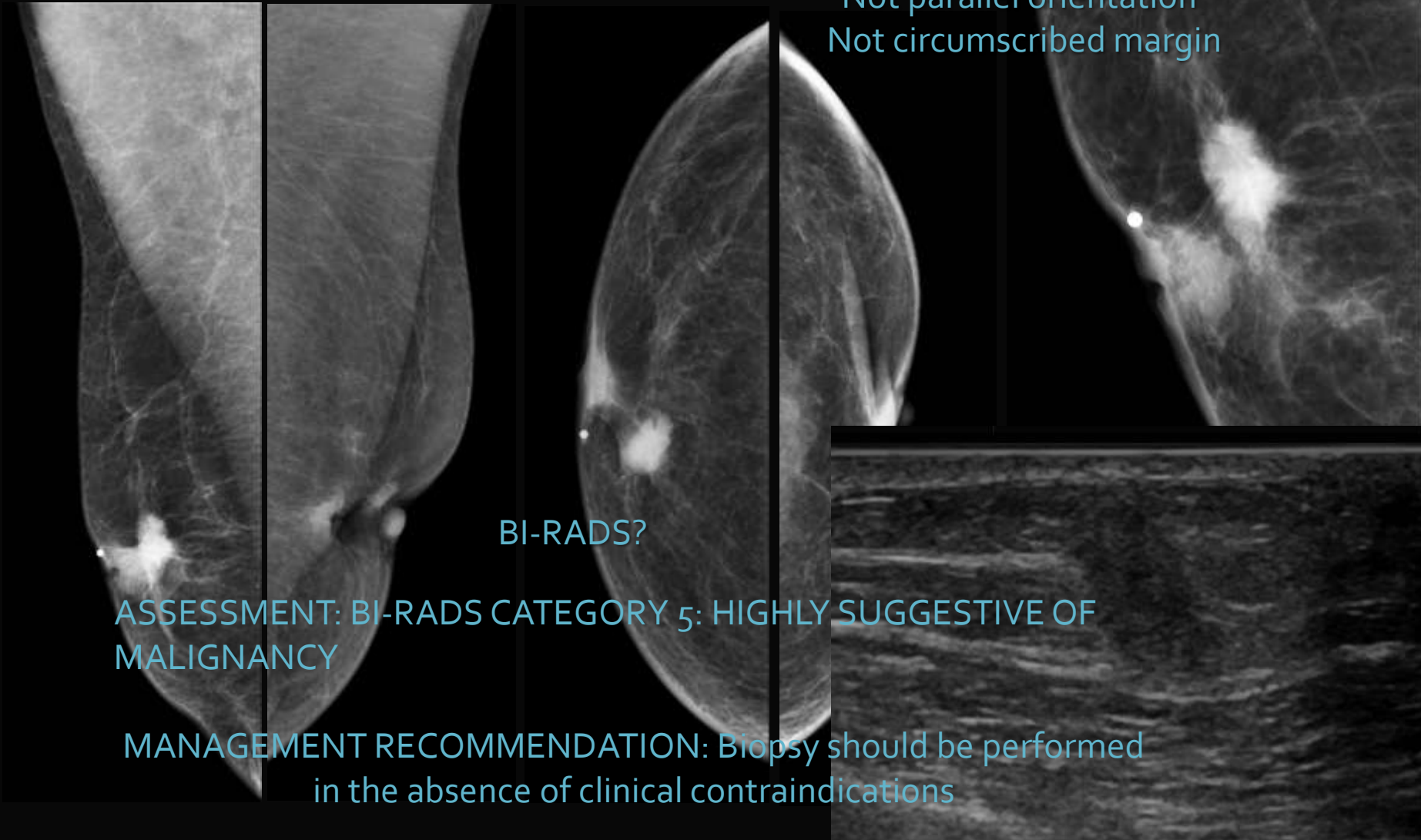
Not parallel orientation

Not circumscribed margin

BI-RADS?

ASSESSMENT: BI-RADS CATEGORY 5: HIGHLY SUGGESTIVE OF MALIGNANCY

MANAGEMENT RECOMMENDATION: Biopsy should be performed in the absence of clinical contraindications



Male Breast Cancer

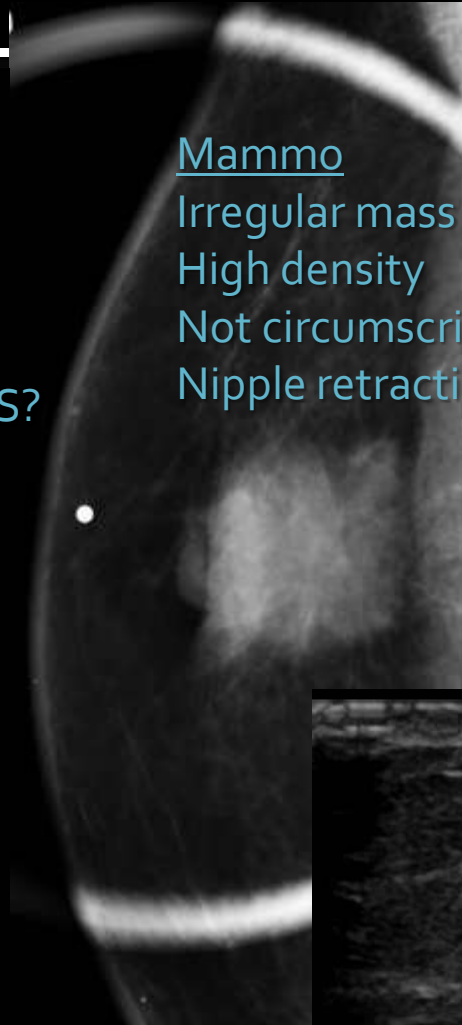


- * Male breast CA: soft or firm nontender mass, nonmobile or mobile; unilateral; eccentric to nipple, typical mammogram irregular hyperdense mass may have calcifications, skin thickening, nipple retraction, axillary LN, ie secondary features
- * Histologies: IDC NOS, DCIS, Invasive papillary
- * Males > 60 years
- * 2014 male new breast CA: 2,240 deaths: 410

PRACTICE CASE: 67yoM with right breast mass



FINDINGS?



