Who Benefits from Enhanced Breast Imaging?

2023 Multidisciplinary Cancer Update

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Ochsner™ Health System

Disclosures

None

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Overview

- ACR/SBI screening recommendations
- 3D Tomosynthesis
- MRI
- Ultrasound
- **Contrast enhanced mammography**

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Overview

- ACR
  - American College of Radiology
- SBI
  - Society of Breast Imaging

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ACR/SBI Screening recommendations

- Average risk women
  - **Once a year screening mammogram starting at age 40**
  - **40% reduction in mortality from breast cancer**

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Sources 1, 9, 10

ACR/SBI High Risk Recommendations

- **All women should have their risk for breast cancer assessed by age 25**

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Source 1

High Risk Classification

- Genetics based
  - Including untested first degree relatives
- Calculated lifetime risk 20% or more
  - **Tyrer Cuzick model**
  - Gail Model, BRCAPRO, etc.

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Source 1

ACR/SBI High Risk Recommendations

- Genetics based or increased calculated lifetime risk
  - **Annual mammography beginning at age 25 to 30**
    - **3D tomosynthesis**
  - **Annual breast MRI beginning at age 25 to 30**

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Source 1

ACR/SBI High Risk Recommendations

- History of chest radiation before age 30
  - **Annual mammography beginning at 25 or 8 years after therapy (whichever is later)**
  - **Annual breast MRI beginning at age 25 to 30**

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Source 1

ACR/SBI High Risk Recommendations

- Personal history of breast cancer
  - Dense breasts (any age)
  - Or diagnosed before age 50
    - **Annual breast MRI**
      - **Bilateral**

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Source 1

ACR/SBI High Risk Recommendations

- Personal history of ADH or lobular neoplasia
  - **Annual breast MRI should be considered**

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Source 1

ACR/SBI High Risk Recommendations

- Dense breasts
  - **If supplemental screening is desired, annual breast MRI with IV contrast should be considered**
    - **If MRI not possible, consider contrast mammography or ultrasound**

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Source 1, 10

ACR/SBI High Risk Recommendations

- ***Consider*** contrast mammography or screening ultrasound for those who cannot undergo MRI

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Source 1

Contrast Mammography

- Patients that qualify for but cannot undergo MRI
  - CDR, sensitivity, and specificity similar to MRI

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3D Tomosynthesis

- Increases breast cancer detection rate
  - Extra 0.2-2.7 cancers per 1000 women
- Decreases recall rate
  - Approximately 15% - 36.8%
- Improves positive predictive value for biopsies
  - (PPV3) 50% over 2D
- Decreases BIRADS 3 follow-up by 50%

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Sources 2-4

Screening Breast Ultrasound

- Increases cancer detection rate
  - 2-4 mammographically occult cancers per 1000 women
- But high false positive rate
  - **Positive predictive value from biopsies (PPV 3) ~8%**

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Sources 5-6

Screening Breast MRI

- Increases cancer detection rate
  - **Examples:**
  - Study 1: Additional 15 cancers in 1000 women
  - Study 2: Additional 16 cancers in 1000 women
    - Interval cancer rate went to zero
- **PPV3 rate is comparable to mammography**

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Sources 7-8

Breast MRI Indications

- ACR Appropriateness Criteria
  - Screening
  - New breast cancer
    - Extent of disease
      - 3-9% of women will have a contralateral breast cancer
      - 12-30% have occult ipsilateral disease
    - Preoperative systemic therapy
    - Lumpectomy positive margins
  - Breast cancer recurrence
  - Metastatic cancer of unknown primary

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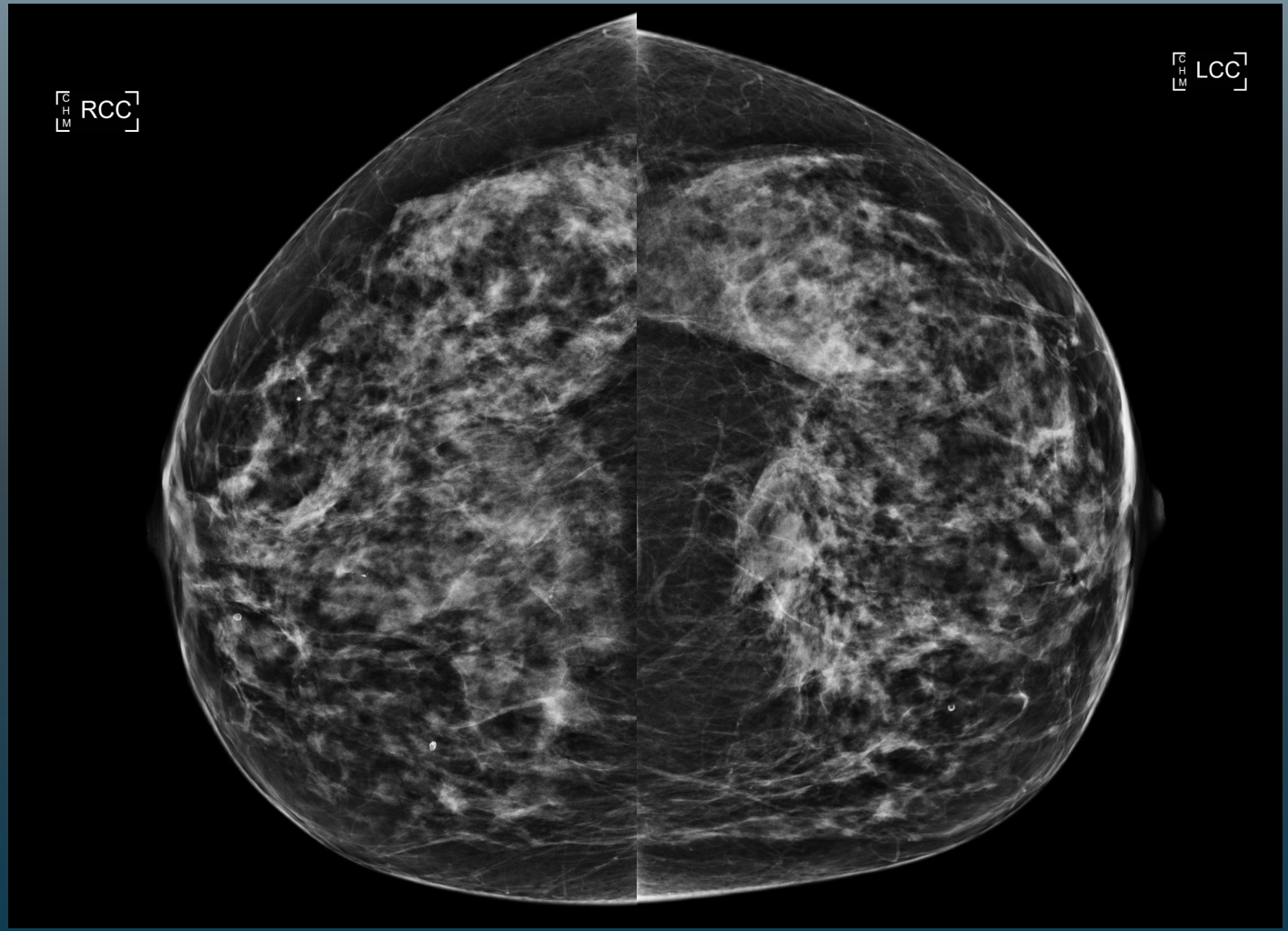
Contrast Enhanced Mammography

- Case
  - High risk screening
  - Dense breast tissue
  - Minimal background parenchymal enhancement
  - Normal exam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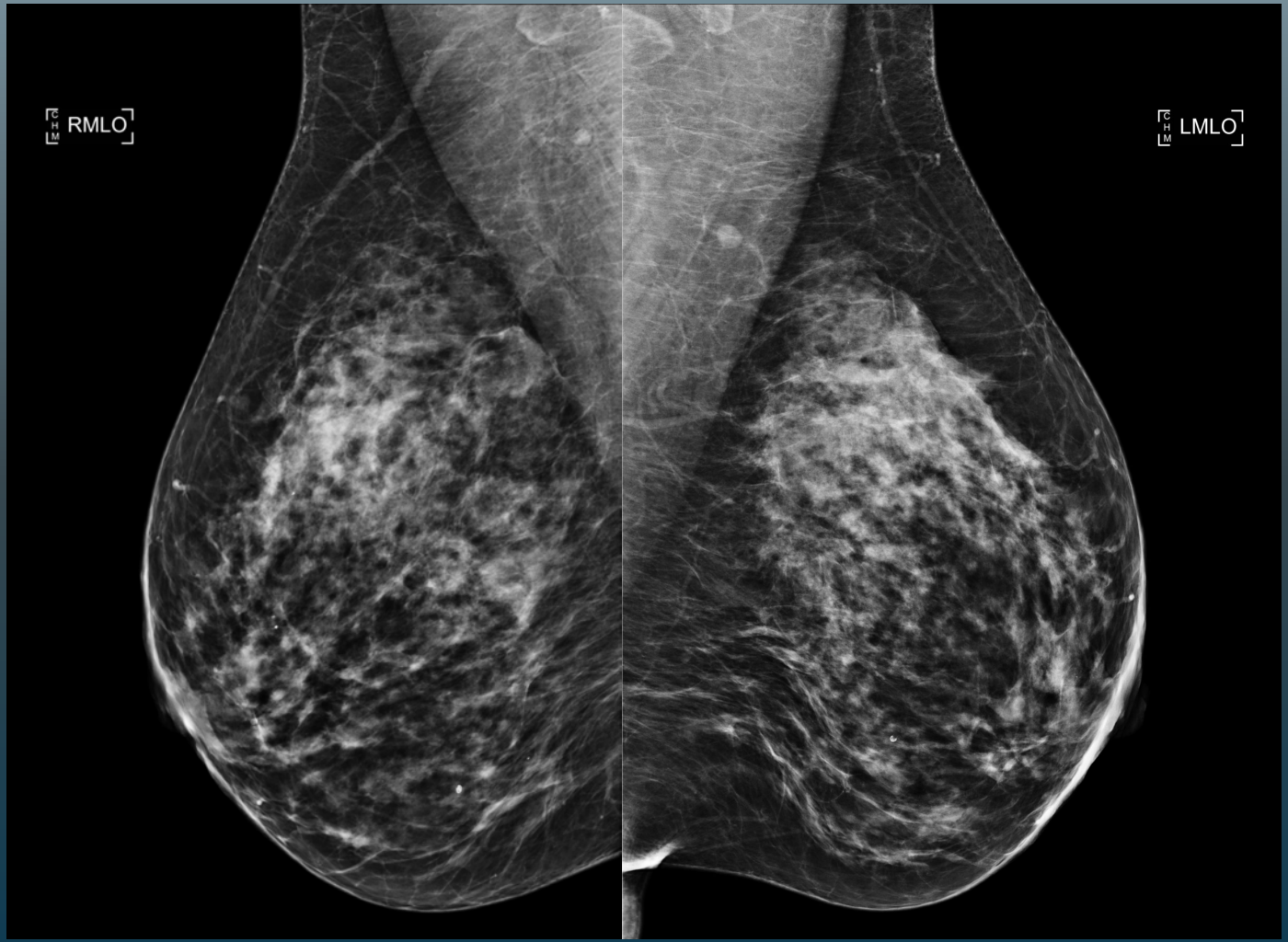
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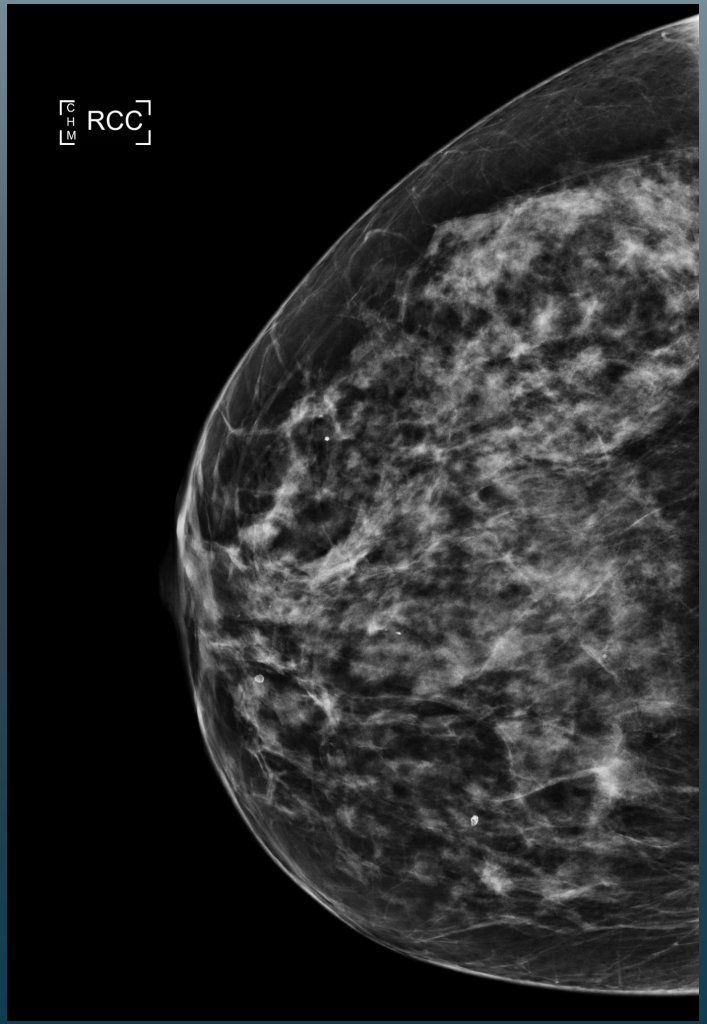
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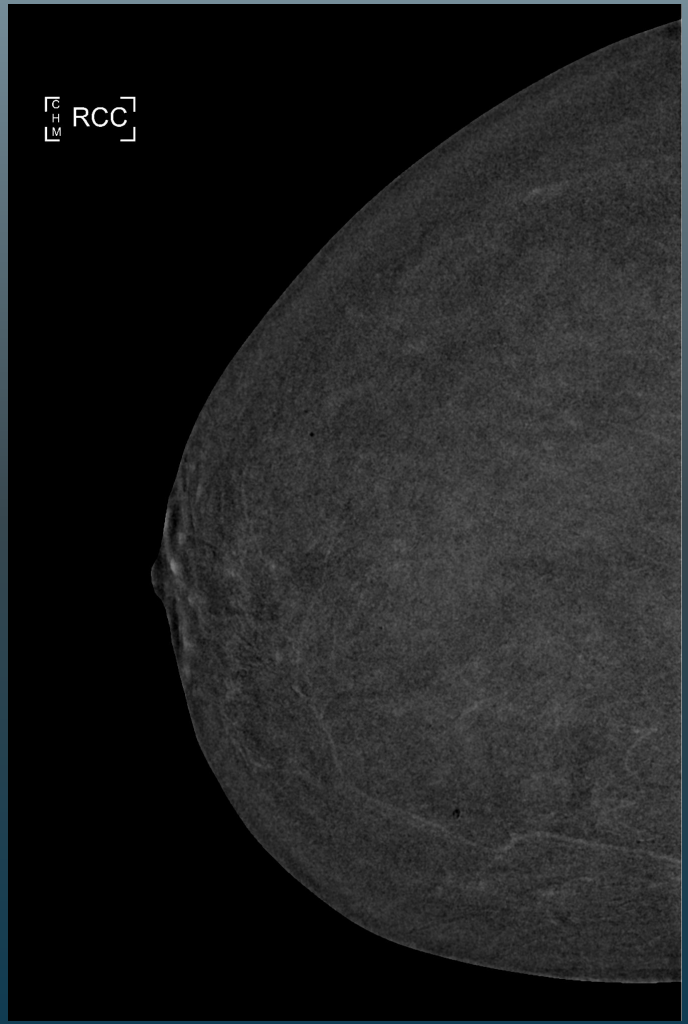
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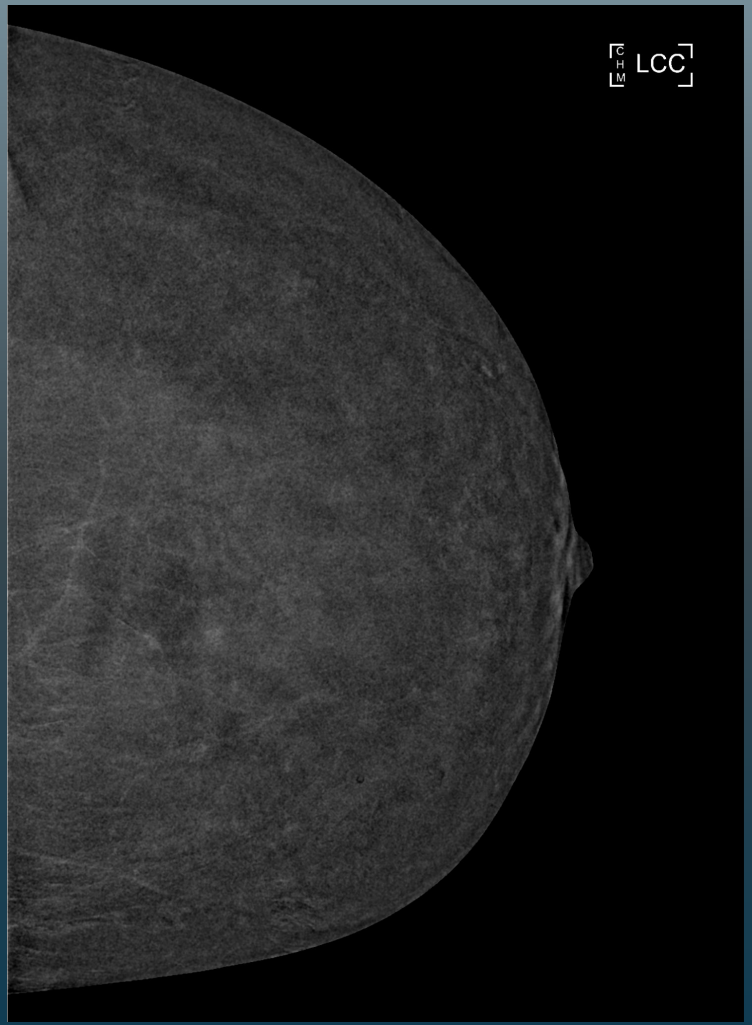
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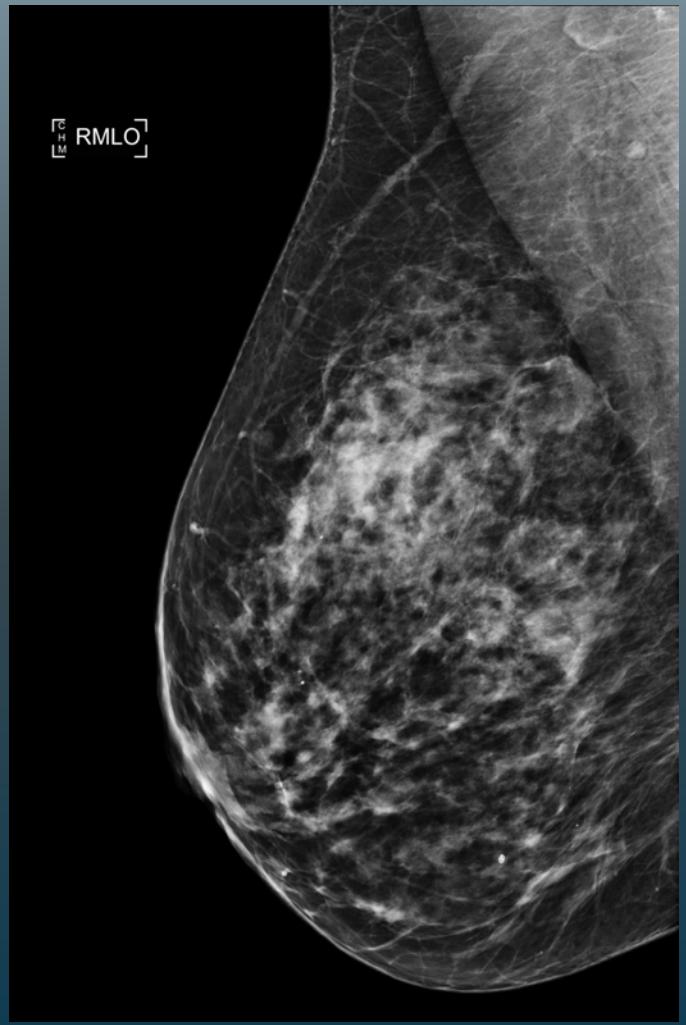
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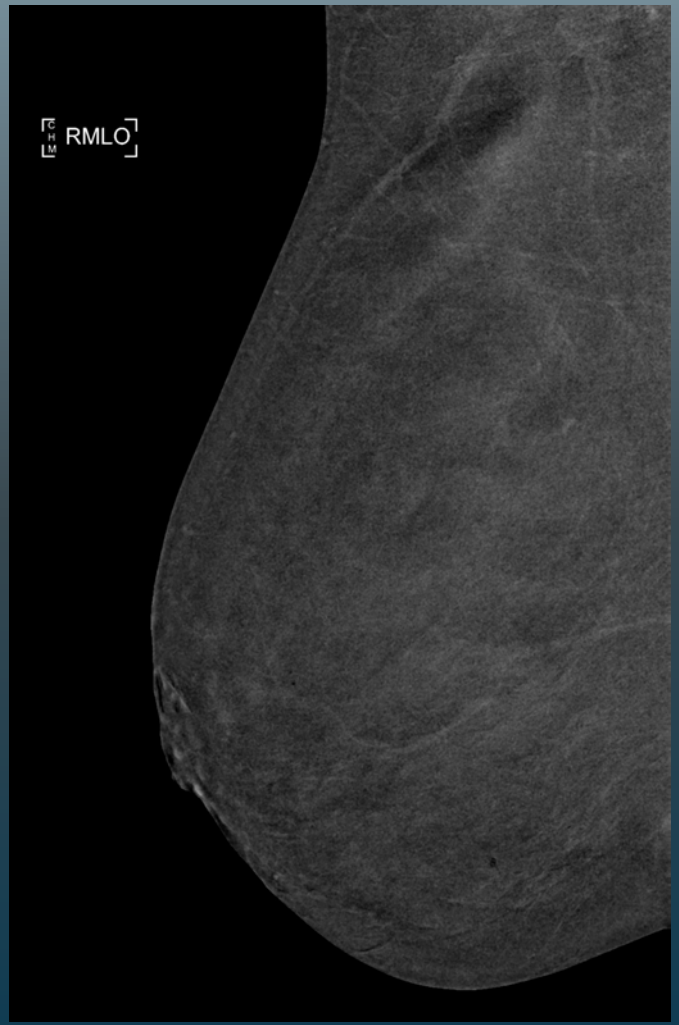
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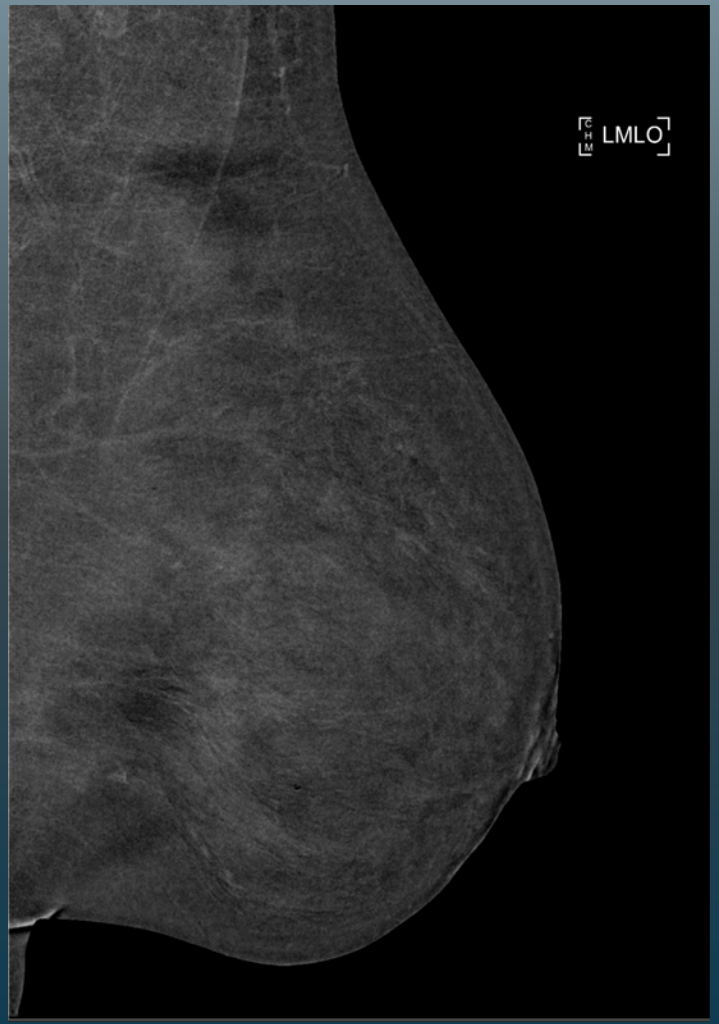
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Contrast Enhanced Mammography

