



# Breast imaging

Dr. Desimpel Julie





# MAMMOGRAPHY AND ULTRASOUND

- Tissue composition / density
- Masses
  - Shape
  - Margin
- Calcifications
  - Typically benign
  - Suspicious morphology
- Associated features
  - Nipple retraction
  - Skin changes / lesions
  - Adenopathy
- Post surgery changes



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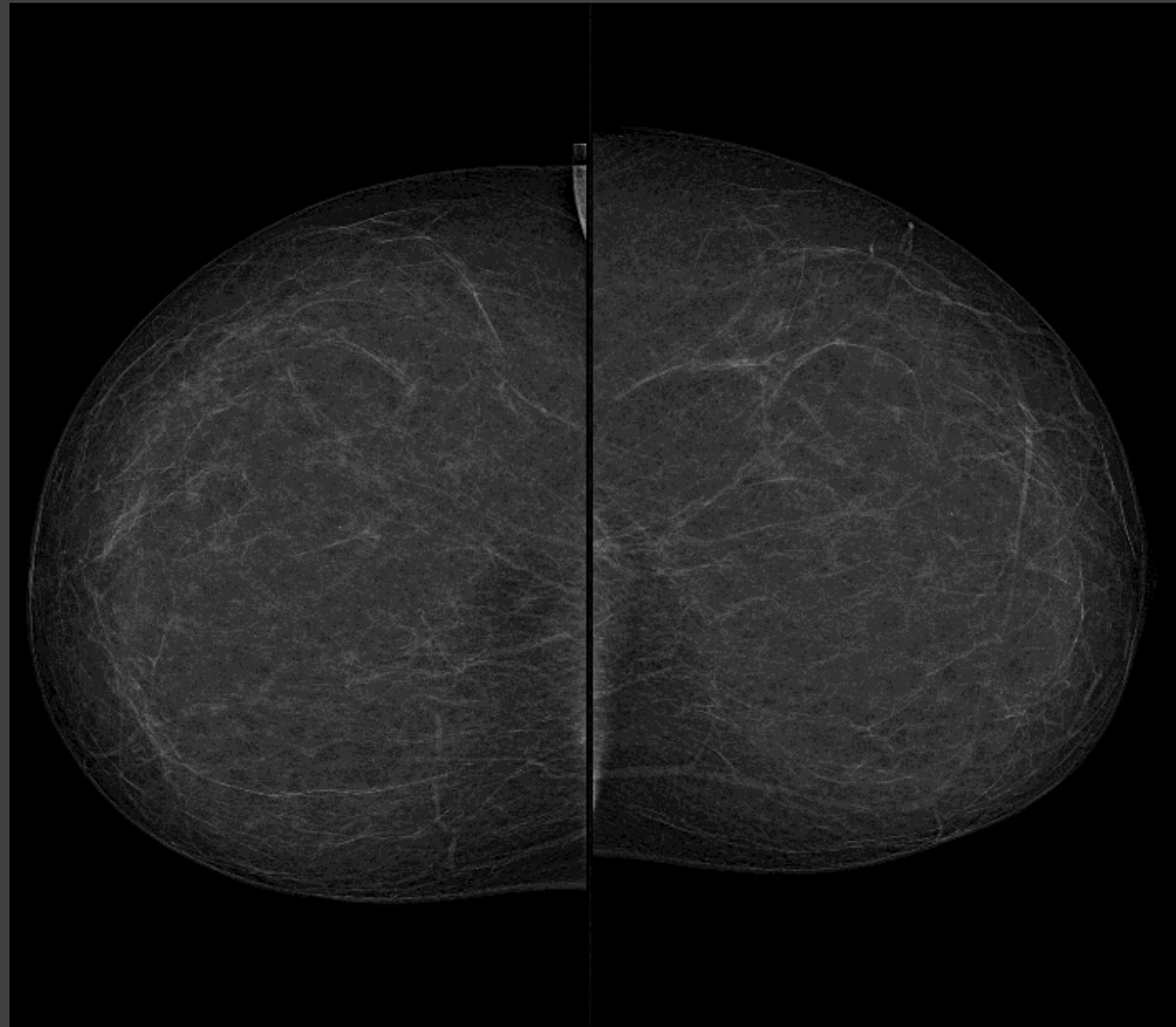


# DENSITY

- BI-RADS A      Entirely fatty tissue  
10% of women
- BI-RADS B      Scattered areas of fibroglandular tissue  
40% of women
- BI-RADS C      Heterogeneously dens  
40% of women
- BI-RADS D      Extremely dens (reduce visibility of cancers on mammogram)  
10% women

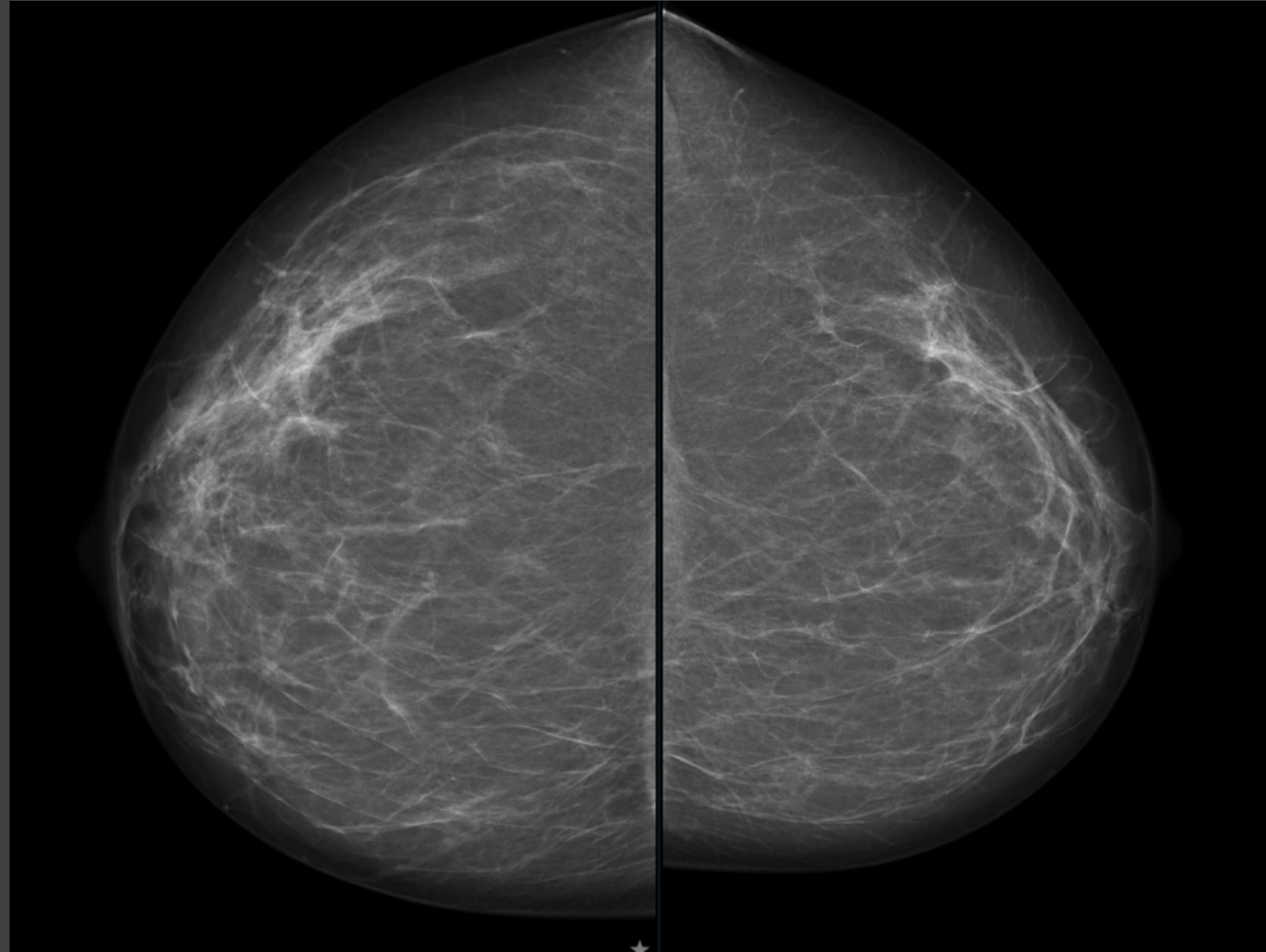


# DENSITY TYPE A



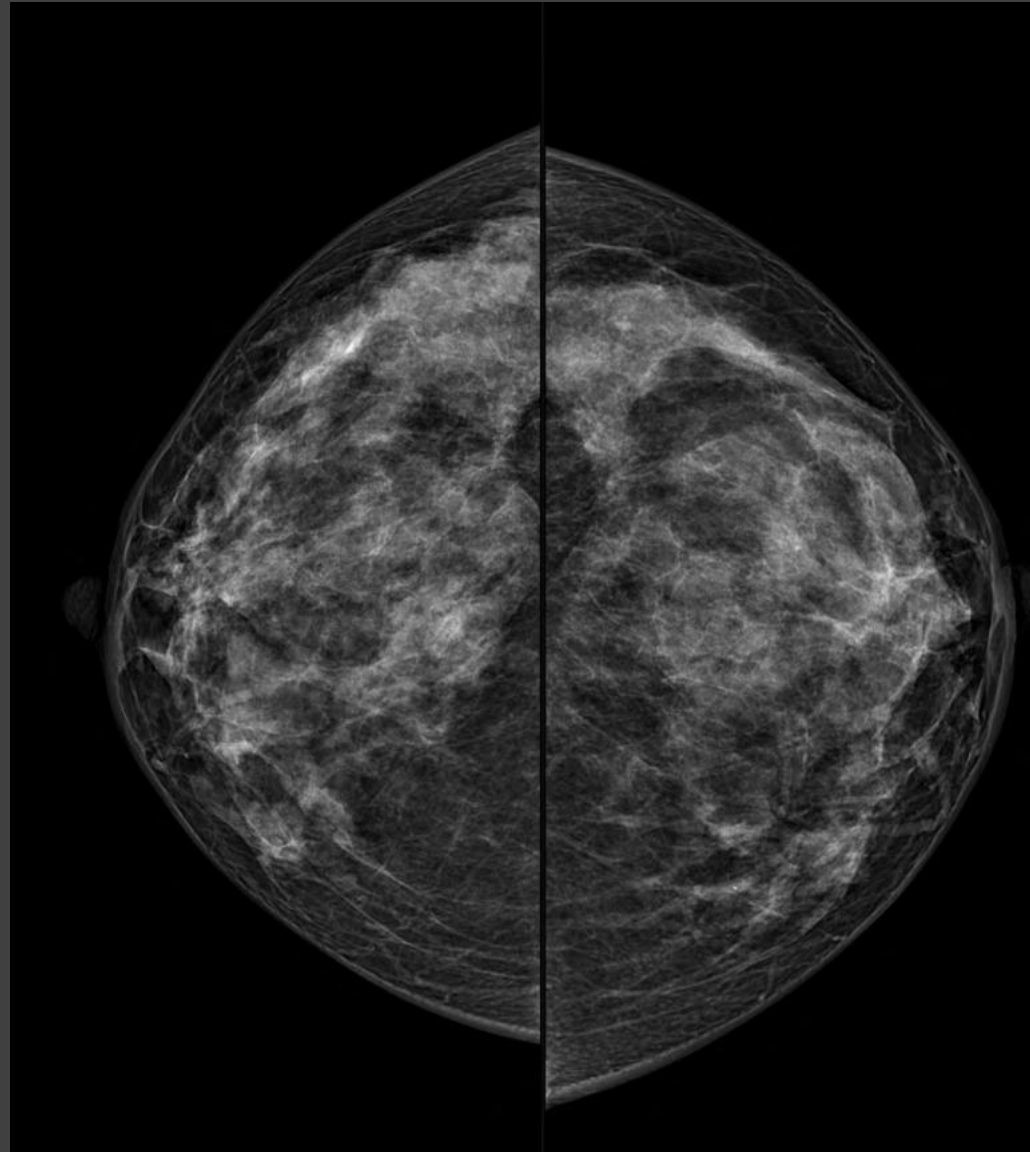


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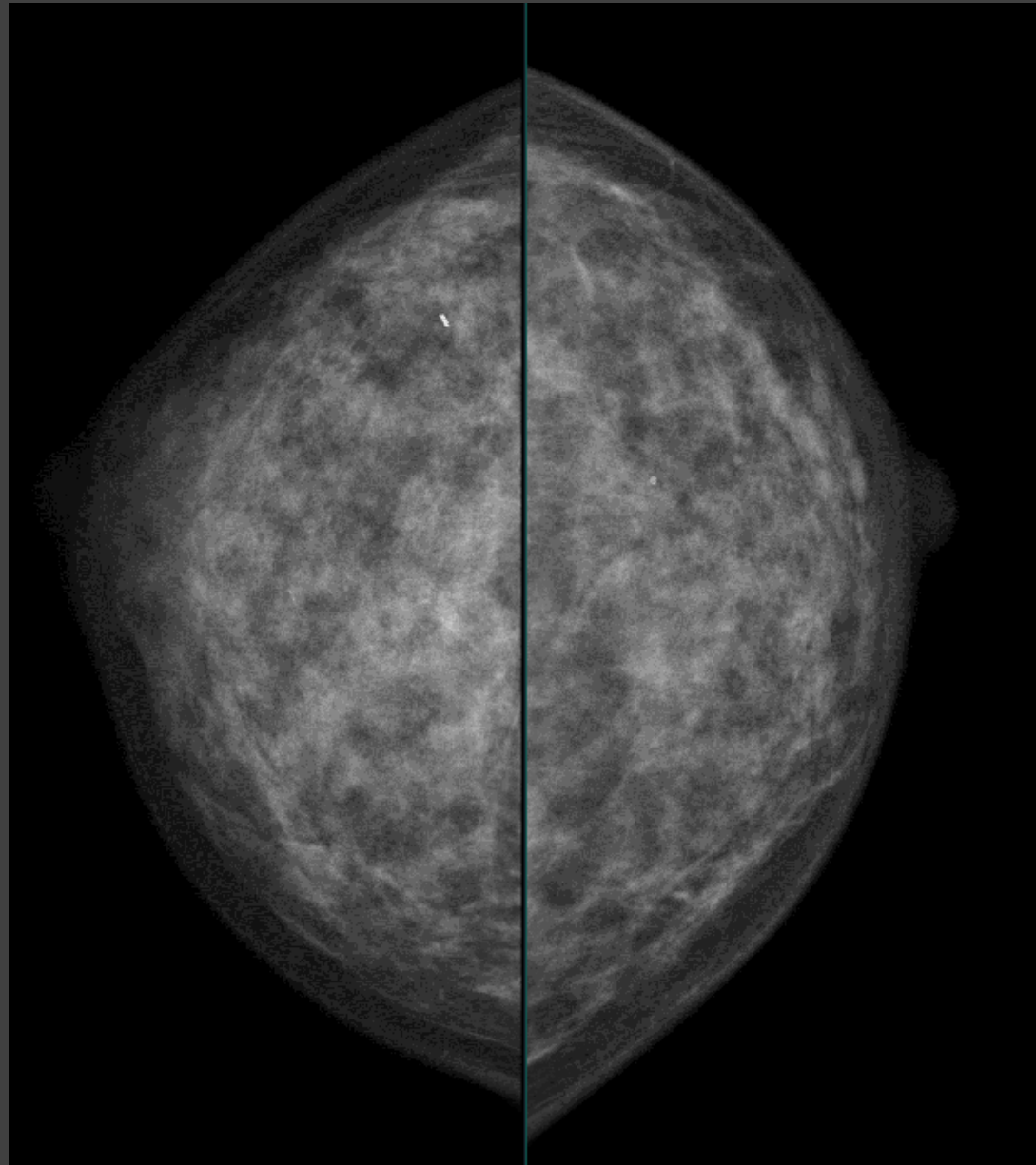


# DENSITY TYPE C





# DENSITY TYPE D







# MAMMOGRAPHY AND ULTRASOUND

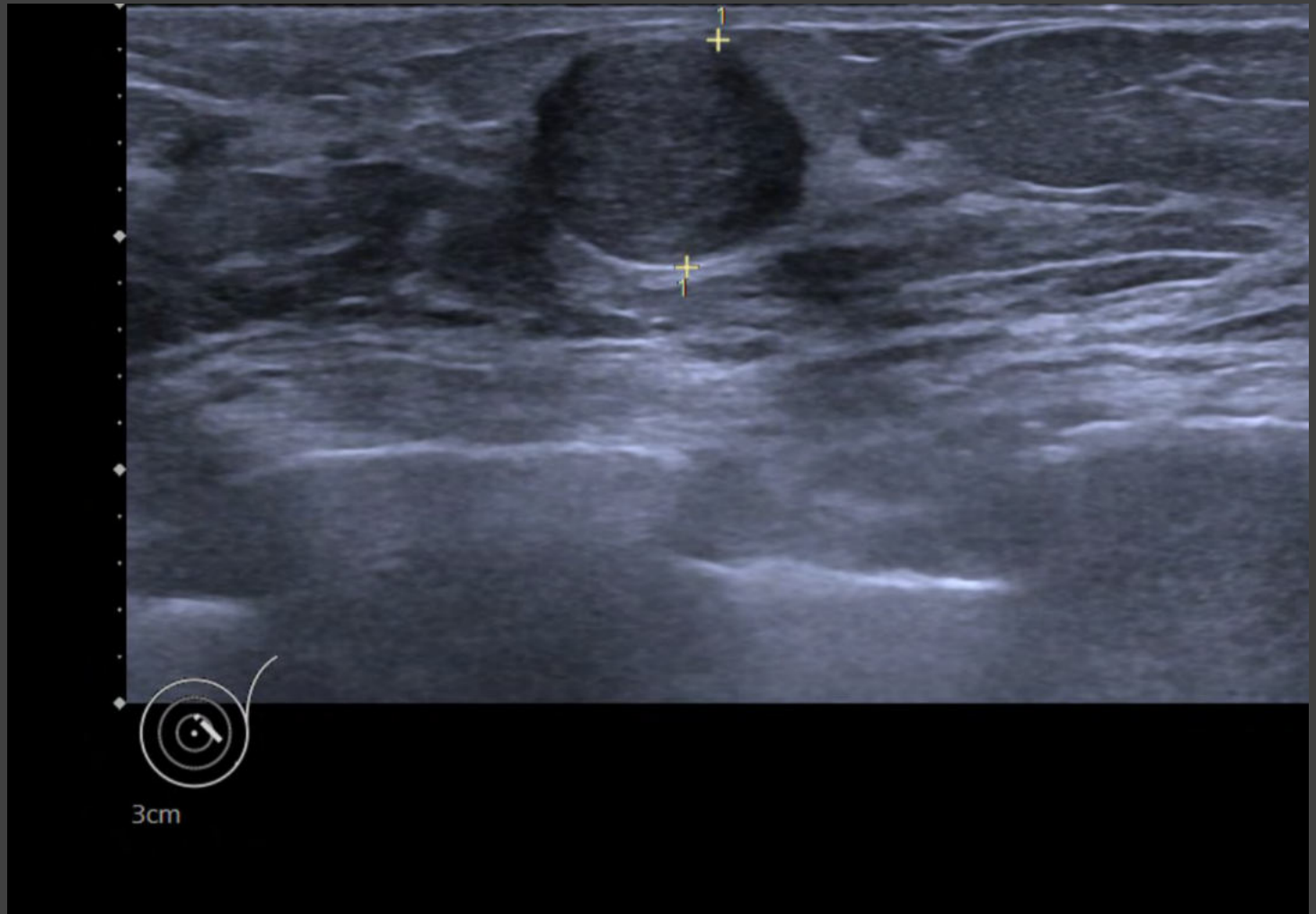
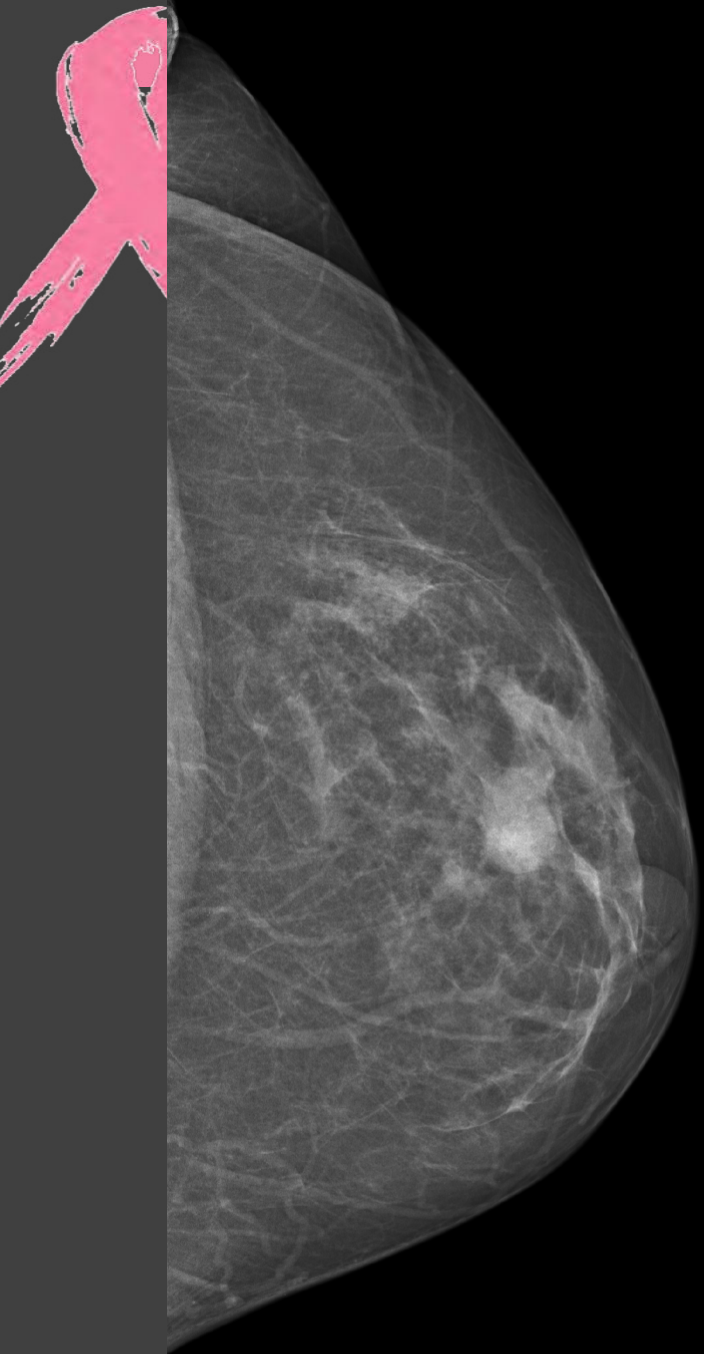
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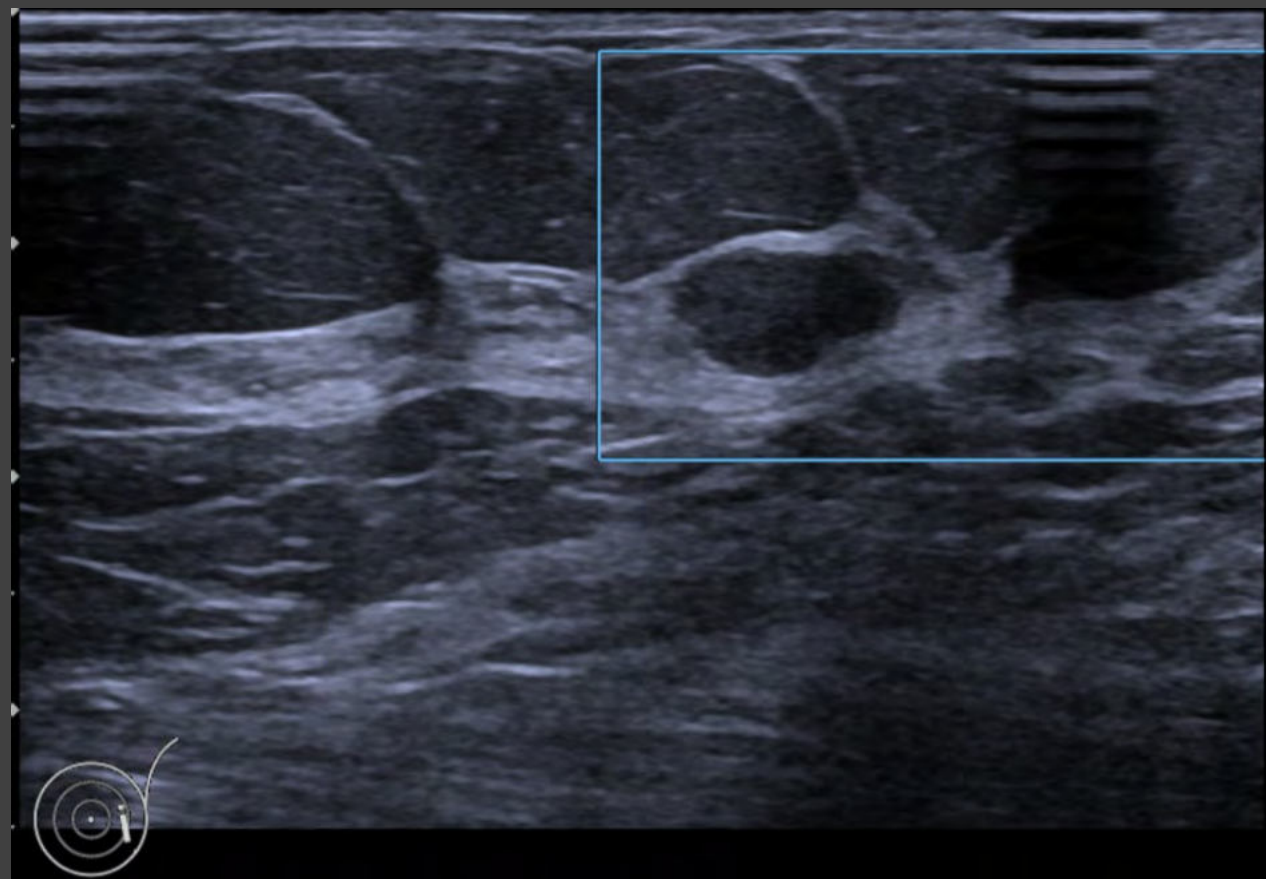
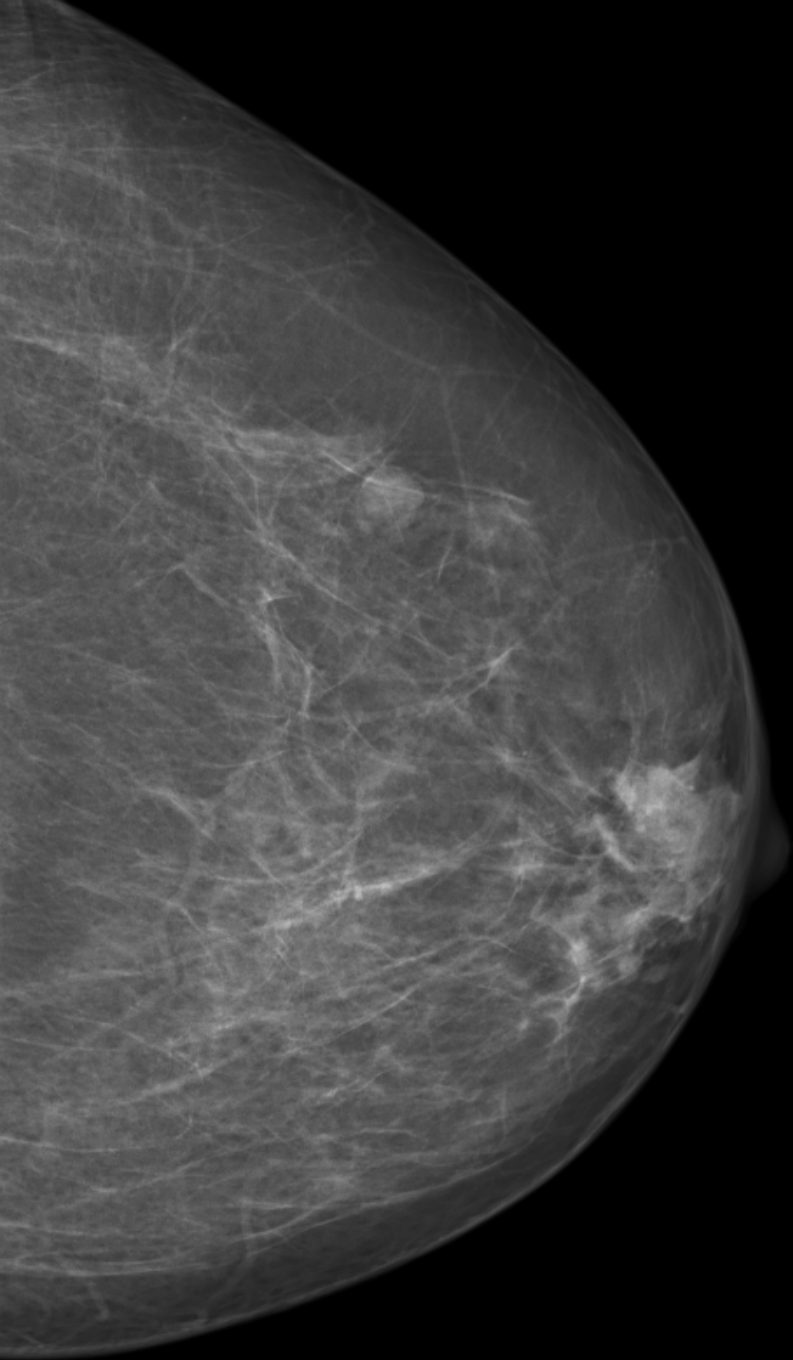
# MASSES