Mammo

Irregular mass

High density

Not circumscribed margin, spiculated

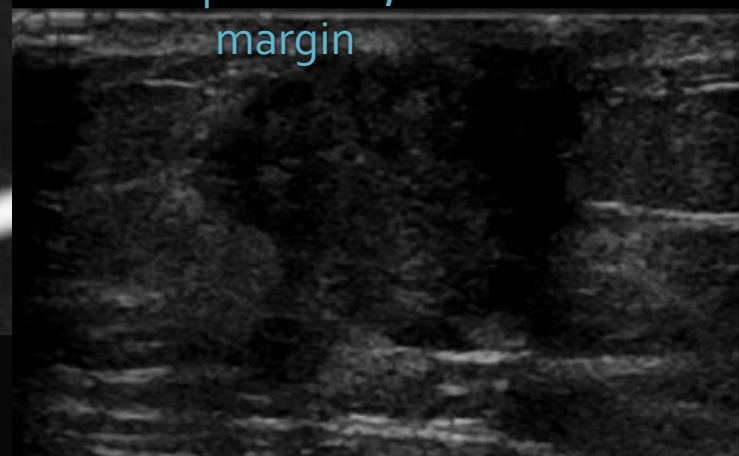
Nipple retraction

US

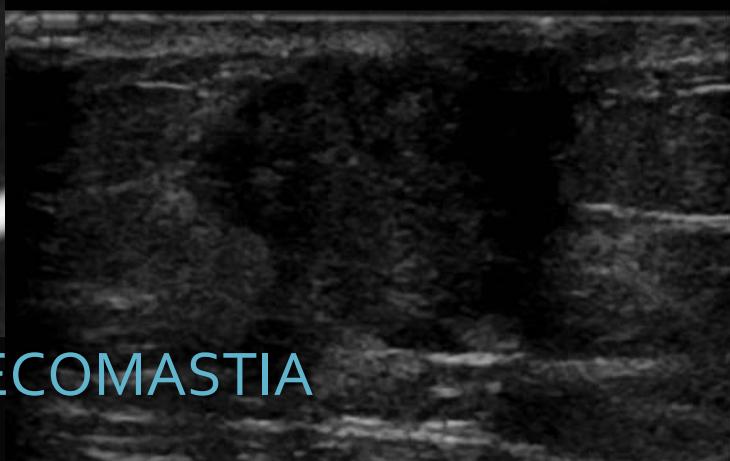
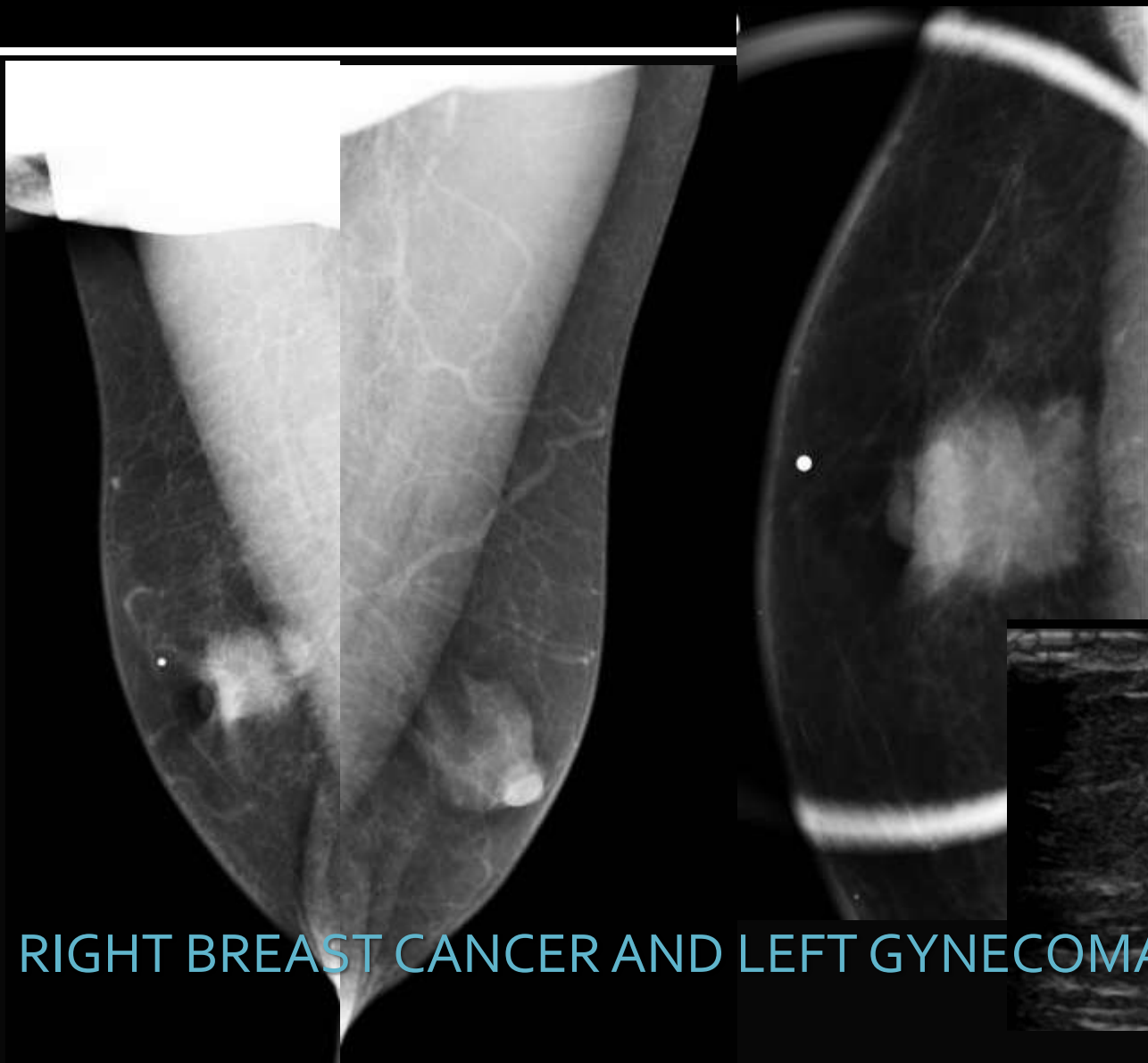
Irregular mass

Not parallel

Spiculated, microlobulated
margin



PRACTICE CASE: 67yoM with right breast mass



RIGHT BREAST CANCER AND LEFT GYNECOMASTIA

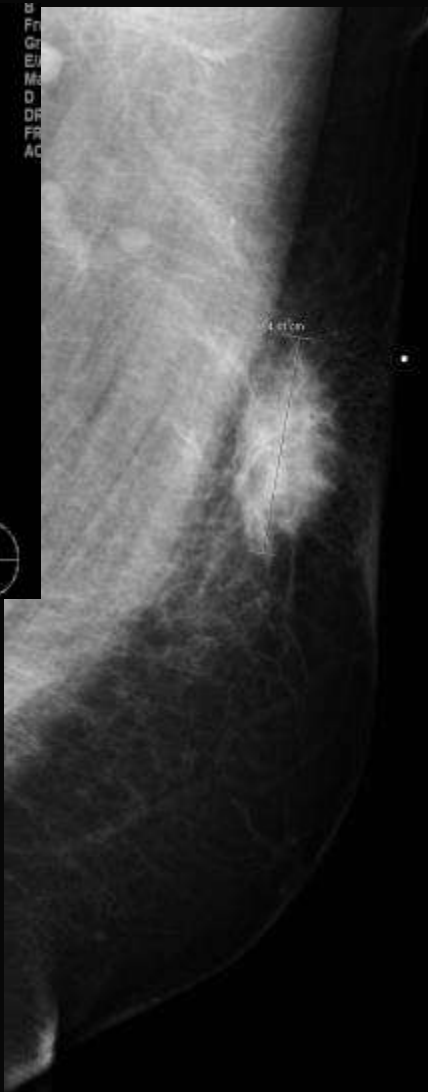
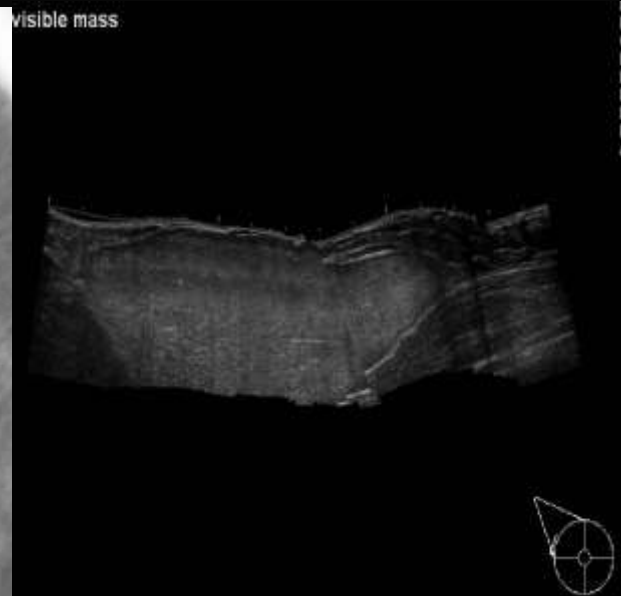
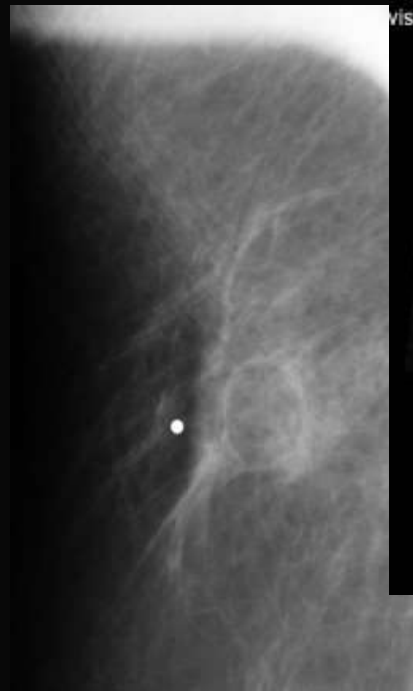
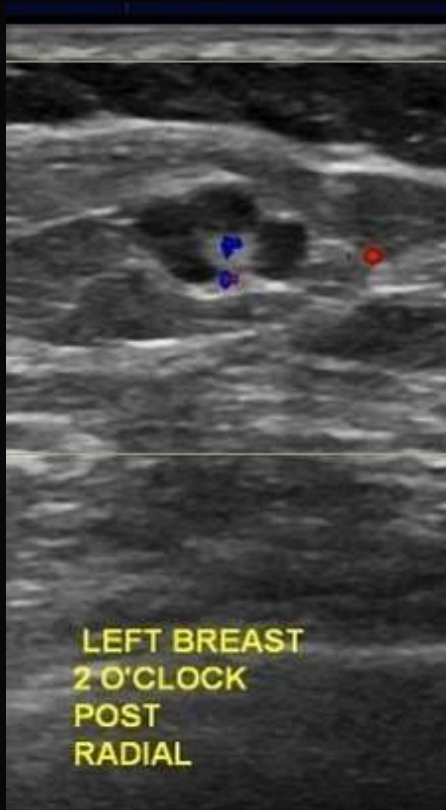
Male Breast Diseases Take Homes

- * Gynecomastia is most common etiology mass
- * Male breast CA <1% of breast cancers. NOT Infiltrating lobular

All other disease present analogous appearance to female:

- * Male breast abscess - typically present as tender palpable mass with erythema warmth. Rx male breast abscess is similar to female
- * Hematoma - antecedent trauma or anticoagulant therapy, complex mass
- * Male breast other - IMLN, EIC, fat necrosis, lipoma /granular cell tumor / other mesenchymal tumors, papillary breast disease

Breast masses in Males - Classic appearance



- Intramammary lymph node
- Oil cyst
- Lipoma and other Mesenchymal tumors
- Hematoma
- Abscess

Remember

- All lesions eccentric to the nipple need biopsy unless they are characteristically benign, i.e. contain fat, resemble abscess, s/p trauma, or are typical of lymph node
- Carcinoma is eccentric (may be subtle), while gynecomastia is *never* eccentric
- Interrogate axilla during diagnostic evaluation.
Surgical Rx male breast cancer Mastectomy, SNI
- Oft delay in dx; stage for stage, male breast cancer prognosis is the same as breast cancer in women

Lecture Outline

Male Patient

- Distinguishing Gynecomastia, Breast Cancer
- Other Male Breast Masses

Transgender Patient

Pregnant & Lactating (PostPartum) Patient

- Benign Masses and PABC
- Puerperal Mastitis and Abscess

Transgender Patient

- Transgender individuals are people who feel an incongruity between their self-identified gender & their birth gender
- Patients may simply live their lives as members of the opposite sex, they may choose to undergo partial transition with hormonal therapy and/or some minor physical changes, or complete the transition with genital reassignment surgery

Transgender Patient

Surgical Options

- Male-to-Female Breast/chest surgery: augmentation mammoplasty (implants/lipofilling)
- Female-to-Male Breast/chest surgery: subcutaneous mastectomy, chest contouring

Hormonal Options

- Male-to-Female: Estrogen therapy
- Female-to-Male: Testosterone therapy

Transgender Patient

Surgical Options

- Male-to-Female Breast/chest surgery: augmentation mammoplasty (implants/lipofilling)
- Female-to-Male Breast/chest surgery: subcutaneous mastectomy, chest contouring

Hormonal Options

- Male-to-Female: Estrogen therapy*
- Female*-to-Male: Testosterone therapy

**breast cancer risk*

Transgender Patient

Phillips et al. Breast Imaging the Transgender Patient. AJR 2014; 202:1149–1156

- Because none of the breast cancer data registries ask or record a patient's transgender status, we have no knowledge of the incidence of breast cancer in this population
- Screening Recommendations for **Transgender Women:**
≥50 years old with past or current hormone use
*Annual mammography if the patient has additional risk factors: a. Estrogen & progestin use for > 5 years b. Body mass index > 35 c. Family history of breast cancer

Transgender Patient

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≥50 years old with past or current hormone use
*Annual mammography if the patient has additional risk factors: a. Estrogen & progestin use for > 5 years b. Body mass index > 35 c. Family history of breast cancer
- If no hormone use
*Routine screening is not indicated unless additional risk
Klinefelter's syndrome

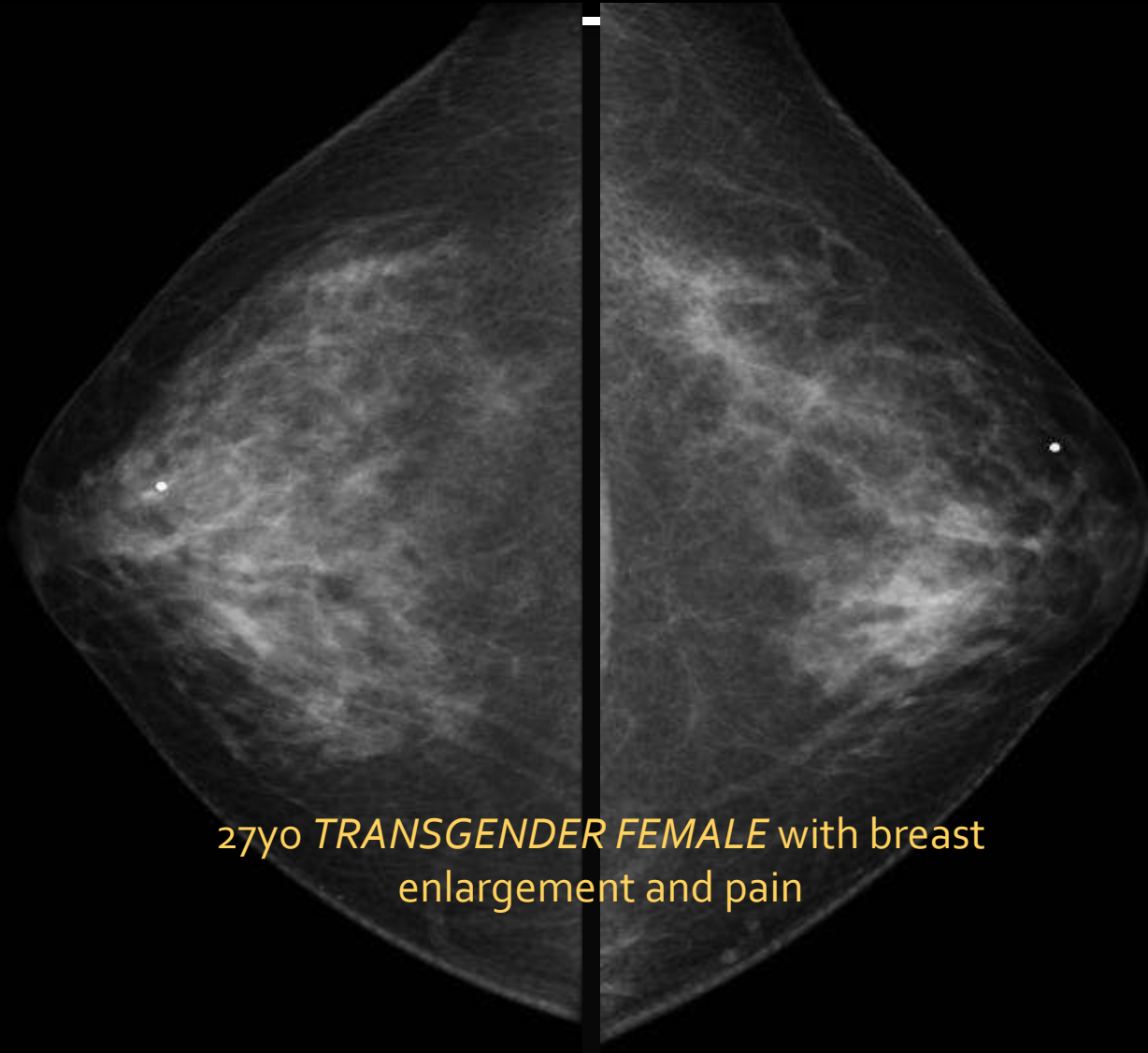
Transgender Patient

Phillips et al. Breast Imaging the Transgender Patient. AJR 2014; 202:1149–1156

Imaging Findings

- Physiologic changes of HRT
- Breast tissue will increase over time, reaching maturity by 2–3 years with a more pronounced nipple-areola complex
- Transgender women can develop a spectrum of breast tissue density including heterogeneously dense and extremely dense breast tissue
- The breast tissue that develops should not be referred to as gynecomastia

~~Gynecomastia~~ *Heterogeneously dense normal*



27yo *TRANSGENDER FEMALE* with breast
enlargement and pain

Transgender Patient

Phillips et al. Breast Imaging the Transgender Patient. AJR 2014; 202:1149–1156

Transgender women:

- **Breast cancer** can occur with appearance same as in natal women
- Concern for a new palpable mass *especially* if the patient has been on hormonal therapy for >5 years
- Invasive ductal or invasive lobular carcinoma

Transgender men:

- Those who have not had 'top surgery' have **similar lifetime risk for breast cancer** as natal women and therefore Annual mammography is recommended >40yo

Transgender Patient

Phillips et al. Breast Imaging the Transgender Patient. AJR 2014; 202:1149–1156

Transgender men:

- Those who have not had 'top surgery' have **similar lifetime risk for breast cancer** as natal women and therefore Annual mammography is recommended >40yo
- Once undergoes bilateral subcutaneous mastectomies with male chest contouring including nipple repositioning as part of sex reassignment surgery, his breast cancer risk dramatically decreases by nearly 90% and therefore Screening mammography is not indicated