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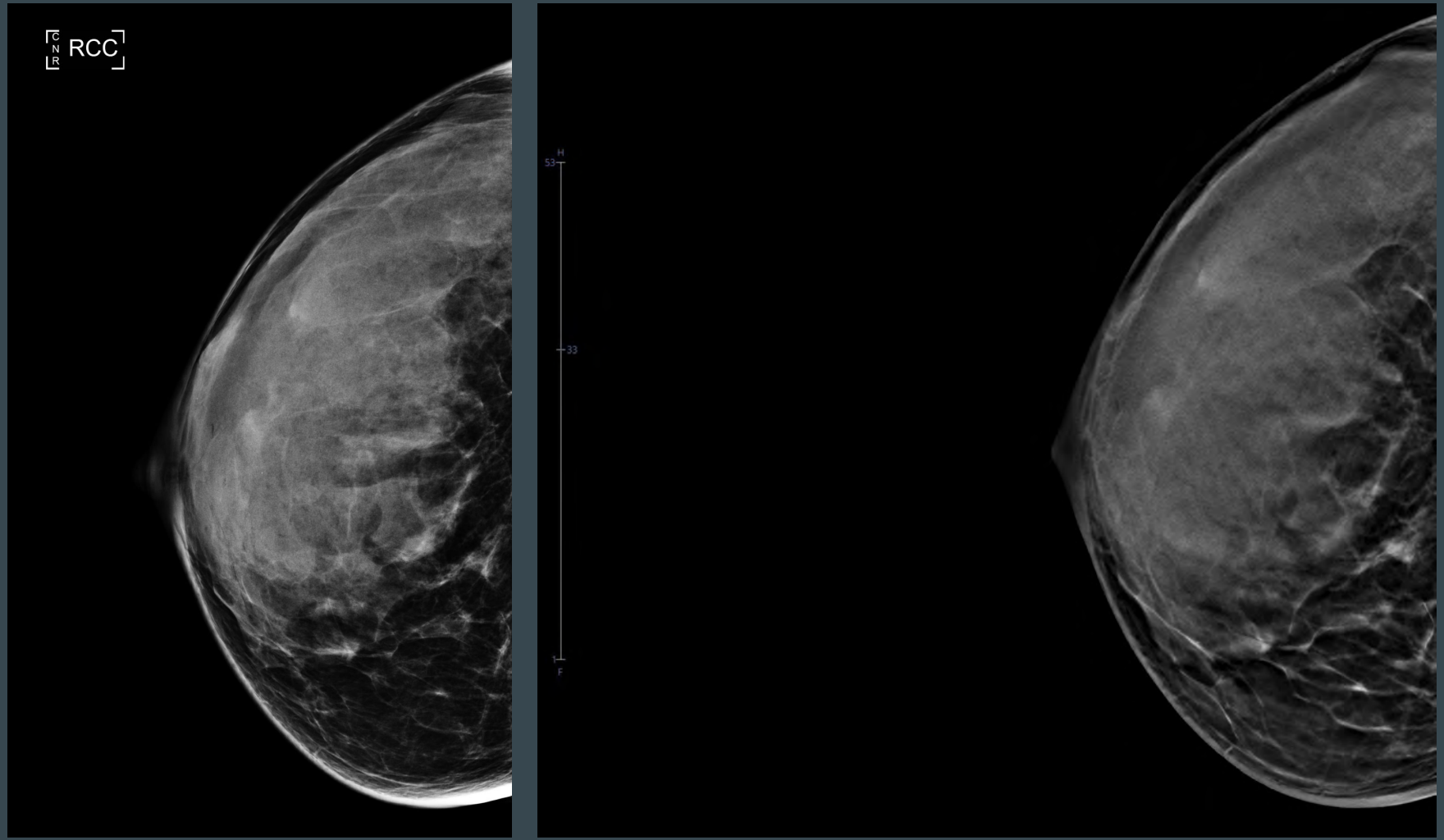
  - High risk screening
  - Extremely dense breast tissue
  - History of left breast cancer, post mastectomy
  - Minimal background parenchymal enhancement
  - Normal exam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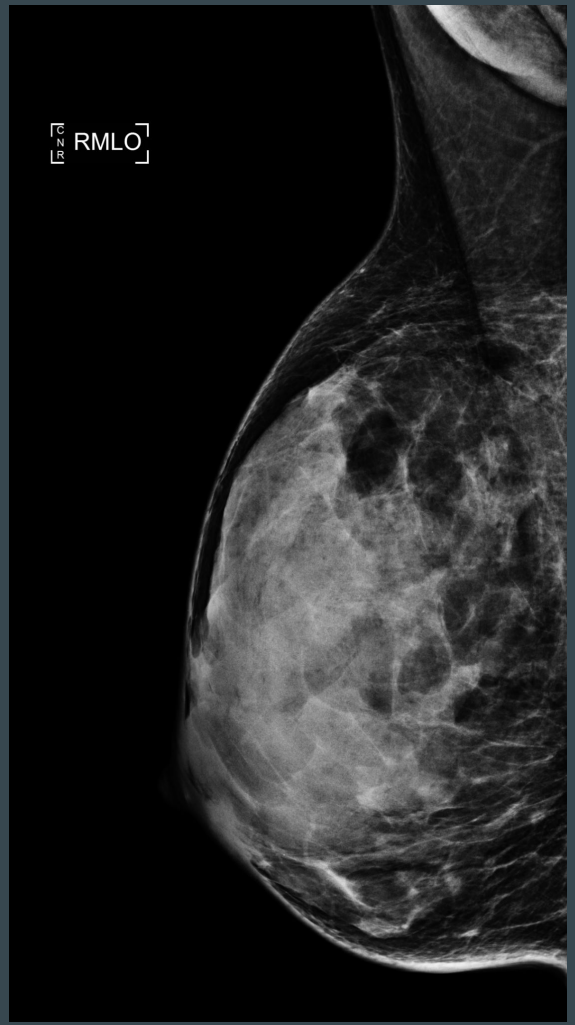
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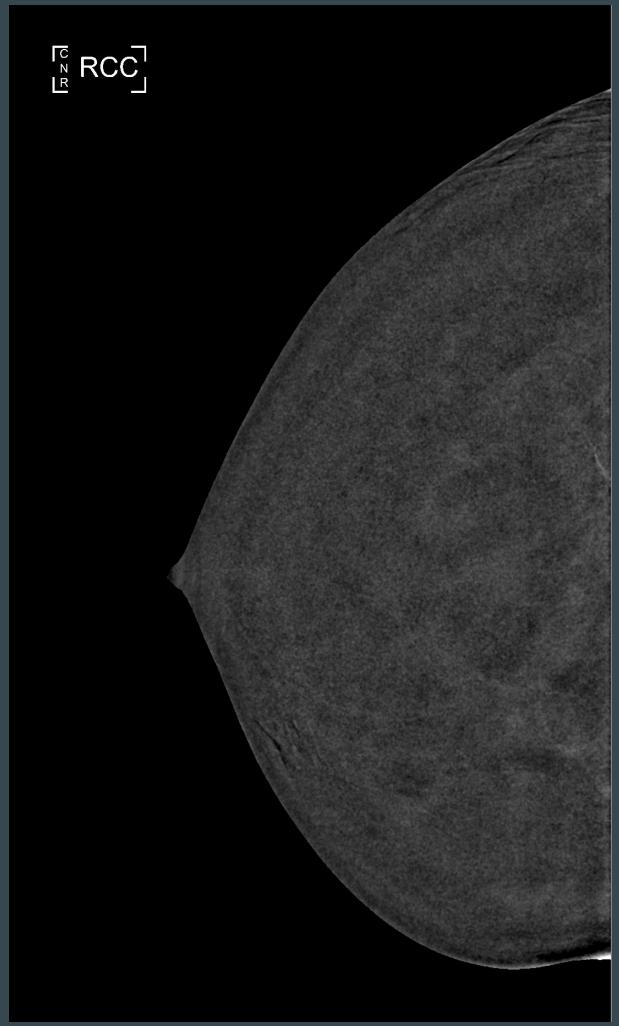
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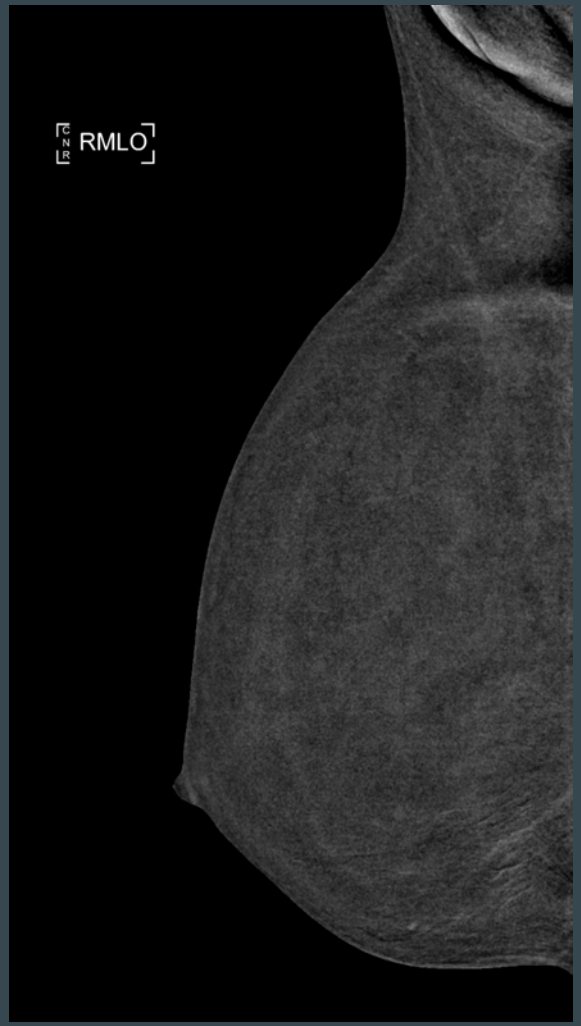
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Contrast Enhanced Mammography

- Case
  - High risk screening
  - Dense breast tissue
  - Minimal background parenchymal enhancement
  - Bilateral retropectoral silicone implants
  - Right 12:00 axis focal non-mass enhancement spanning 1.2 cm
    - Recommended ultrasound followed by ultrasound biopsy
    - Biopsy was benign, but marker in different location
      - Fibroadenomatoid change, focal chronic inflammatory infiltrate
    - Opted for 6 month follow-up right CEM


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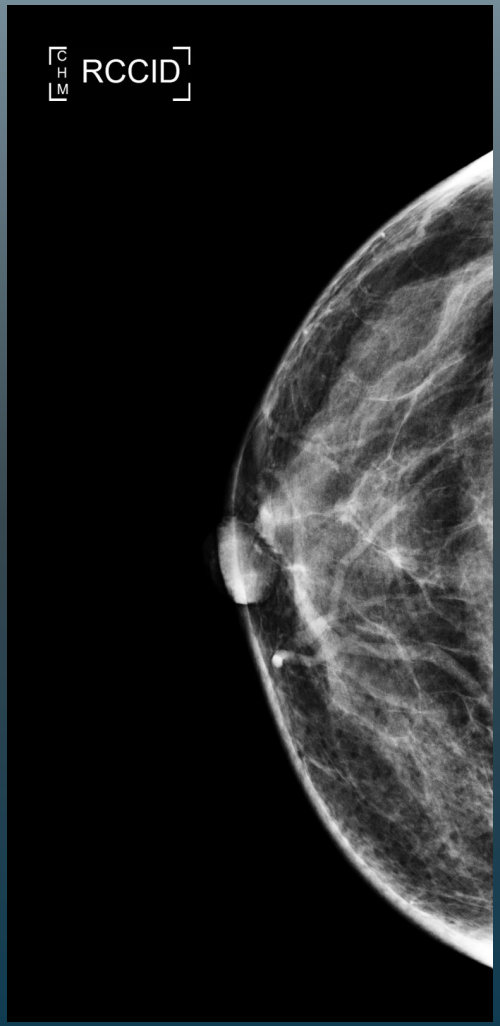
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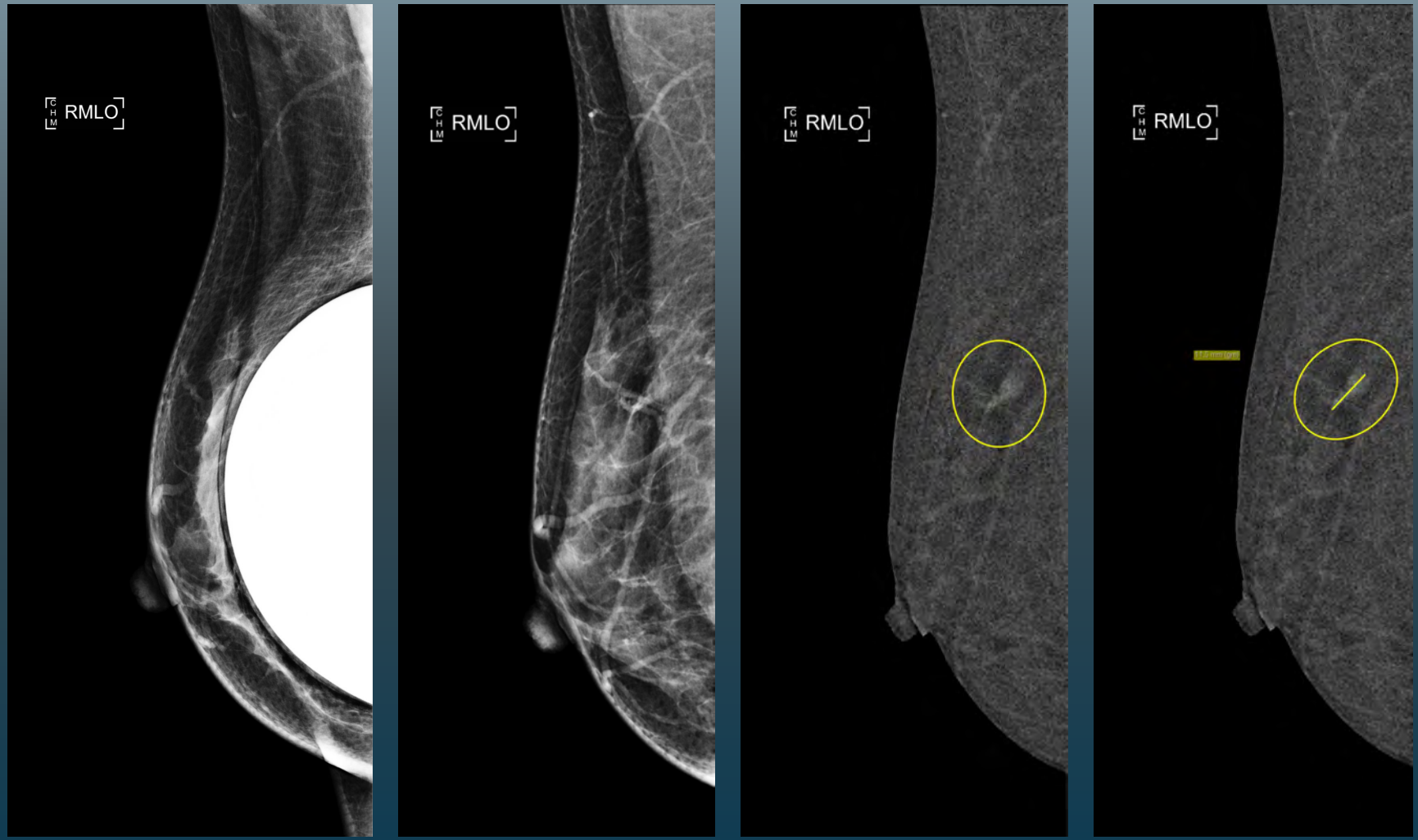
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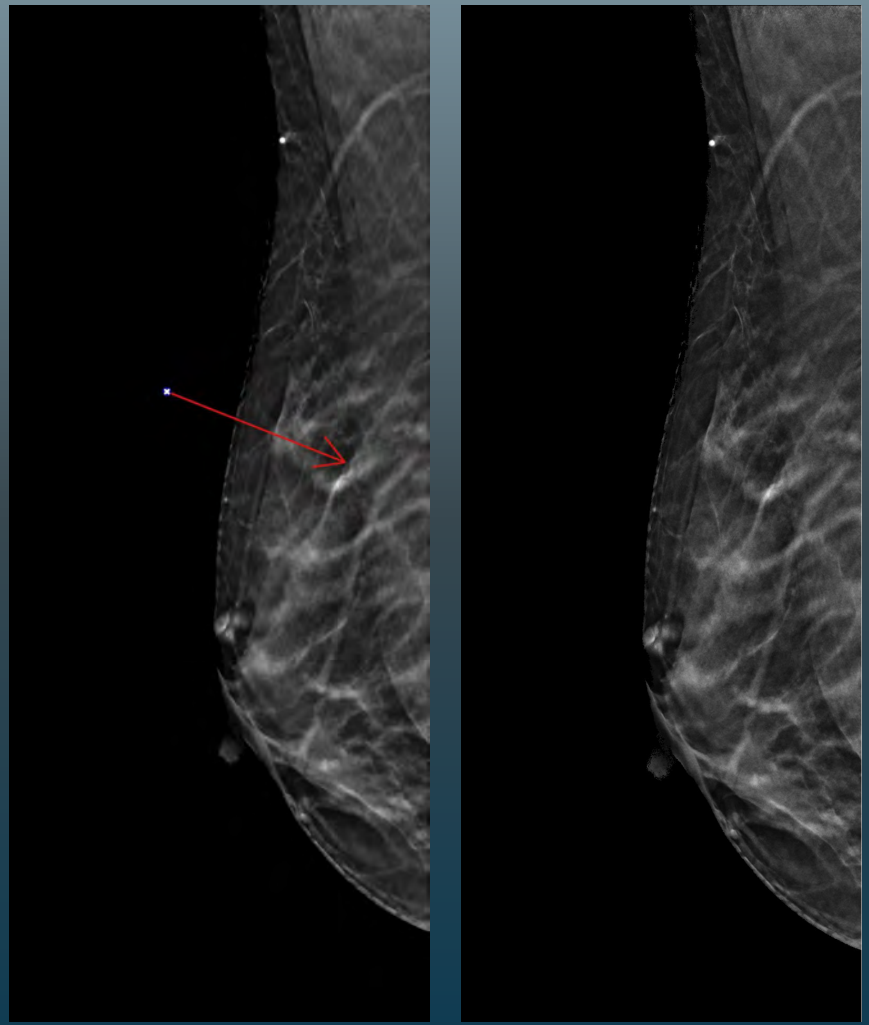