- Definition: space occupying lesion seen on 2 different projections
- Opacity on 1 single projection = asymmetry
- Shape: round, oval, irregular
- Margin: circumscribed, lobulated, ill defined, spiculated
- Density: high density, fat containing

# SHAPE & MARGIN

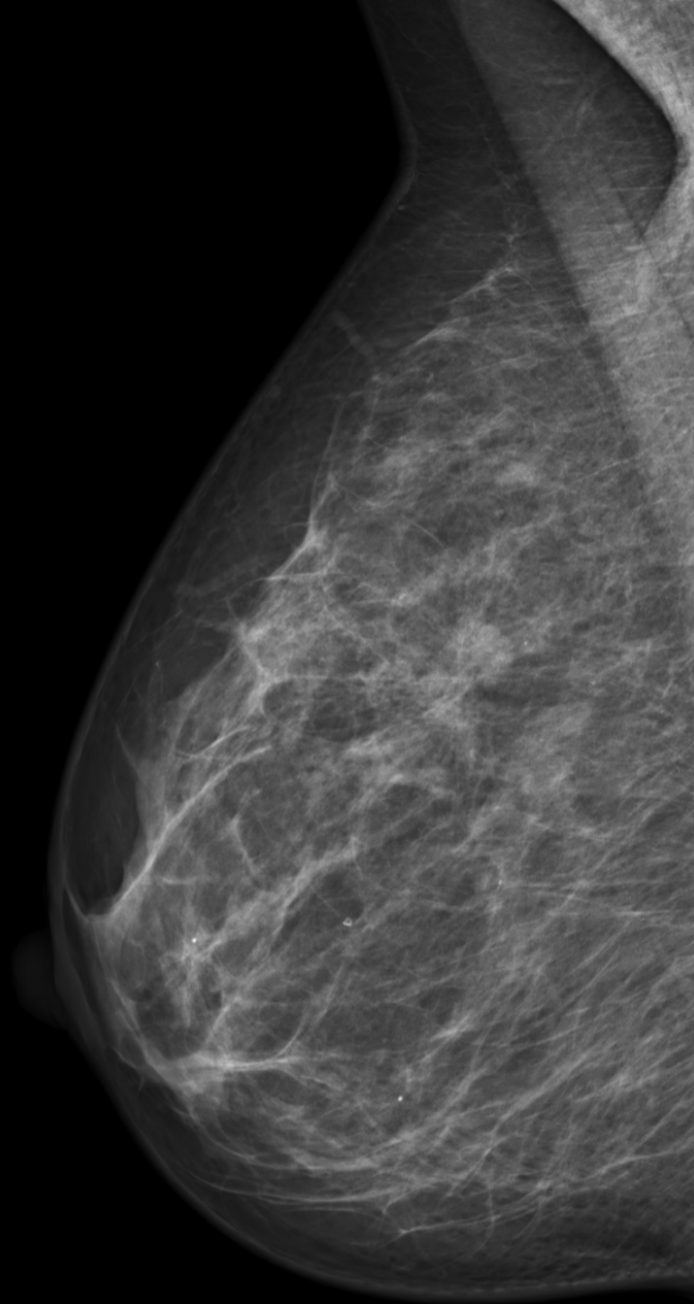
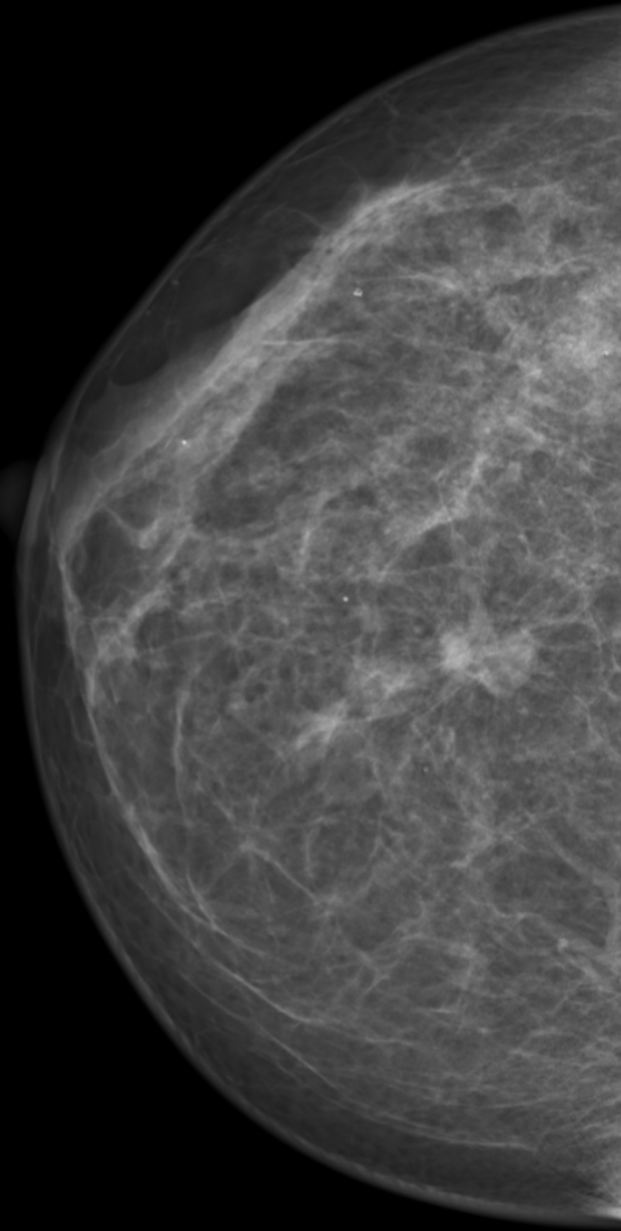


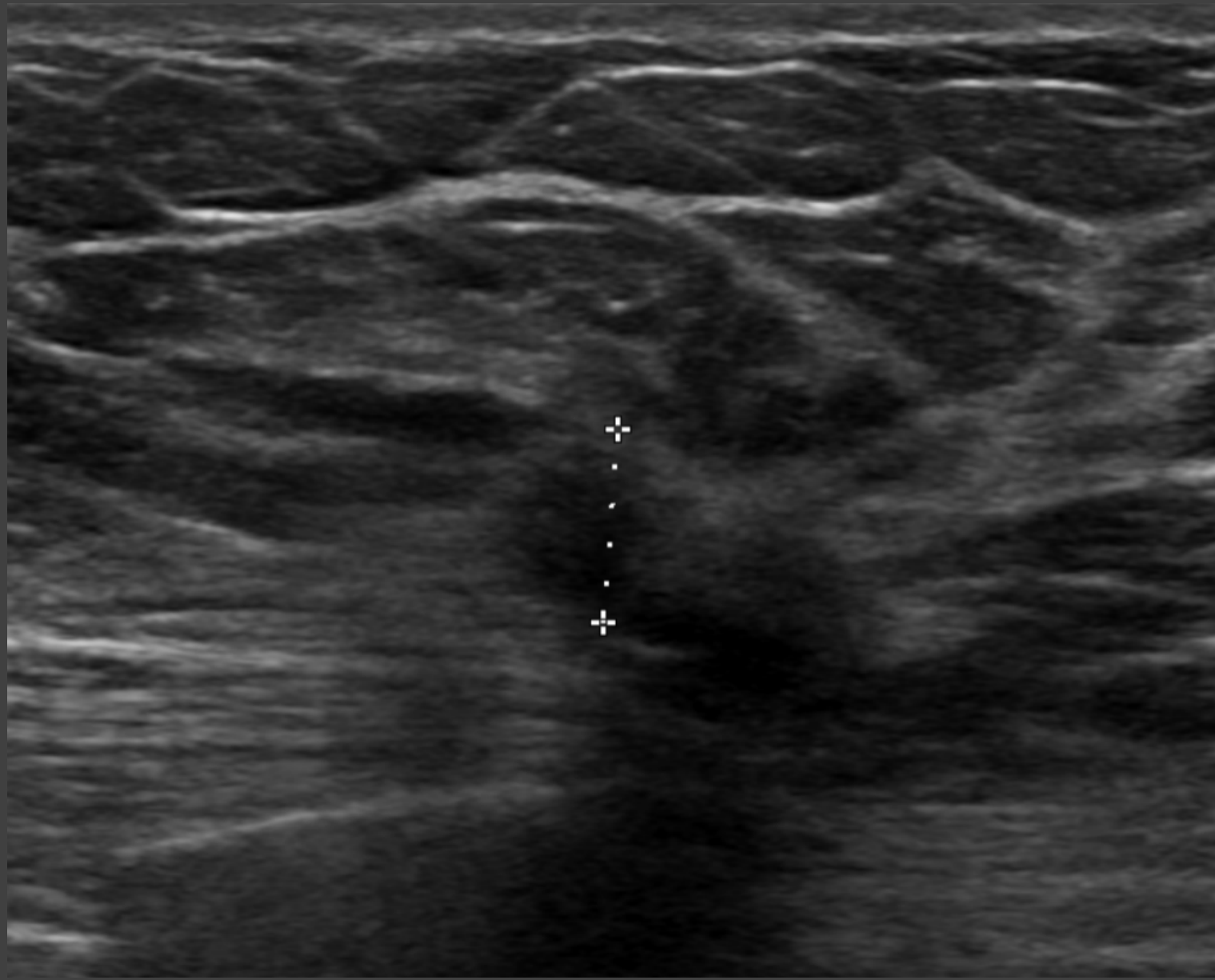
# SHAPE & MARGIN





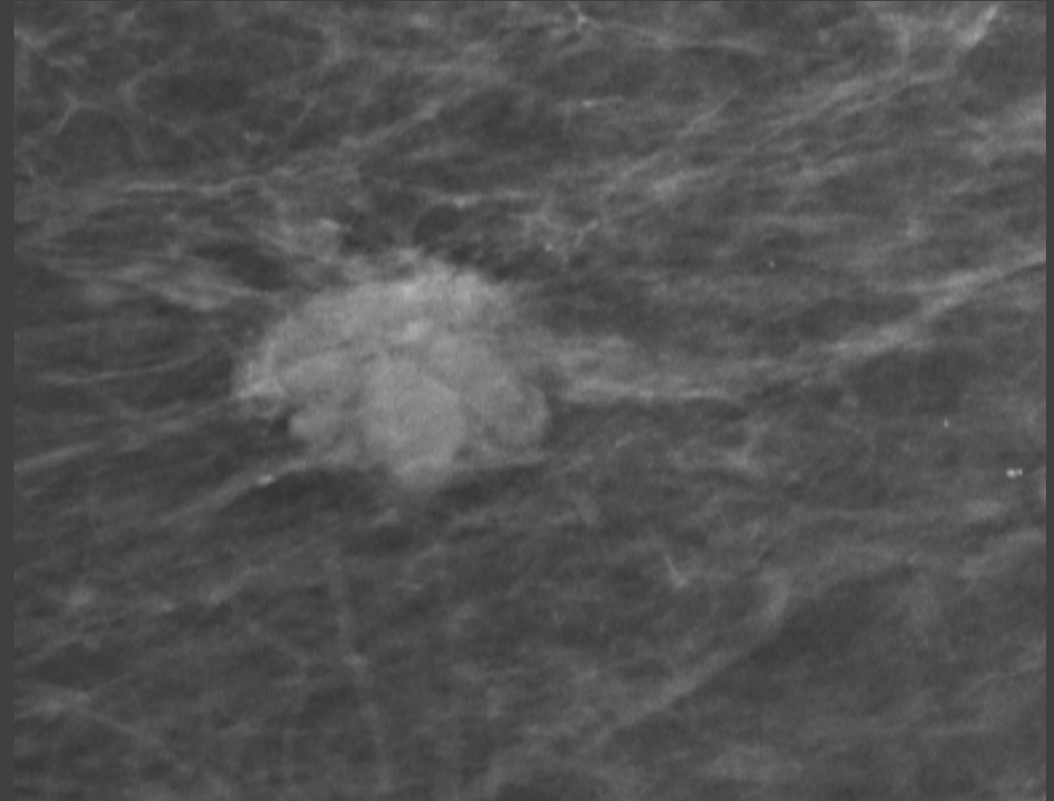
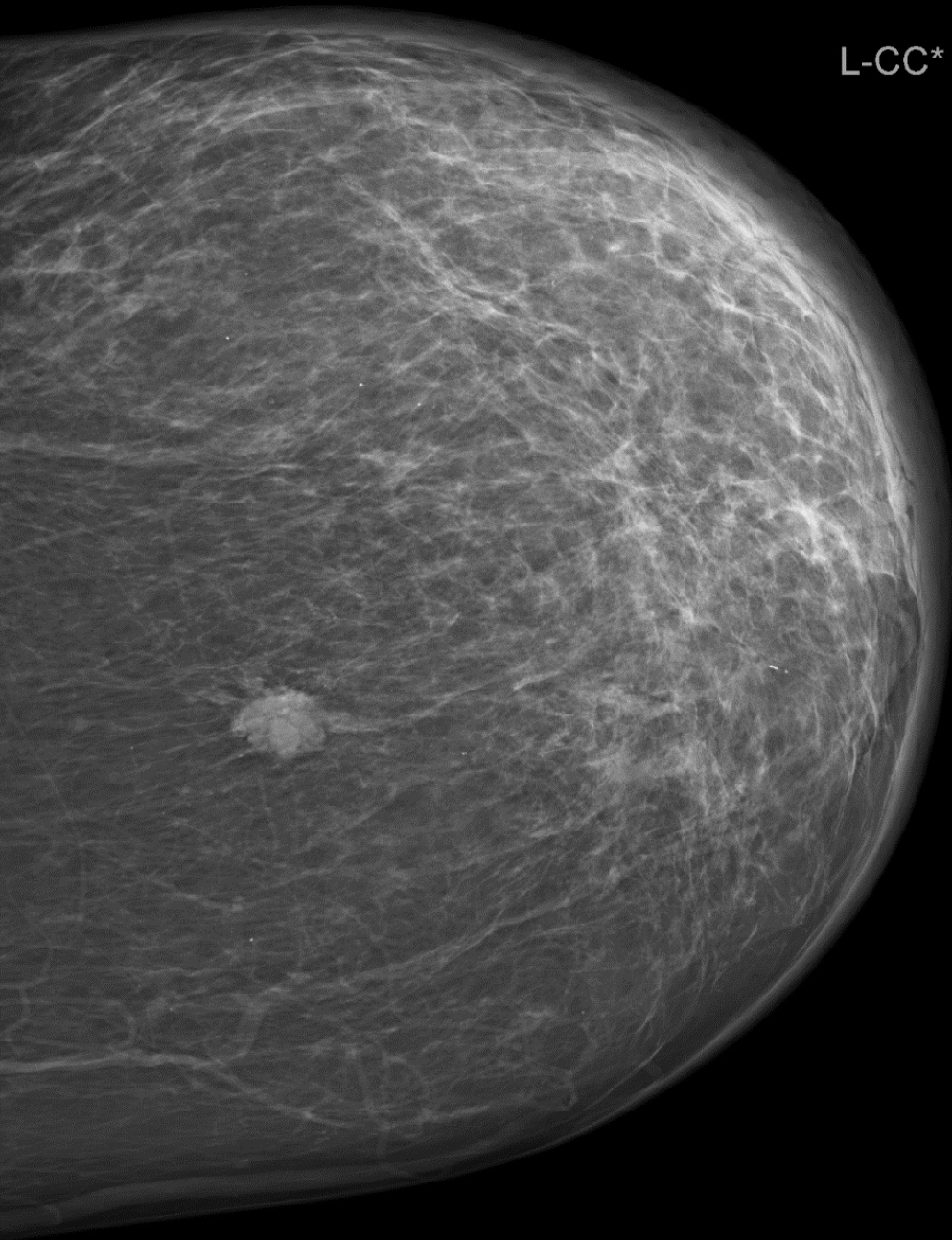
**& M**