Lecture Outline

Male Patient

- Distinguishing Gynecomastia, Breast Cancer
- Other Male Breast Masses

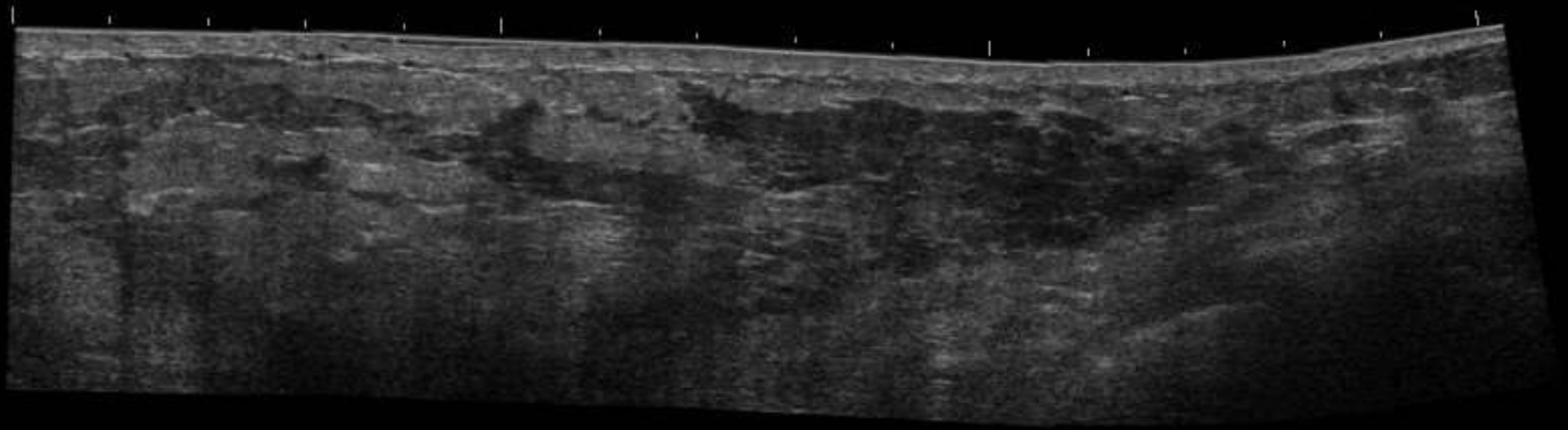
Transgender Patient

Pregnant & Lactating (PostPartum) Patient

- * Benign Masses and PABC
- * Puerperal Mastitis and Abscess

Unknown Case #2

33yo lactating female
left breast pain erythema



Expanded Field of View US can be extremely helpful in highlighting architectural distortion



Pregnant & Lactating Breast

Physiologic Changes

Non-Pregnant Breast: TDLU and Stromal background

Pregnant Breast:

1st trimester Estrogen yields • Lobular & ductal growth • Involution of fibrofatty stroma • Increase in vascularity often associated with infiltration by mononuclear cells

2nd & 3rd trimester Progesterone yields • Marked lobular growth • Cellular enlargement • Stromal decrease

Lactating Breast: Prolactin, insulin, steroids, oxytocin yield Secretion in distended lobular glands and Milk ejection

DDx Breast Masses & Utility of US

PREGNANT & LACTATING

1. (FA)
2. (Cyst)
3. Lactating adenoma
4. Galactocele
5. Puerperal mastitis / abscess
6. Pregnancy-associated breast cancer (PABC)

ULTRASOUND

1. Modality of choice in these women
2. Non ionizing
3. Non invasive
4. Easy to perform
5. Cost effective
6. Majority of lesions are benign and those that aren't typically follow rules ie BI-RADS Ultrasound

Ultrasound Features of Benignity

- **Oval shape**
- **Parallel orientation**
- **Circumscribed margins**
- **Anechoic, Hyperechoic echogenicity**
- **Enhanced or no posterior acoustic features**

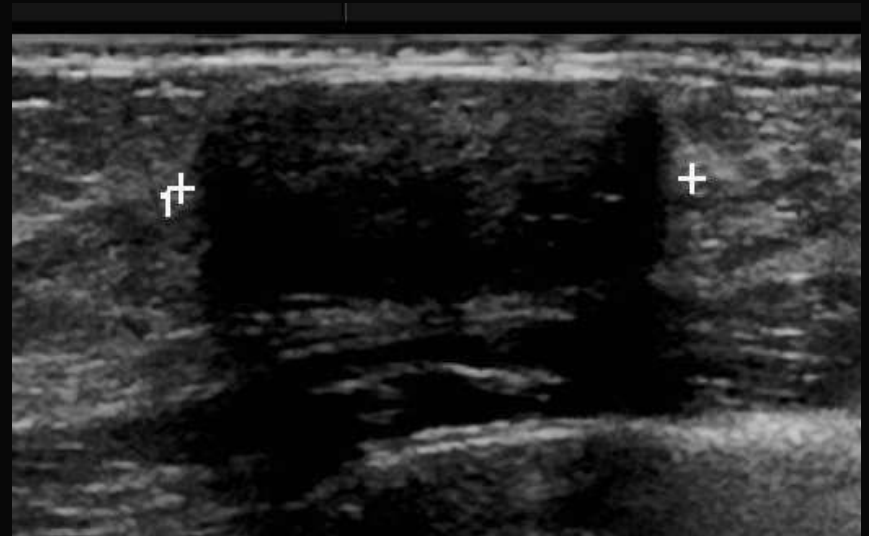
Mendelson EB, Böhm-Vélez M, Berg WA, et al. ACR BI-RADS® Ultrasound. In: ACR BI-RADS® Atlas, Breast Imaging Reporting and Data System. Reston, VA, American College of Radiology; 2013.

Ultrasound Features of Malignancy

- Irregular (round) **shape**
- Not parallel **orientation**
- Not circumscribed (indistinct, angular, microlobulated, spiculated) **margins**
- Hypoechoic, isoechoic, complex cystic and solid, and heterogeneous **echogenicity**
- No, shadowing, or combined **posterior acoustic features**
- Architectural distortion, skin thickening, skin retraction, edema **associated features**

Mendelson EB, Böhm-Vélez M, Berg WA, et al. ACR BI-RADS® Ultrasound. In: ACR BI-RADS® Atlas, Breast Imaging Reporting and Data System. Reston, VA, American College of Radiology; 2013.

Ultrasound Features Mass Characterization



DDx Breast Masses

PREGNANT & LACTATING

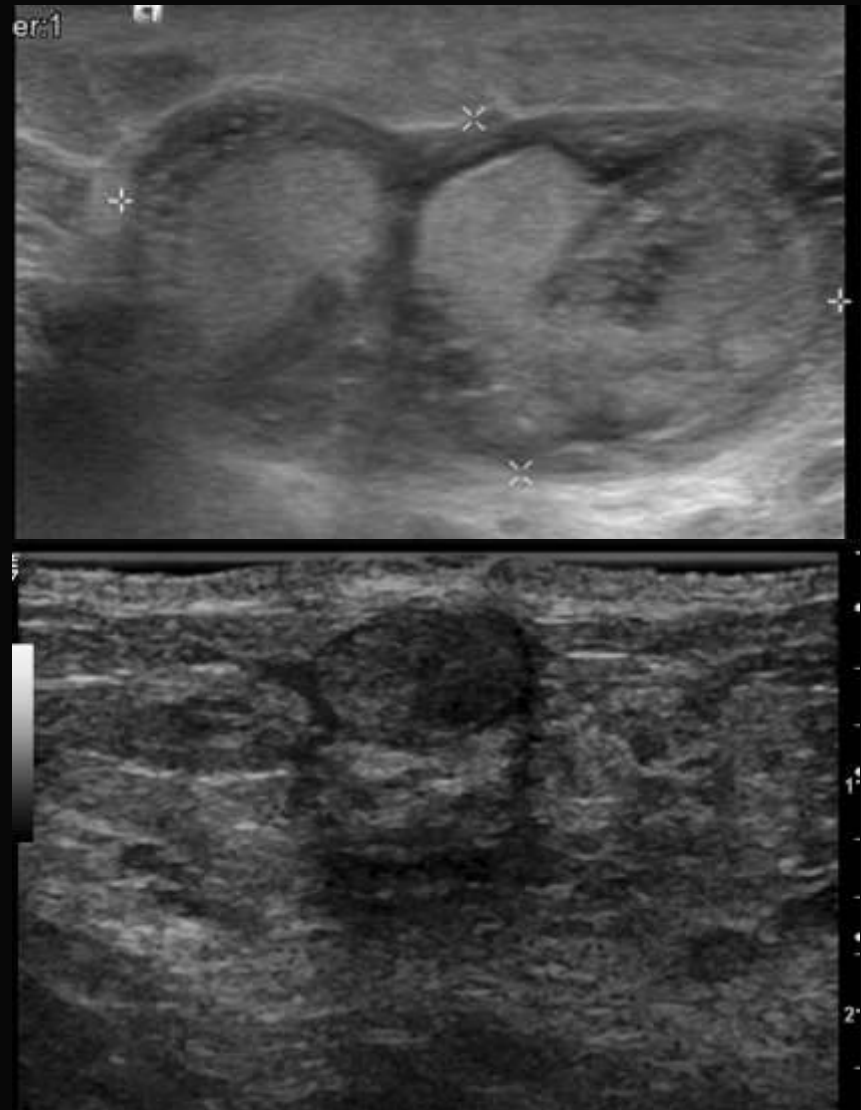
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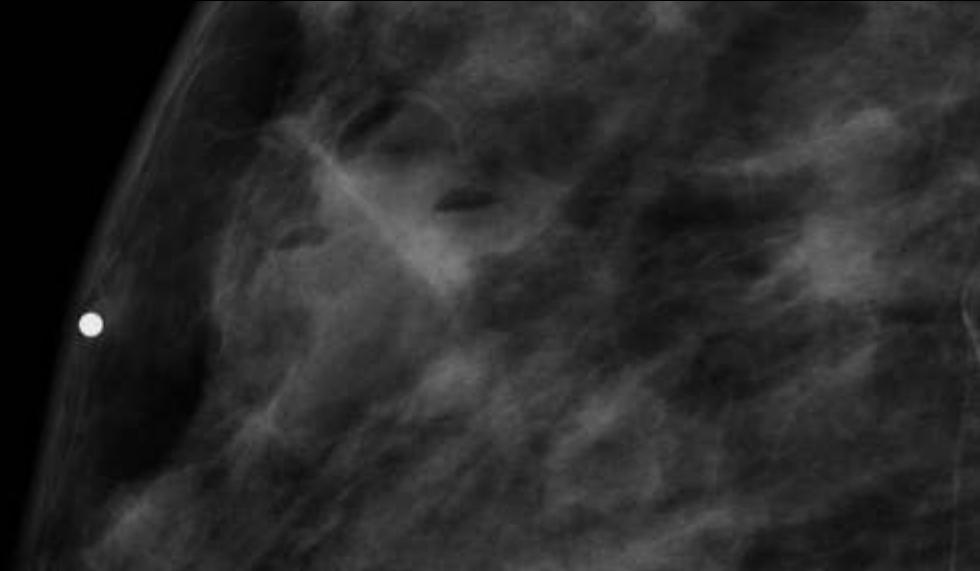
Galactocele