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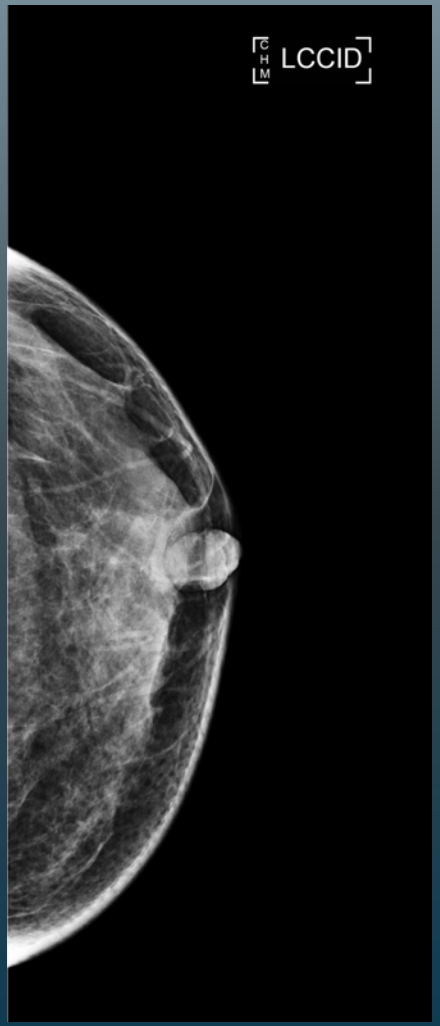
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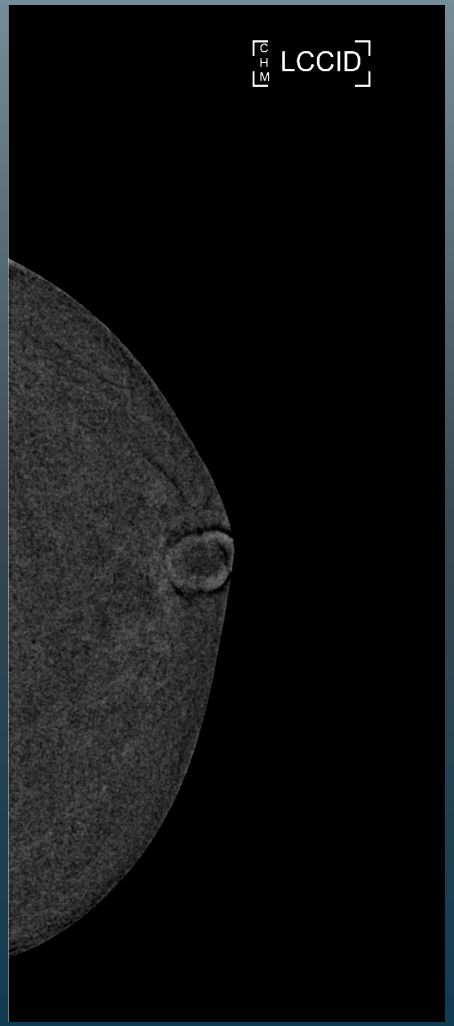
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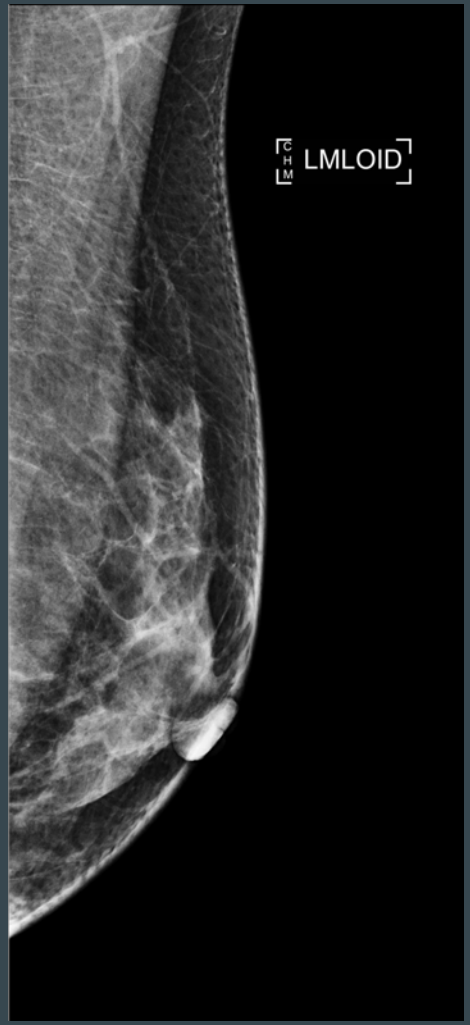
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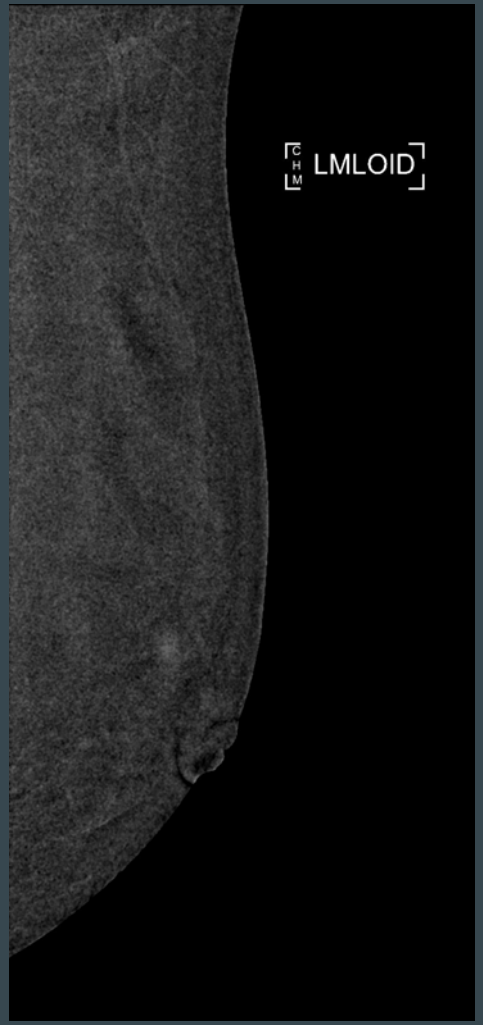
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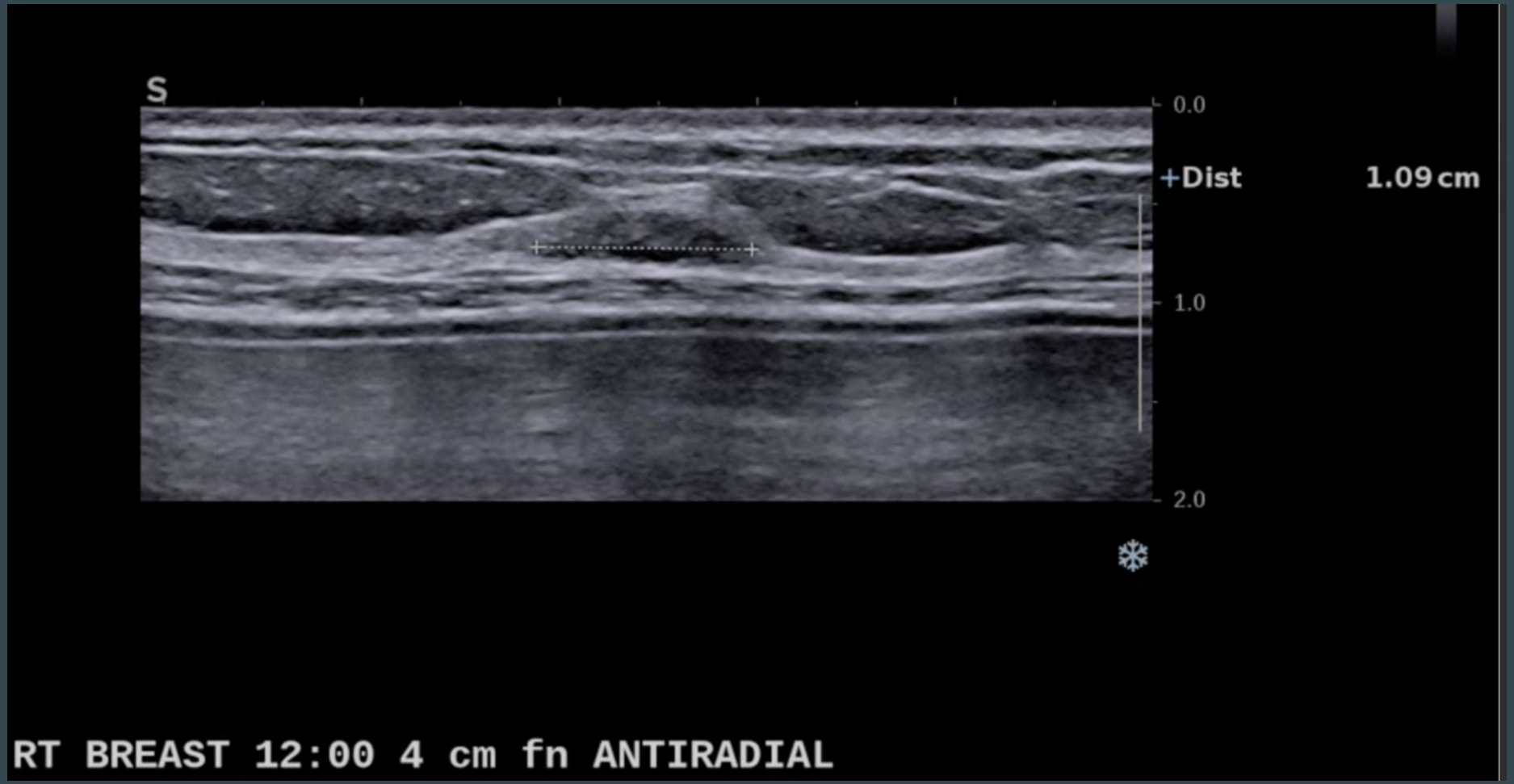
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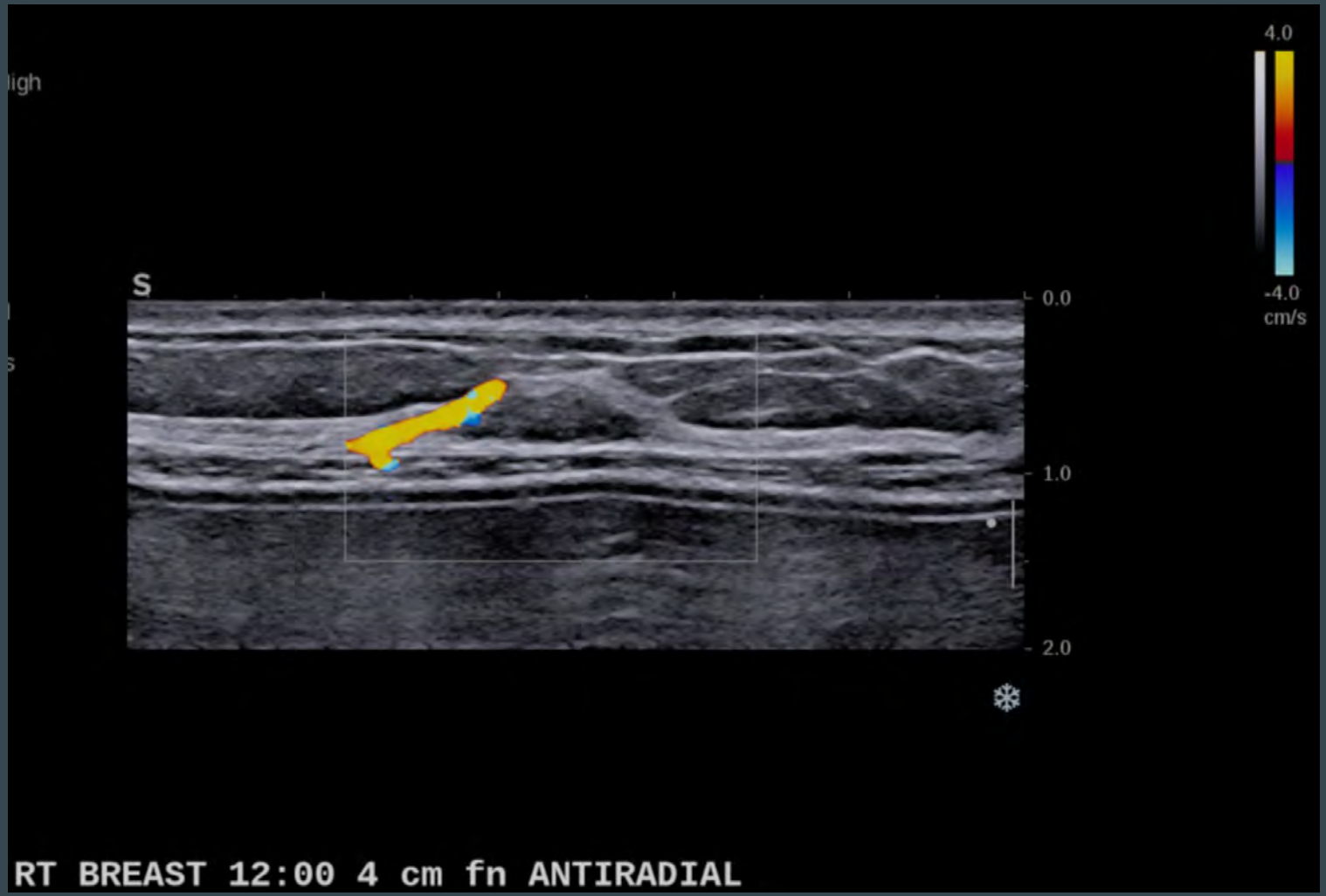
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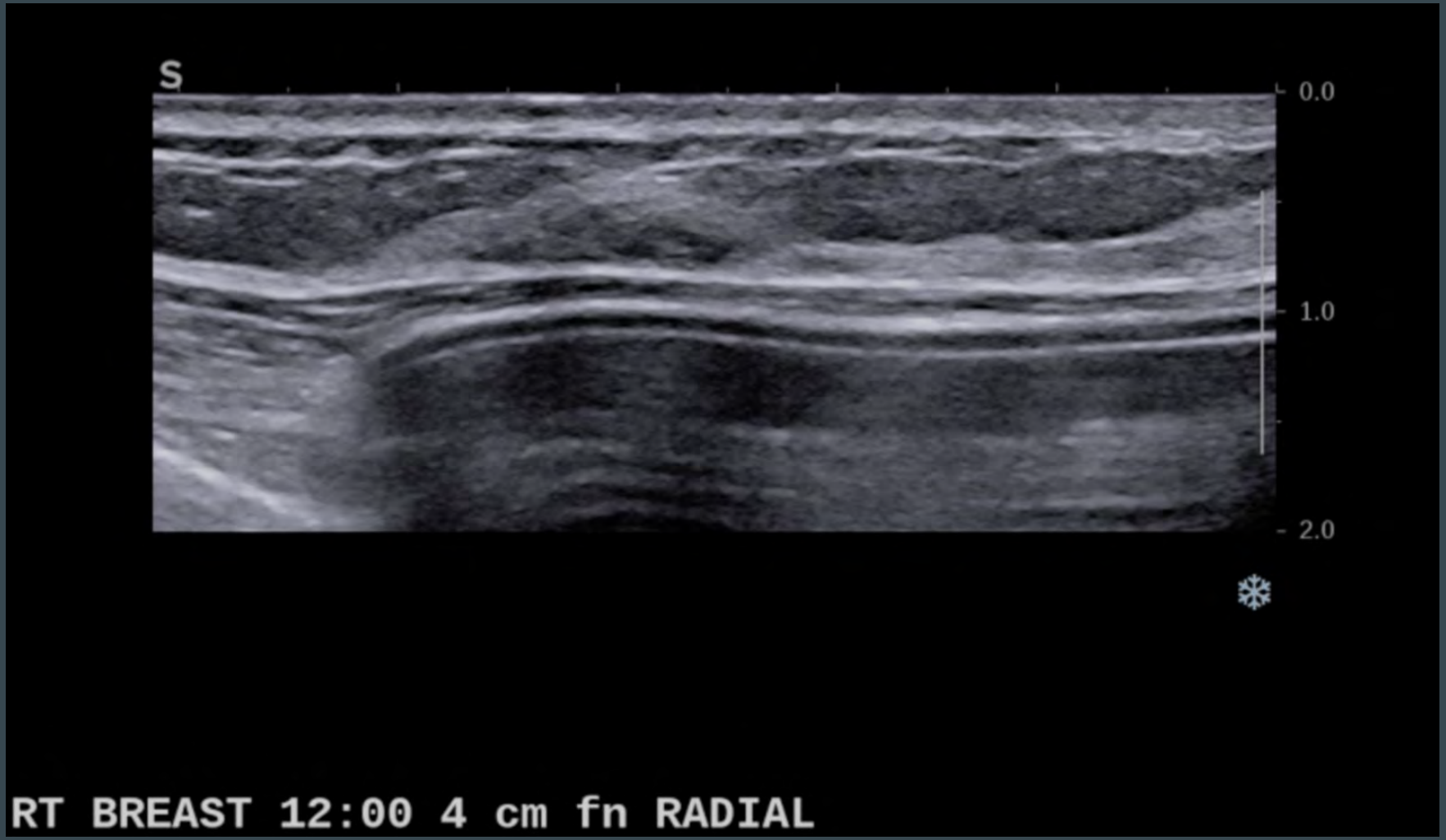
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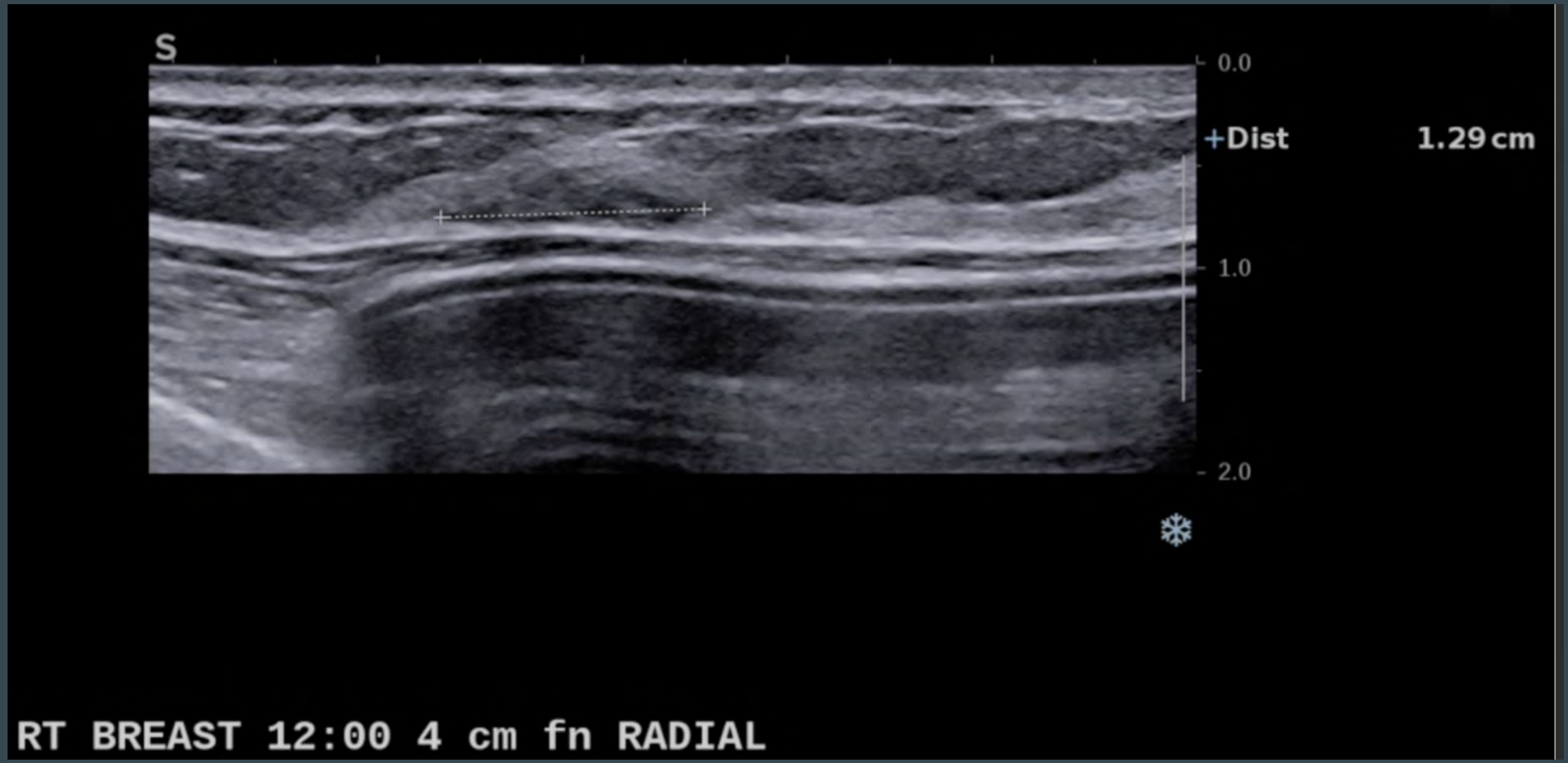
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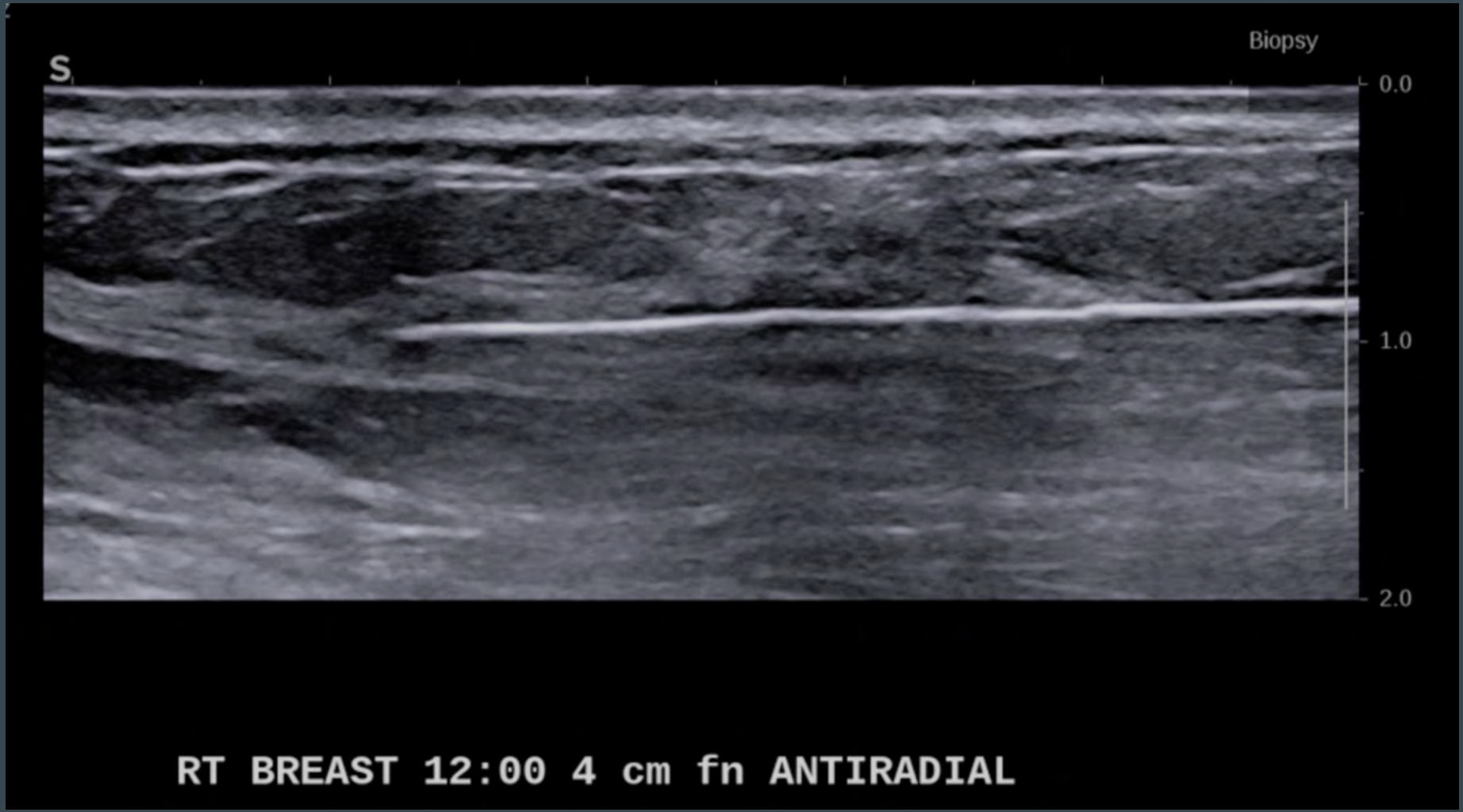
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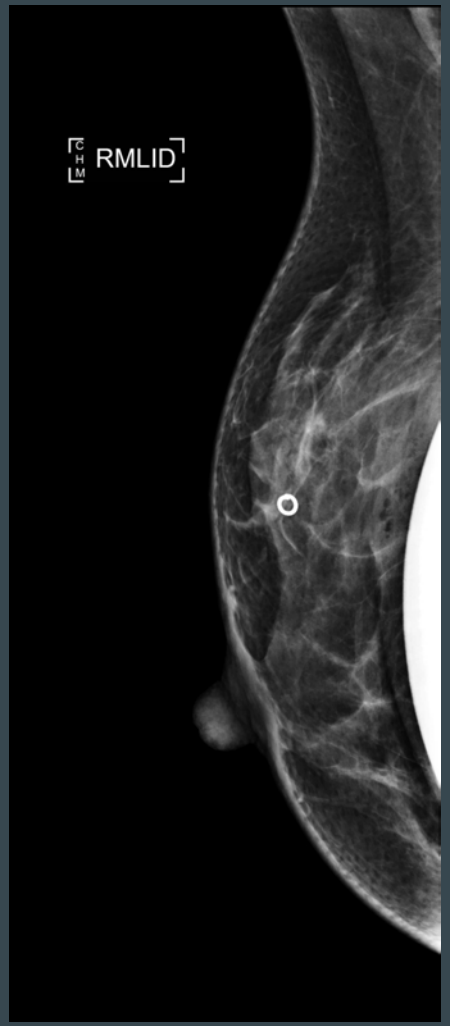
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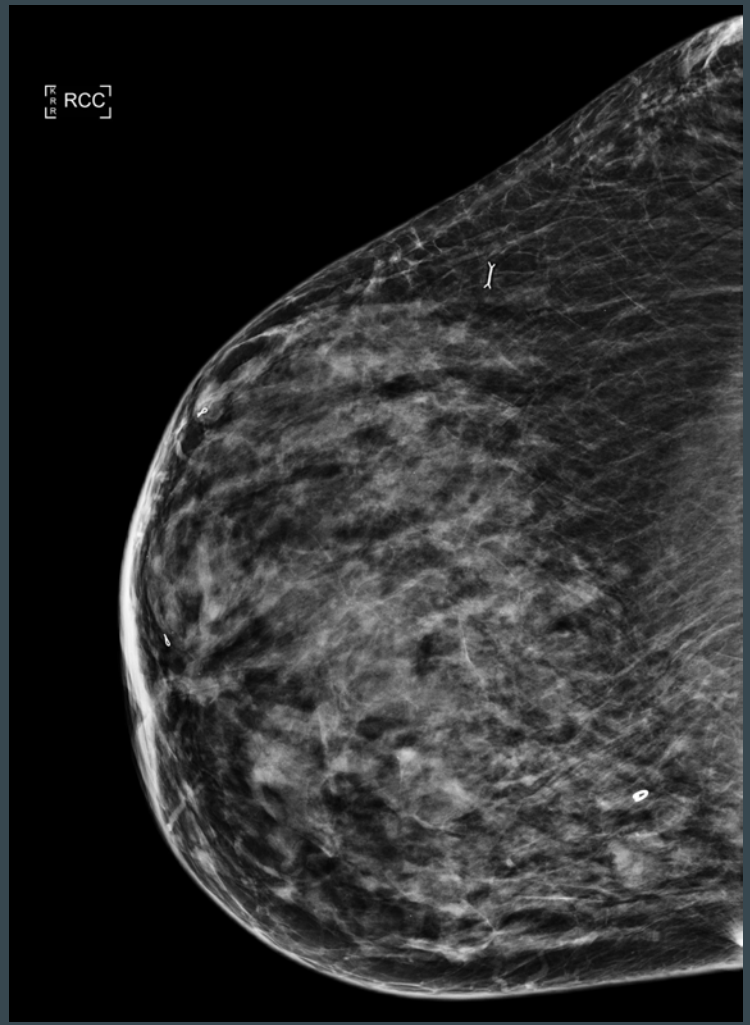
Contrast Enhanced Mammography