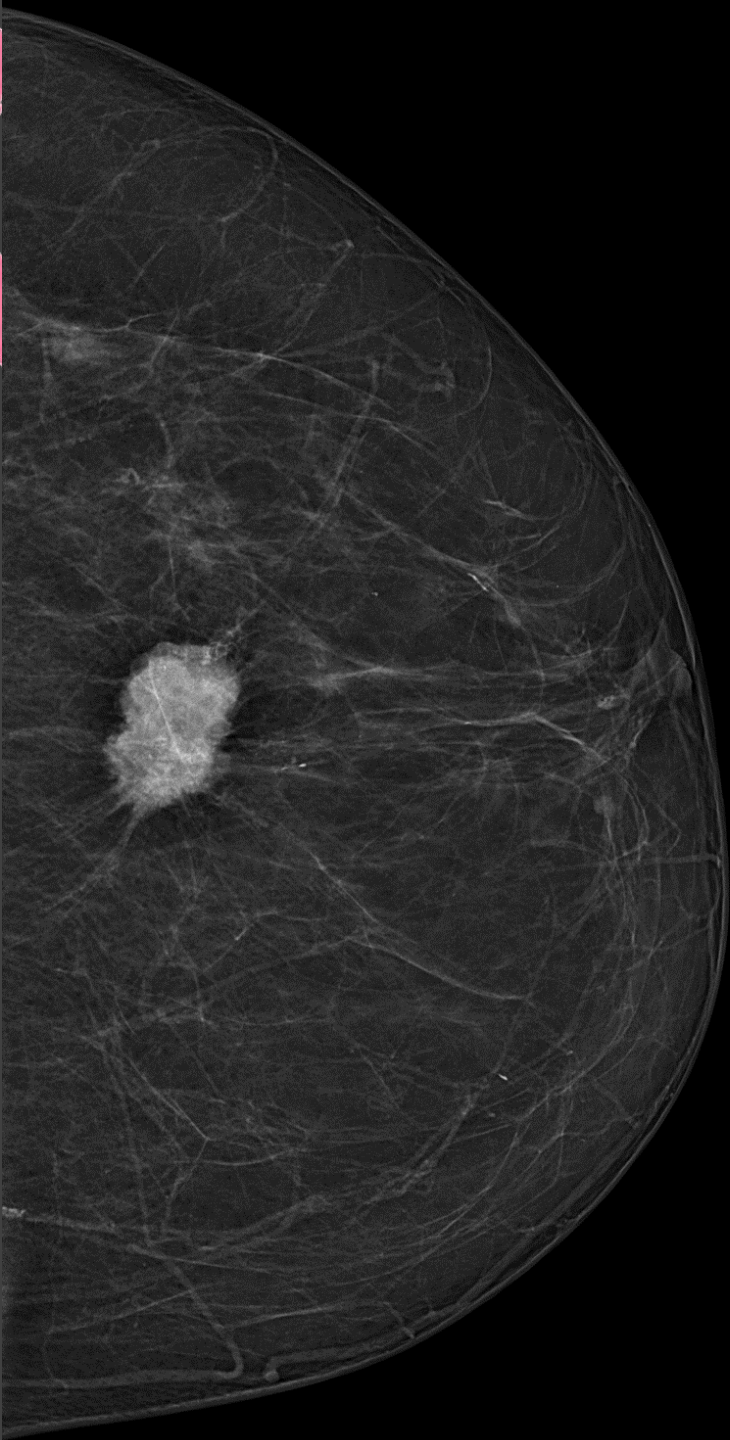
L-CC\*

# SHAPE & MARGIN





# APE & M

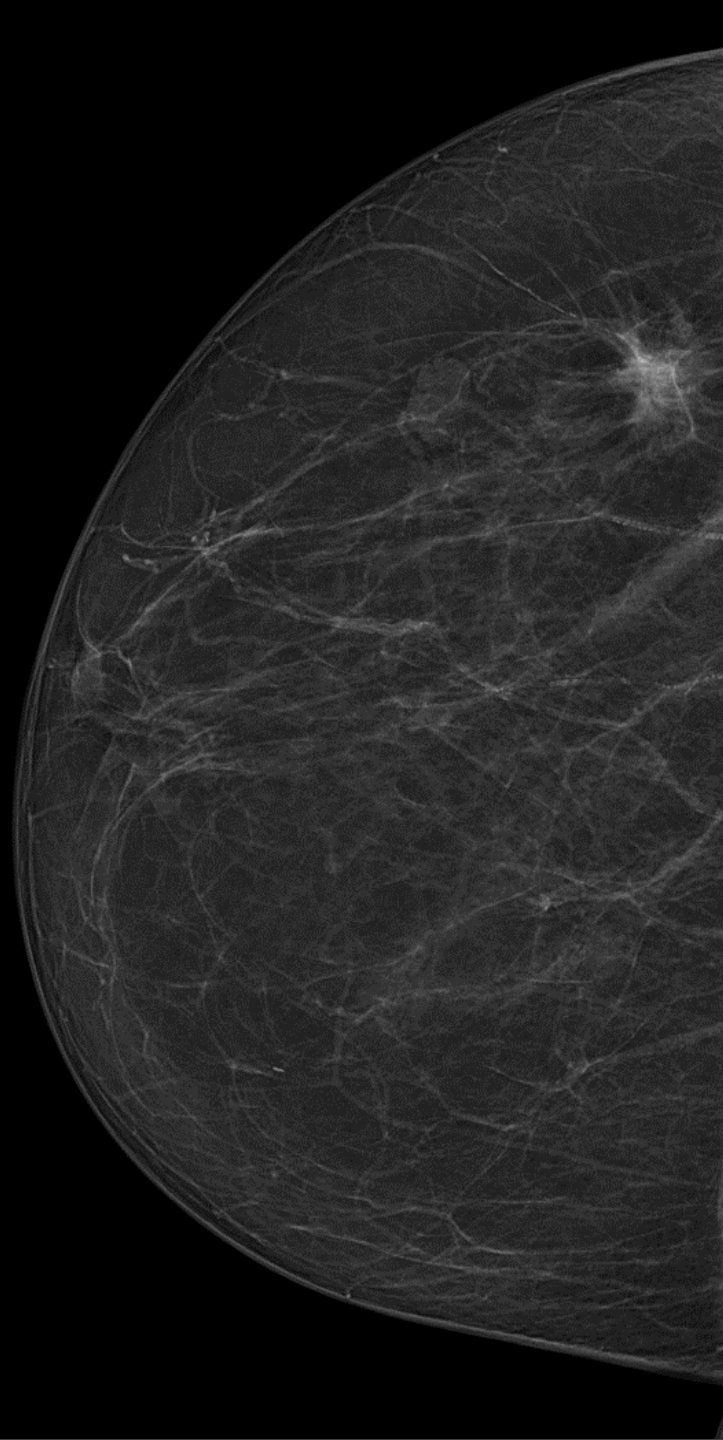
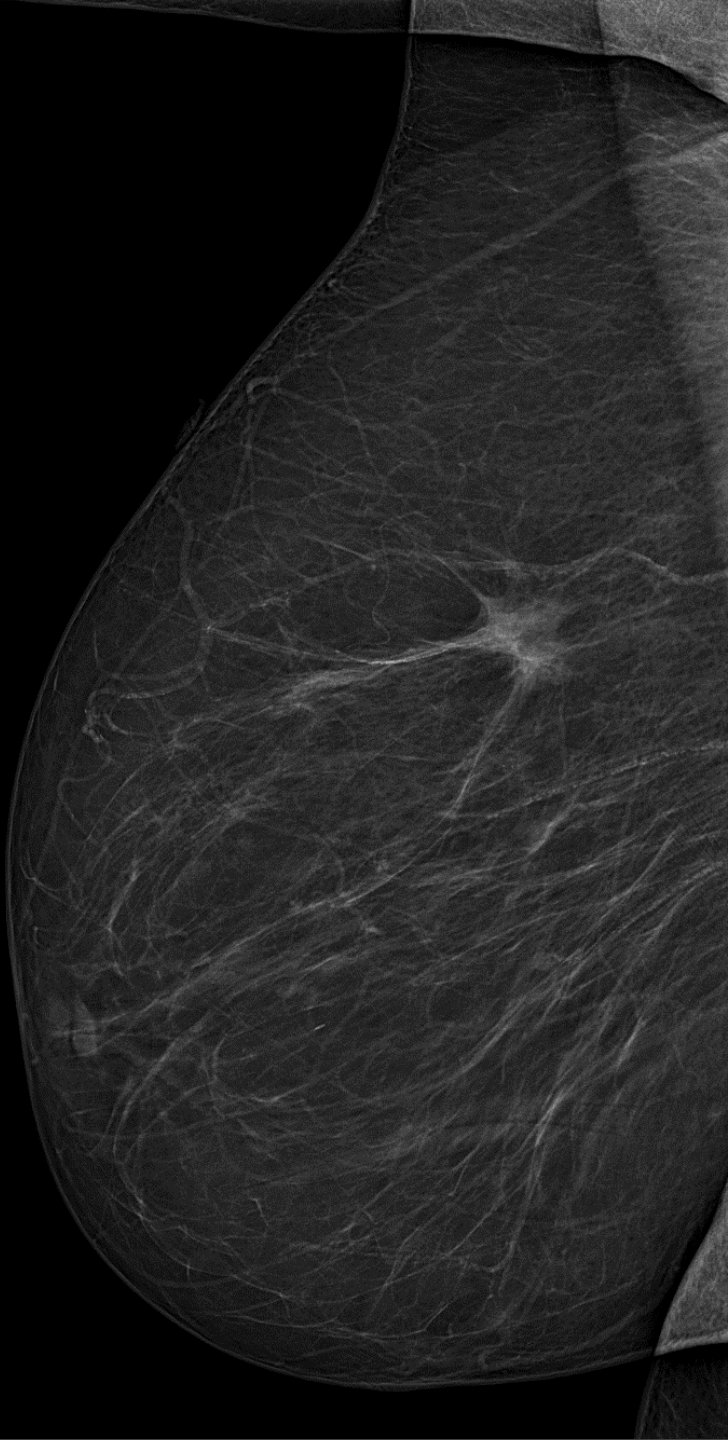






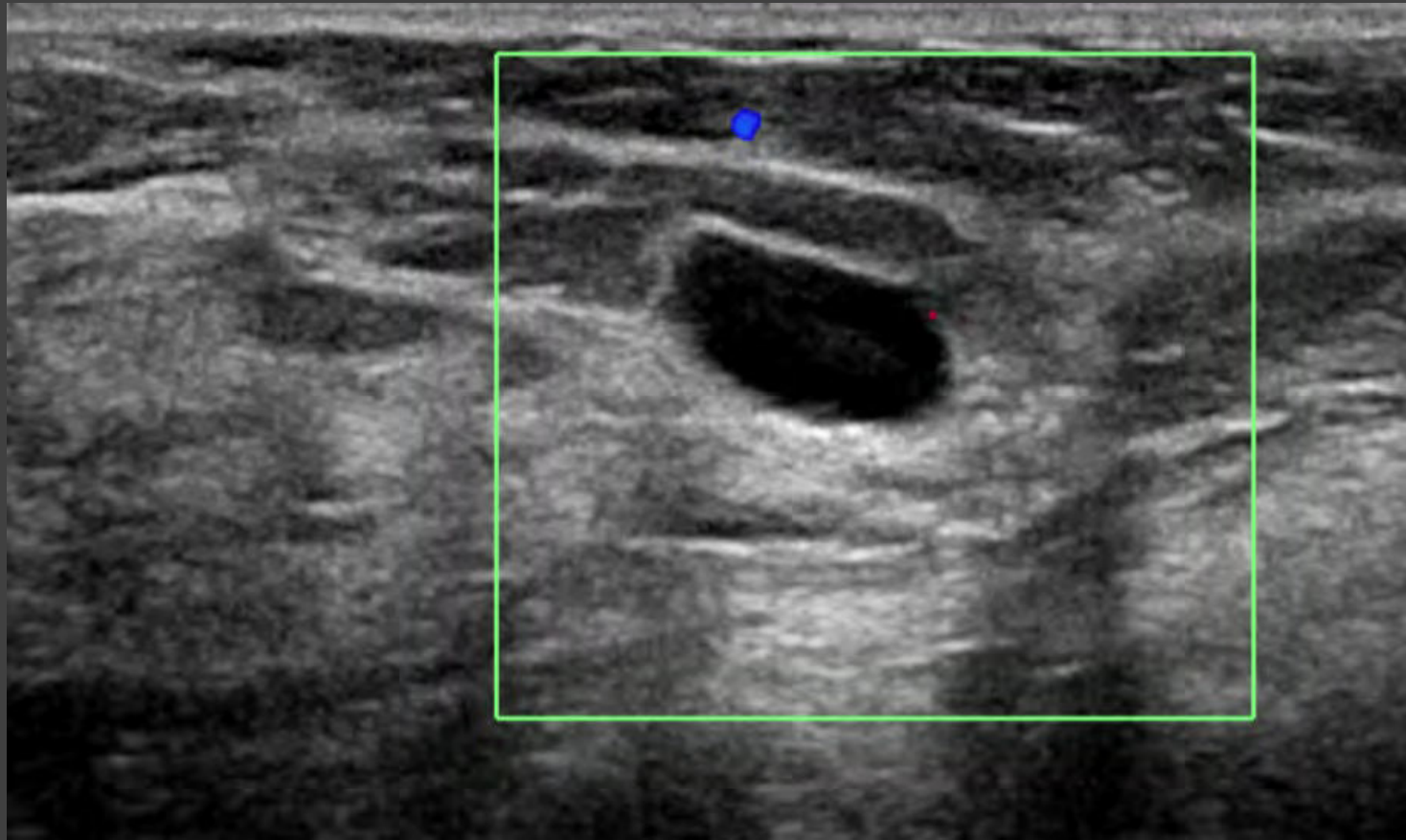


TYPE 8



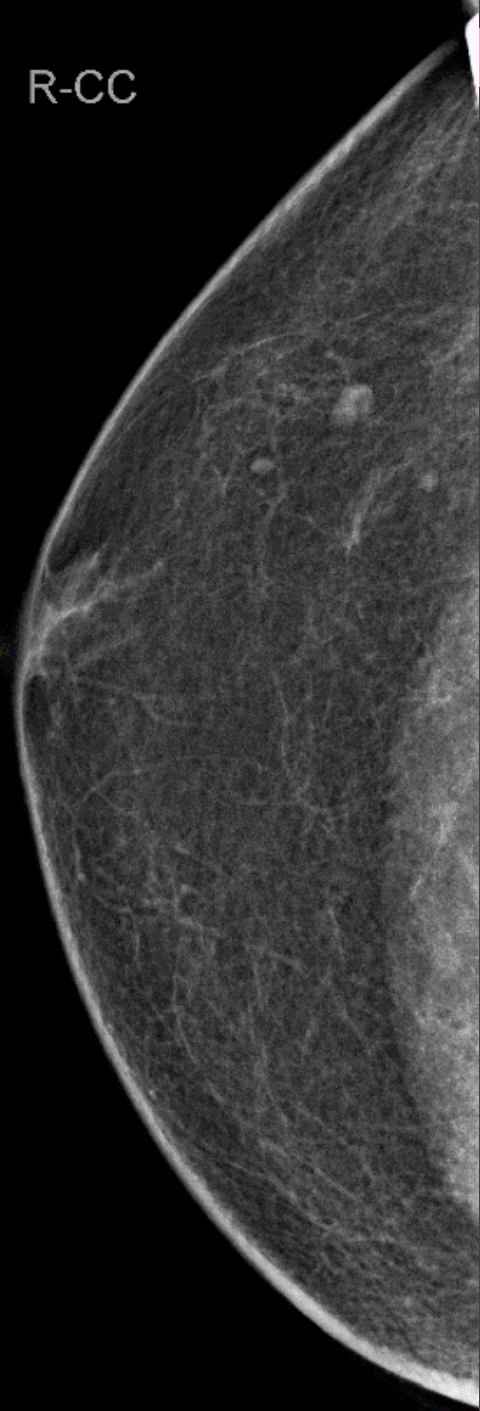


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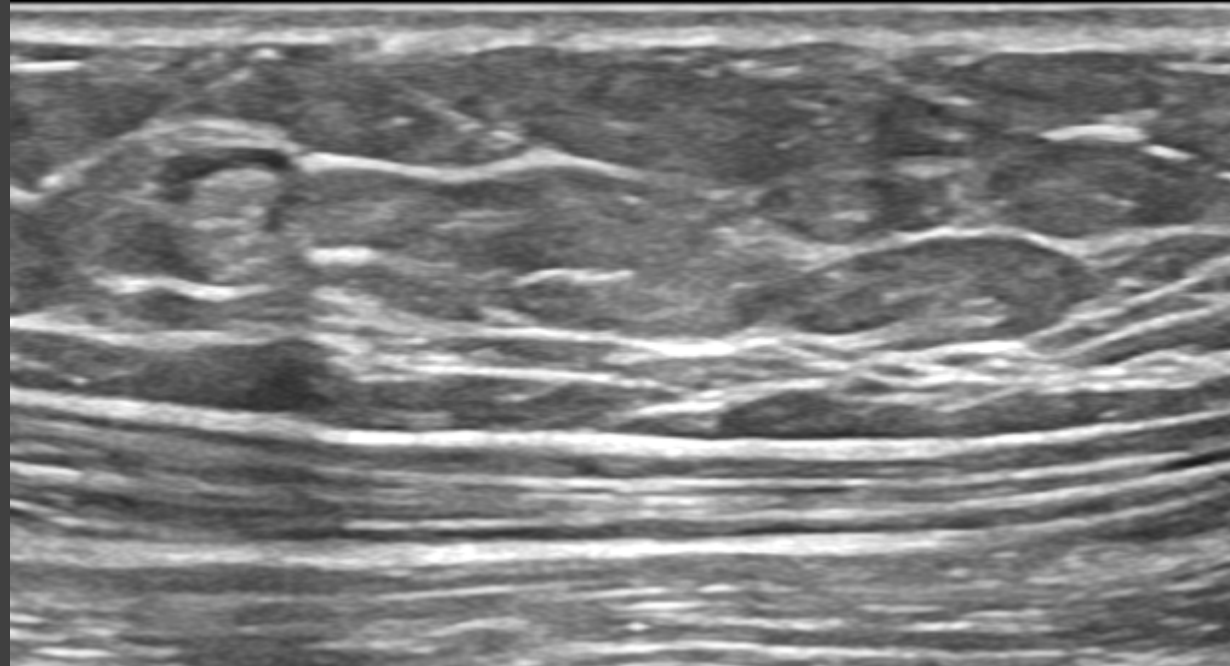




R-CC

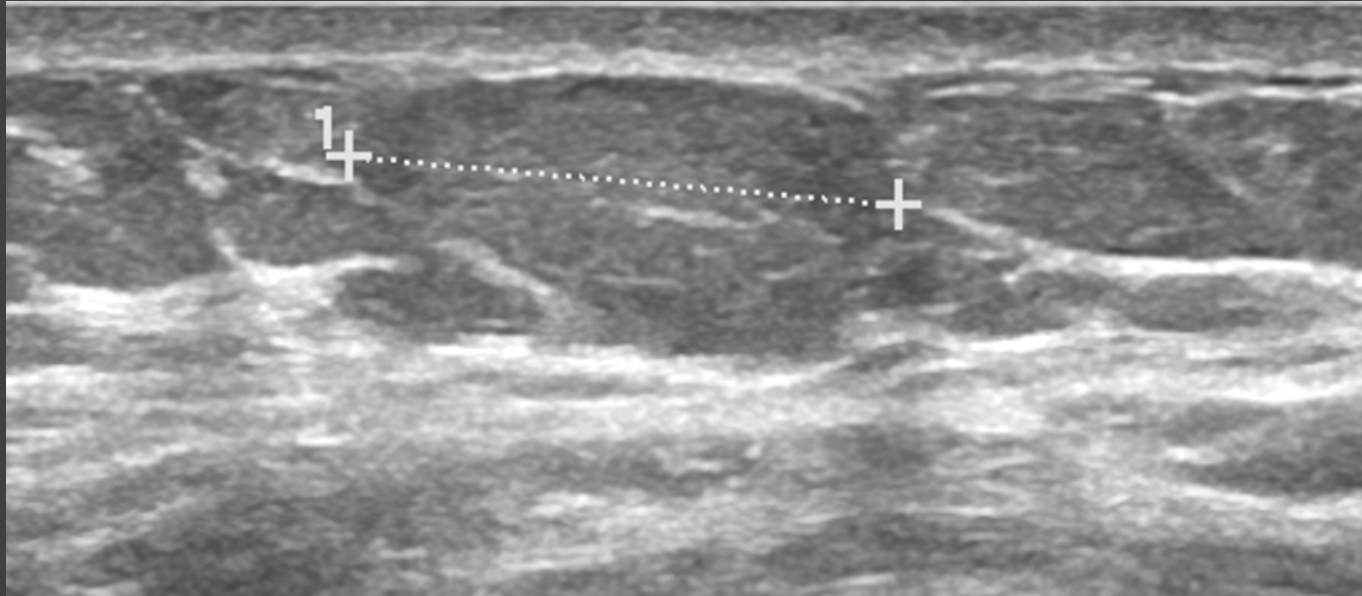


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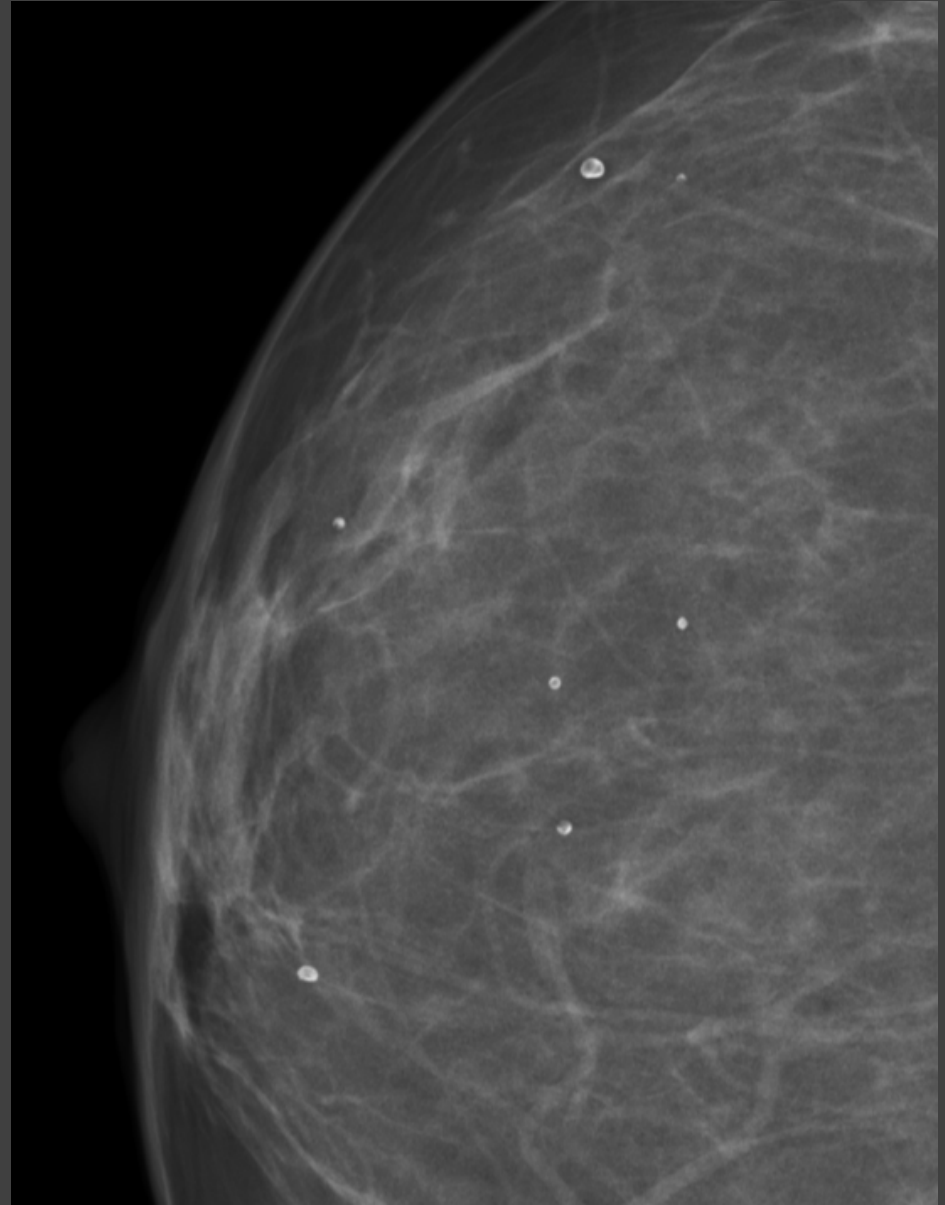
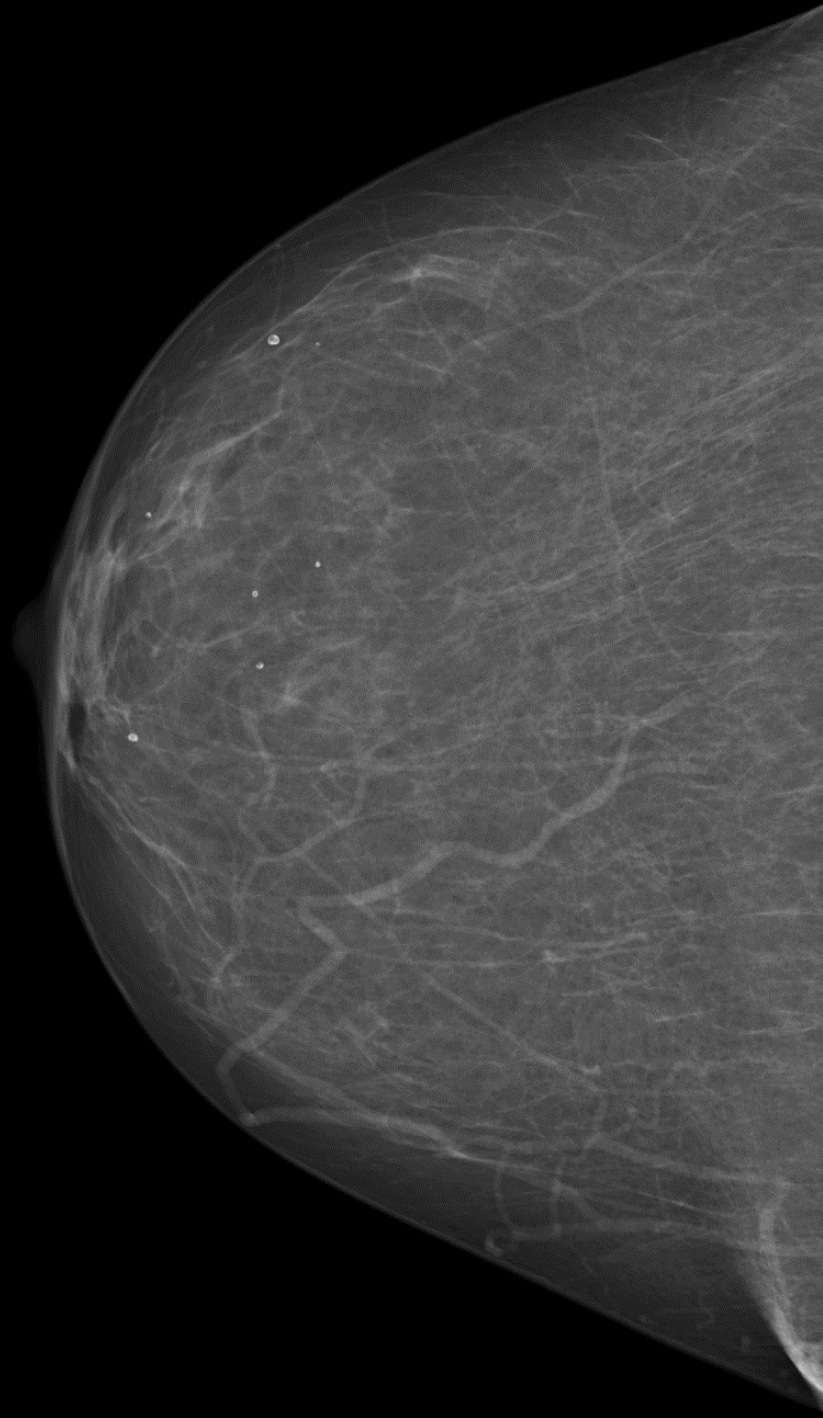