- * Benign mass with milk contents
- * Results from obstructed milk duct
- * During and following cessation of lactation
- * Most regress over time
- * Aspiration can be diagnostic and therapeutic
- * Oval or round, variable internal echogenicity
- * Fat-fluid level



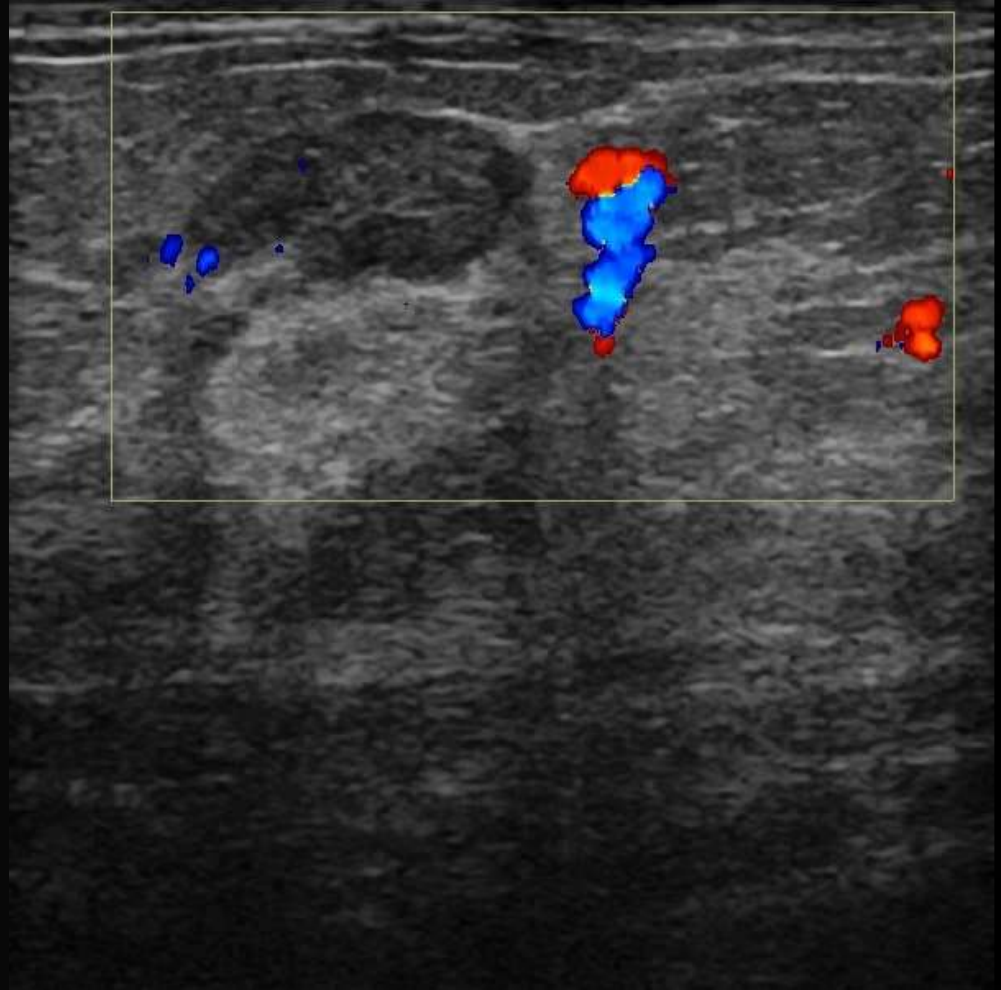
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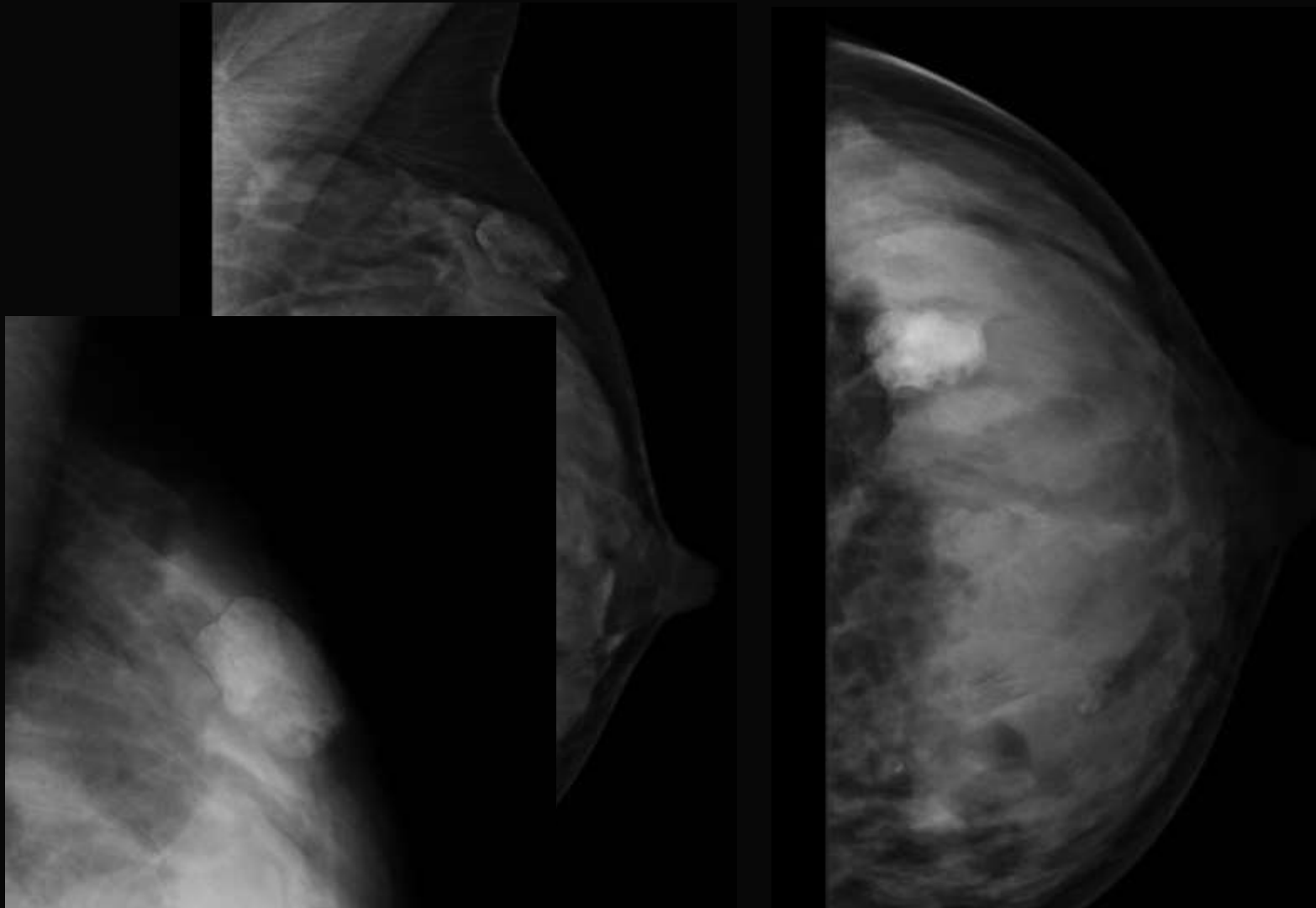
Lactating Adenoma