- Case
  - Average risk screening
  - Dense and complex breast tissue
  - History of 6 benign breast biopsies
  - Moderate background parenchymal enhancement
  - Right breast medial region posterior depth non-mass enhancement
    - Biopsy proven benign fibroadenomatoid changes and stromal fibrosis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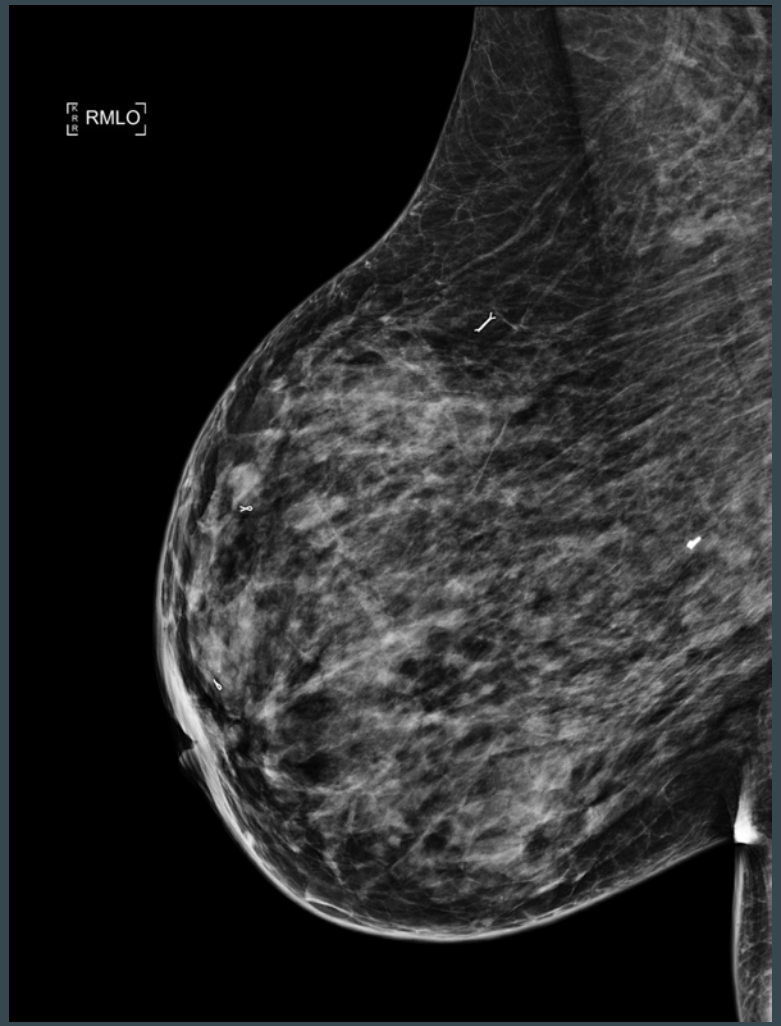
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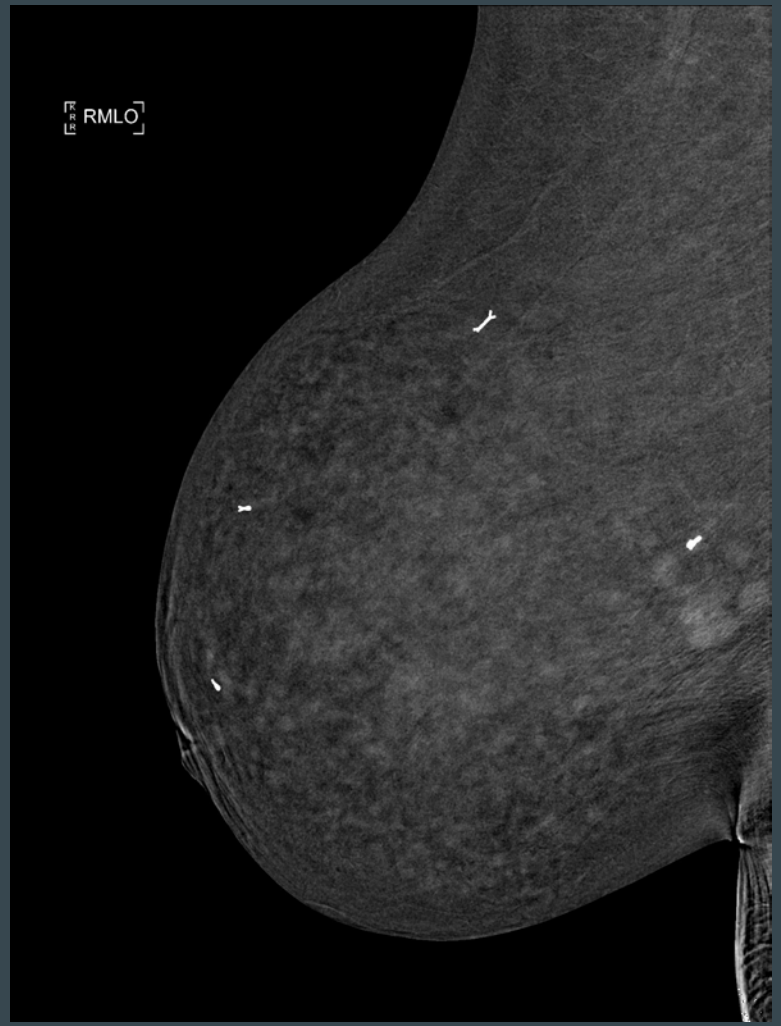
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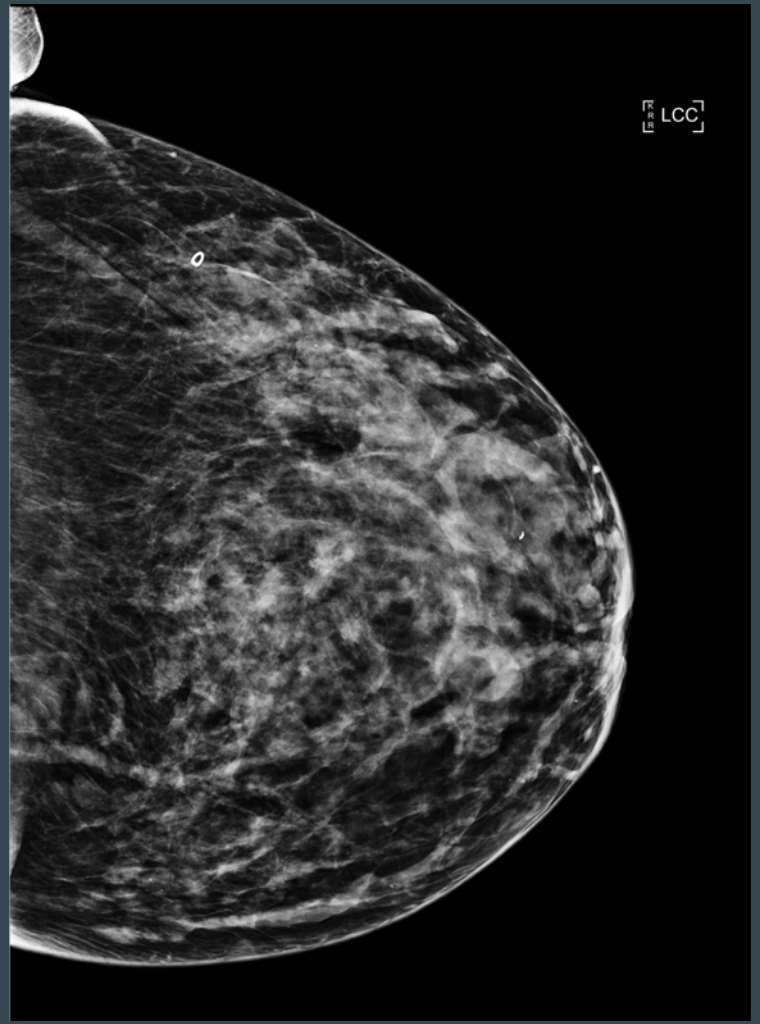
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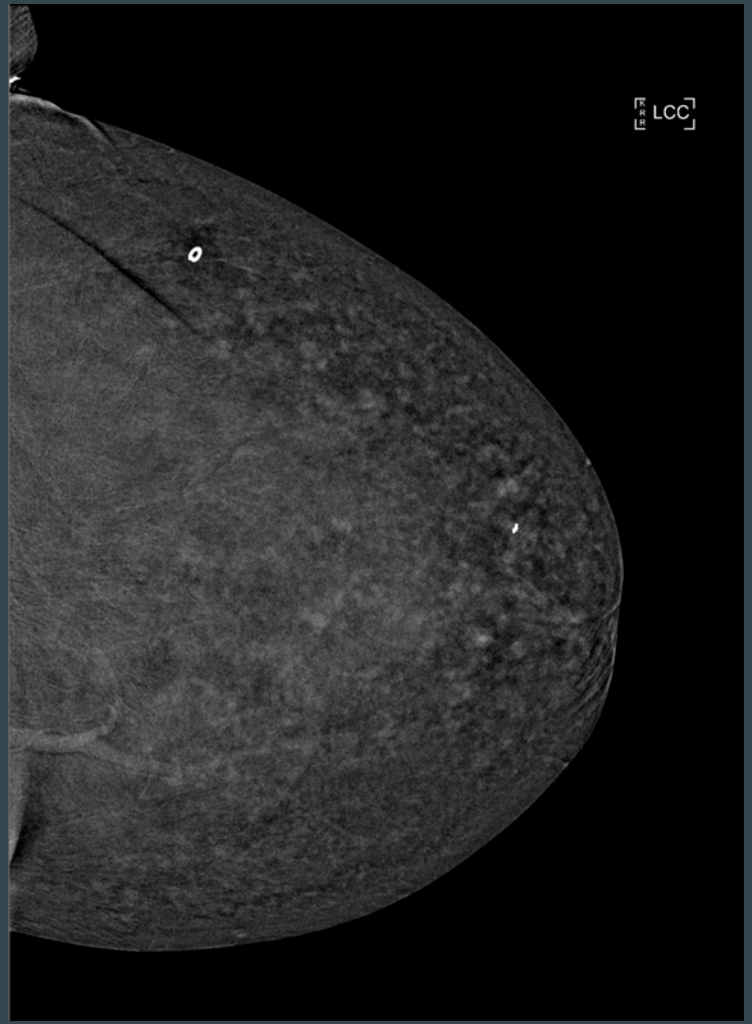
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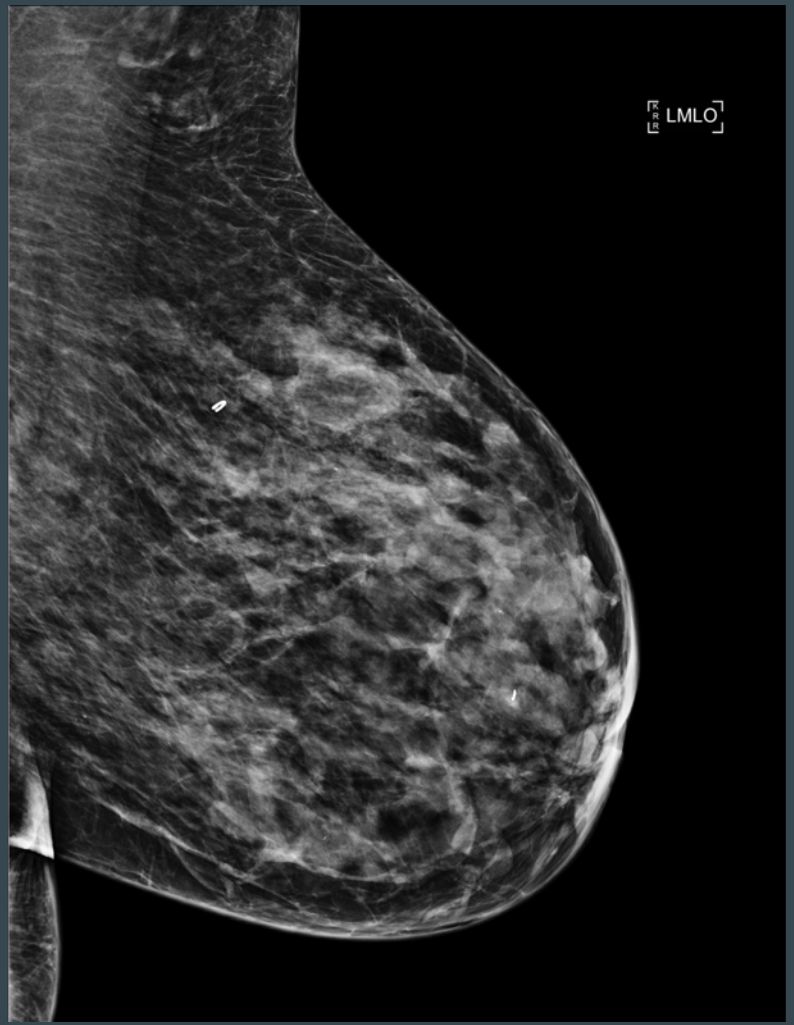
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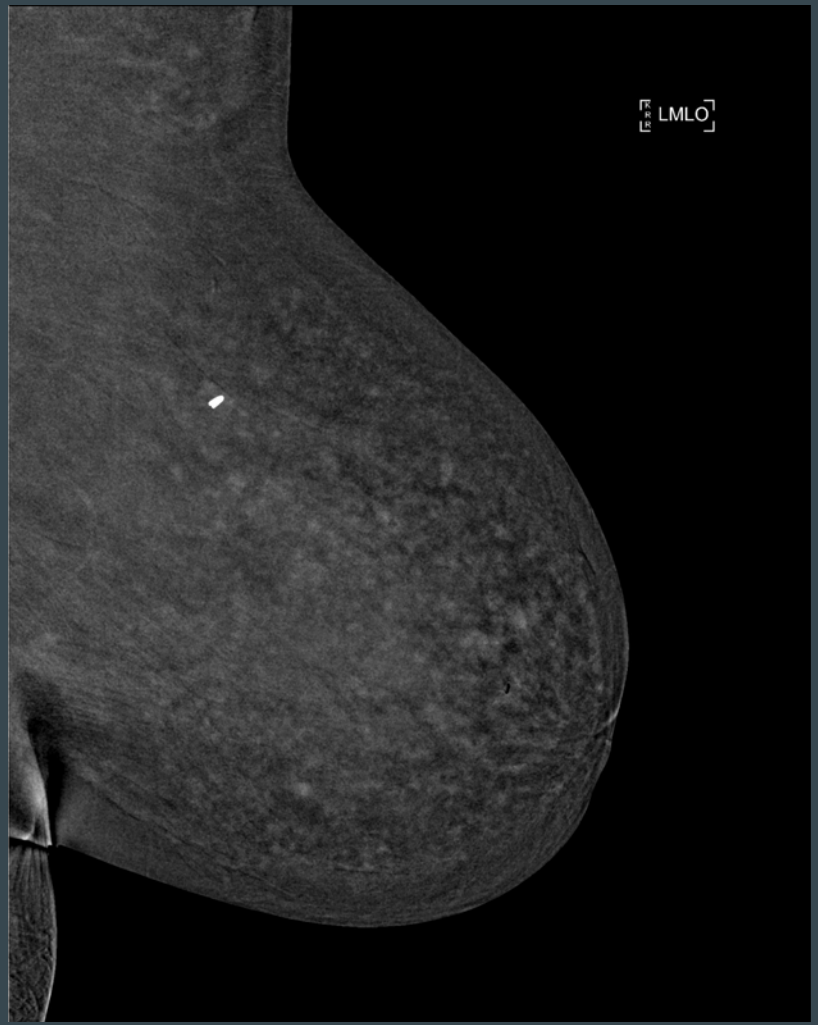
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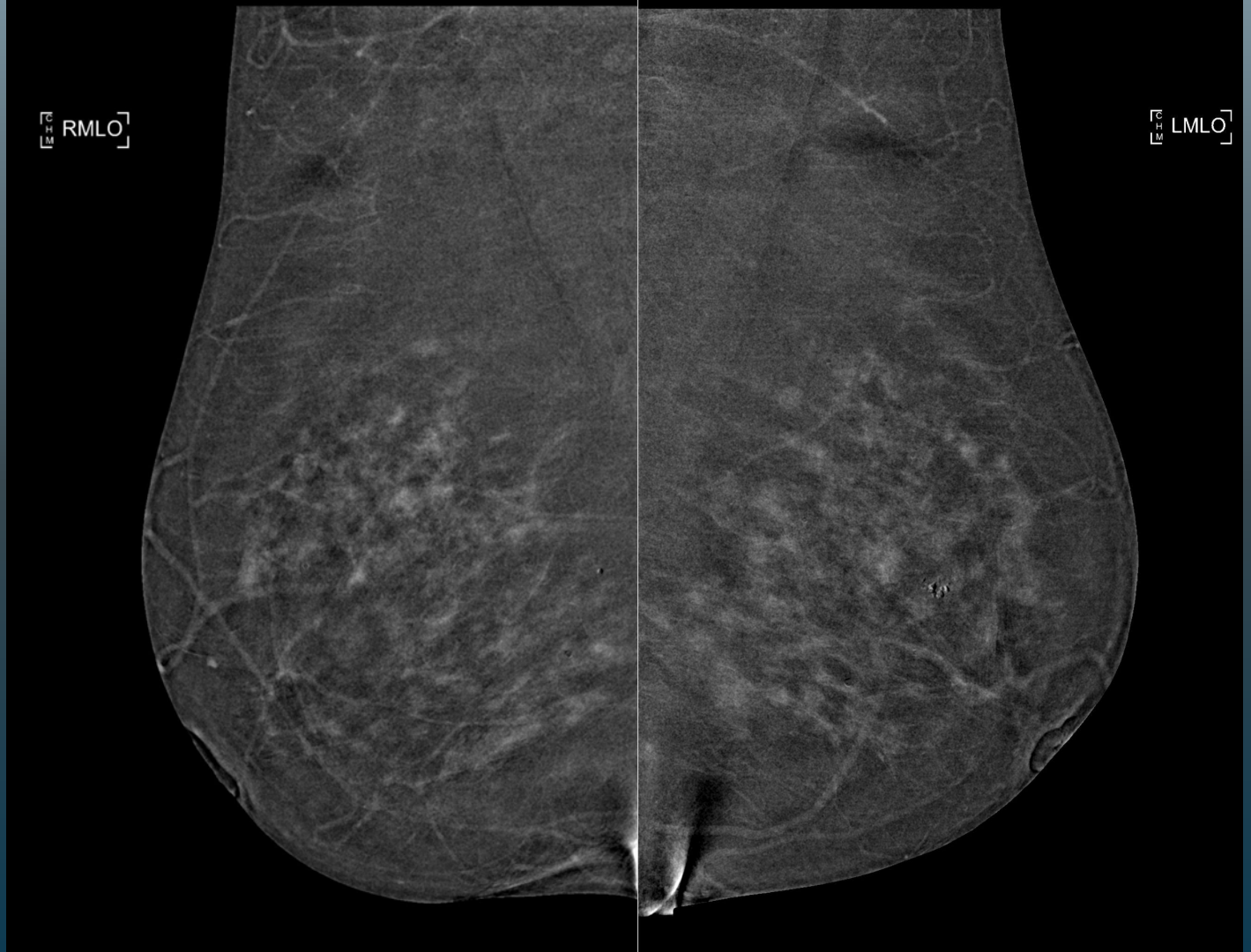
Contrast Enhanced Mammography