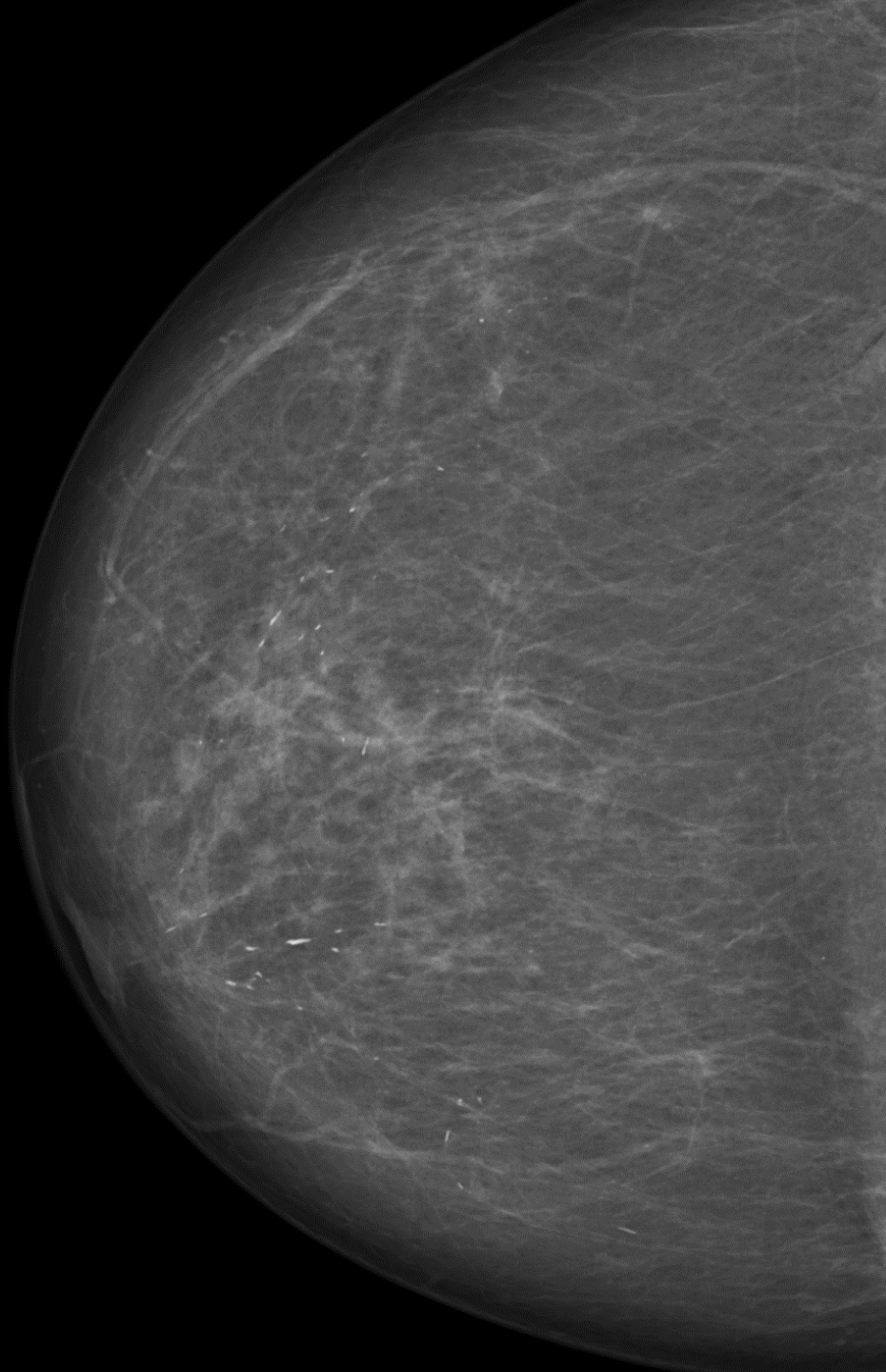


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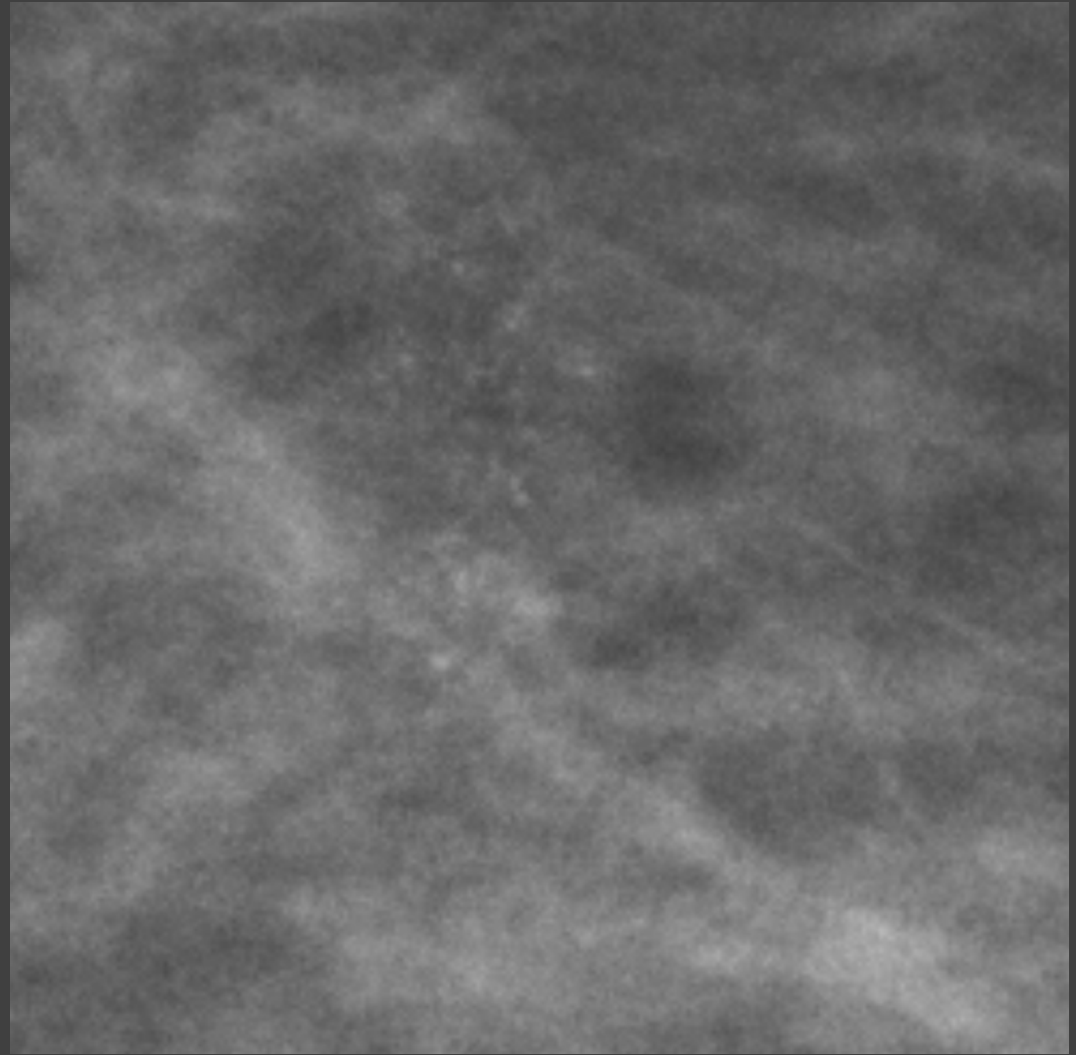
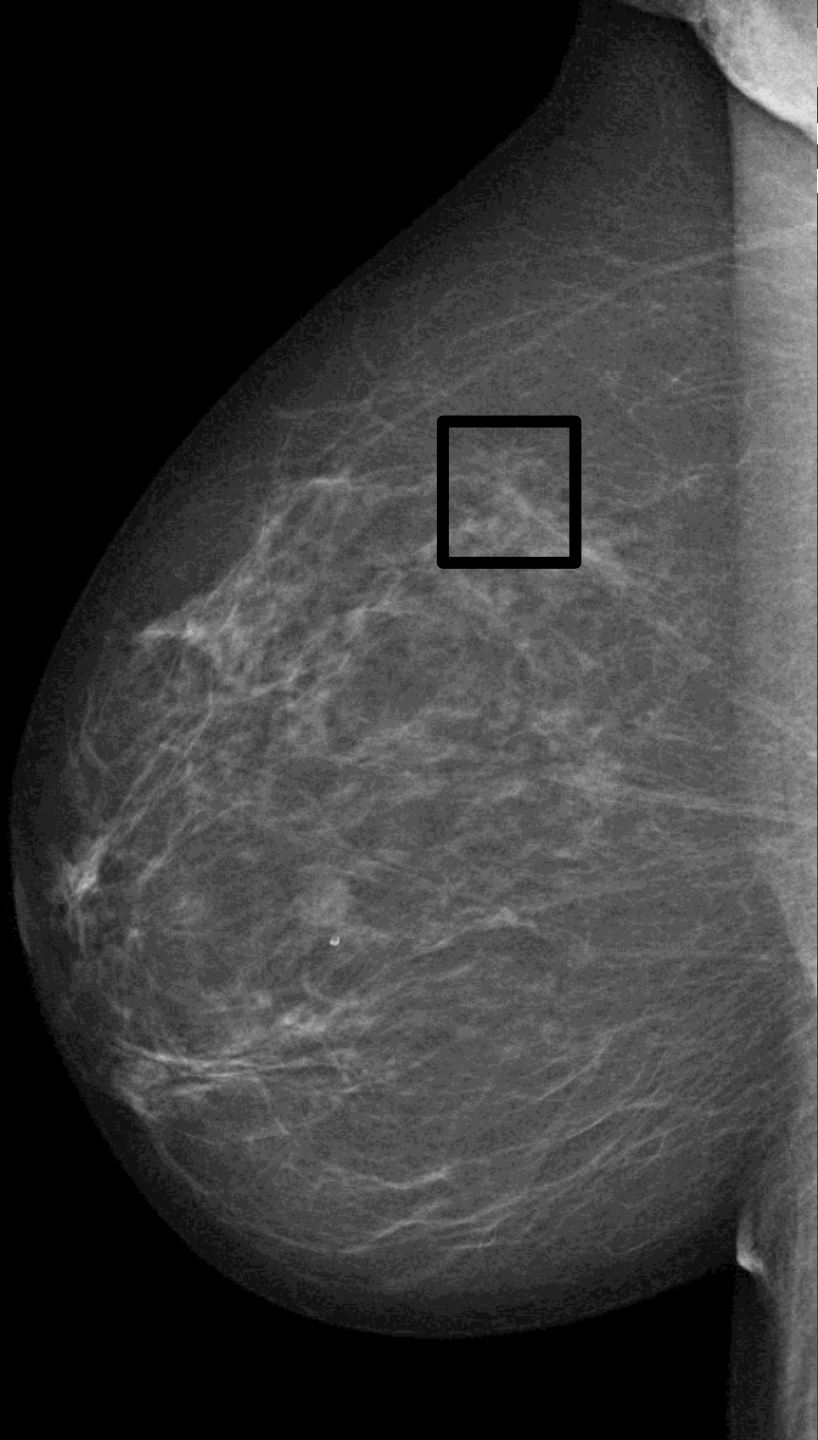
# CALCIFICATIONS







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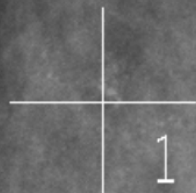
# STEREOTACTIC BREAST BIOPSY





S

OSY





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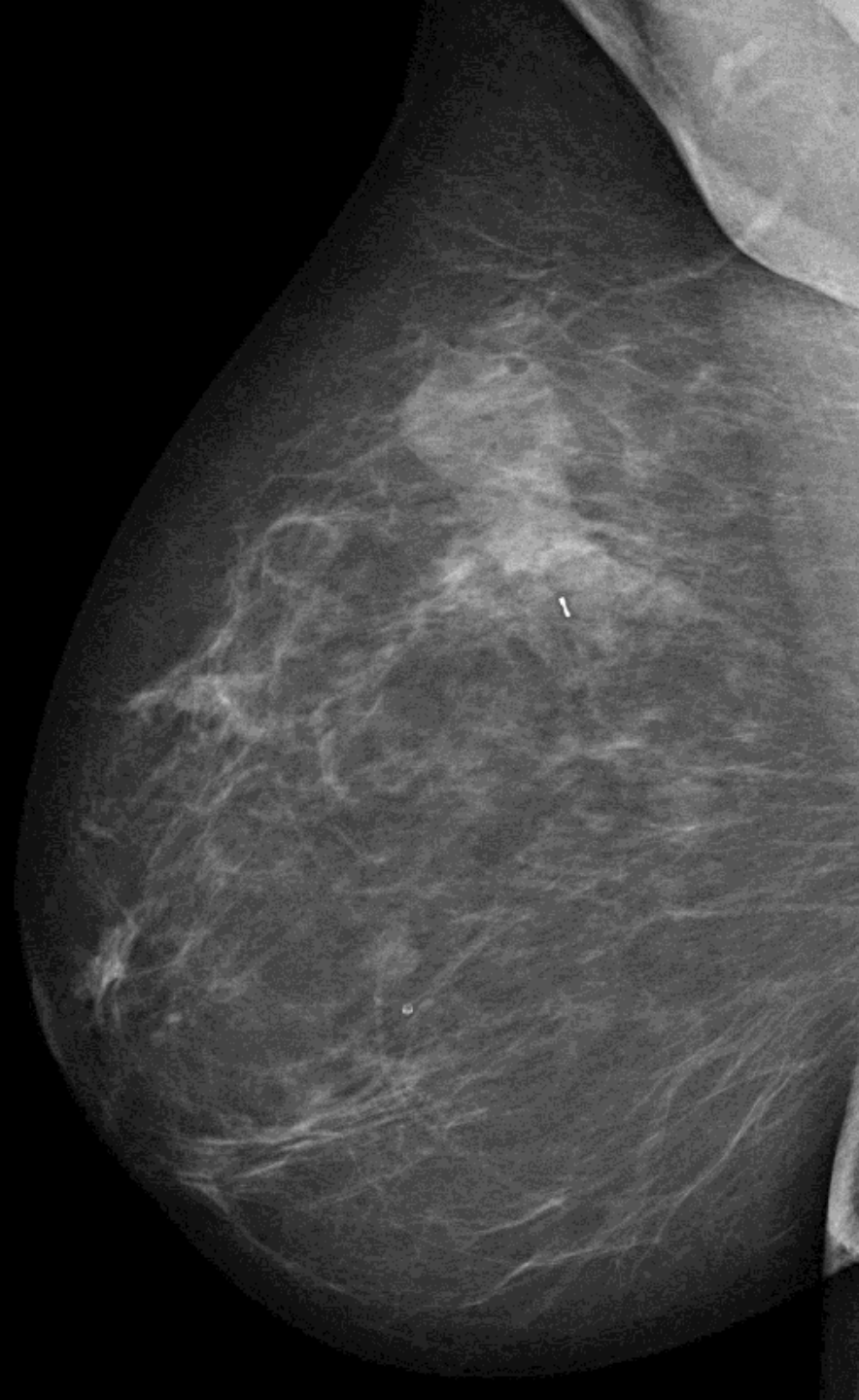


# STEREOTACTIC BREAST BIOPSY





**STERE**



**BIOPSY**

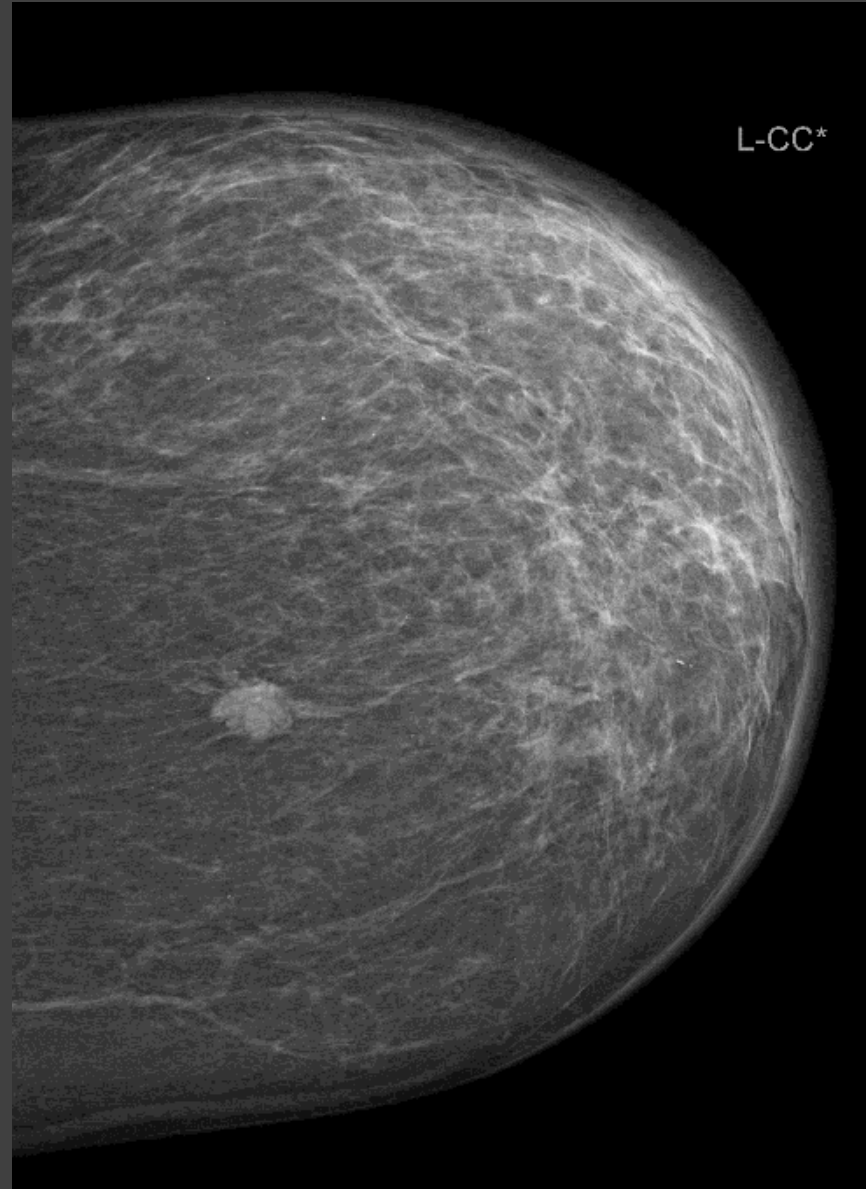


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# ASSOCIATED FEATURES





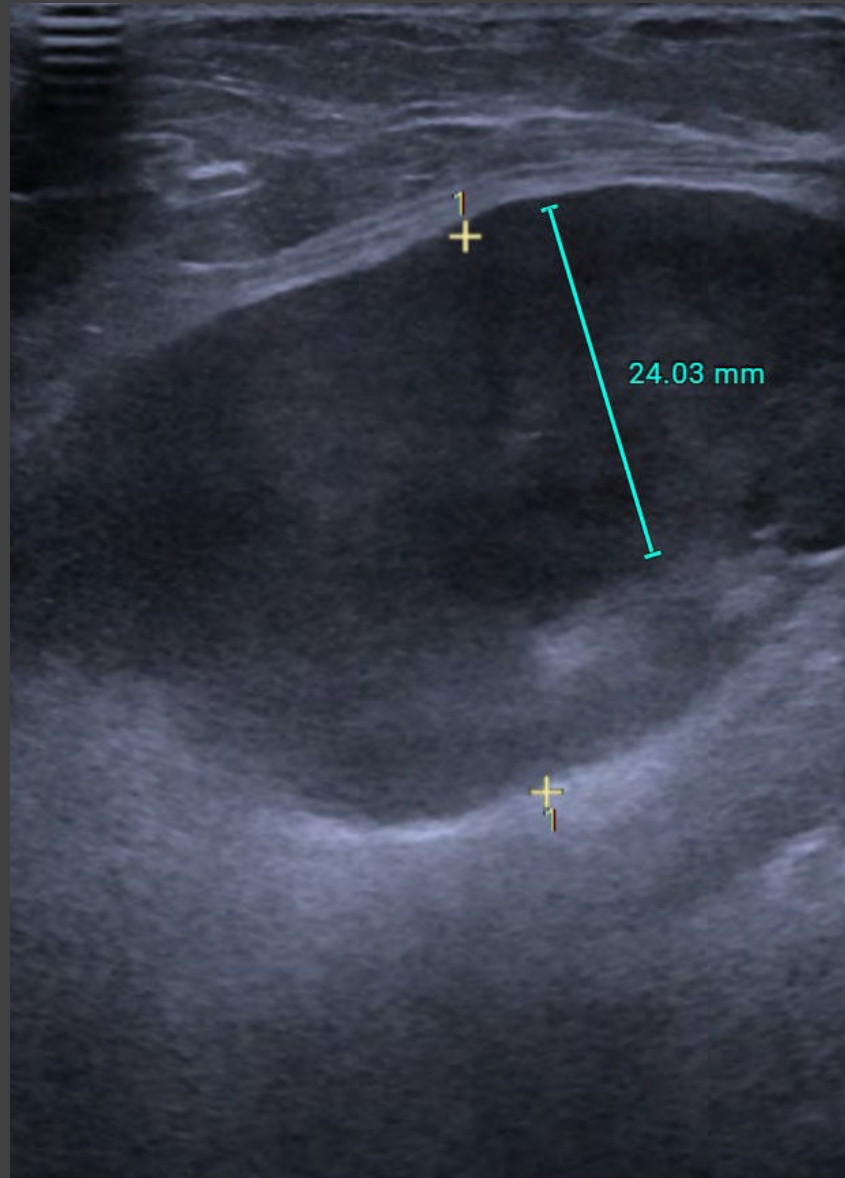


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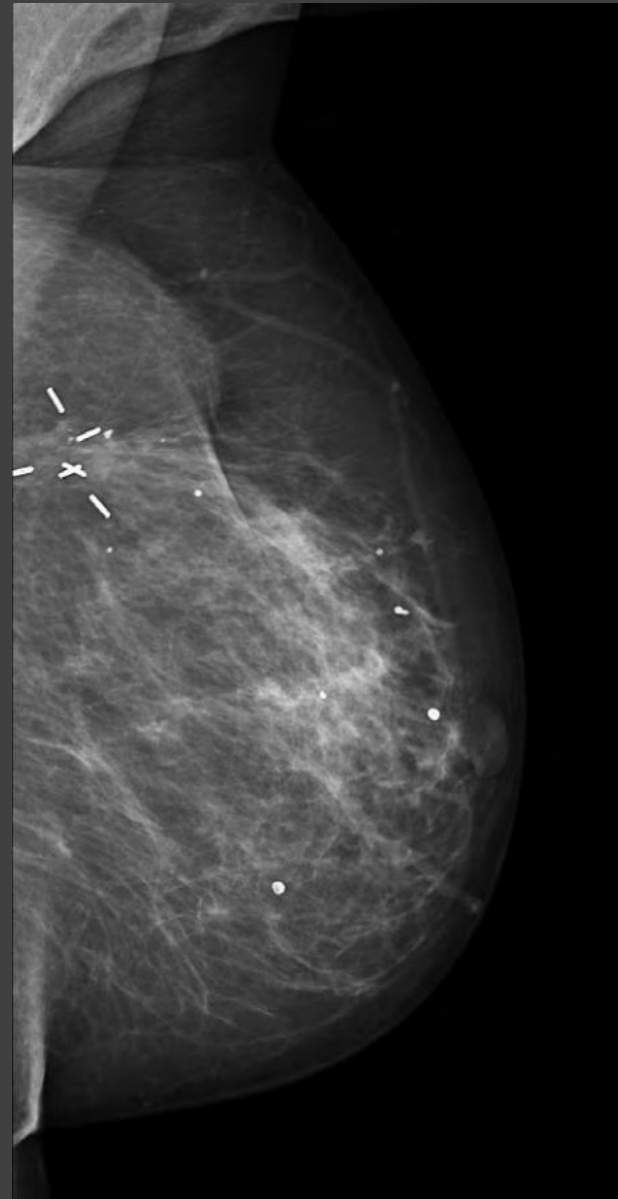
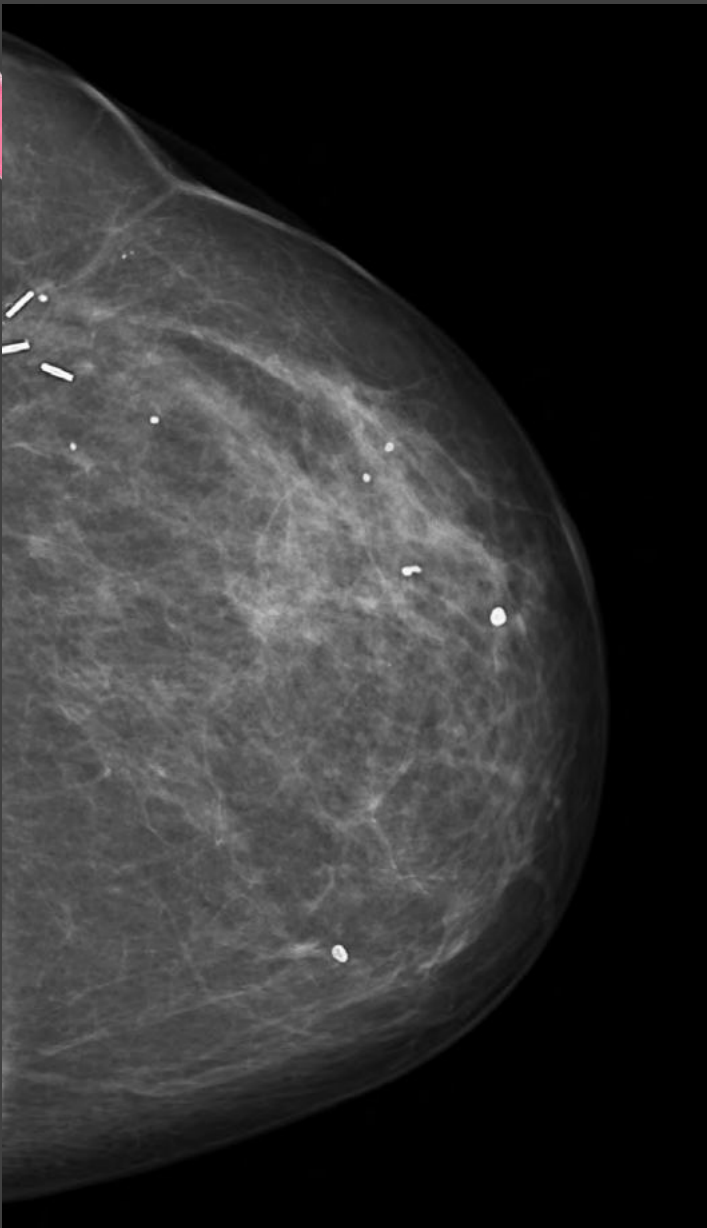