- * Variant of fibroadenoma, tubular adenoma, or lobular hyperplasia - Benign stromal tumors
- * Third trimester through lactation
- * Natural course is regression following cessation of breast feeding
- * Oval or lobulated



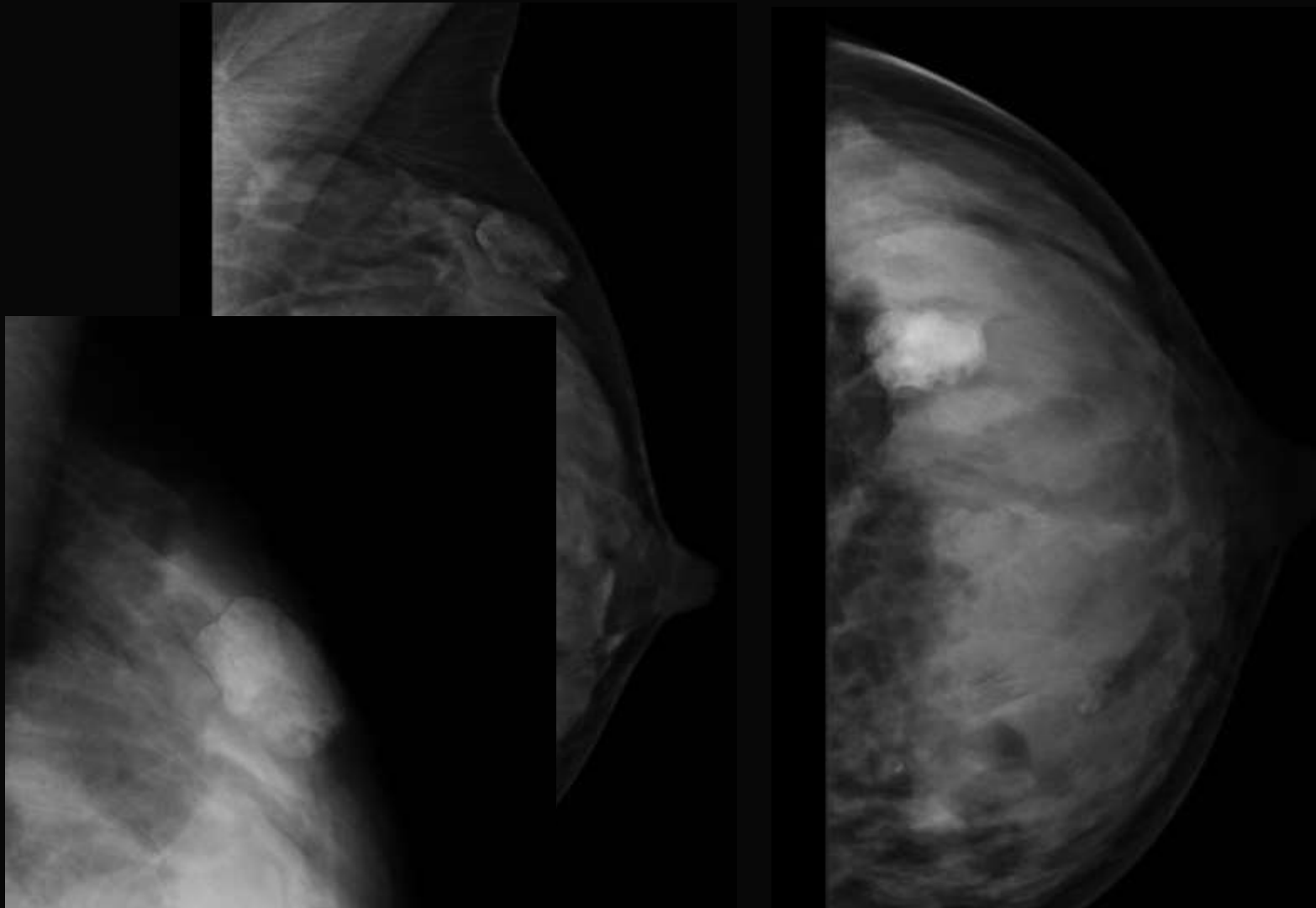
Lactating Adenoma

31yo lactating F bloody nipple discharge father BRCA gene mutation



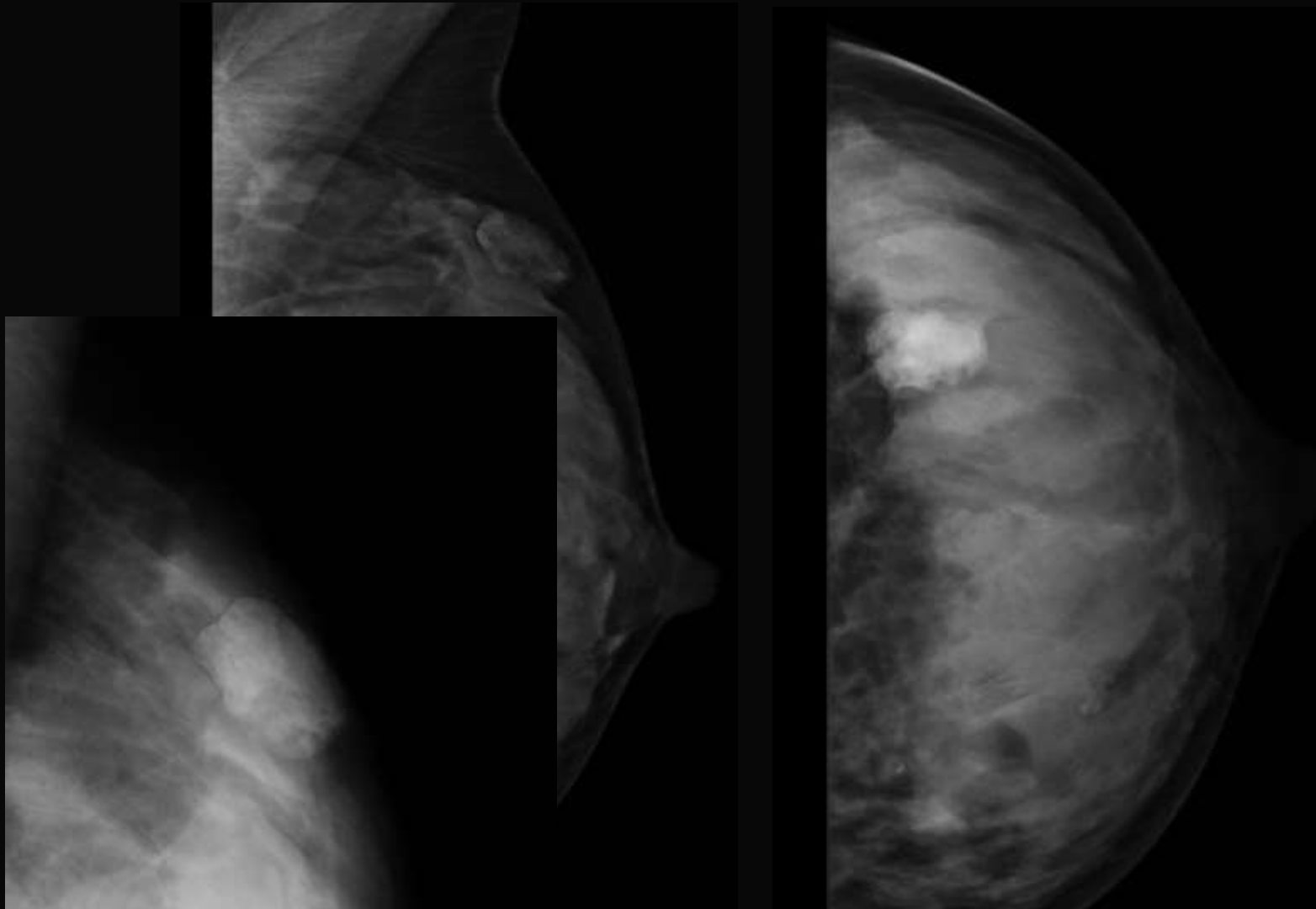
Lactating Adenoma

31yo lactating *F* bloody nipple discharge father BRCA gene mutation