- Miscellaneous cases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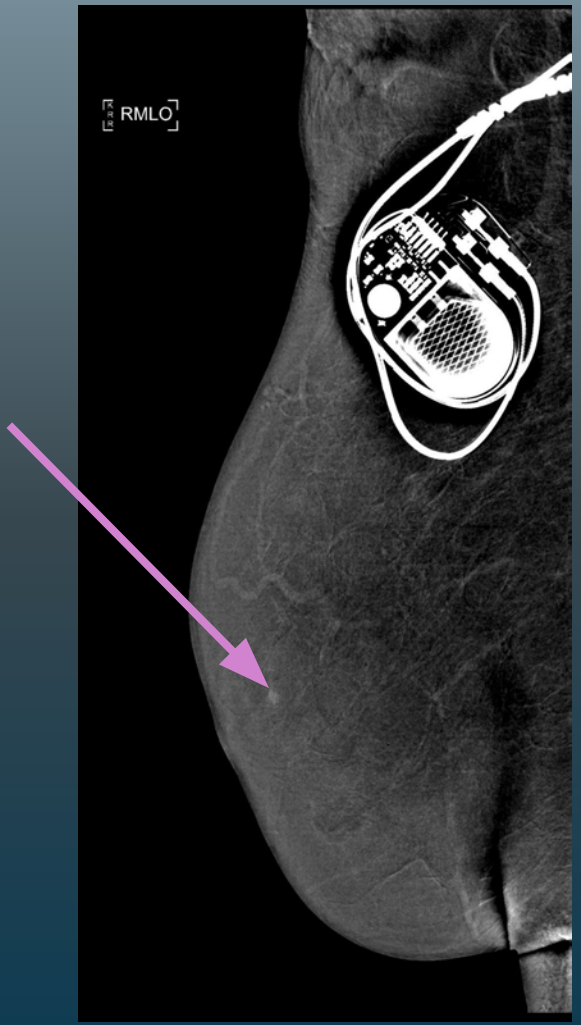
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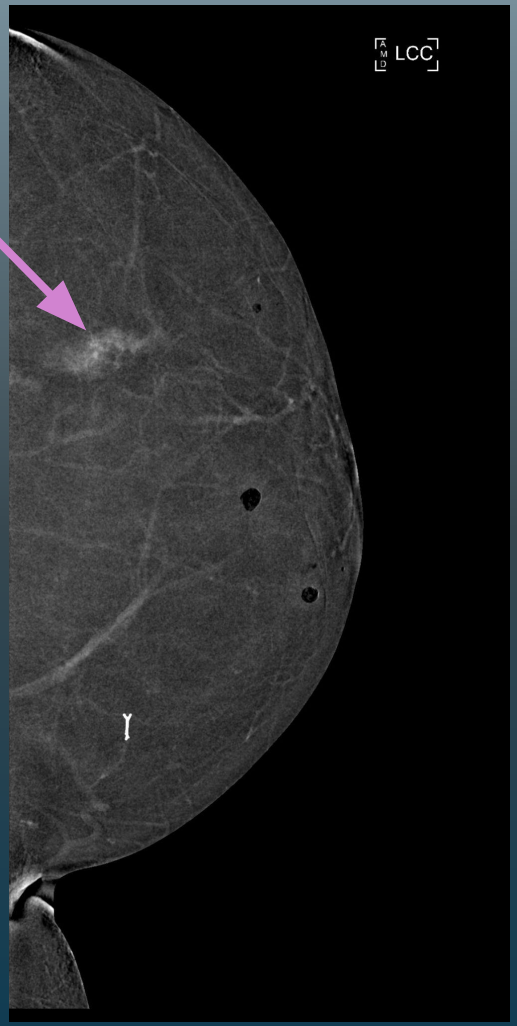
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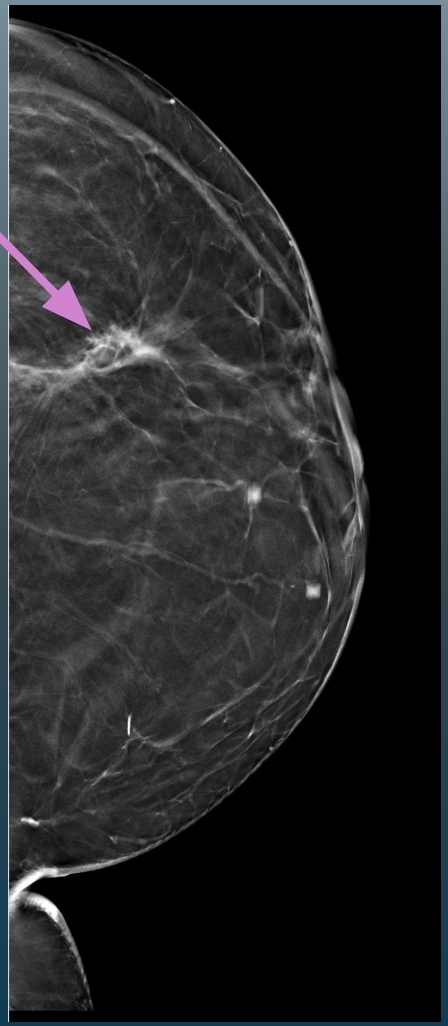

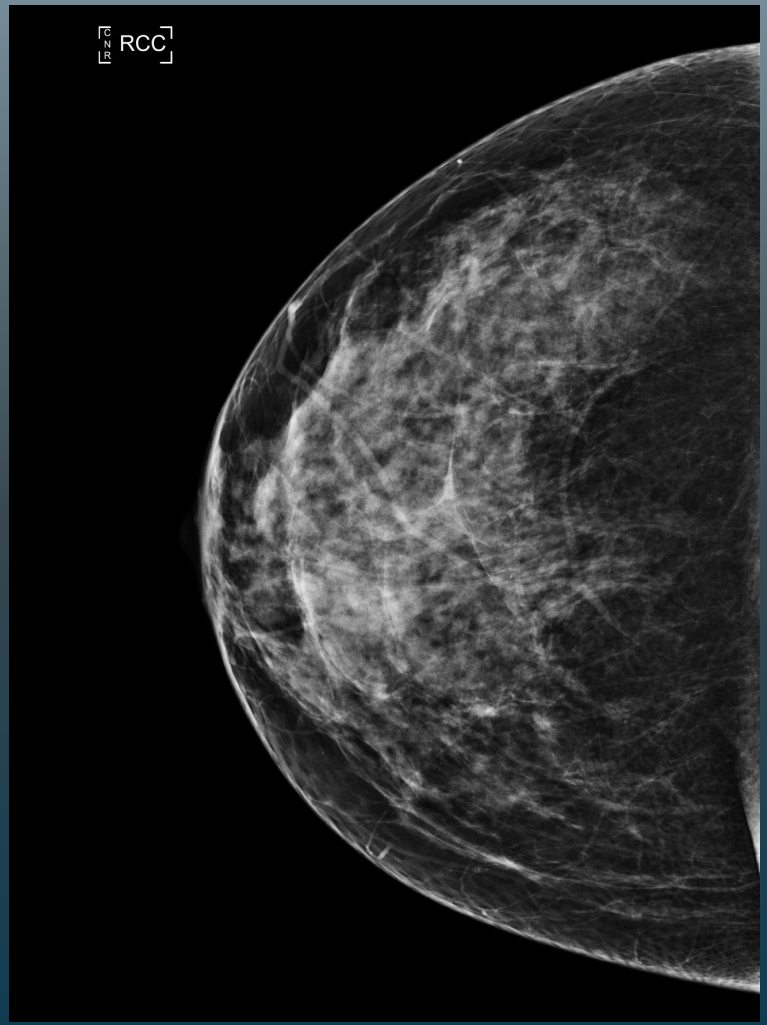
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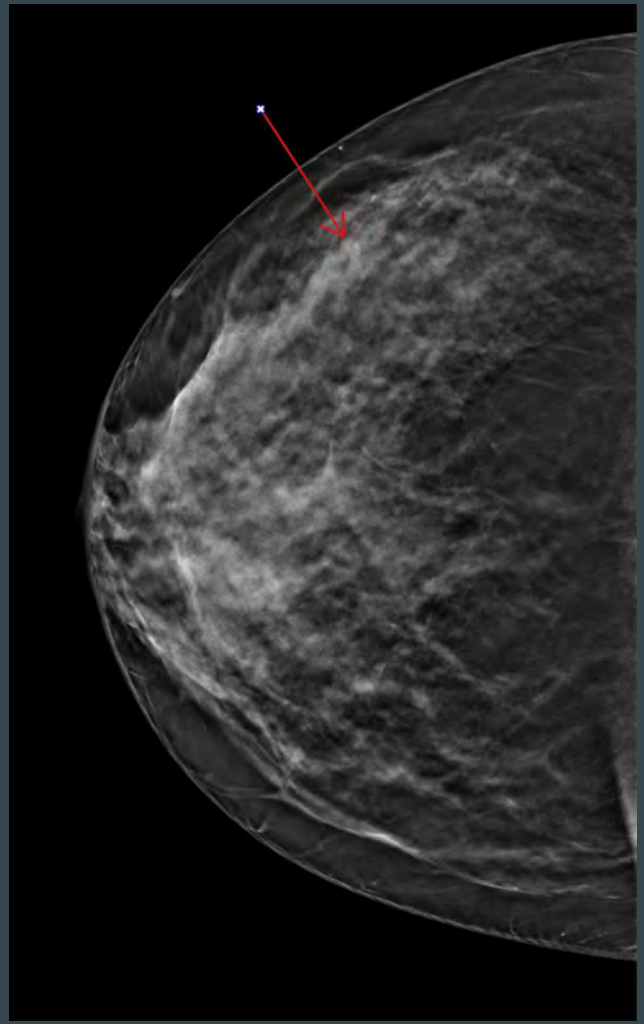

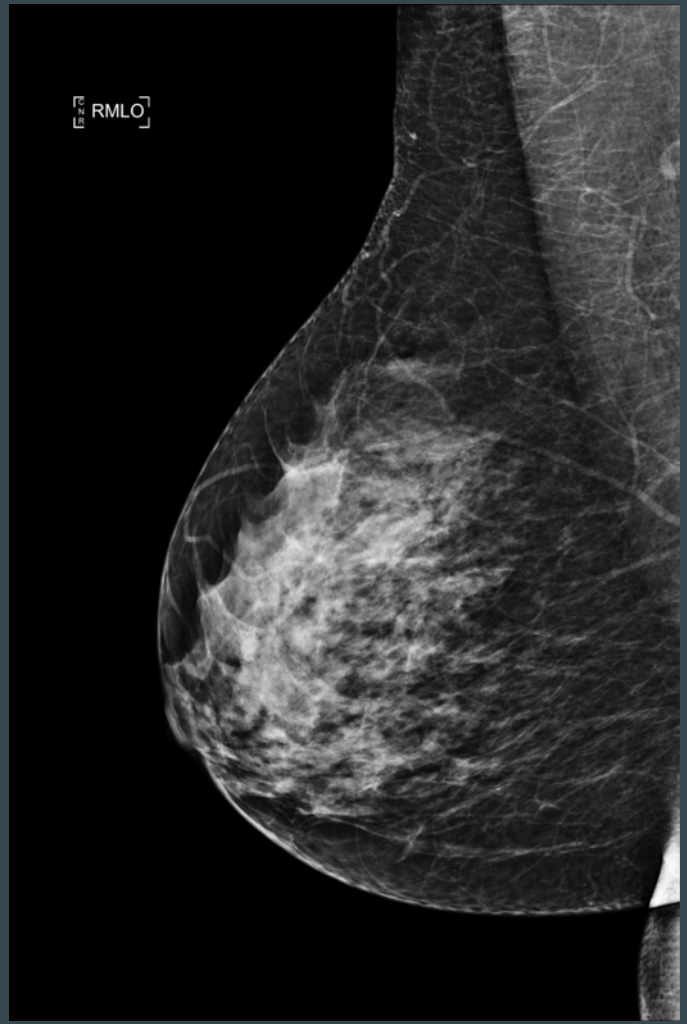
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Upright Mammogram Biopsy, Standard Technique

- Case
  - Screen detected right breast calcifications
  - History of bilateral breast reduction and lift
  - Upright mammogram biopsy
    - Lateral to medial needle direction


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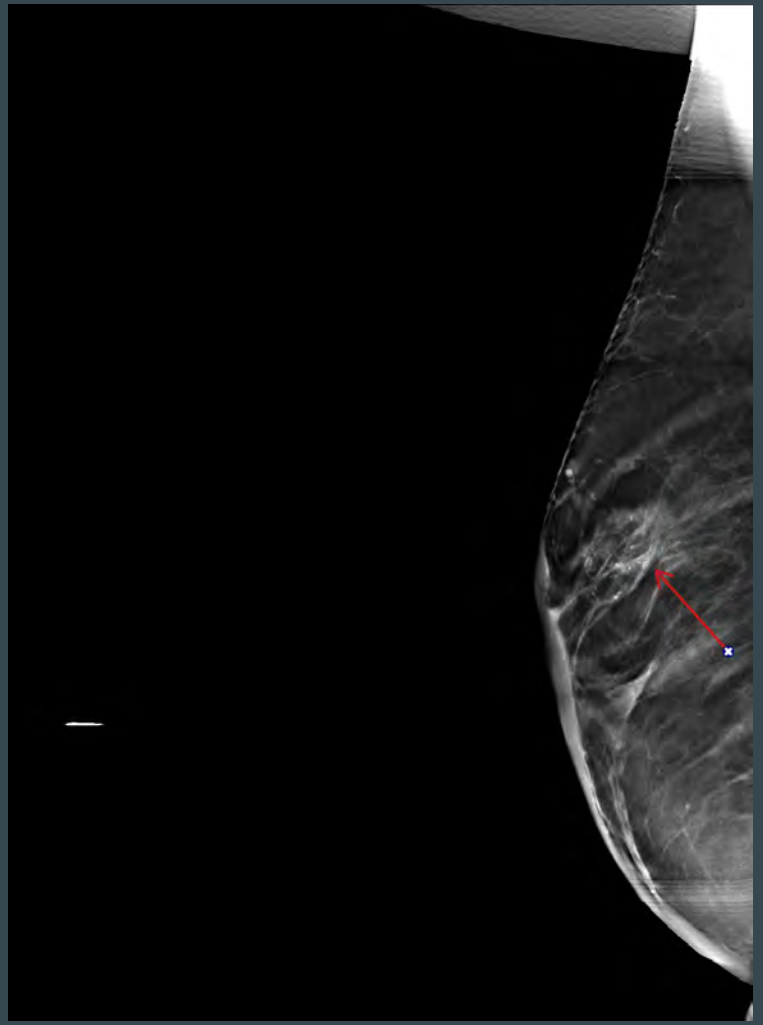