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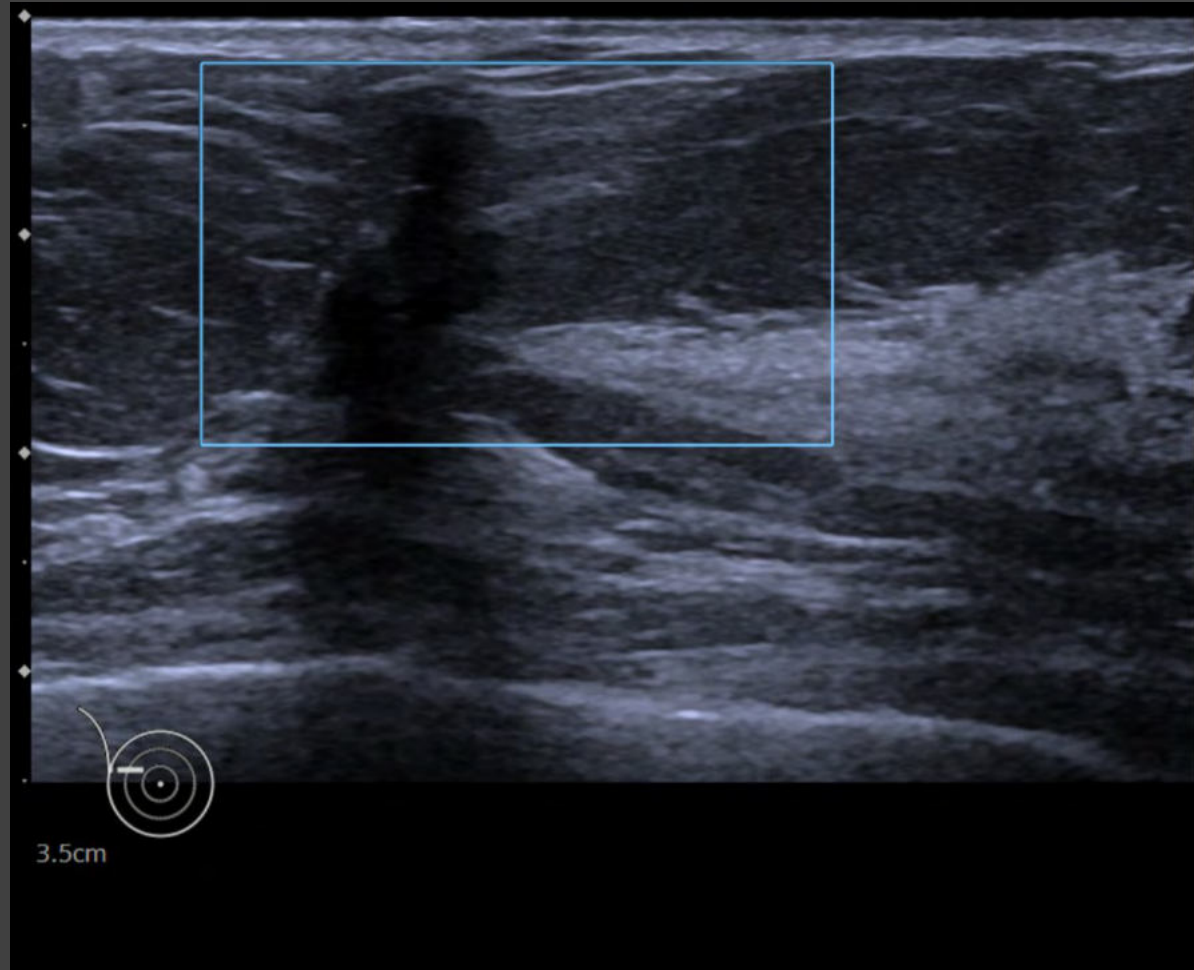
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# POST SURGERY CHANGES



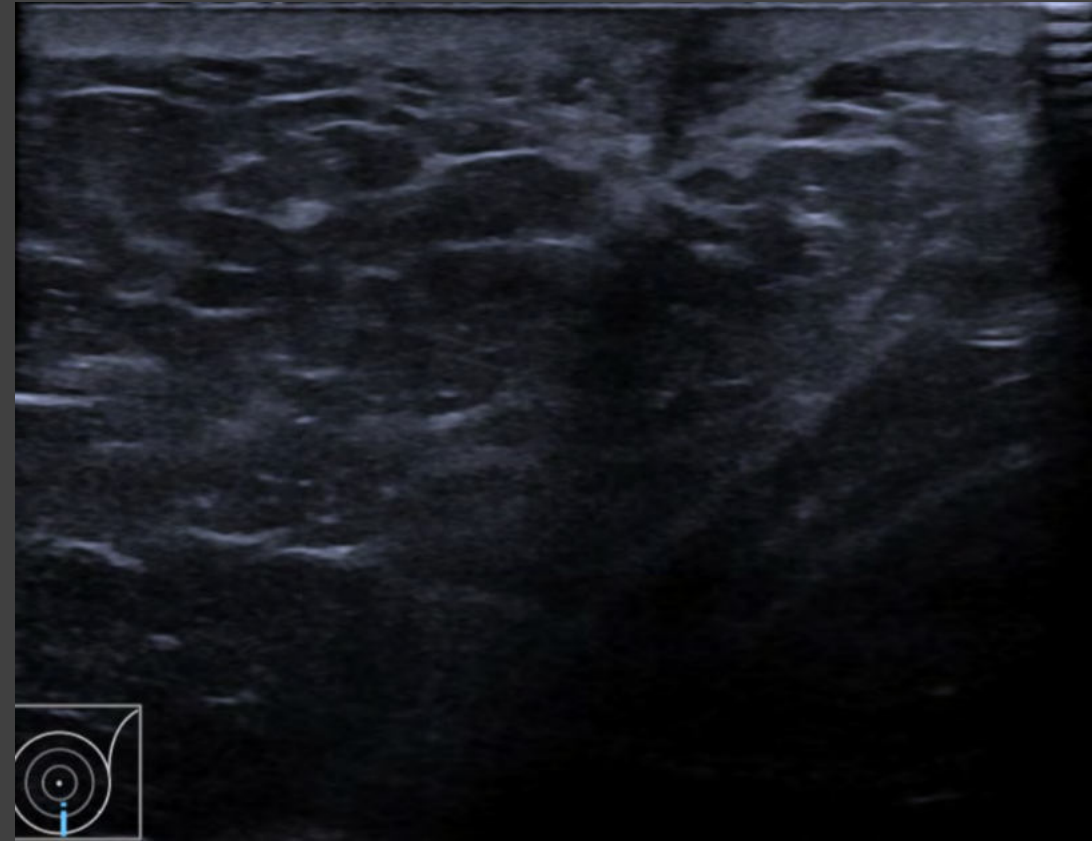
# POST SURGERY CHANGES



PO



CHANGES





# BI-RADS GRADING

- BI-RADS 0 additional imaging
- BI-RADS 1 negative
- BI-RADS 2 benign findings
- BI-RADS 3 probably benign short interval follow-up (6m) or continued tissue diagnosis
- BI-RADS 4 suspicious tissue diagnosis
- BI-RADS 5 highly suggestive for malignancy (>95%) tissue diagnosis
- BI-RADS 6 biopsy proven malignancy treatment



# PINTUITION SEED





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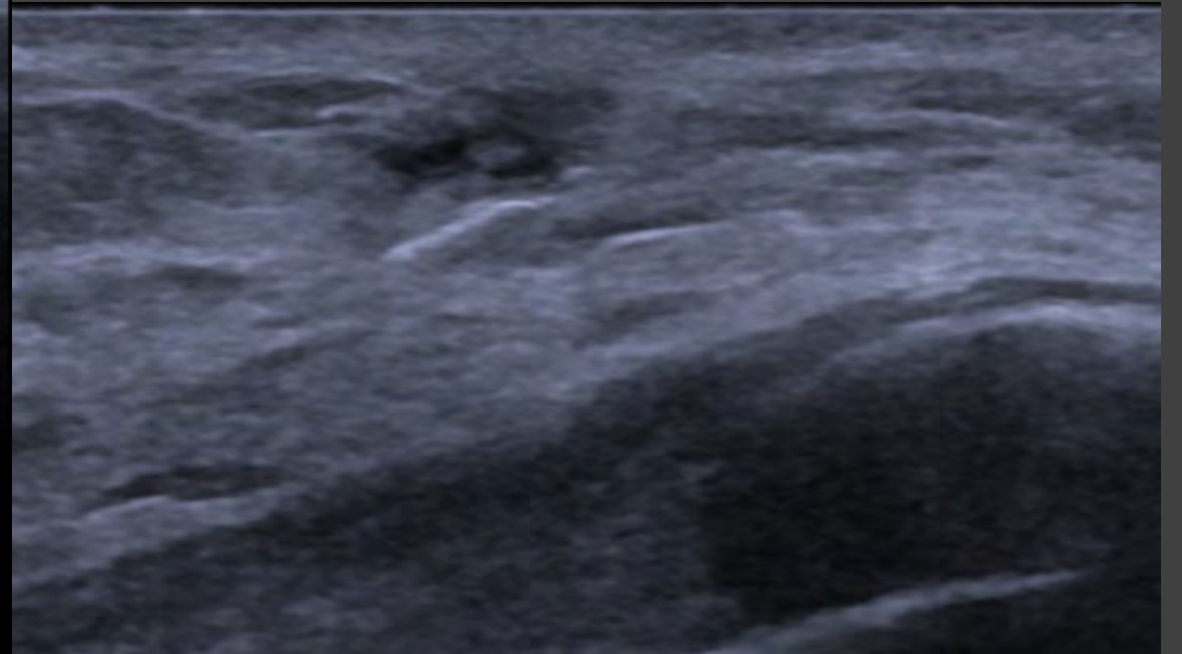
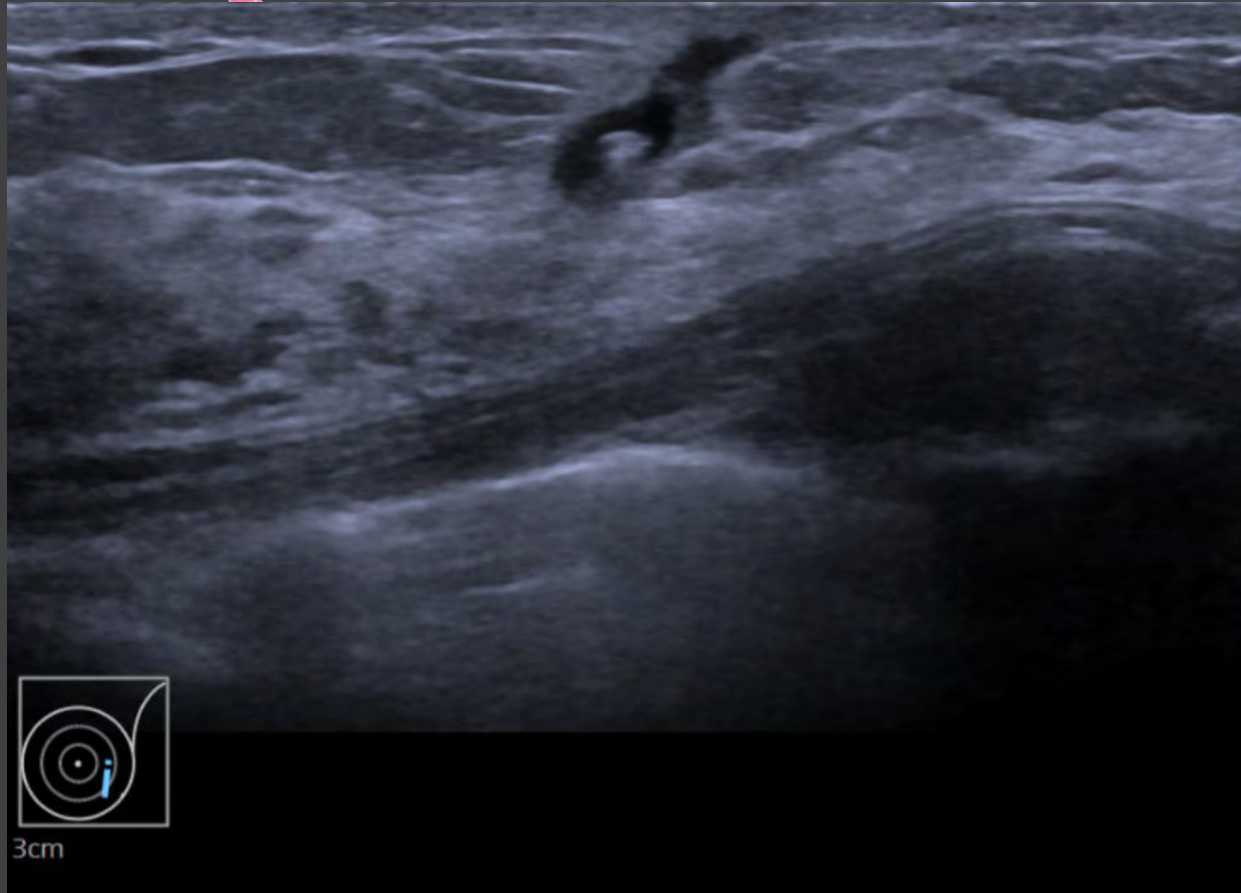


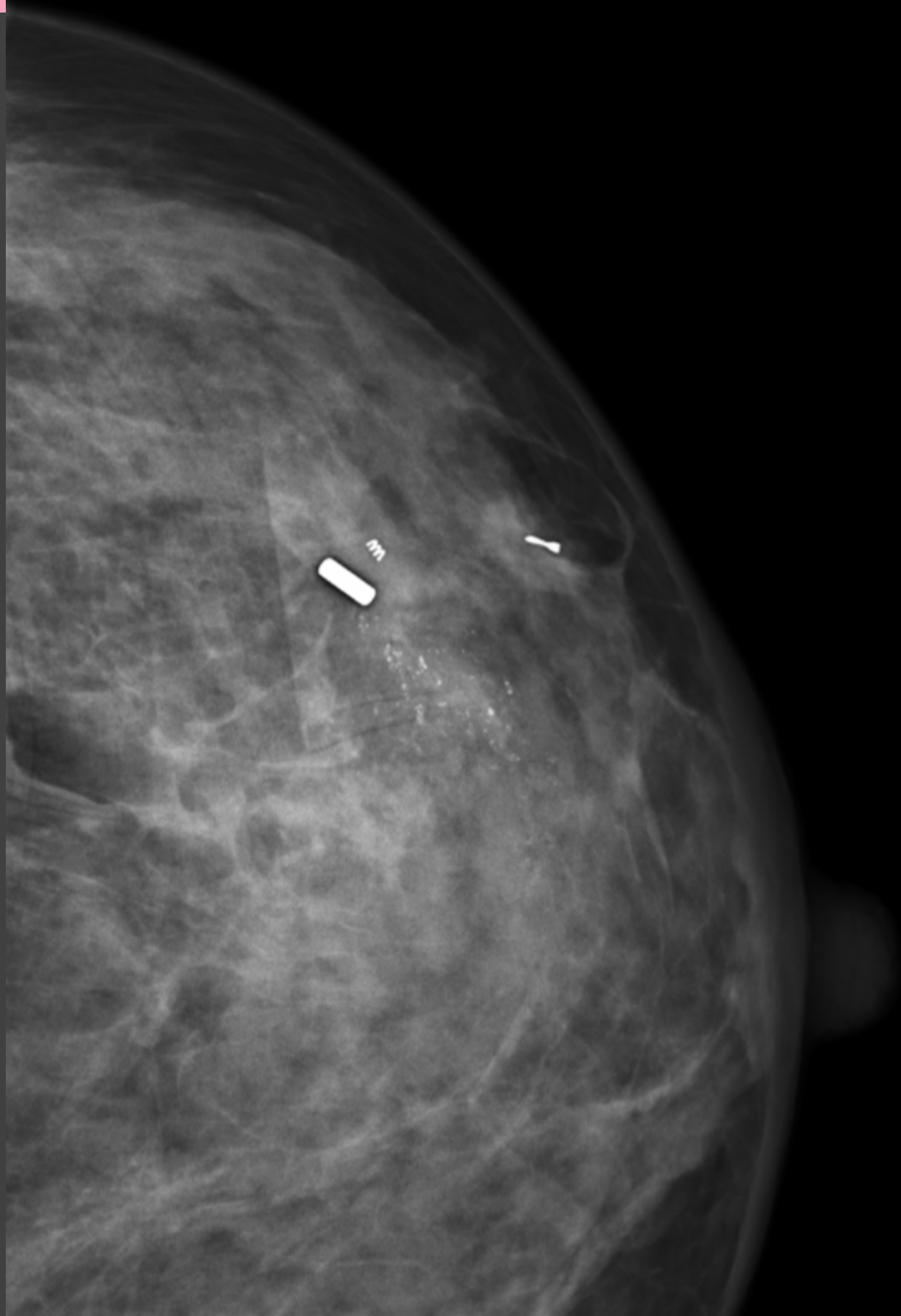
- Pintuition needle
  - Magnetic seed
  - Encapsulated in high-grade, nickle-free biocompatible titanium
  - 14G
- Pintuition probe
  - 50 mm directional detection range
  - Handhold, reusable
- Pintuition base unit
  - Audio & visual feedback