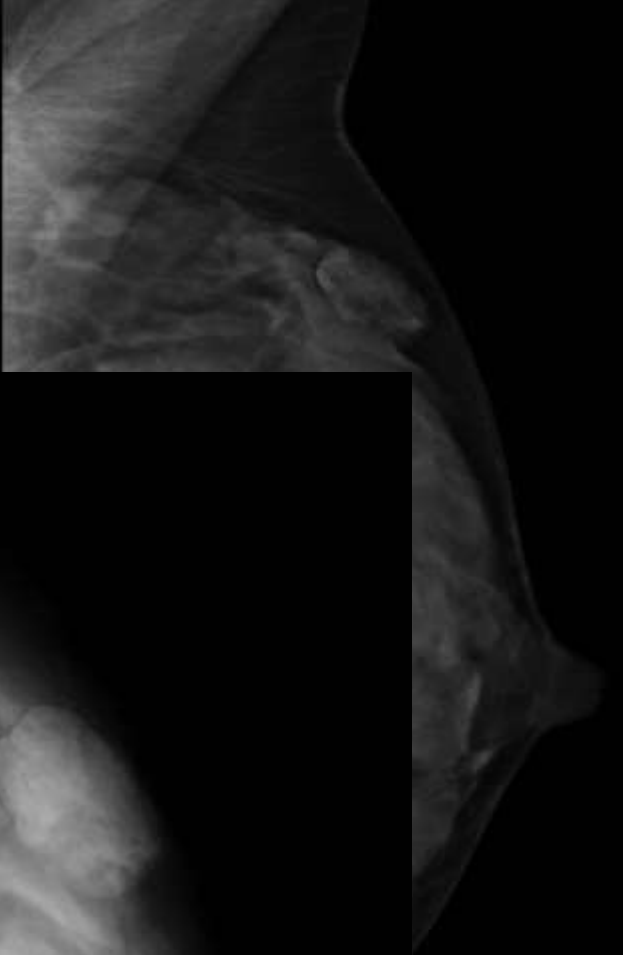
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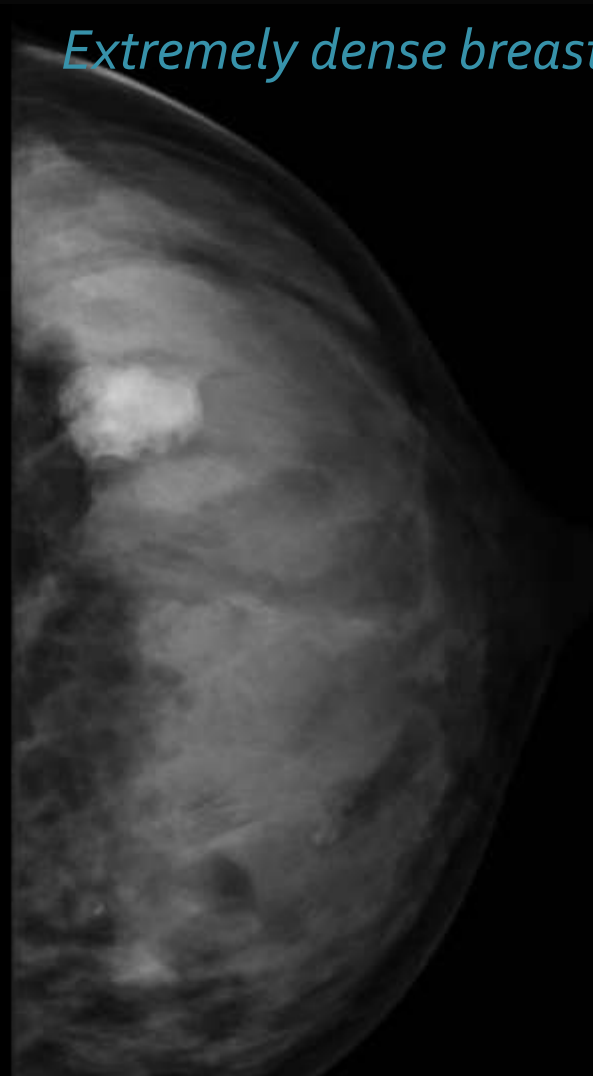


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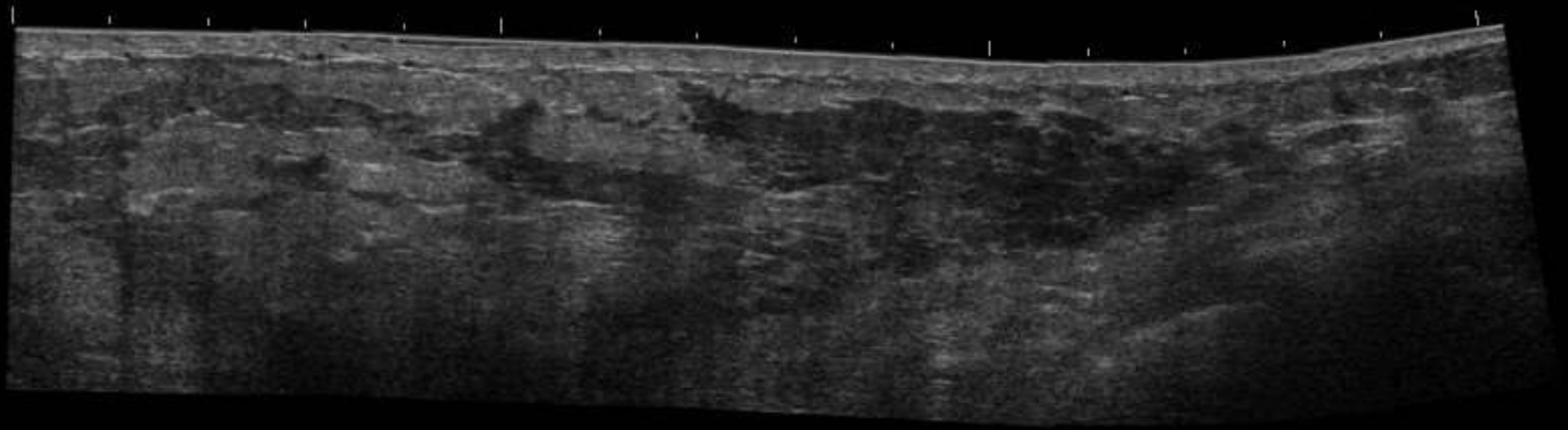


Extremely dense breast composition



Unknown Case #2

33yo lactating female
left breast pain erythema

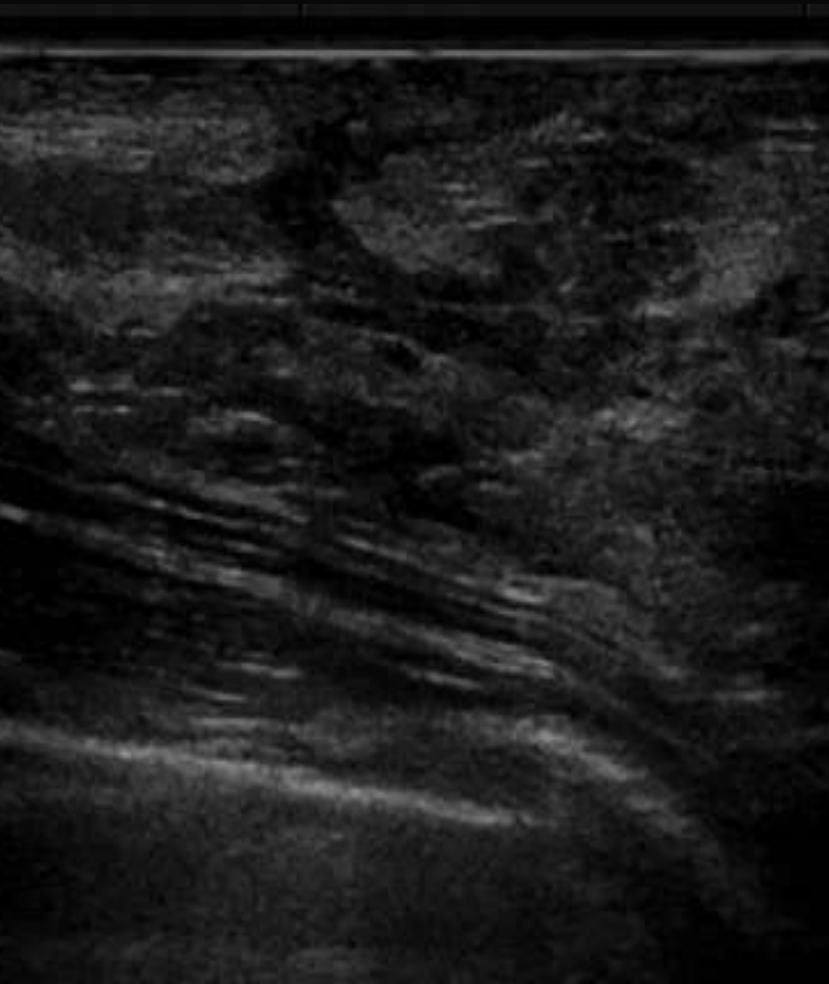


Expanded Field of View US can be extremely helpful in highlighting architectural distortion