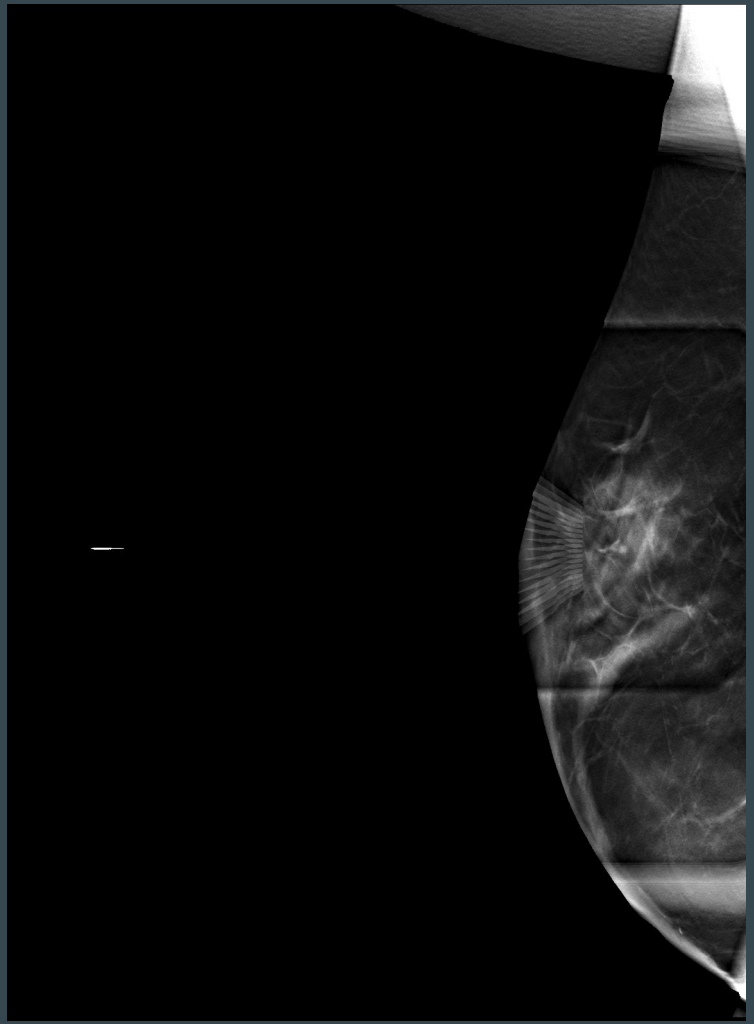

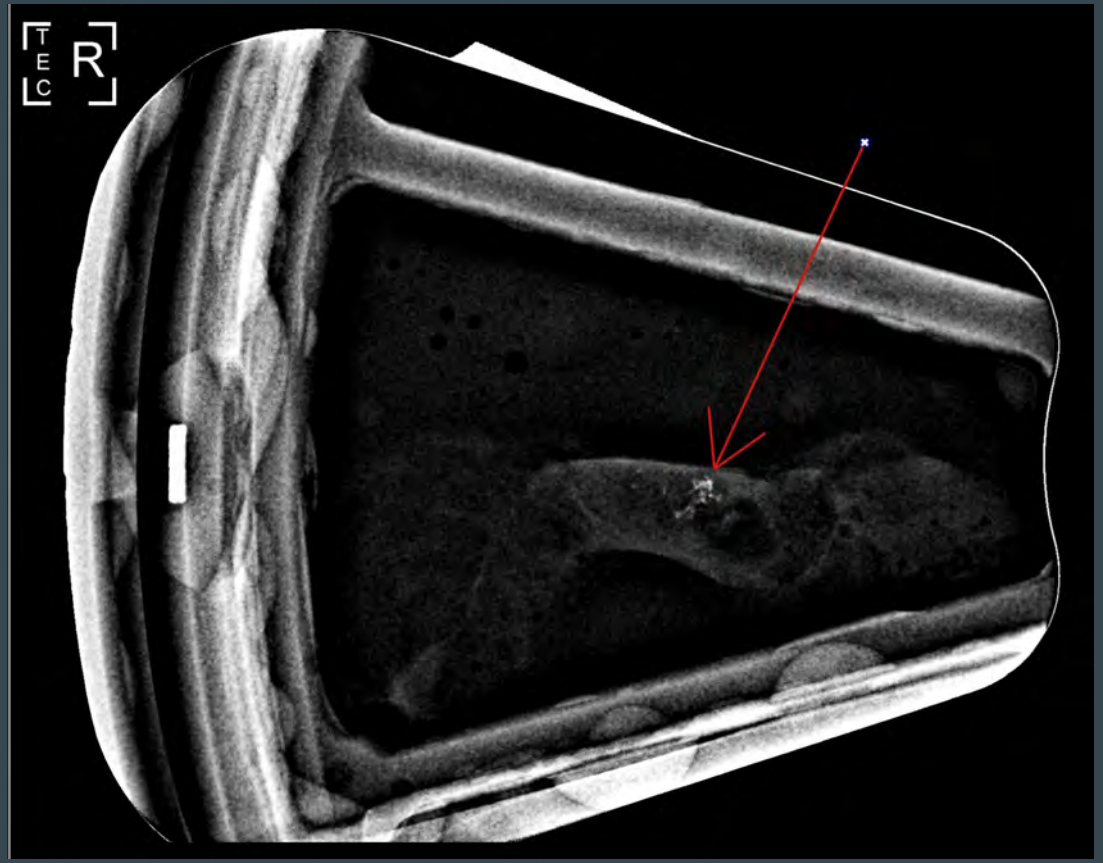
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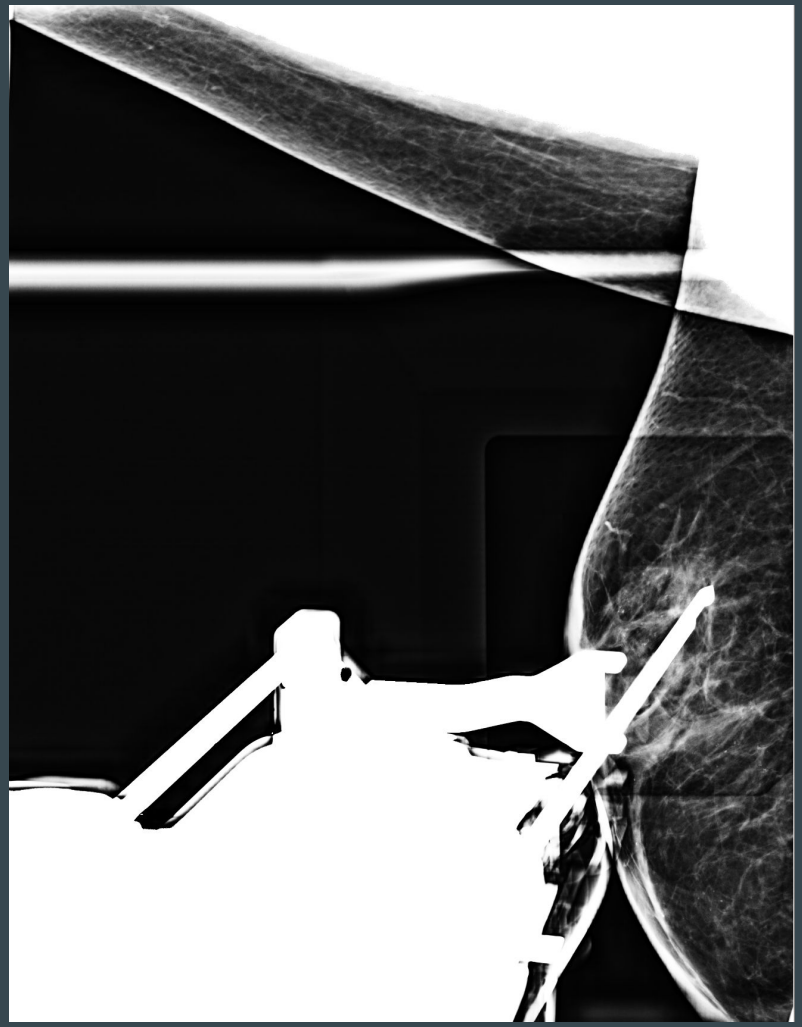
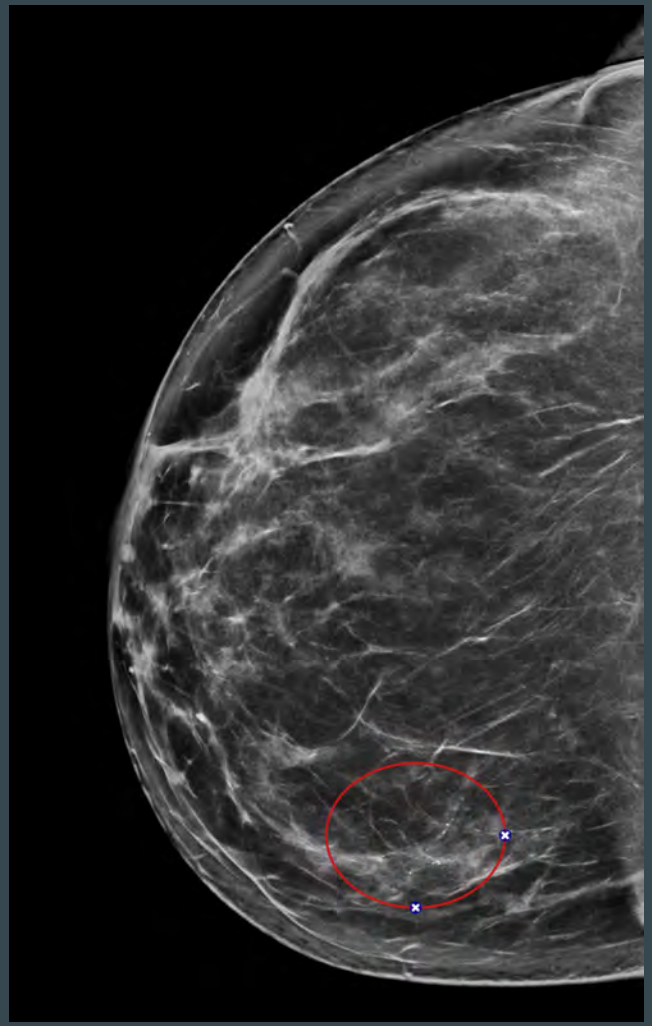
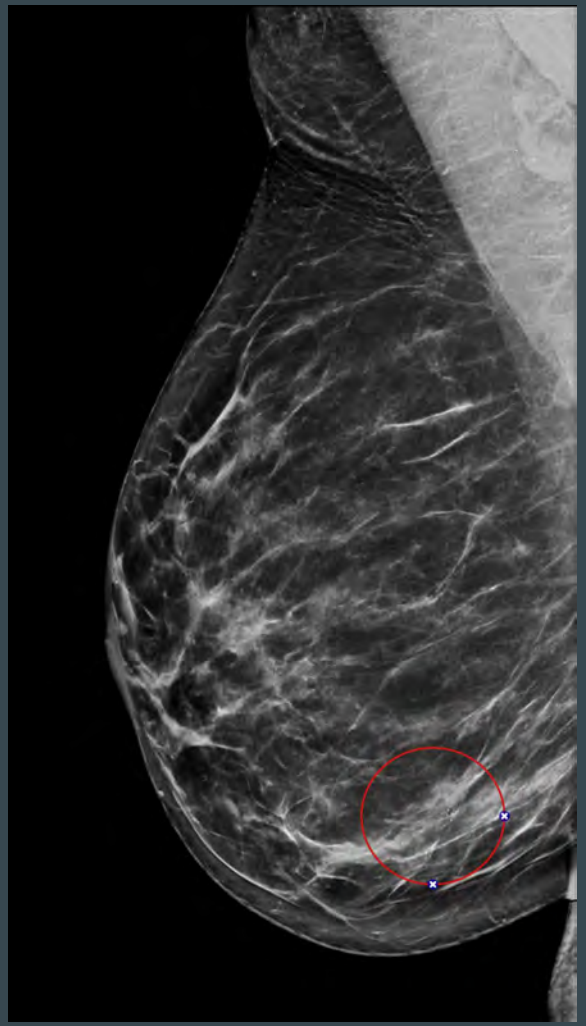
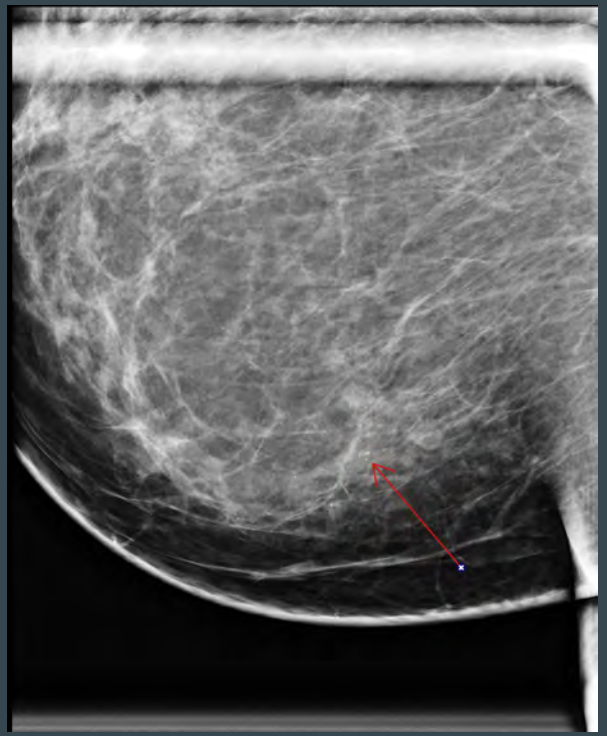


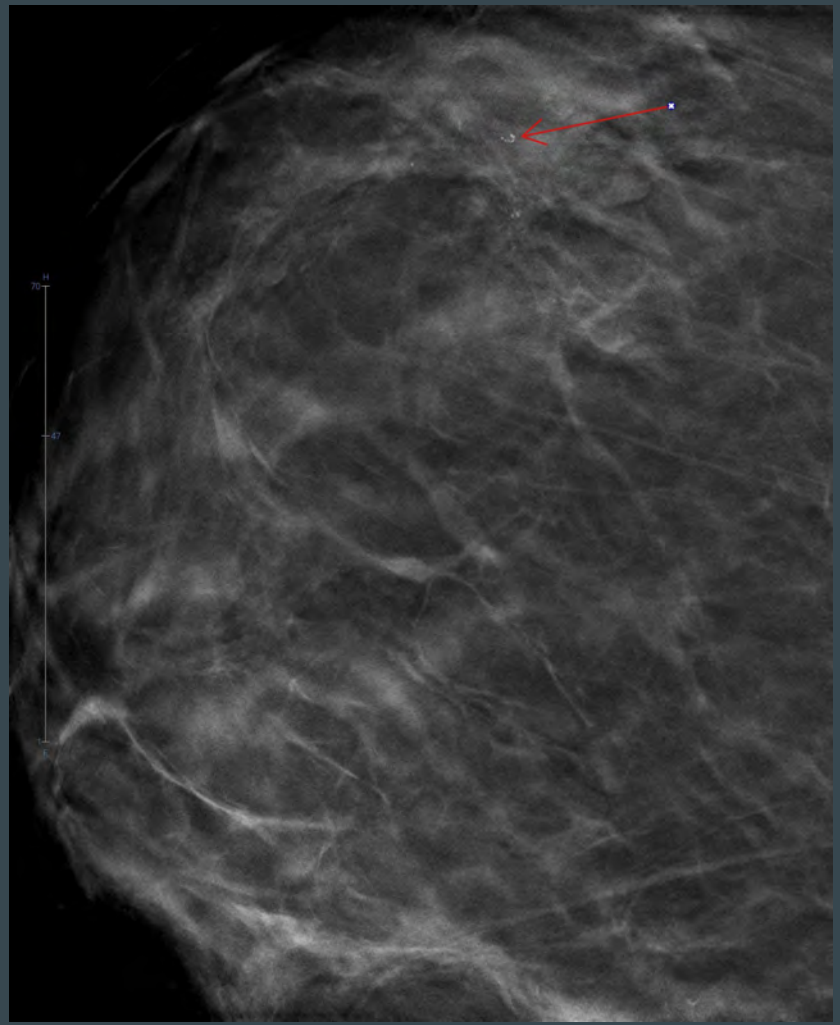
Prone Mammogram Biopsy, Lateral Arm

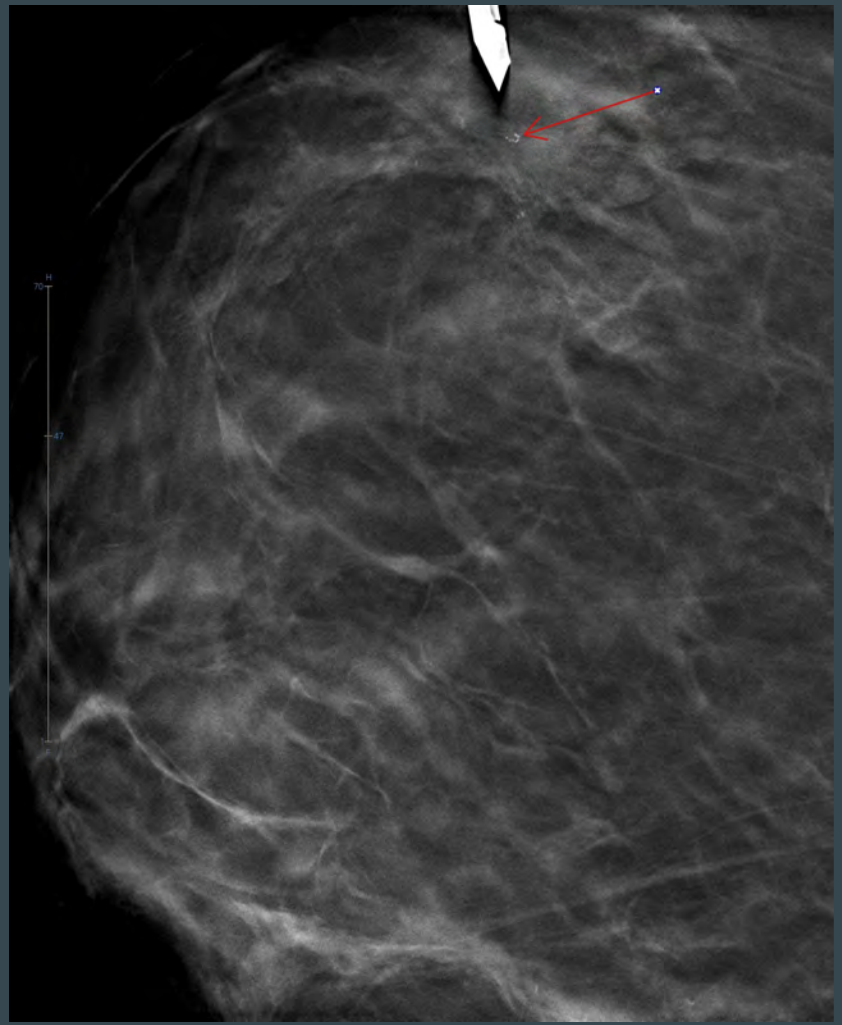
- Case
  - Patient presents from an outside institution
    - Right breast lower inner quadrant calcifications
      - Superficial in location
        - Surgical biopsy was recommended