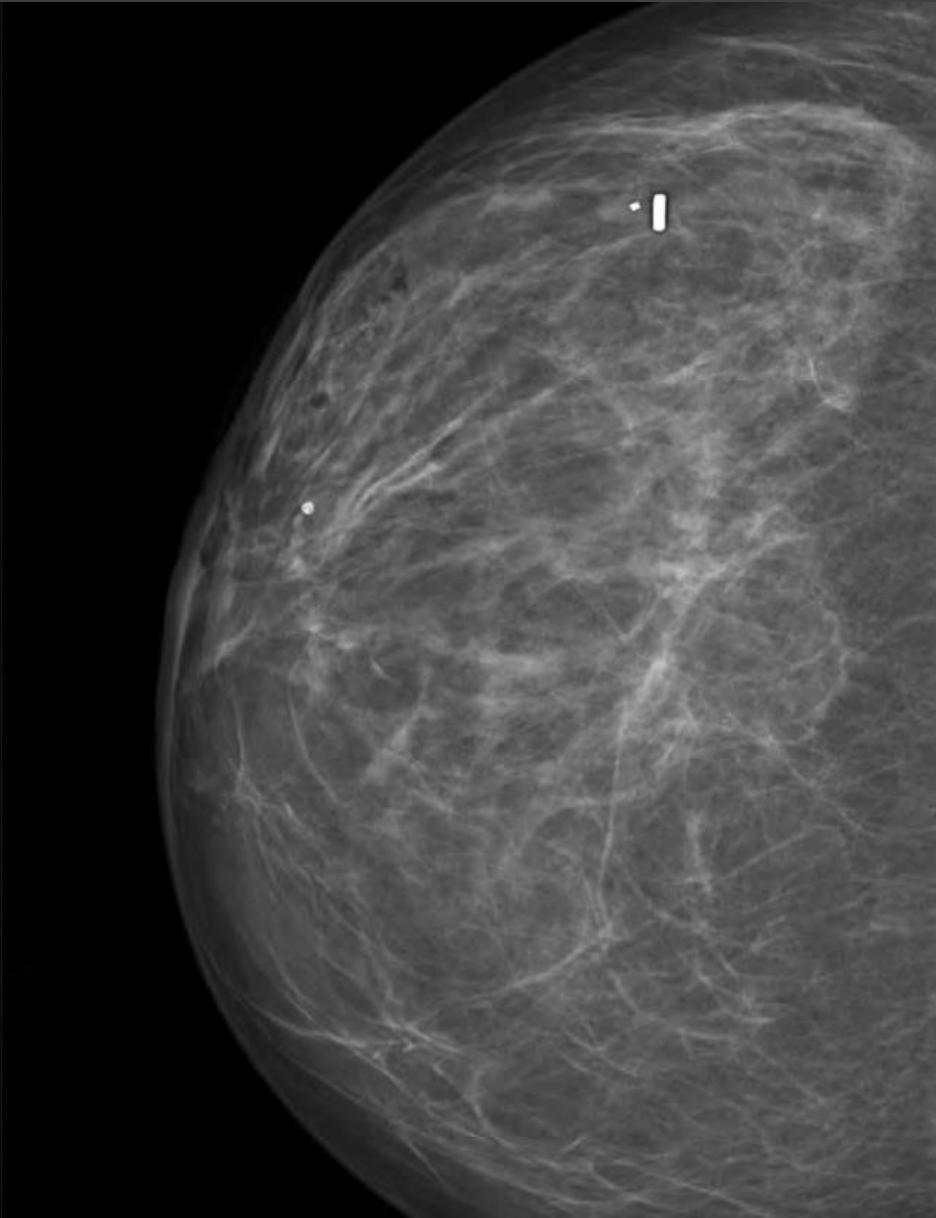
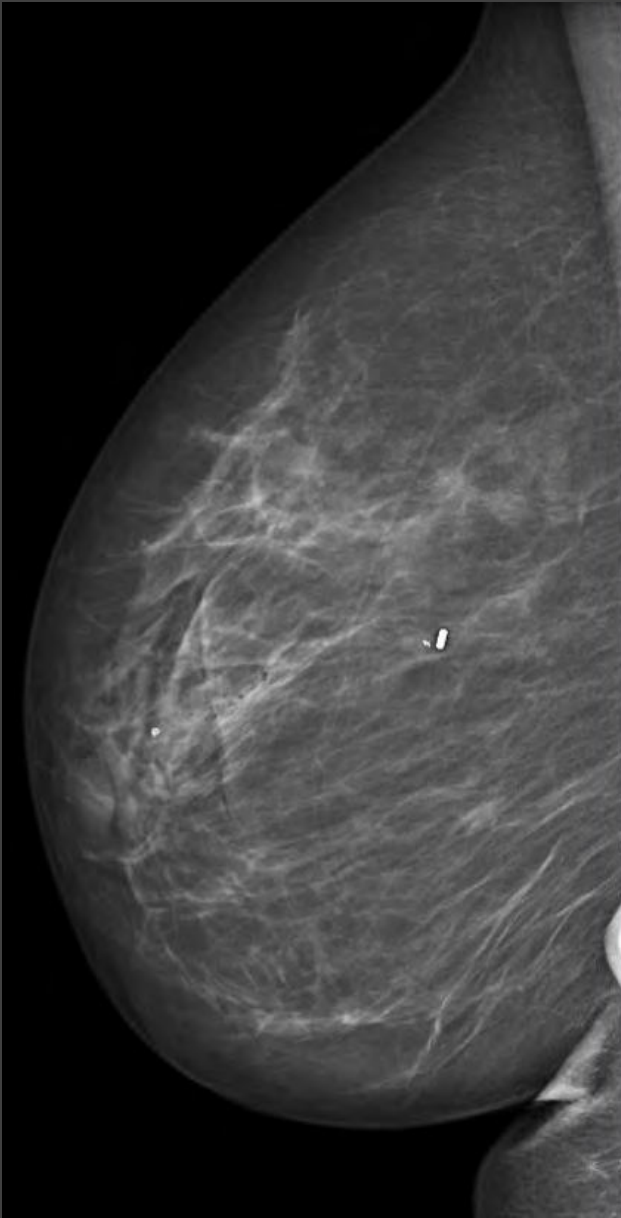
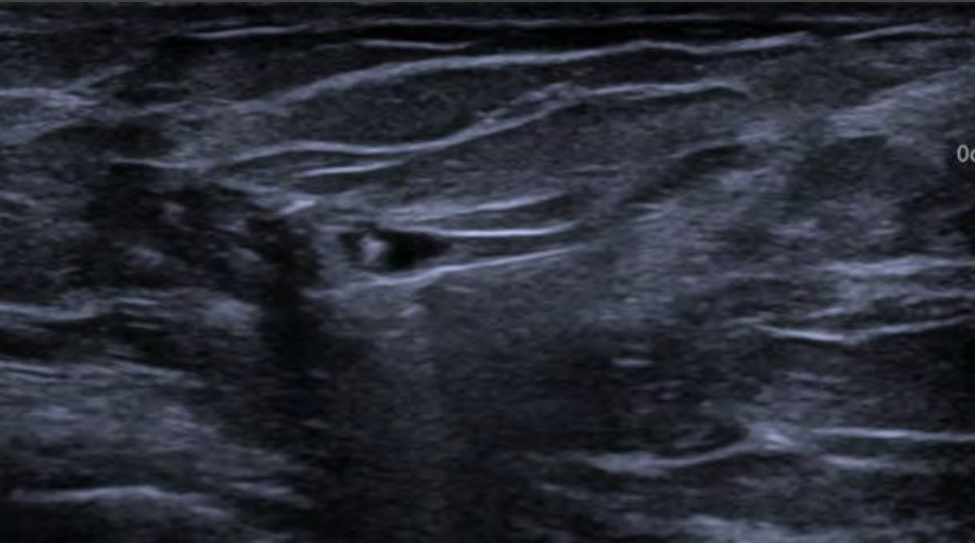
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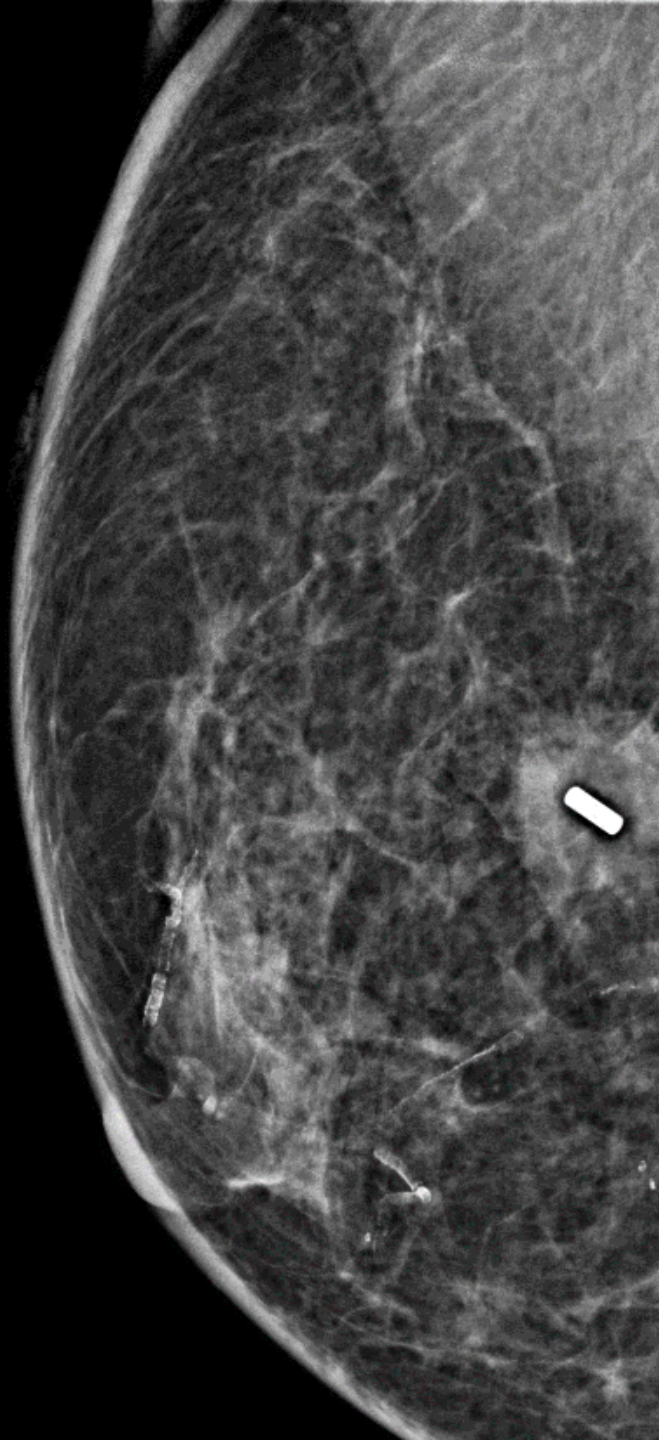
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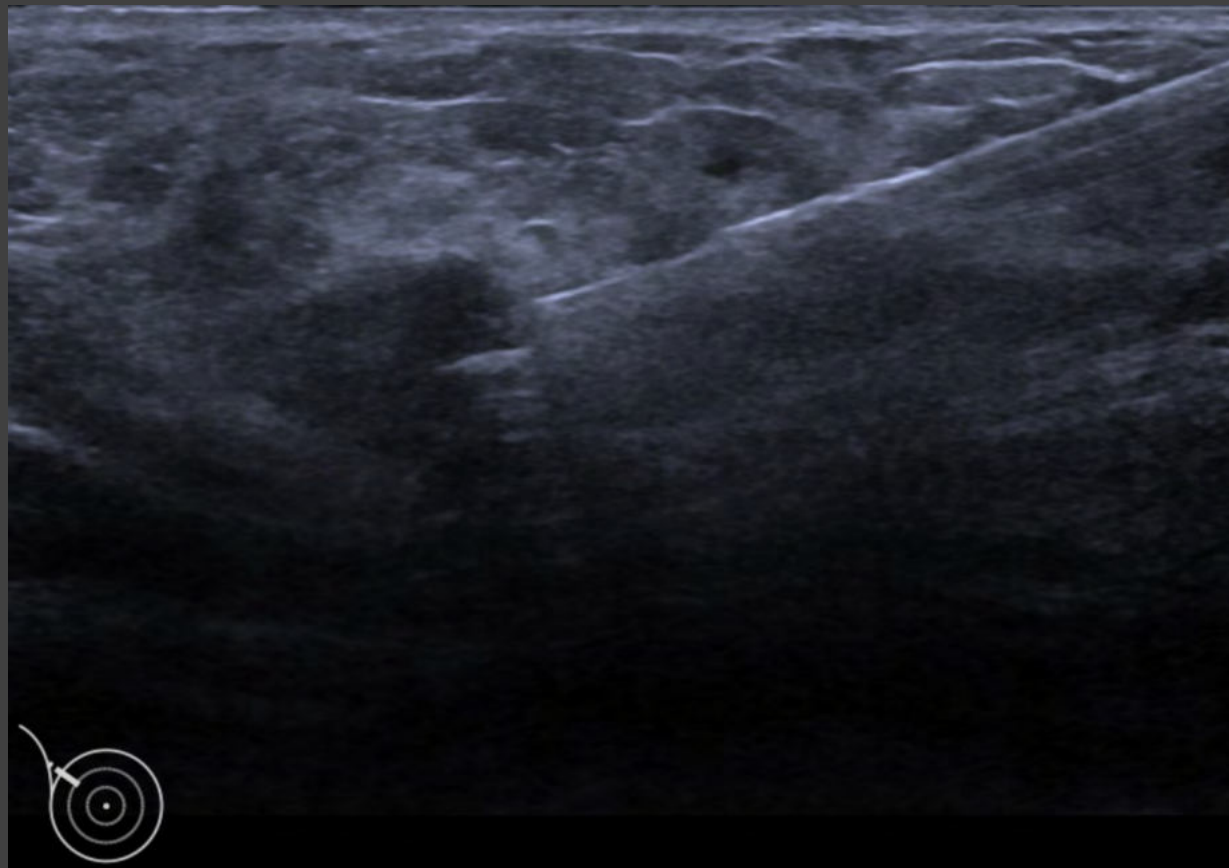
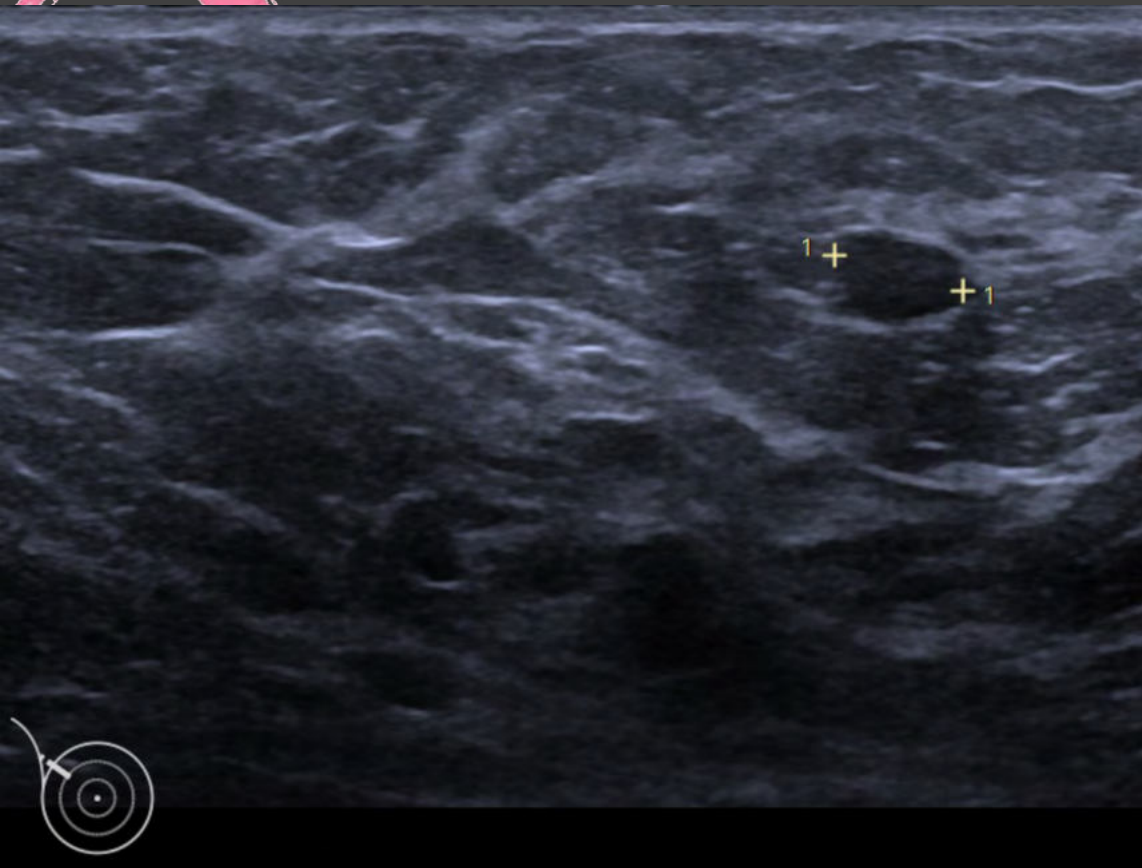
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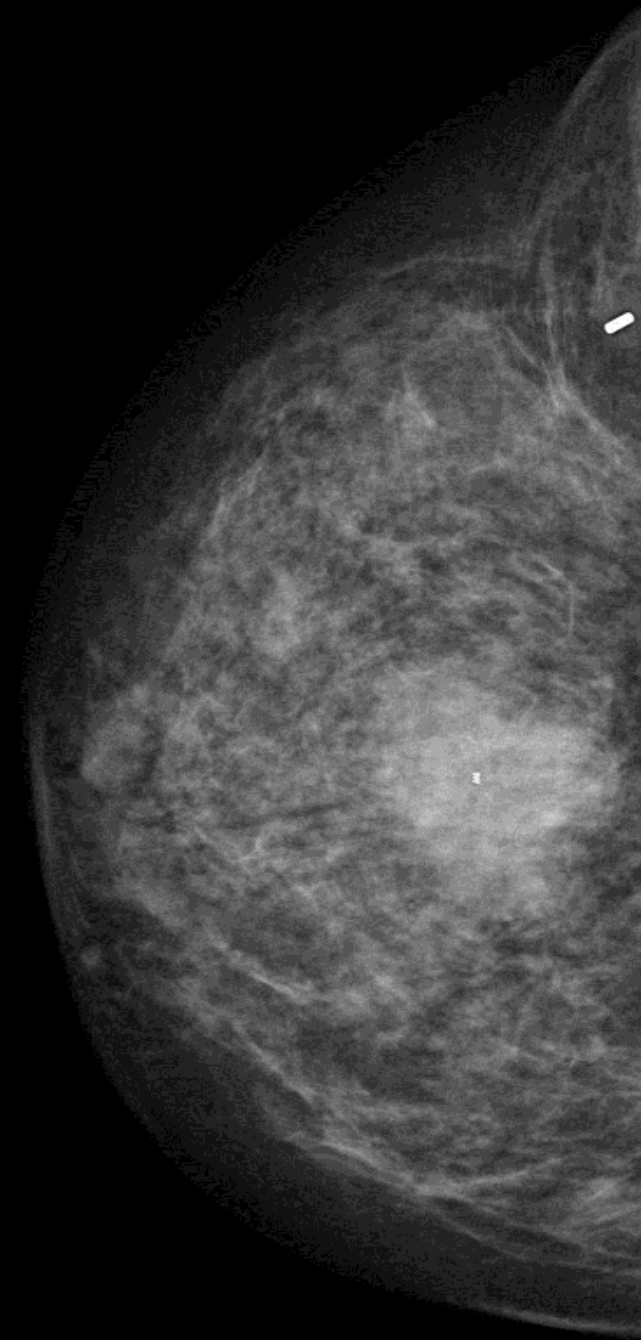
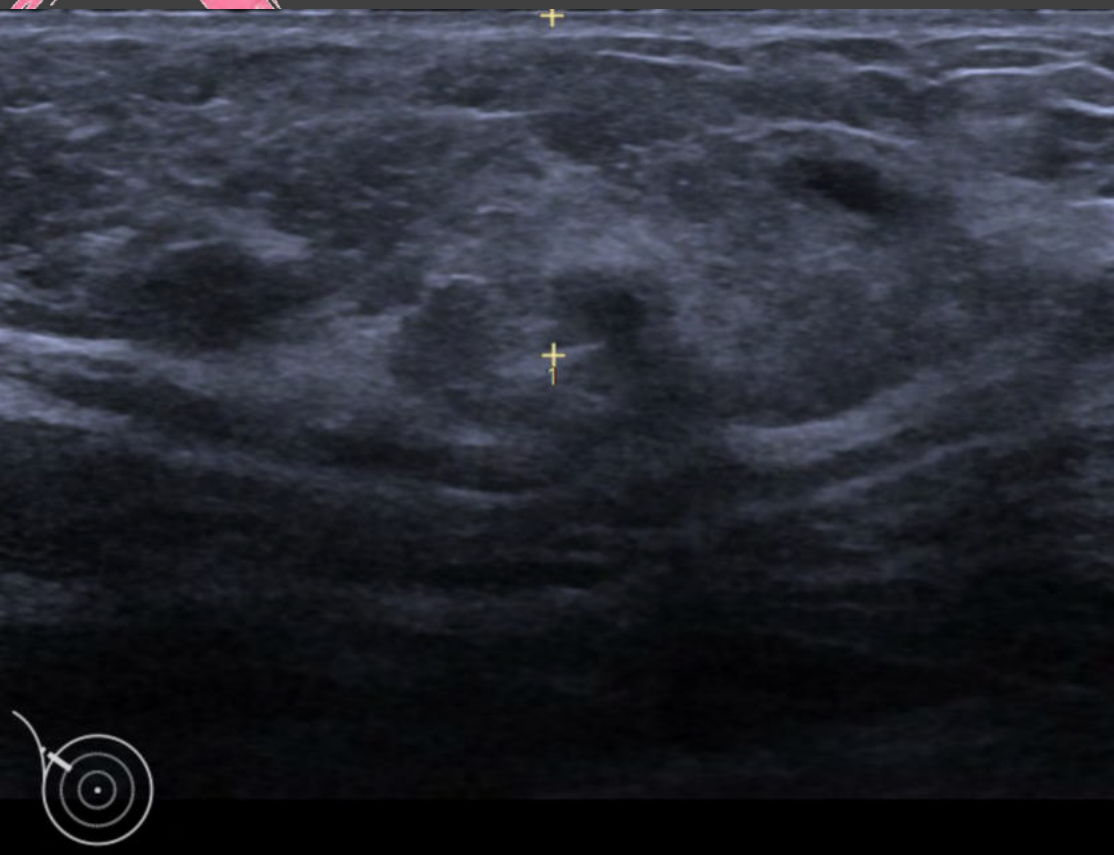


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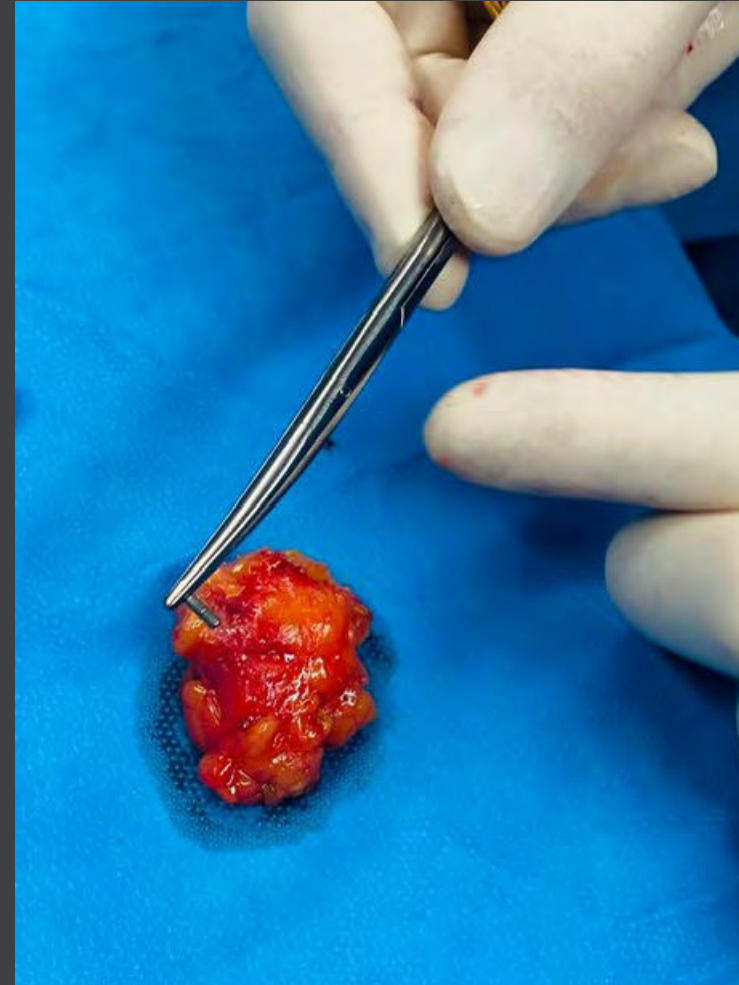
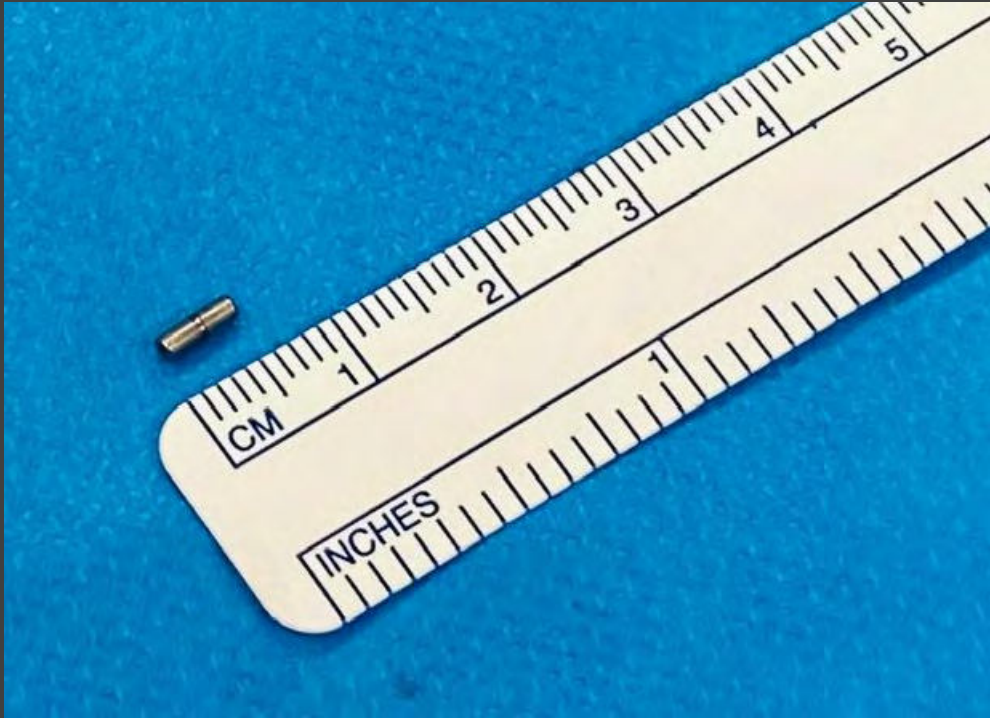


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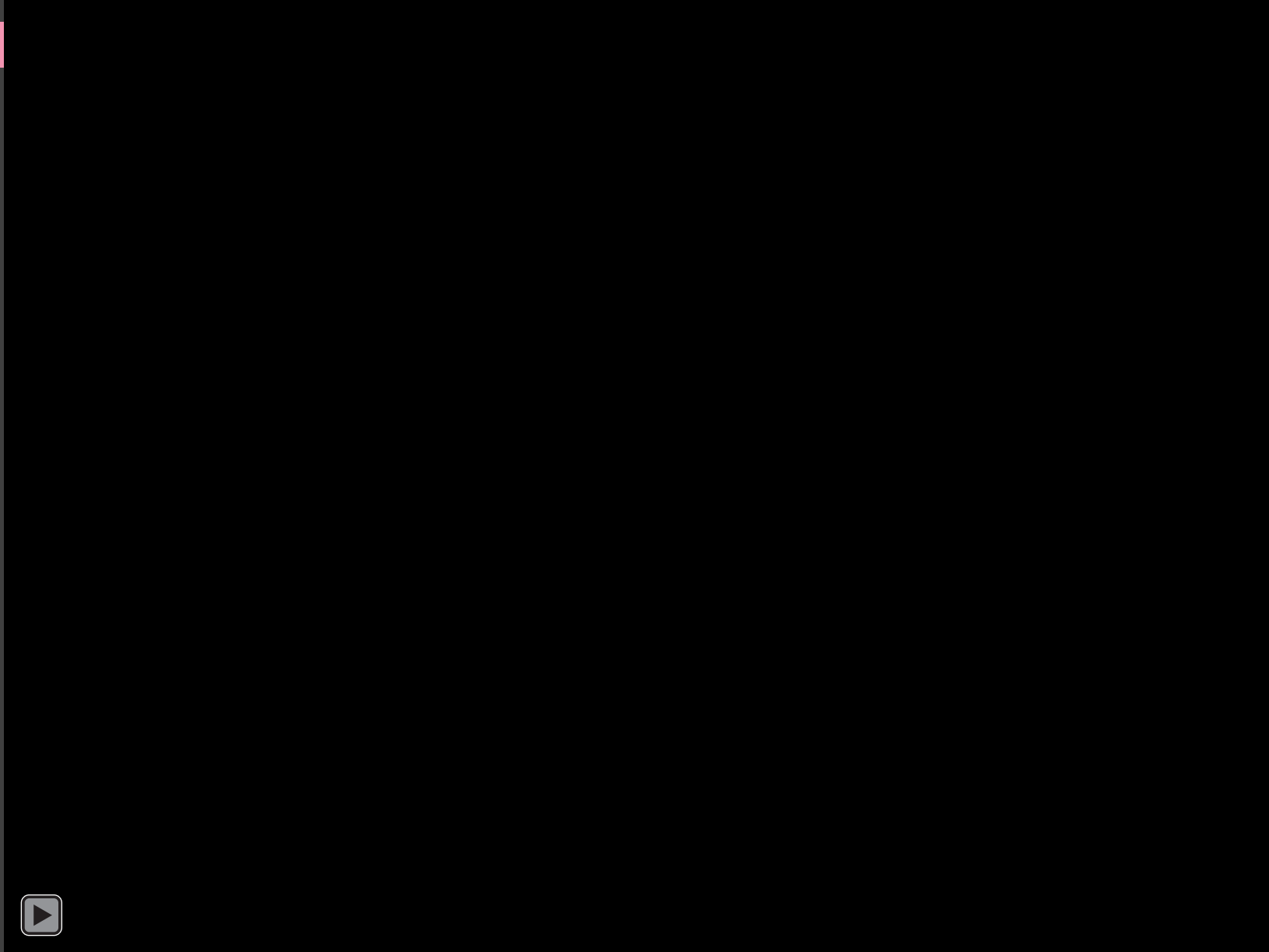


# PINTUITION SEED



Special thanks to Dr. Brouckaert for the images and peroperative video's.