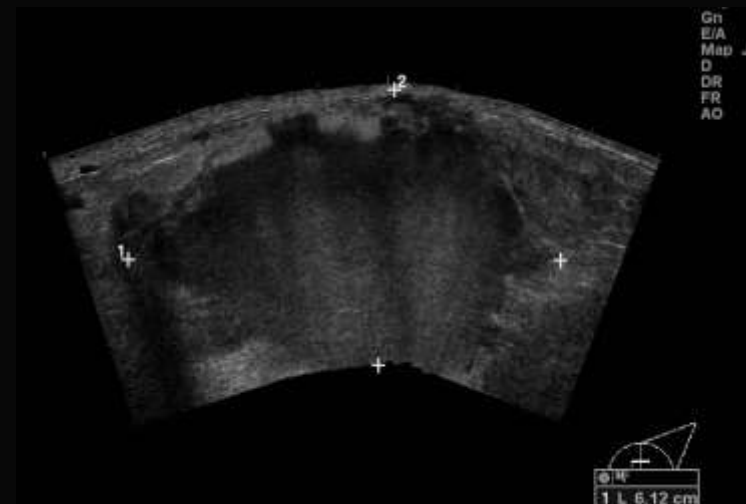
Puerperal Mastitis

35yo lactating F erythema and pain Lt versus normal asx pt Rt



Puerperal Mastitis Abscess

- * Progression of mastitis most common etiology
- * Delayed or inadequate antibiotic treatment
- * Staph aureus in nursing woman, also strep
- * Pain, erythema, edema, mass
- * US study of choice for diagnosis and IR guidance
- * Round or irregular complex mass, fluid-debris levels or mobile debris
- * US surveillance

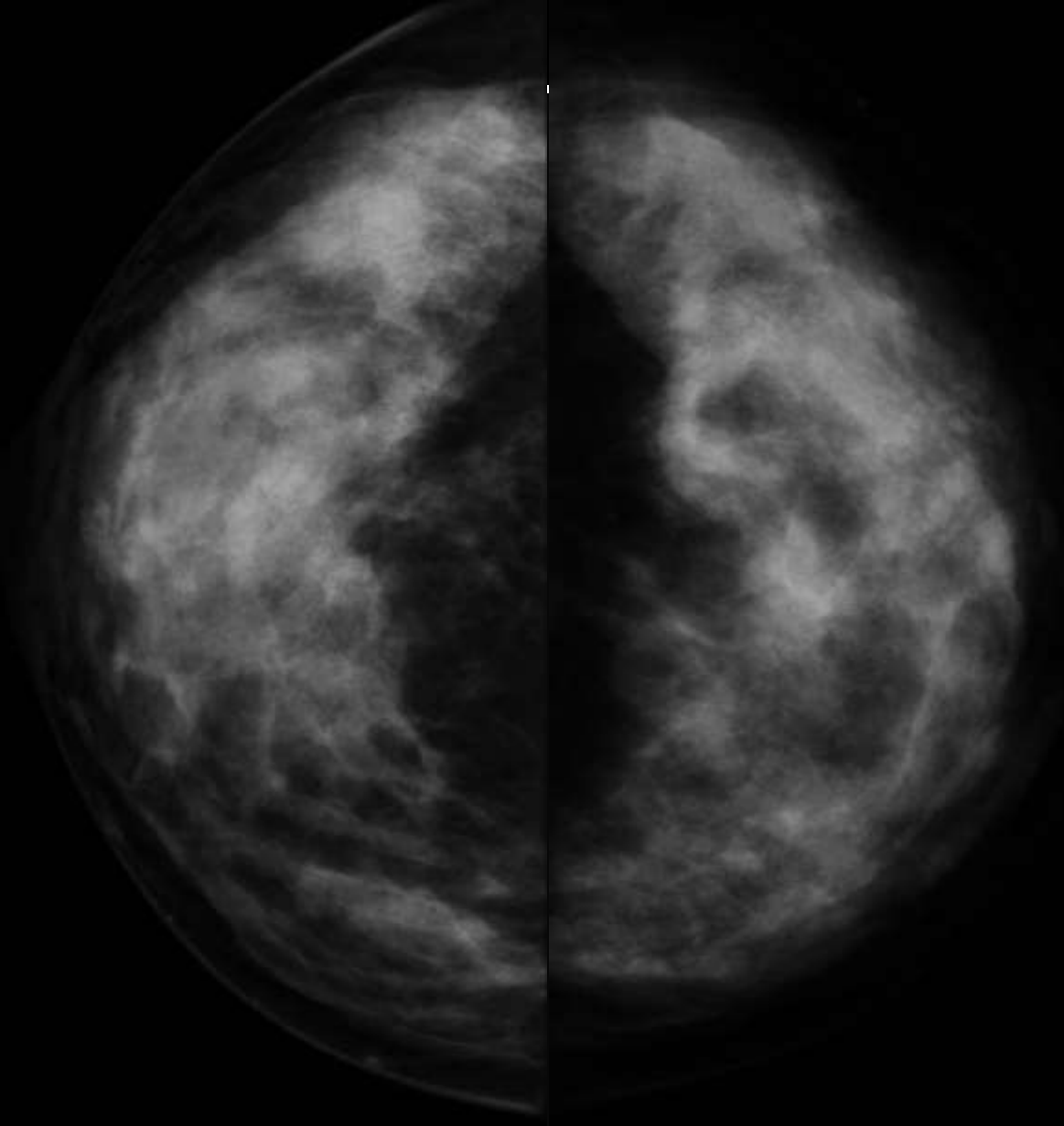


Pregnancy Associated Breast CA

- * PABC defined as breast cancer found during pregnancy or in the first year following
- * 1 in 3000 pregnancies complicated by breast CA
- * Increasing incidence
- * 50% are high grade and 80% are lymph node +
- * Poorer prognosis including recurrence < 3yrs
- * 90% present with palpable mass



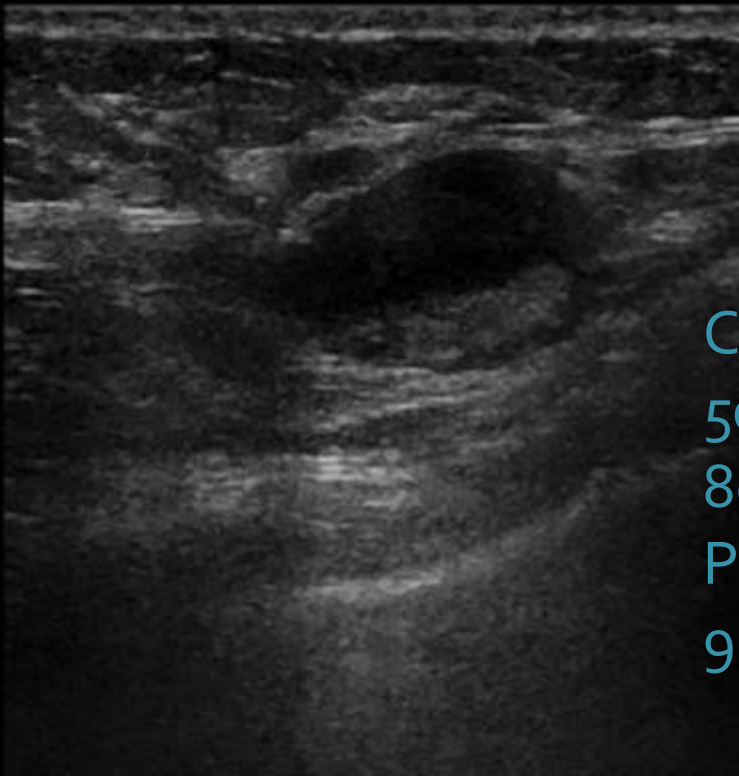
33yoF lactating, with left breast mass x 2mo



Next step?

33yoF lactating, with left breast mass x 2mo

GE
L7



Case Illustrates :

50% are high grade and

80% are lymph node +

Poorer prognosis

90% present with palpable mass

Pregnant & Lactating Take Homes

- * Though Cyst and FA are still commonly encountered consider the 4 DDx unique to pregnant and lactating patient
- * Unique clinical presentations with little overlap
- * **Puerperal Abscess** inflammatory sx early postpartum
- * **Lactating Adenoma** present like FA as painless, soft, mobile masses. They may also become infarcted and present atypically as a firm tender mass. Unique feature of LA is the tendency to occur earlier then regress after cessation of breast-feeding
- * **Galactocele** tendency to occur near cessation of breast-feeding
- * **PABC** defined as breast cancer found during pregnancy or in the first year following. Increasing incidence due to US maternal demographics. 50% are high grade and 80% are lymph node +. Poorer prognosis including recurrence < 3yrs. 90% present with palpable mass

Thank you very much!

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