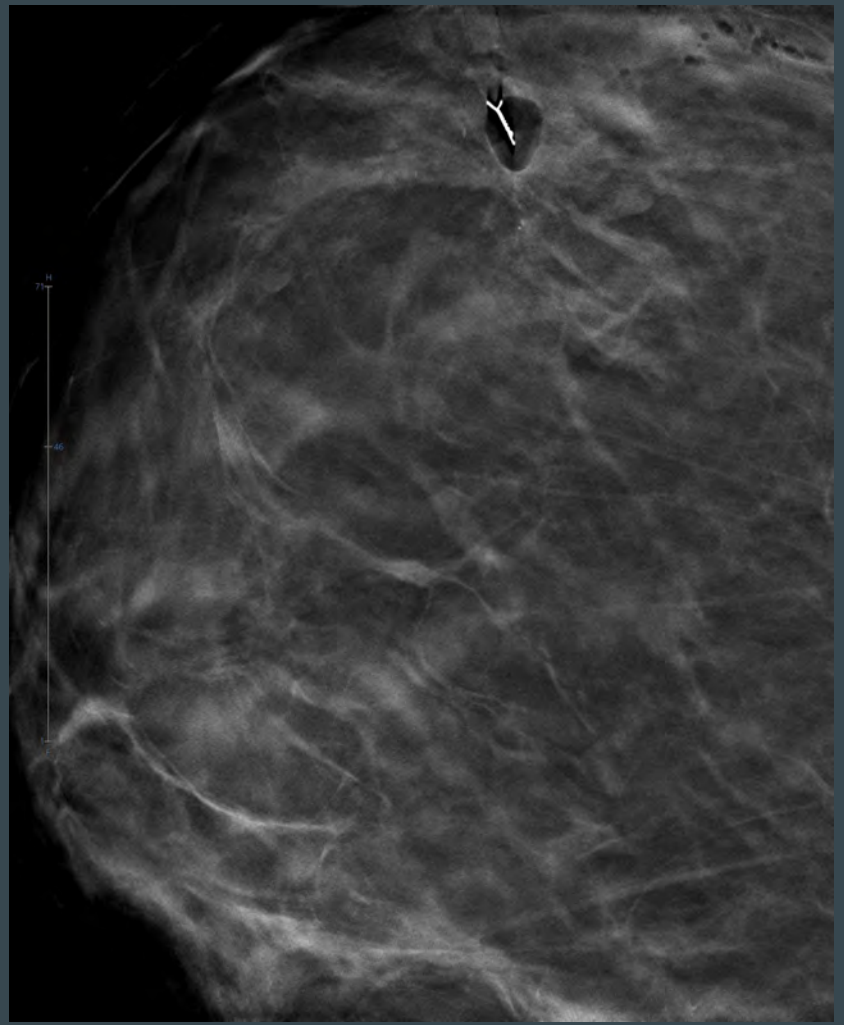


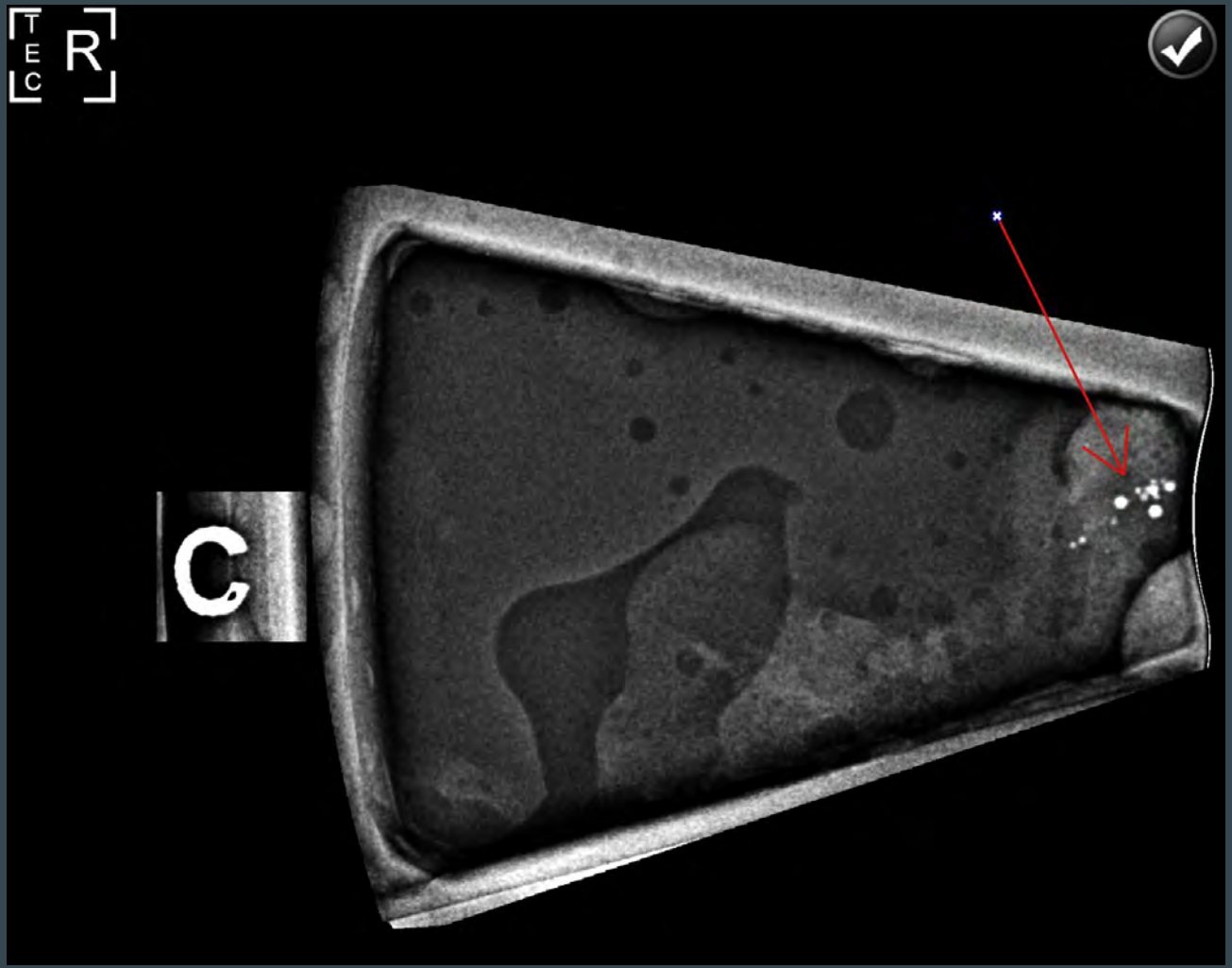






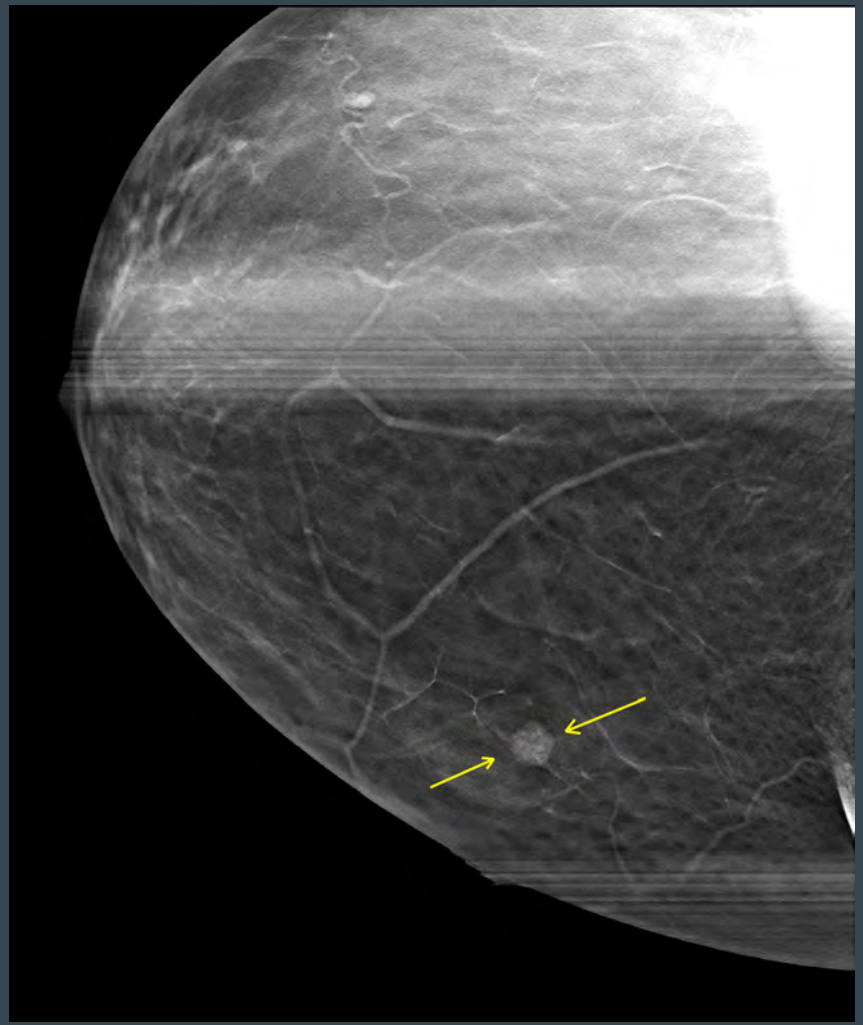


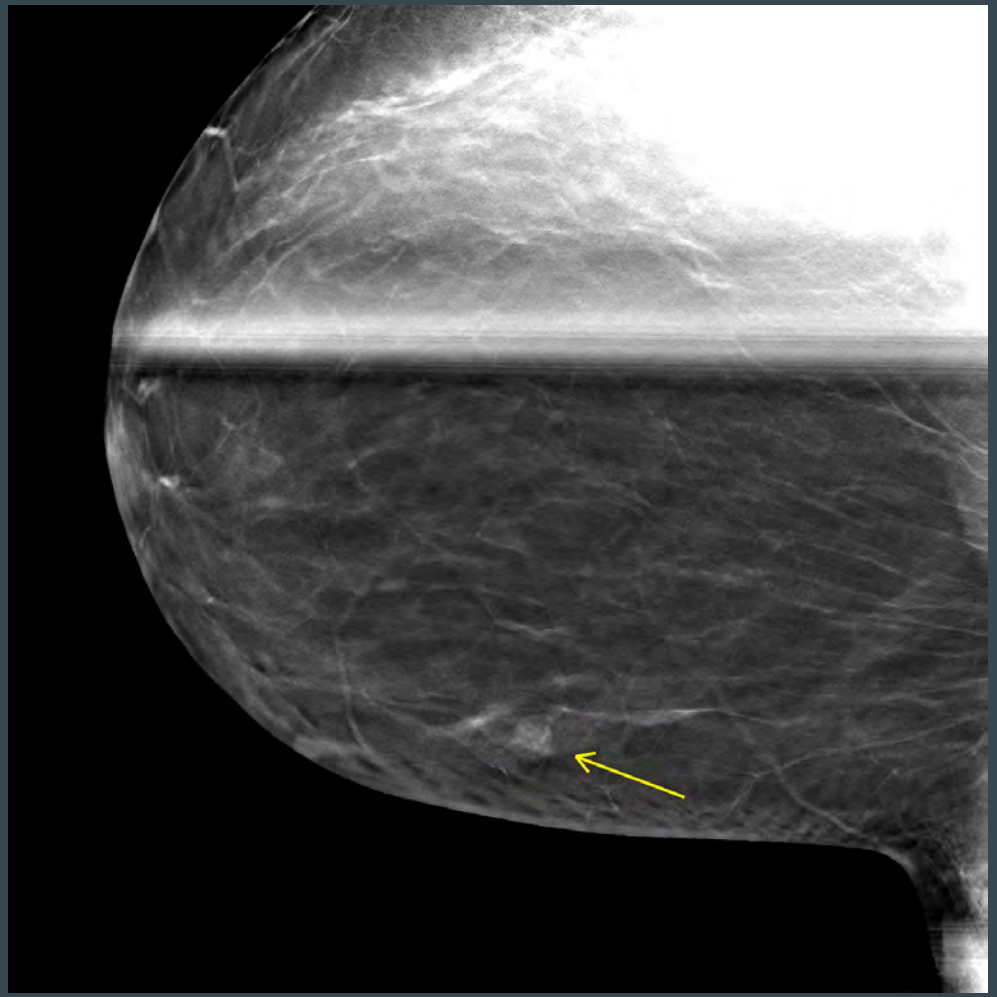


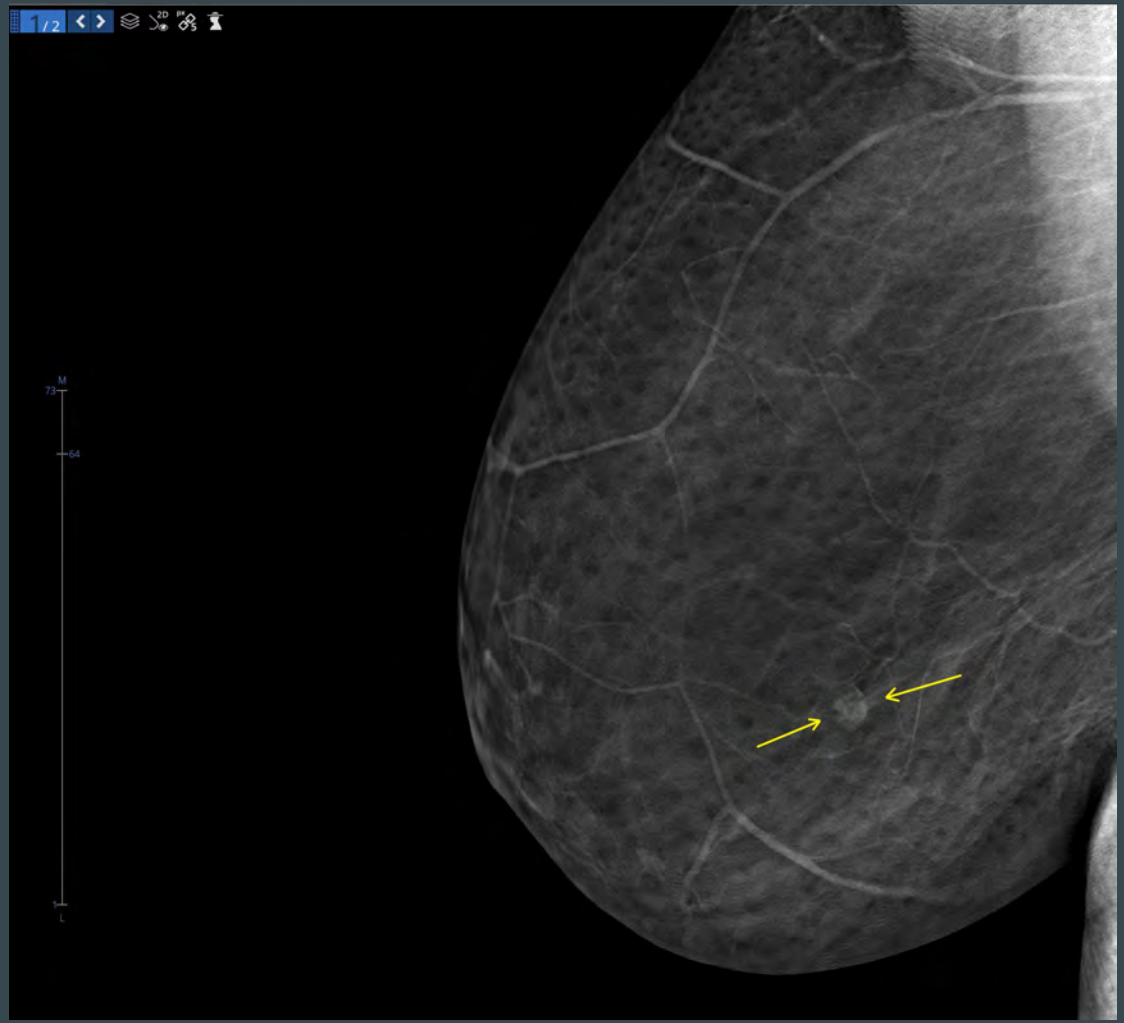

C

Prone Mammogram Biopsy, Lateral Arm

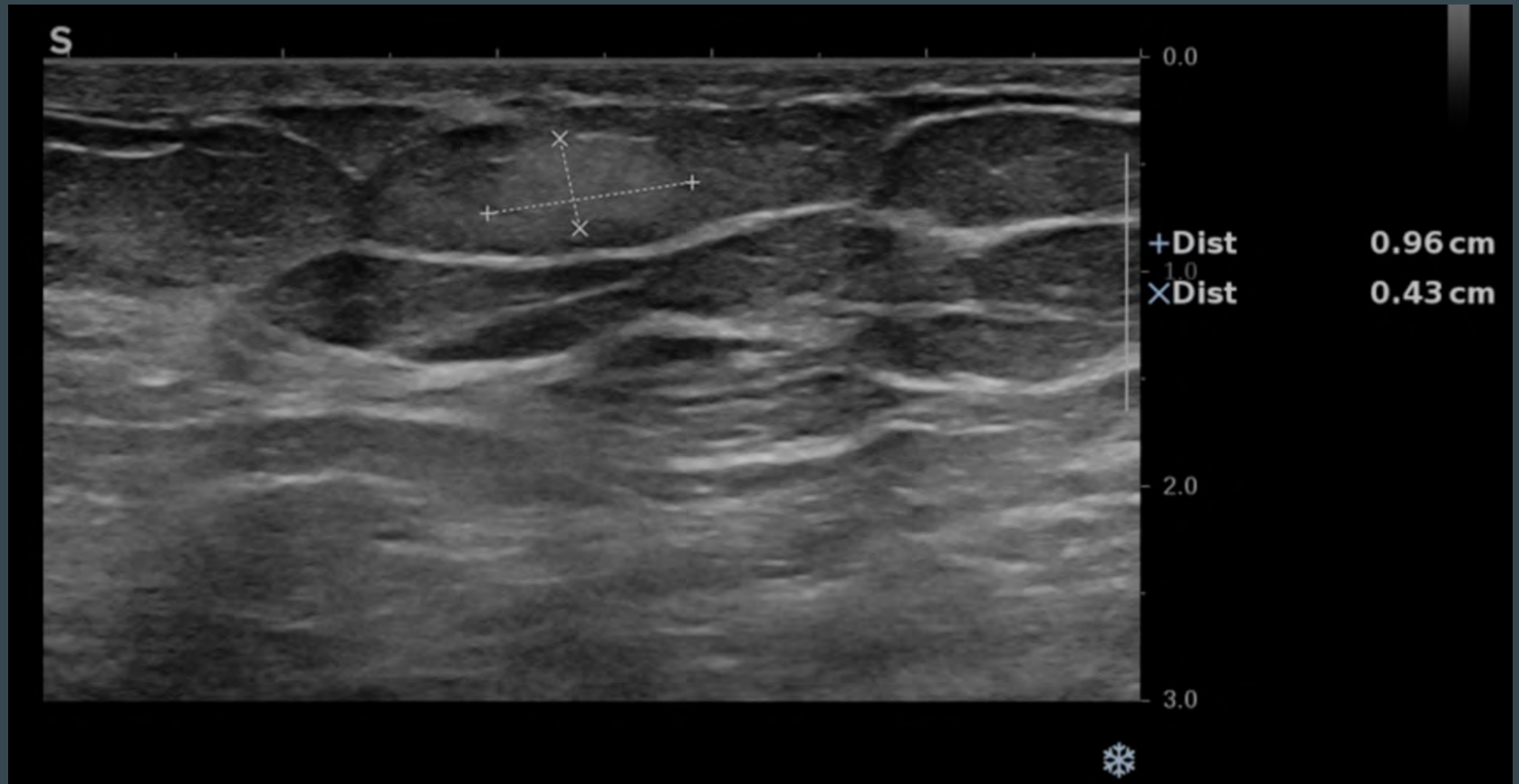
- Case
  - Screen detected superficial right breast finding
    - Focal asymmetry with indistinct margins (possible interspersing fat)
  - Sonographic correlate, but better seen by mammogram
  - Prone mammogram biopsy
    - Too superficial for standard technique
    - Lateral arm biopsy
  - Benign vascular lesion
    - Capillary hemangioma vs angiolipoma