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# BREAST PROTHESES



# INTRODUCTION

- 10 million women worldwide
- 450.000 / year in the USA
- Outer silicone membrane or shell

## Silicone filling

- Pro:
  - Natural feeling
  - No deformation when rupture
  - Less rippling
- Contra:
  - “ Silent” rupture

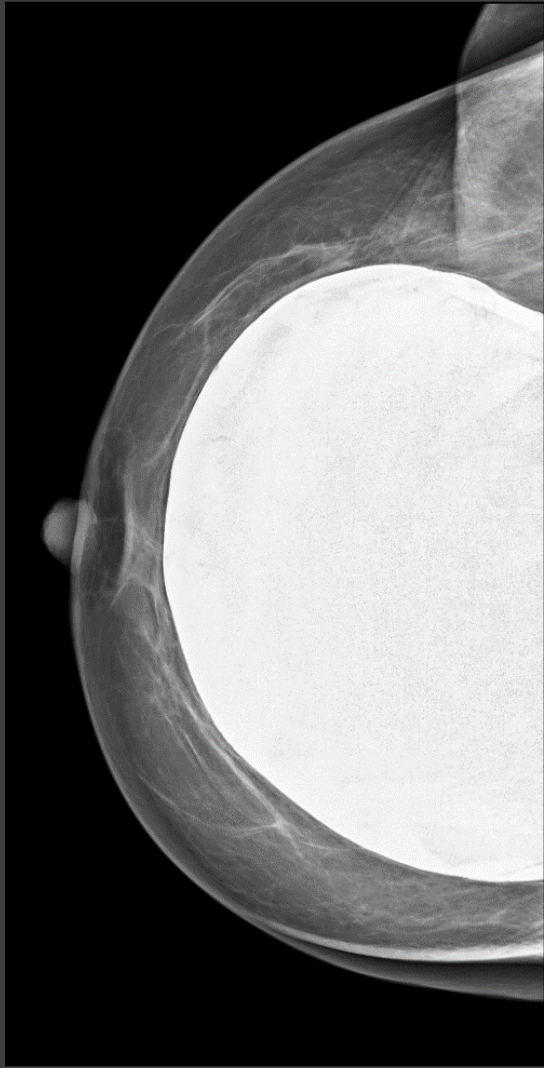
## Saline filling

- Pro:
  - Non-toxic
  - Less invasive insertion (non filled implant)
- Contra:
  - If rupture: complete deflation

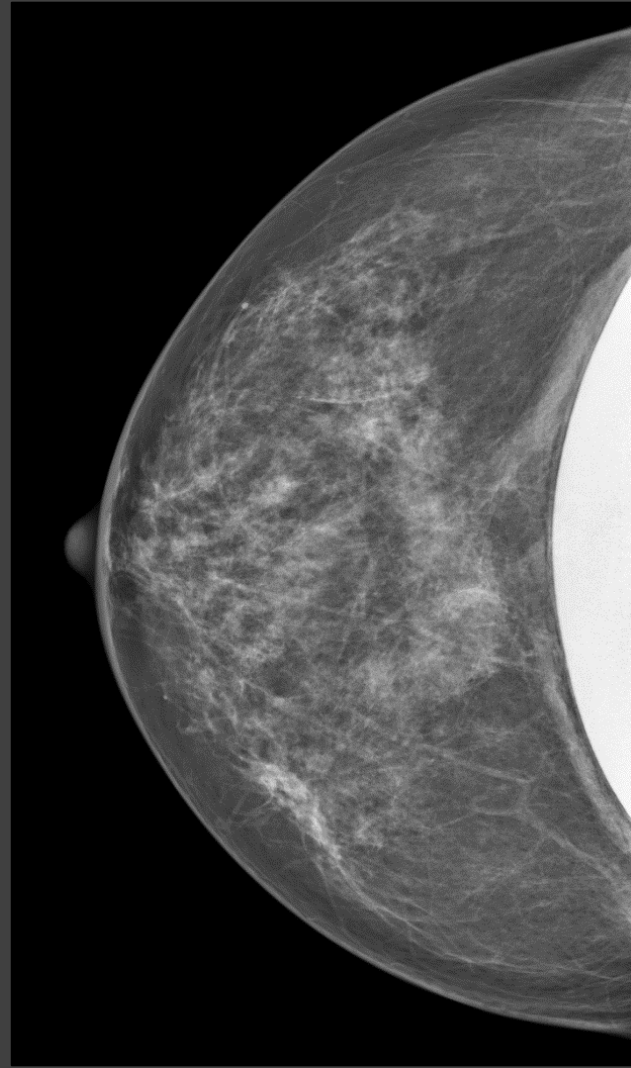


# IMAGING

Subglandular

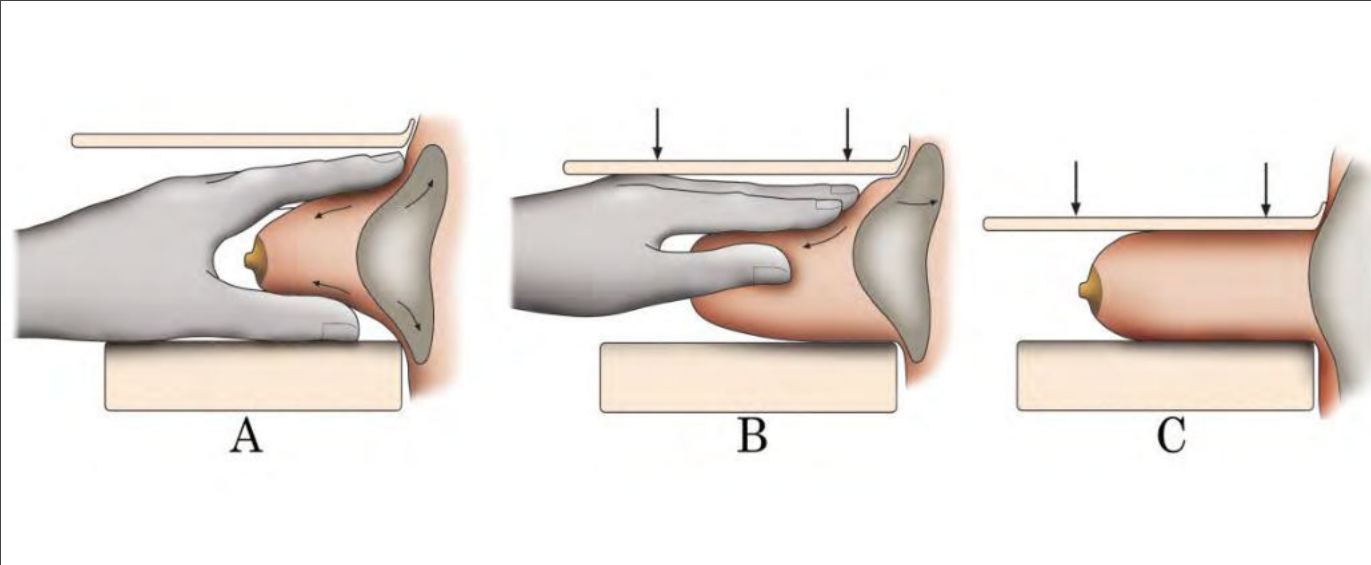


Retropectoral





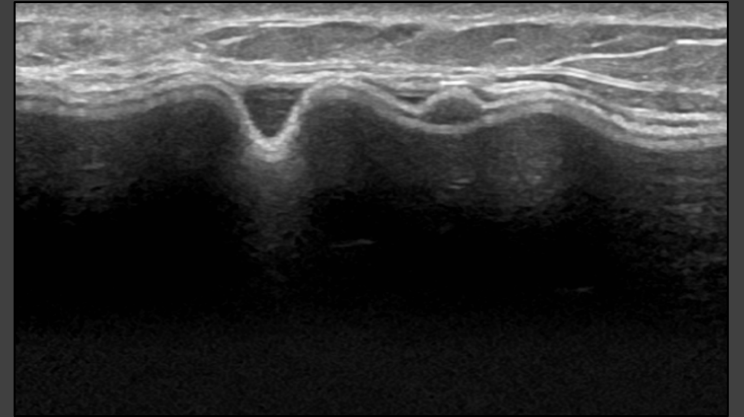
# IMAGING: EKLUND





# IMAGING: ULTRASOUND

- Fast
- Inexpensive
- High sensitivity and specificity
- Normal findings
  - Homogeneous anechogenic content on ultrasound
  - Periprosthetic fluid (small amount)
  - Radial folds: echogenic lines extending from periphery of the implant to the inferior

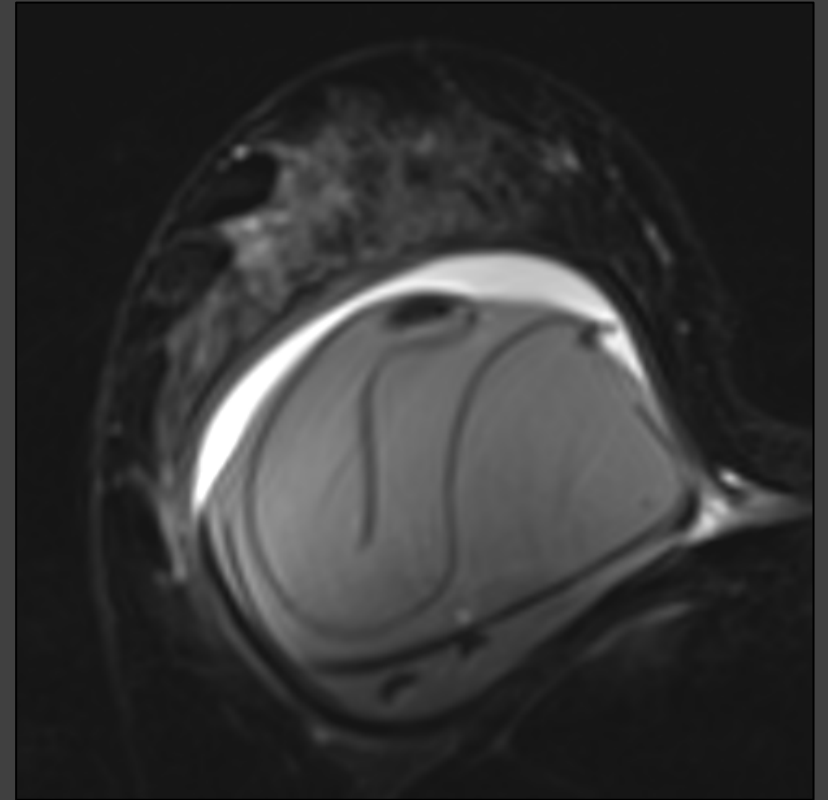






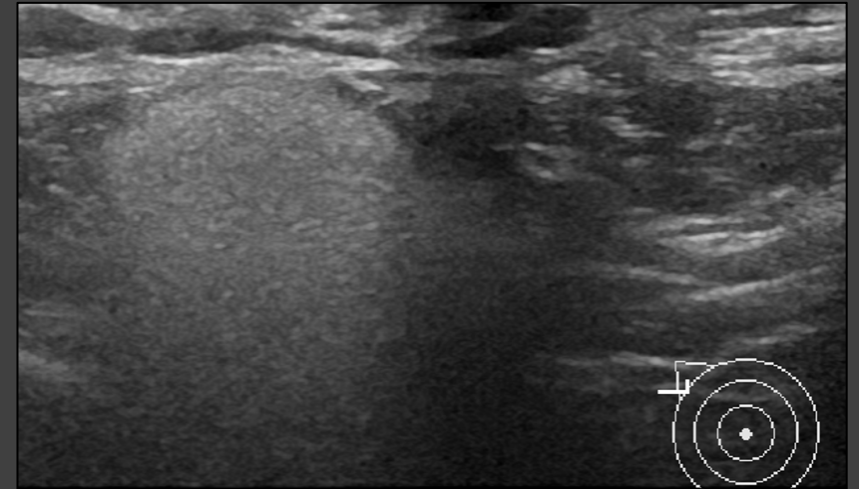
# IMAGING: MRI

- Inconclusive ultrasound
- Malignancy
- Rupture
  - Intra-capsular
    - Most common (77-89%)
    - Fibrous capsule is intact
    - No deformation
    - Asymptomatic
    - Linguine sign (broken shell freely moves in silicone)





- Inconclusive ultrasound
- Malignancy
- Rupture
  - Extra-capsular
    - Rupture of both prosthetic shell and fibrous capsule
    - (a)symptomatic
    - Deformation is possible
    - Free silicone
    - Silicone in lymph nodes: snowstorm shadowing





# IMPLANT-ASSOCIATED ANAPLASTIC LARGE CELL LYMPHOMA (ALCL)

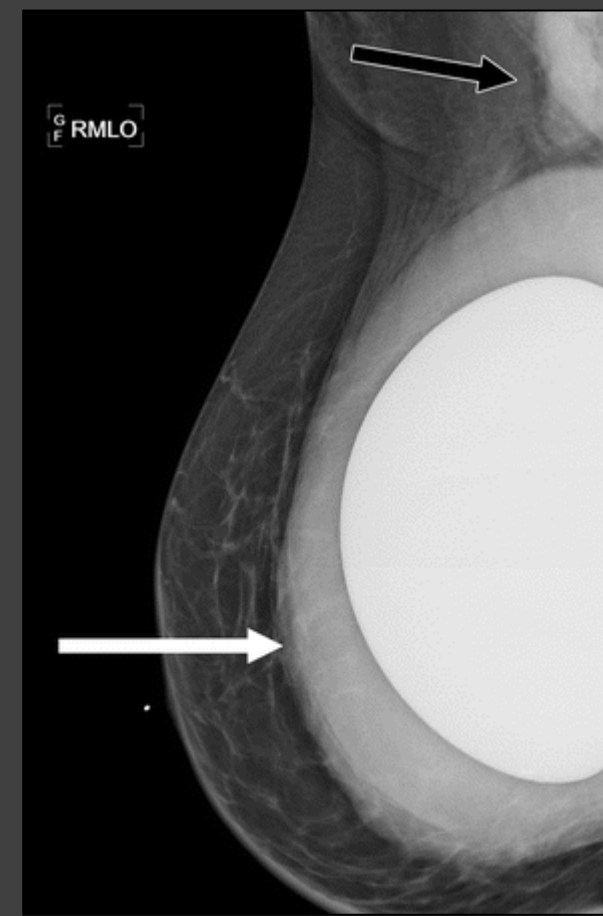
- Extremely rare
- First case in 1997
- Clinical presentation
  - Swelling due to effusion
  - Changes in breast shape
  - Mass (less frequent)
- Peripheral T cell lymphoma
- Pathogenesis: implant-induced chronic inflammation
- Texturing of the surface (93%)
  - Increased numbers of lymphocytes (predominance of T cells)
  - Allergan BIOCELL textured implants





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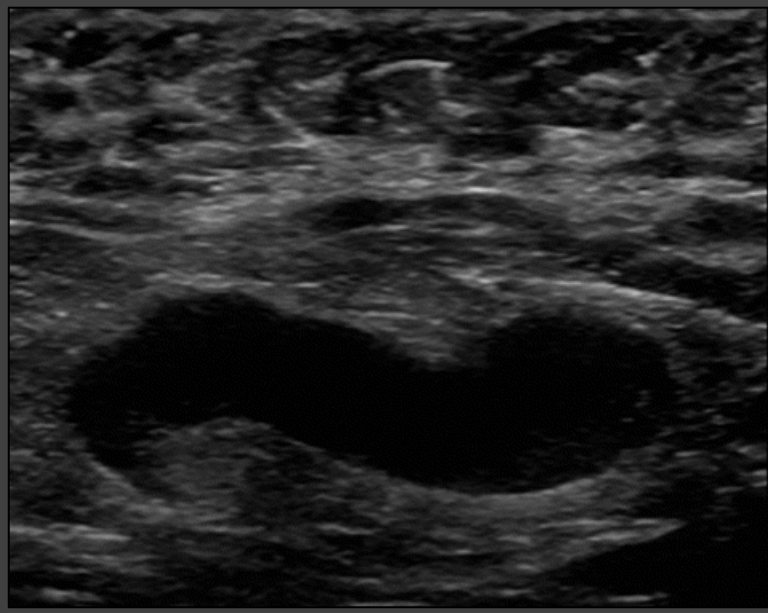
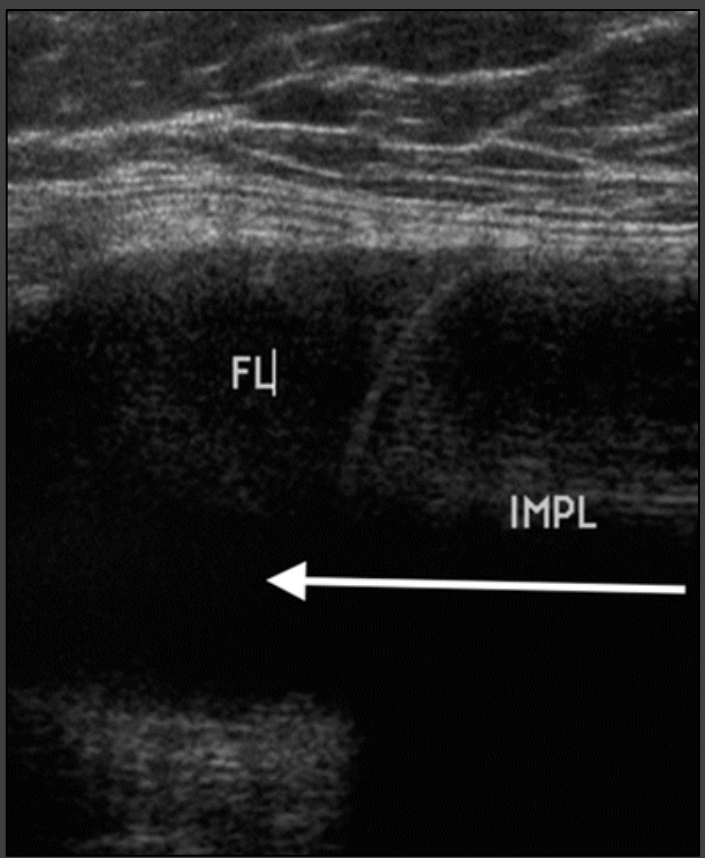
- Mammography
- Ultrasound
  - Seroma fluid sample
  - Thickened capsule
  - Mass
  - Therapeutic drainage



Eisenberg AM, Eppelheimer CN, Fulop TA, Abramson LL. Breast implant-associated anaplastic large-cell lymphoma, Radiology 2018;288(2): 624-629



# IMPLANT-ASSOCIATED ANAPLASTIC LARGE CELL LYMPHOMA (ALCL)



Eisenberg AM, Eppelheimer CN, Fulop TA, Abramson LL. Breast implant-associated anaplastic large-cell lymphoma, *Radiology* 2018;288(2): 624-629



# MALE BREAST



# INTRODUCTION

- Subcutaneous fat
- Remnant subareolar ductal tissue (involution & atrophy of the ducts due to high testosterone levels)
- Pectoralis muscle (more prominent)
- No Cooper ligaments





# GYNAECOMASTIA

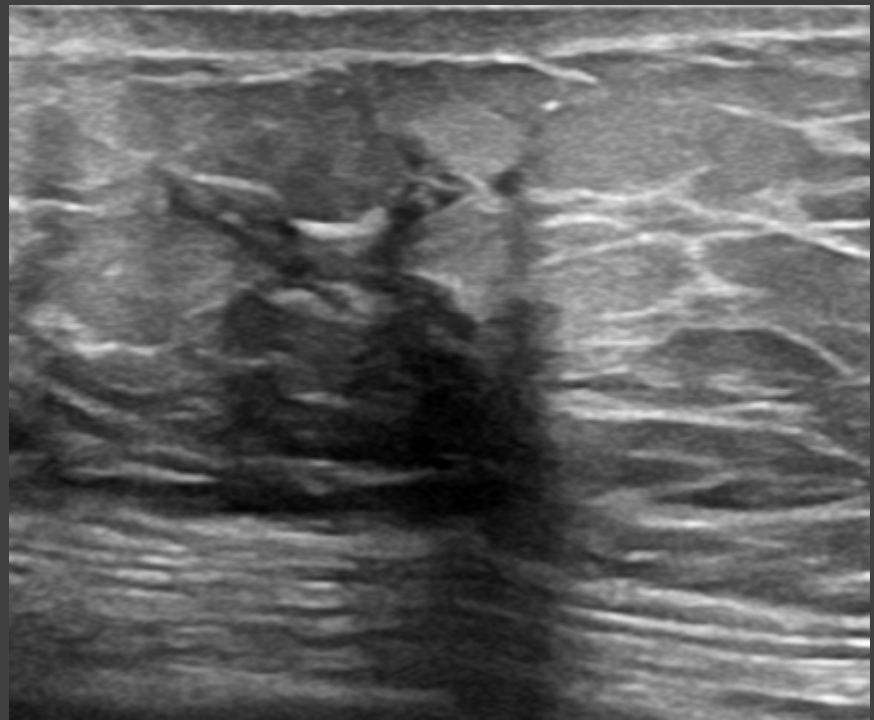
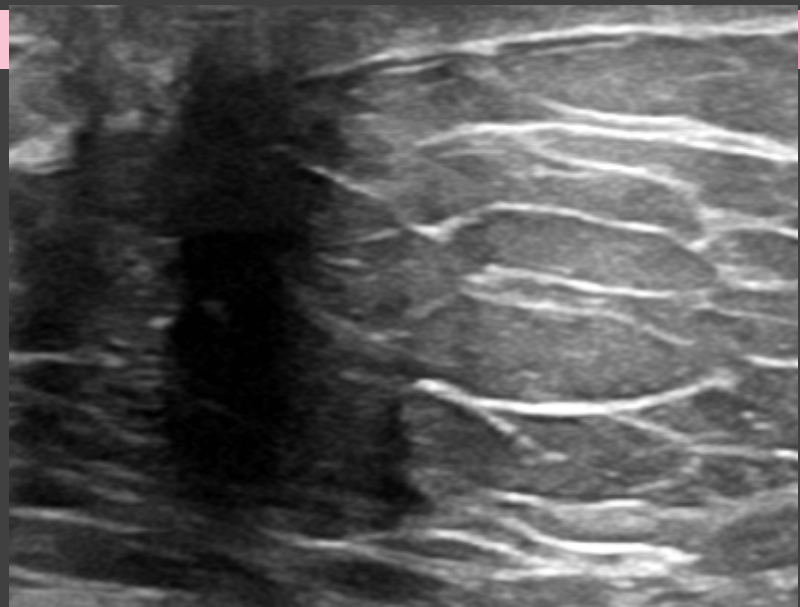
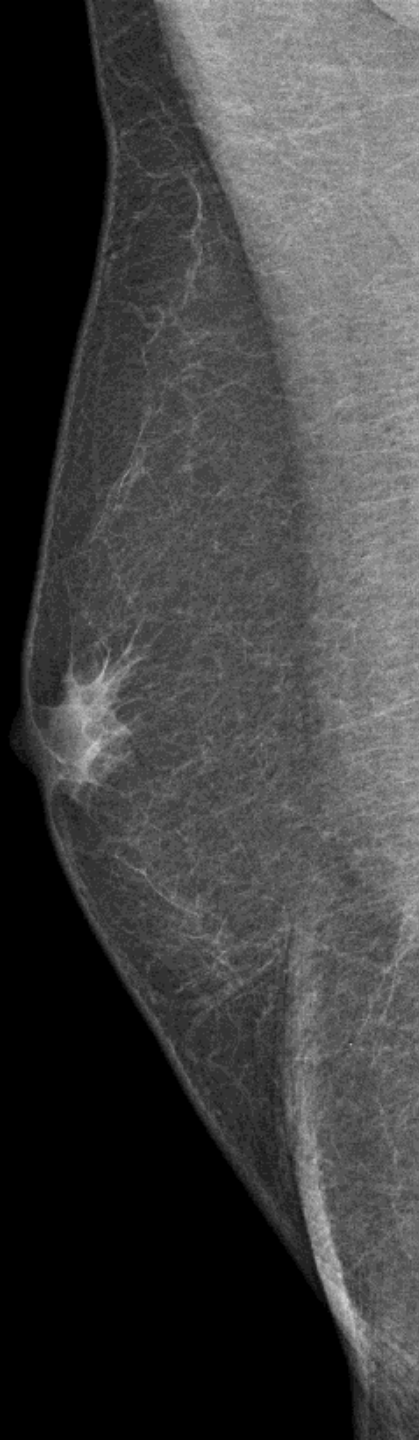
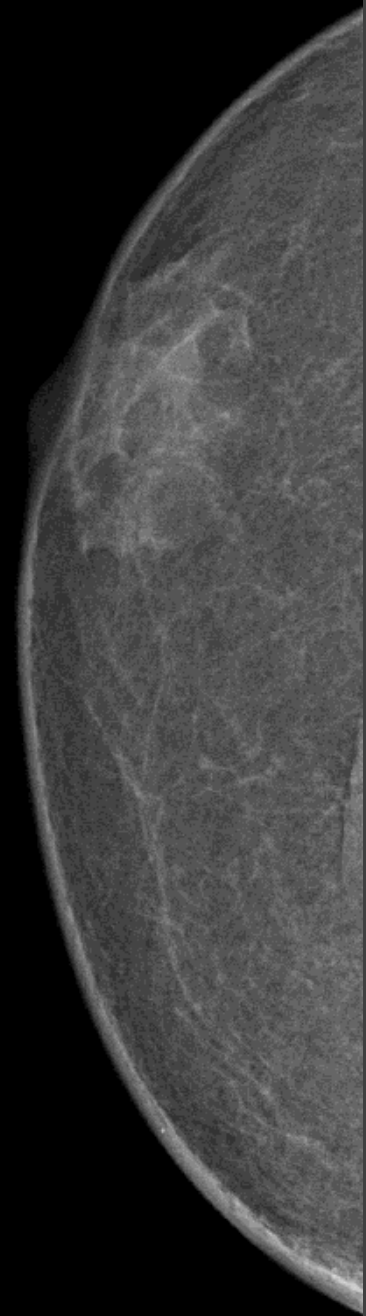
- Most common benign condition
- Due to benign ductal & stromal proliferation
- Age: bimodal distribution
  - Adolescence: excessive production of estrogen in relation to testosterone (20-70%). Peak age: 13-14 year
  - Senescence: 30-85% in men aged 50 to 80. Due to age related reduced production of testosterone
- Bilateral or unilateral (left)
- Clinical: soft, mobile and tender subareolar mass
- Imaging: central location under the nipple

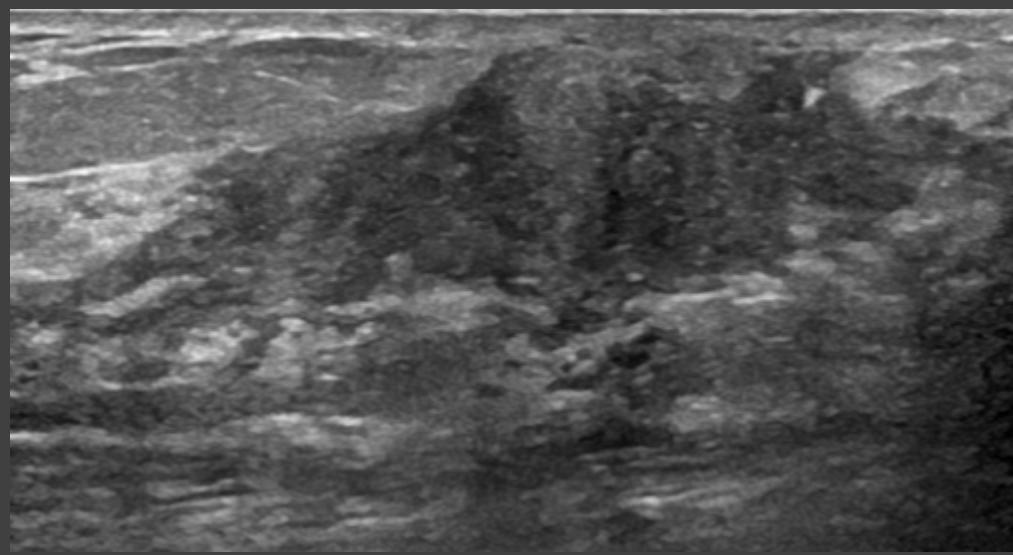
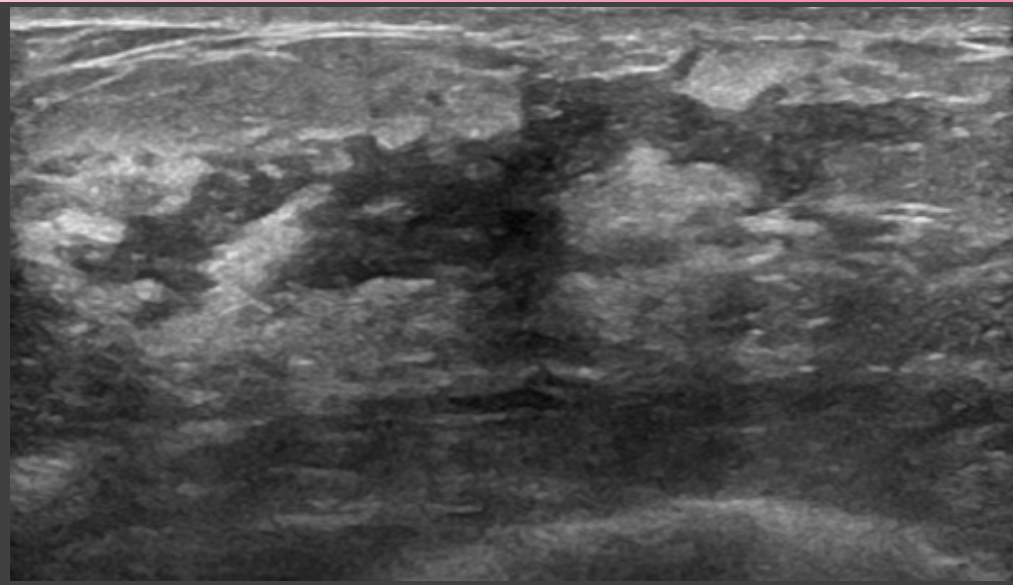




# GYNAECOMASTIA: CAUSES

- Physiological
- Drug-induced: anti-androgen, anabolic steroids, AIDS medications, Anti-anxiety medication (diazepam), tricyclic antidepressants, antibiotics, ulcer medications, chemotherapy, heart medications (digoxin, spironolactone)
- Pathological
  - Adrenal or testicular tumor
  - Endocrine: primary (10%) or secondary hypogonadism, prolactinoma
  - Systemic illness: liver cirrhosis, renal failure, HIV, obesity, malnutrition
- Drugs: Amphetamines, heroin, marijuana, alcohol
- Stress induced







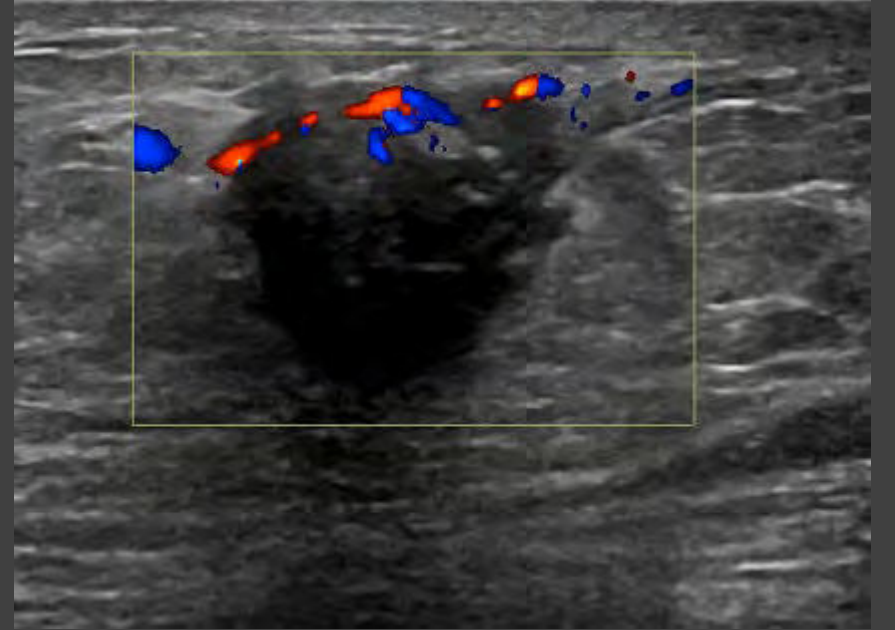
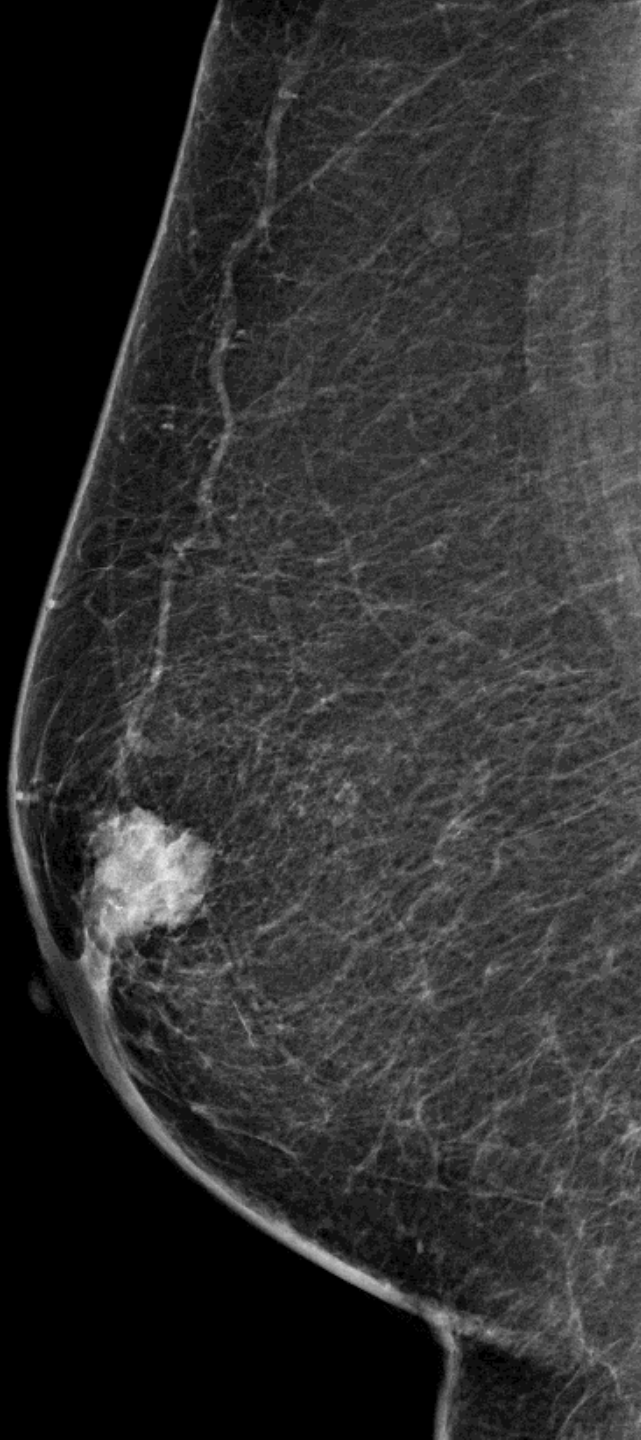
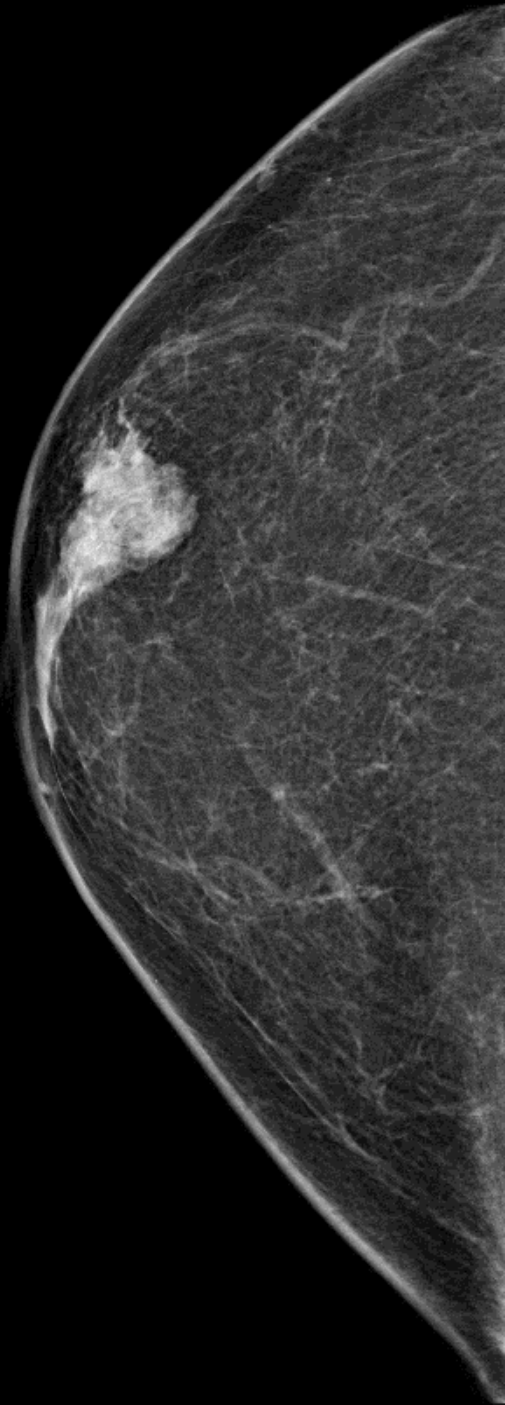
# MALIGNANCY

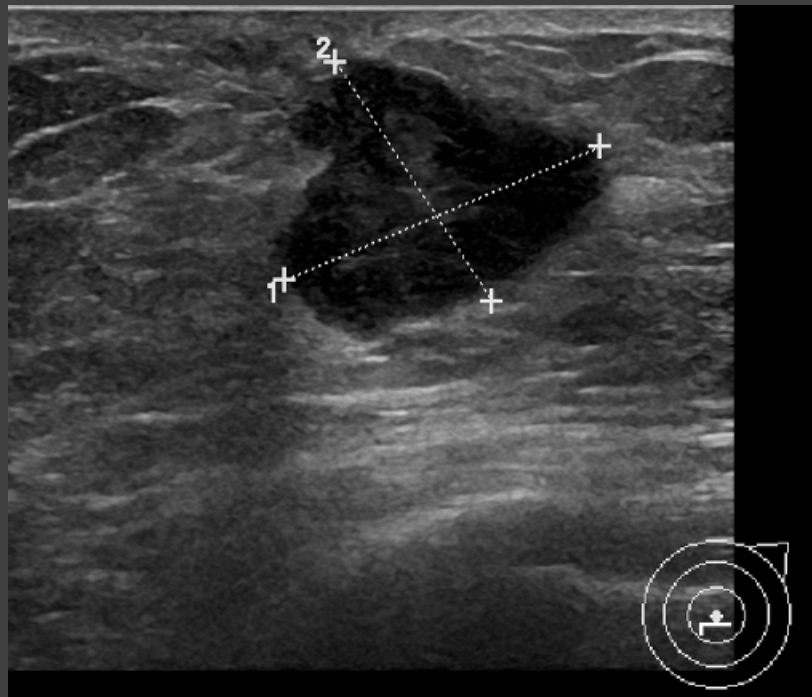
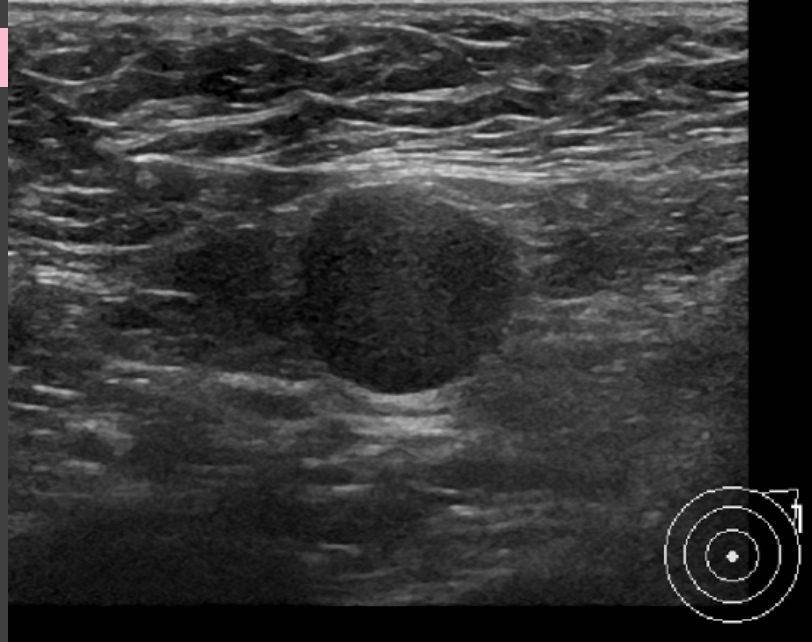
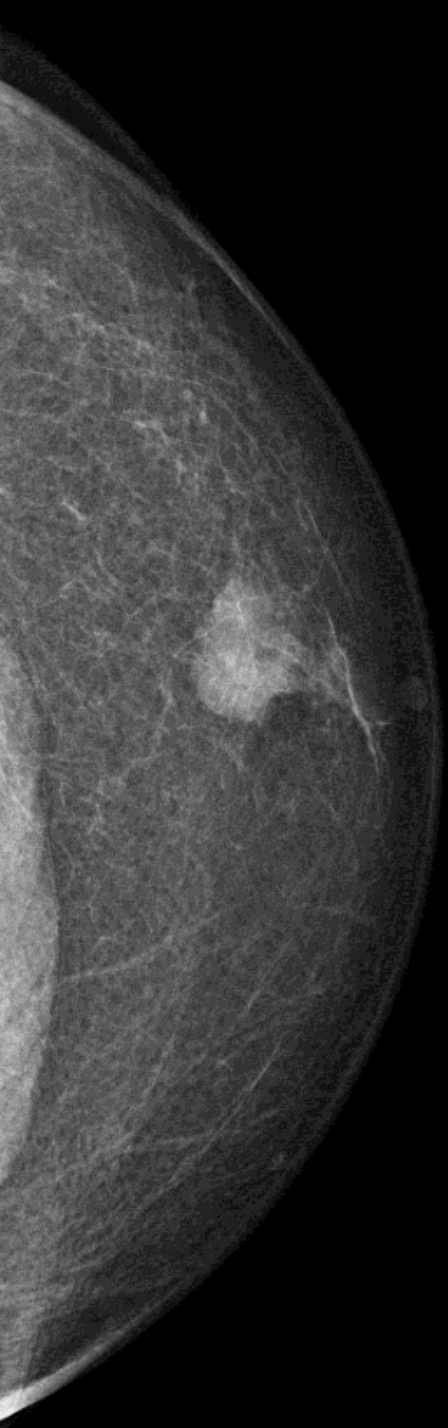
- 0,7 % of all breast cancers
- Only 1% of the lesions
- Belgium: 110 / year
- Mean age: 67 years
- Clinical presentation
  - Palpable mass (excentric)
  - Skin thickening
  - Nipple retraction
  - Every! (bloody) nipple discharge
  - Paget's disease
  - Axillary lymph nodes (50% !)



# MALIGNANCY: RISK FACTORS

- Family history
  - First degree relative: 1.9 x
  - Mother and sister 10 x
- Advanced age
- Prior chest irradiation
  - Diagnostic / therapeutic radiotion: 1 – 2 x
  - Atomic bomb survivors: 15x
- Hyperestrogenism / estrogen treatment
- Undescended testes – orchidectomy
- Liver disease (hyperestrogenism)
- BRCA 2 mutation: 80 x
- Klinefelter syndrome (XXY): 16 – 19 x → bilateral breast Ca







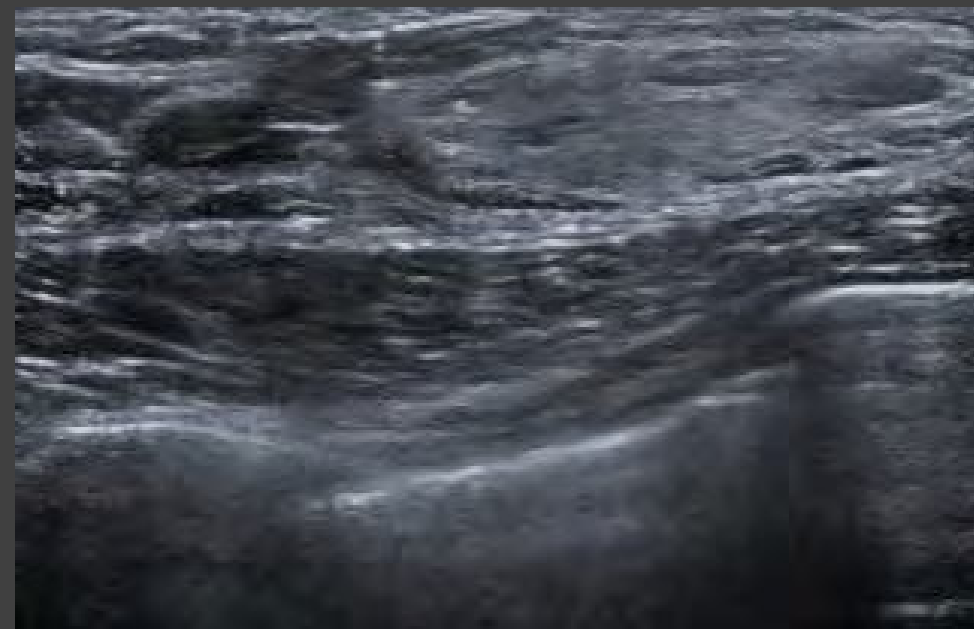
# TRANSGENDER PATIENTS



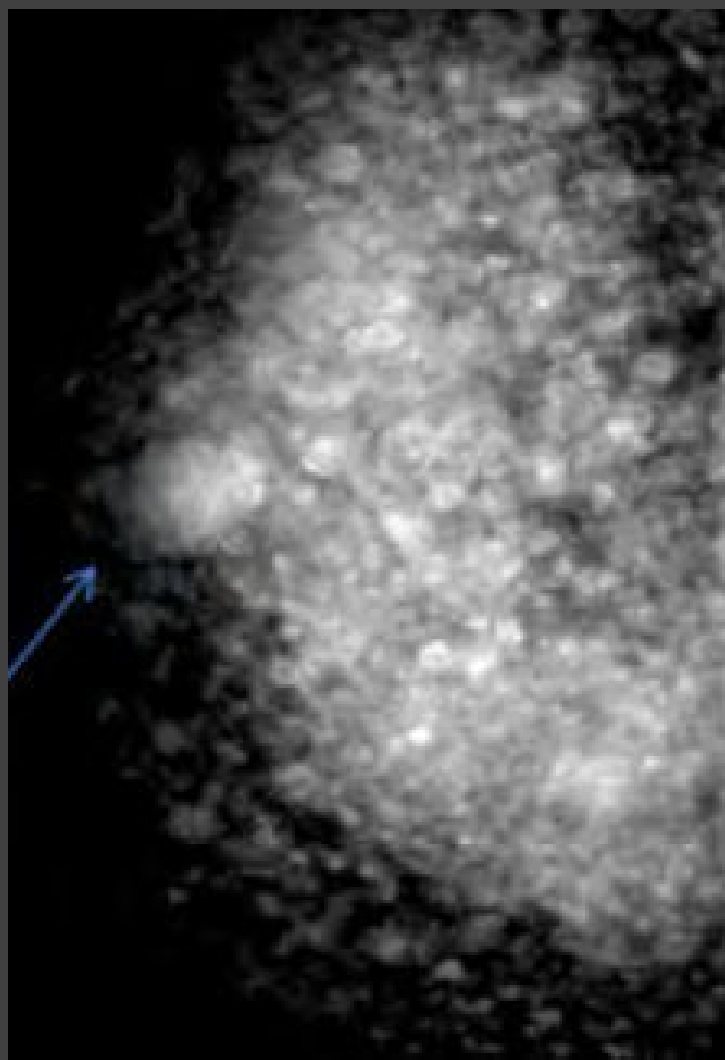
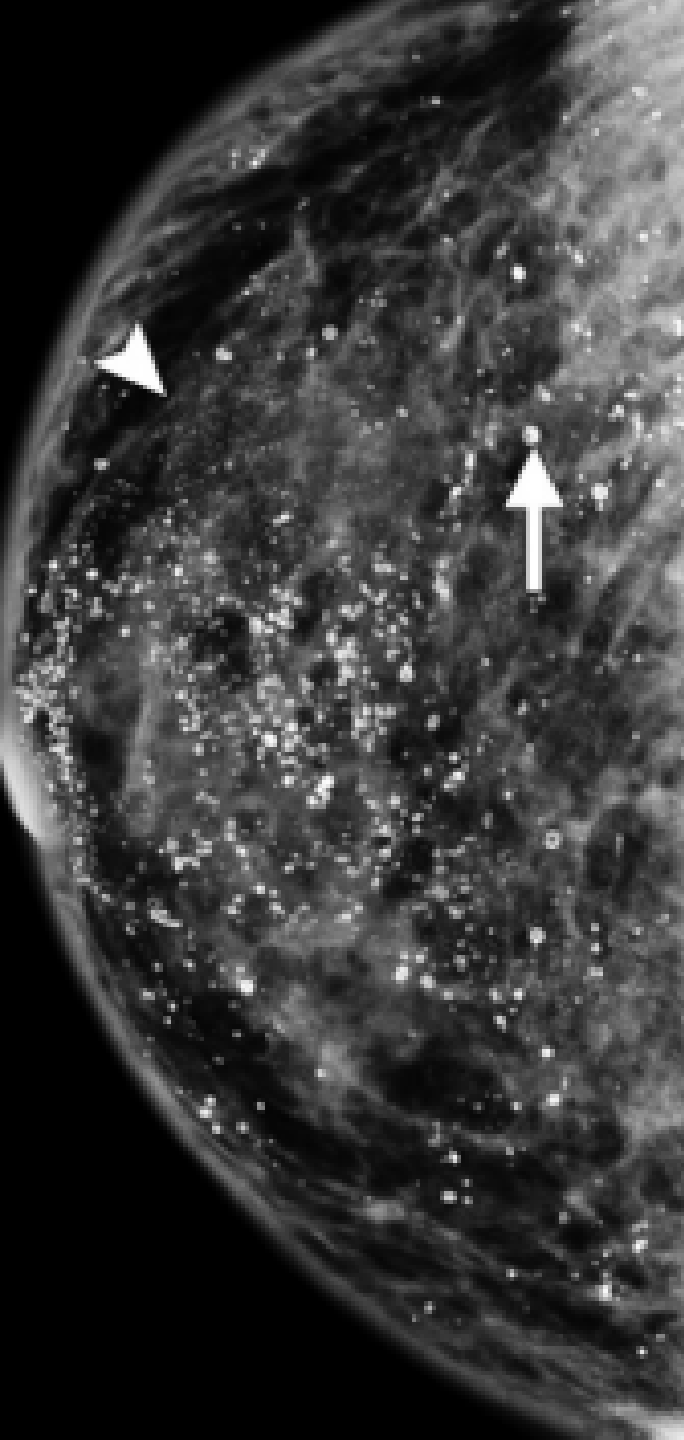


# TRANSGENDER WOMEN

- Hormone therapy: estrogen & antiandrogen medication
- Breast development
- Histologically: breast tissue similar to that of cisgender women comprising breast ducts, lobules, and acini (gynaecomastia!!)
- Broad range of pathology: benign & malignant
- Post-augmentation changes: injections or implant (ALCL)
- Diagnostic work-up: mammo, US, biopsy
- Screening: annual / biennial screening at the age of 50



Parikh U. et al. Breast imaging in transgender patients: what the radiologist should know. RadioGraphics 2020;40:13-27



Nguyen C et al. Male breast disease: pictorial review with radiologic-pathologic correlation. *RadioGraphics* 2013;33:763-779

Sonnenblick E. et al. Breast imaging of transgender individuals: a review, *Curr Radiol Rep* 2018;6: 1-12



# TRANSGENDER MEN

- Hormone therapy: testosterone
- Reduce breast glandular tissue and promote the formation of connective tissue
- Diagnostic work-up: US, biopsy
- Screening
  - No surgery or reduction mammoplasty: clinical examination and screening
  - Bilaterale mastectomy: yearly clinical chest wall and axillary examination



**THANK YOU FOR YOUR ATTENTION**