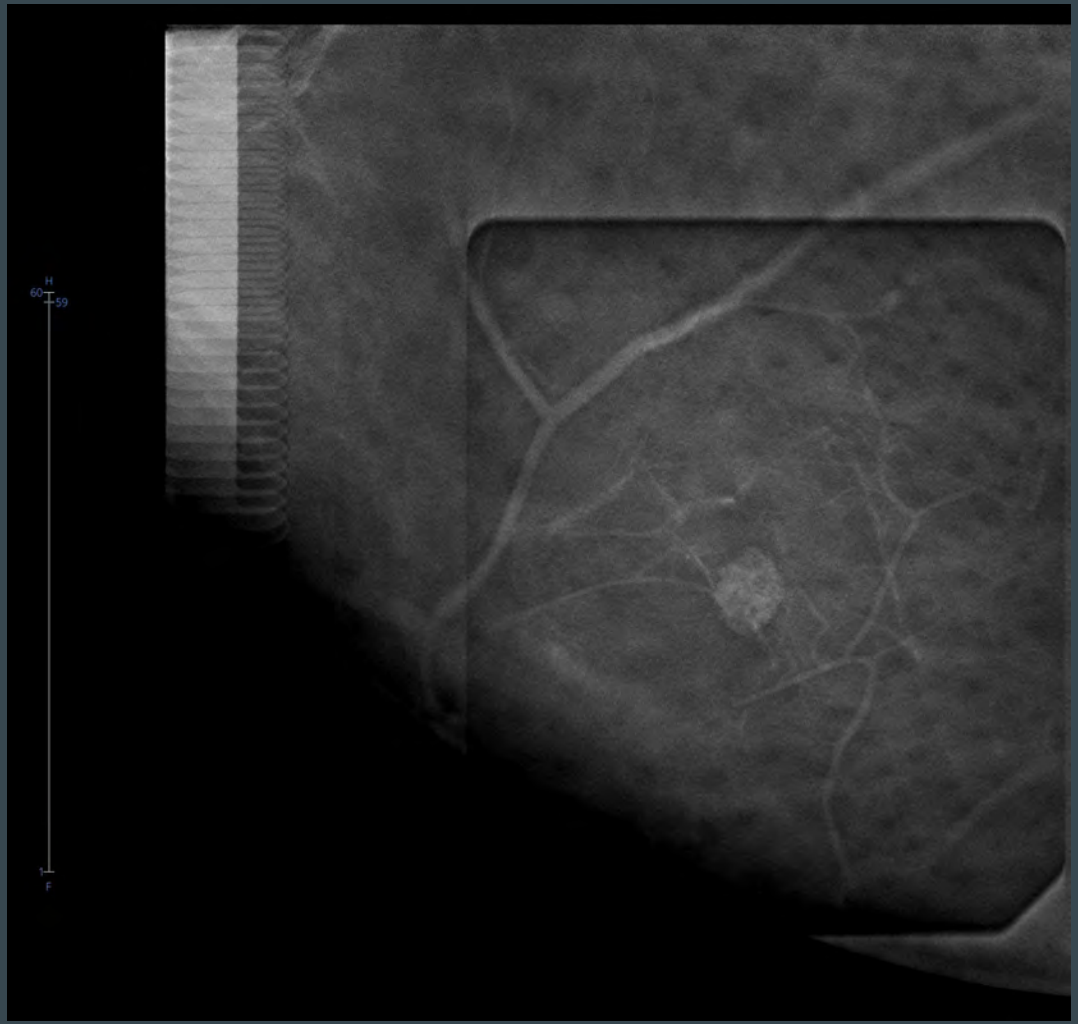




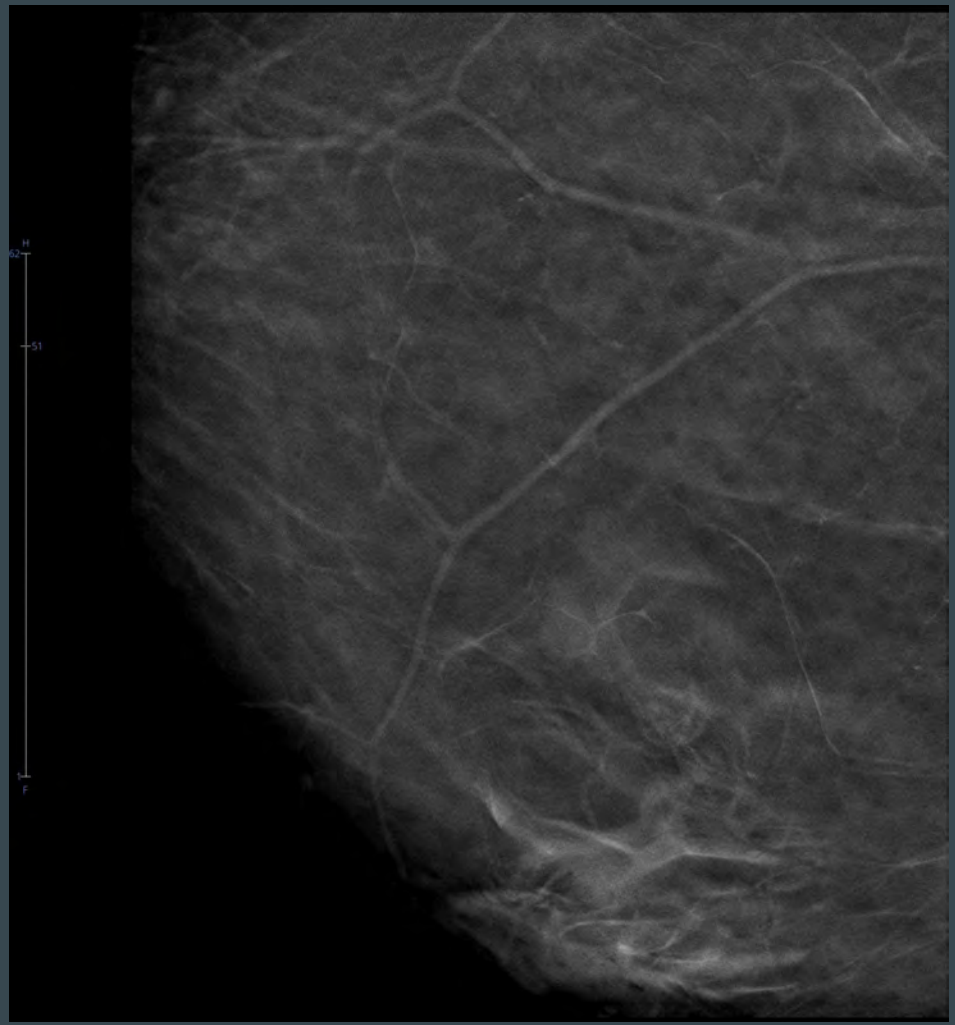

1 / 2
M
73
64
L


S
0.0
1.0
2.0
3.0
RT BREAST 4:00 6 cm fn ANTIRADIAL


S
0.0
+Dist 0.96 cm
1.0
×Dist 0.43 cm
2.0
3.0
RT BREAST 4:00 6 cm fn ANTIRADIAL

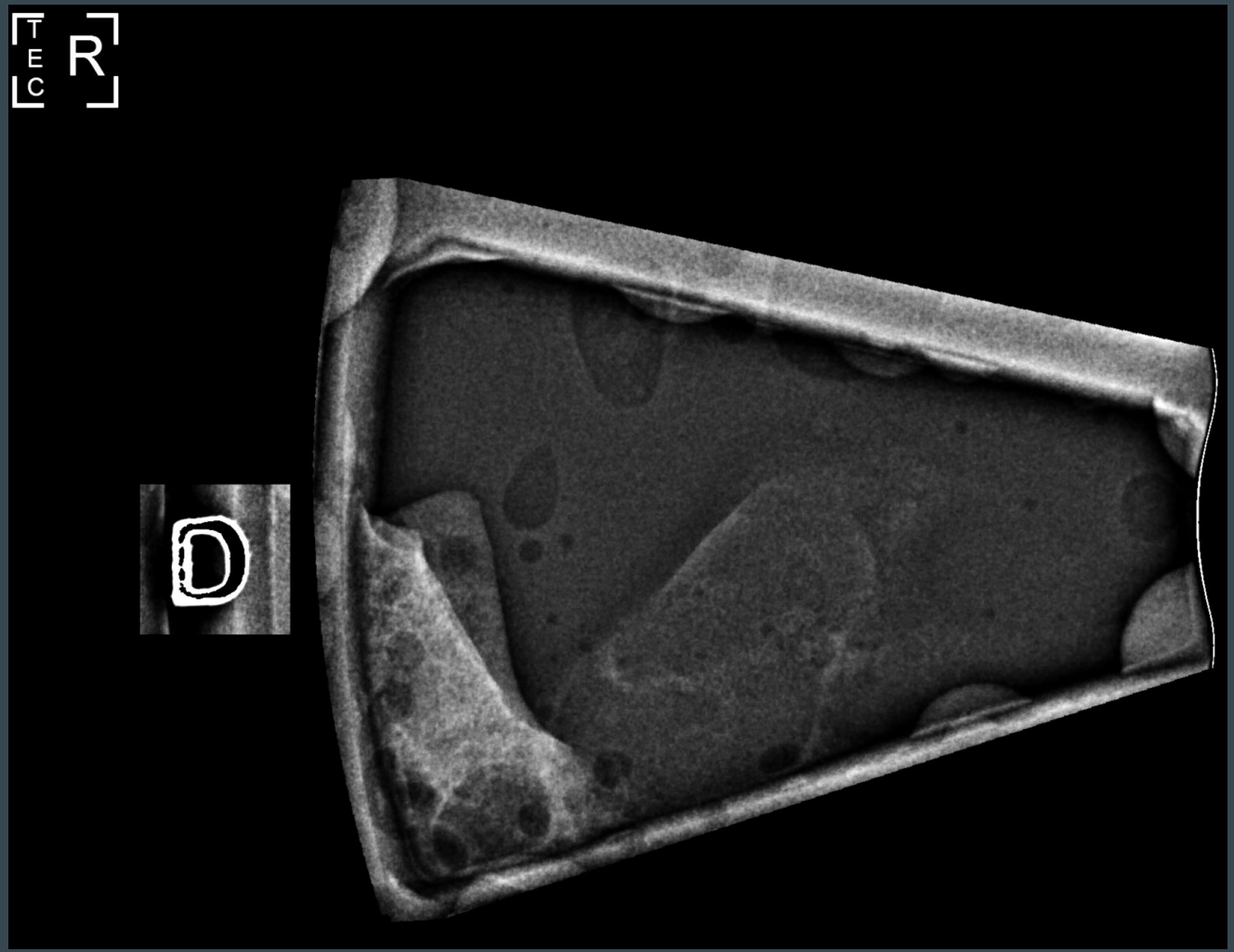

H
60
59
1
F


H
62
54
F


H
62
51
1
F


RCC


RML


D

Case

Negative screening mammogram
Screening MRI same month
IDC, triple negative

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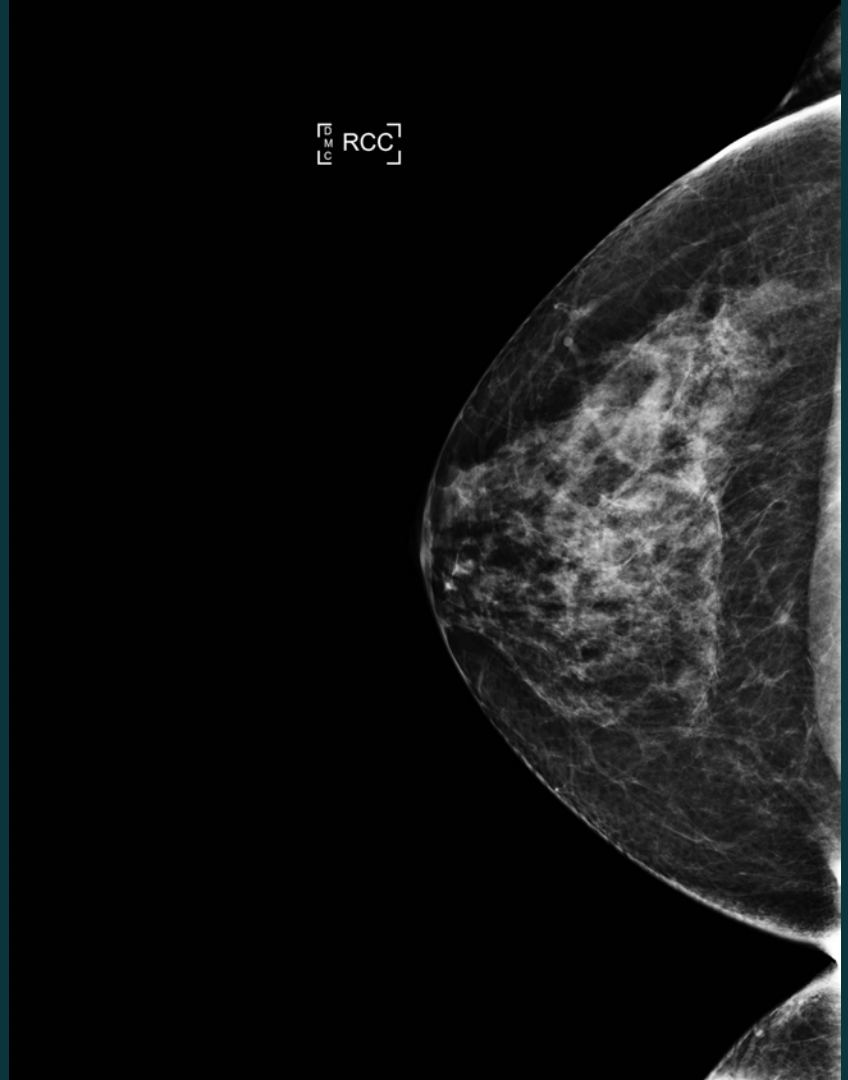
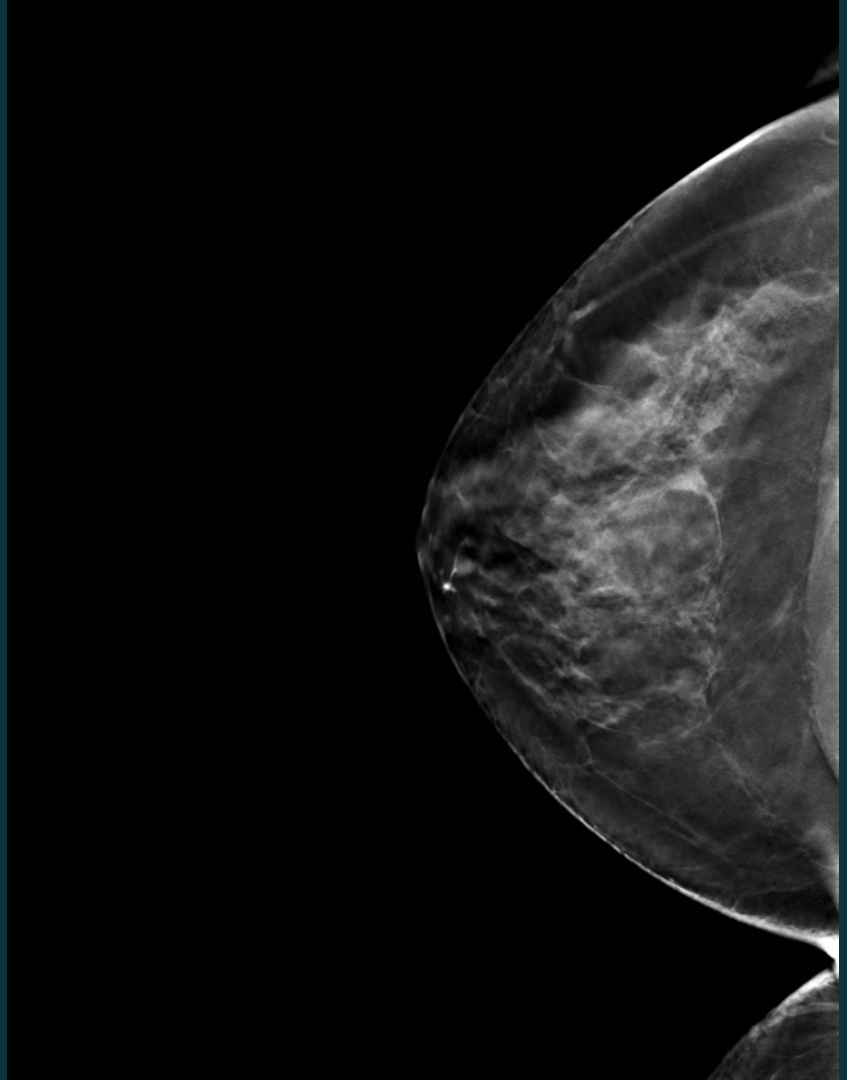
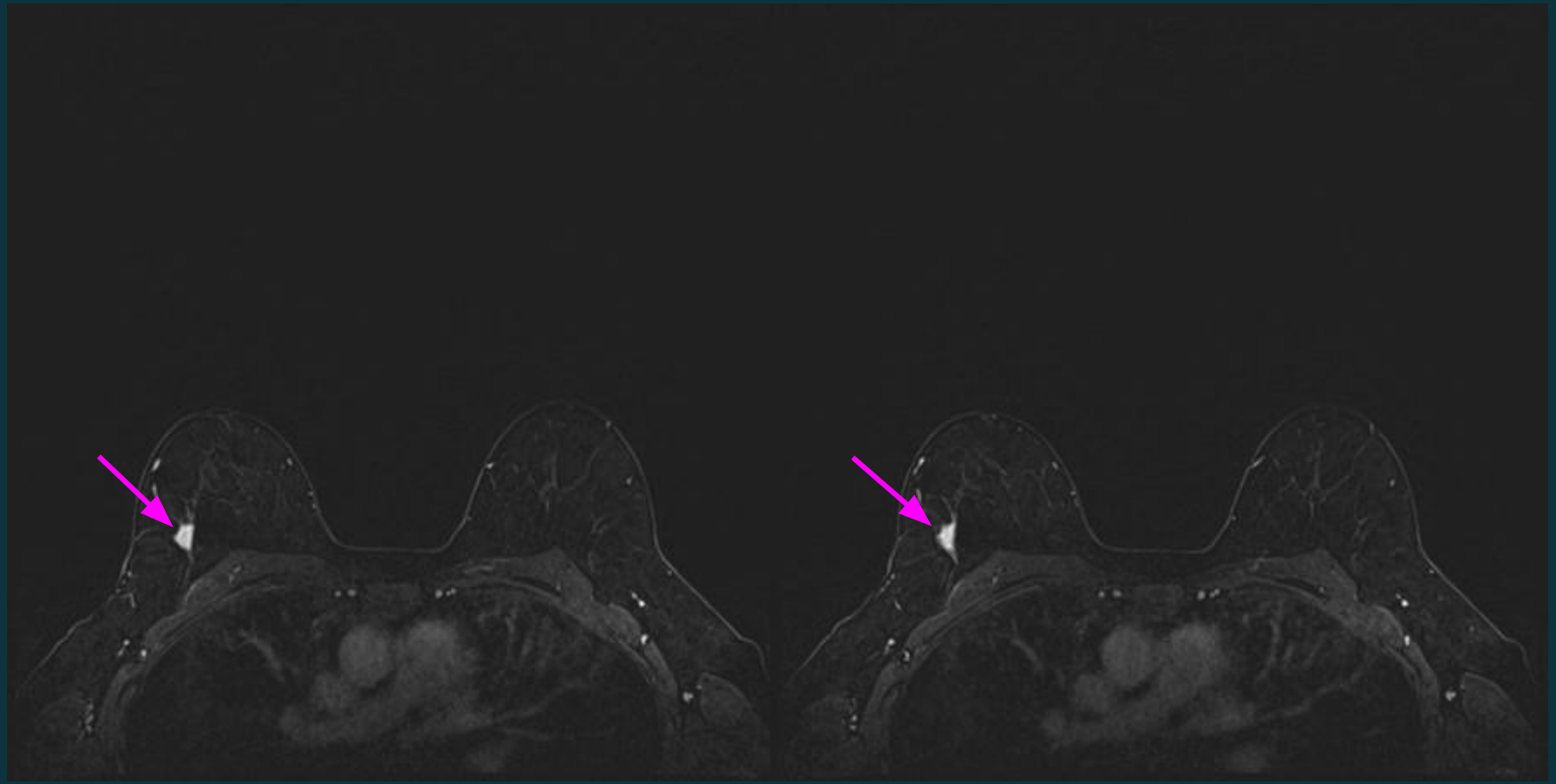
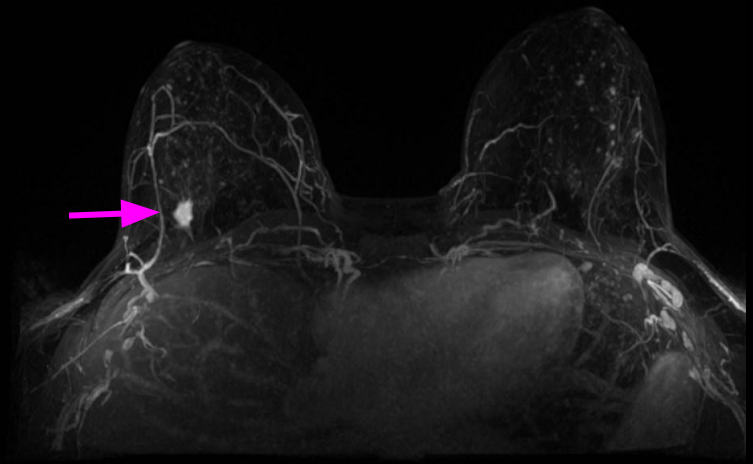
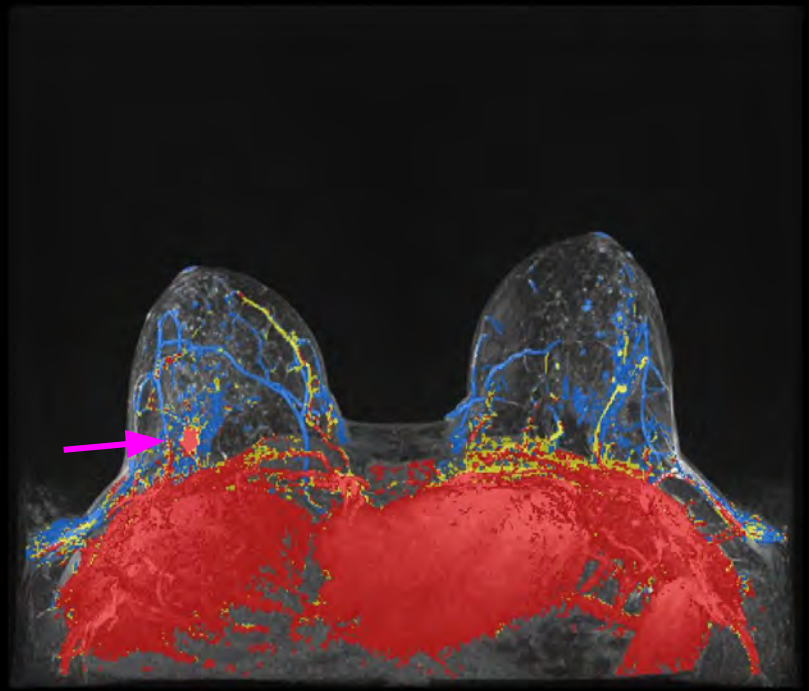

RCC



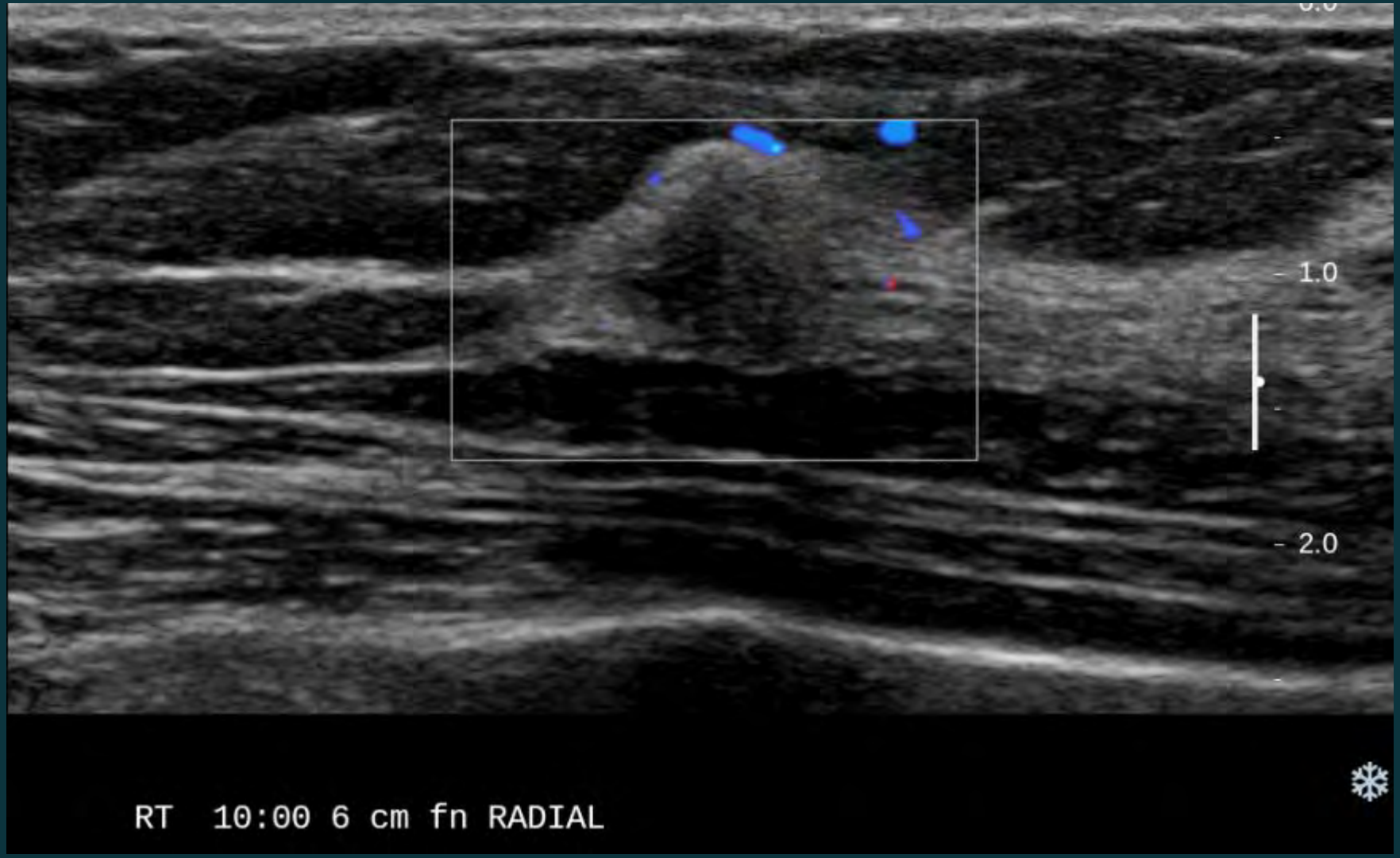

RMLO

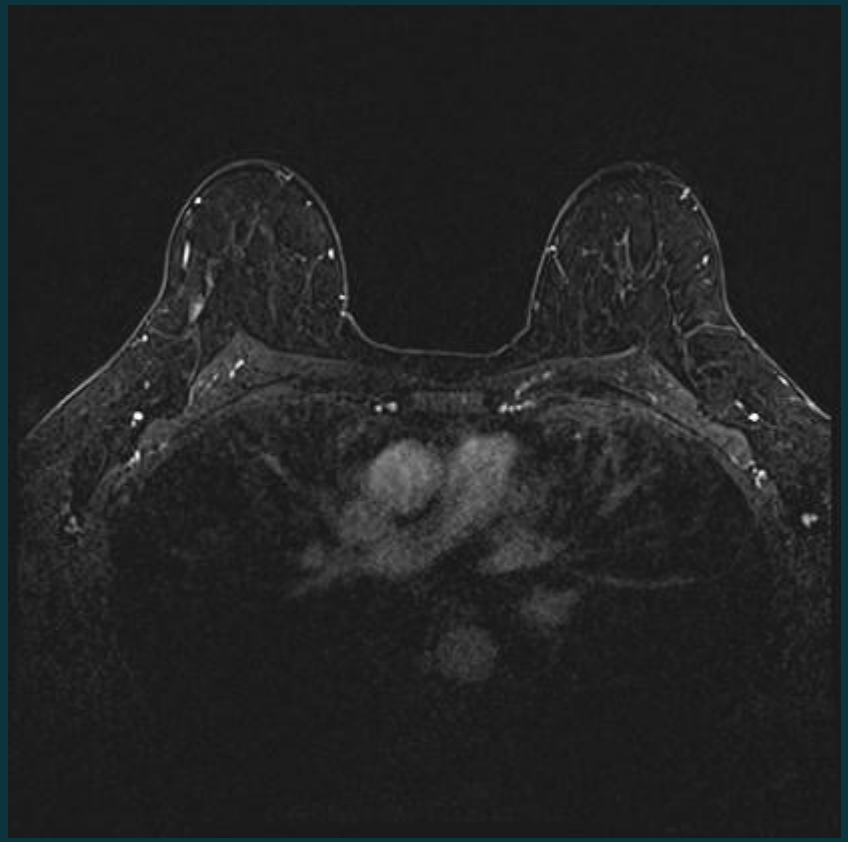


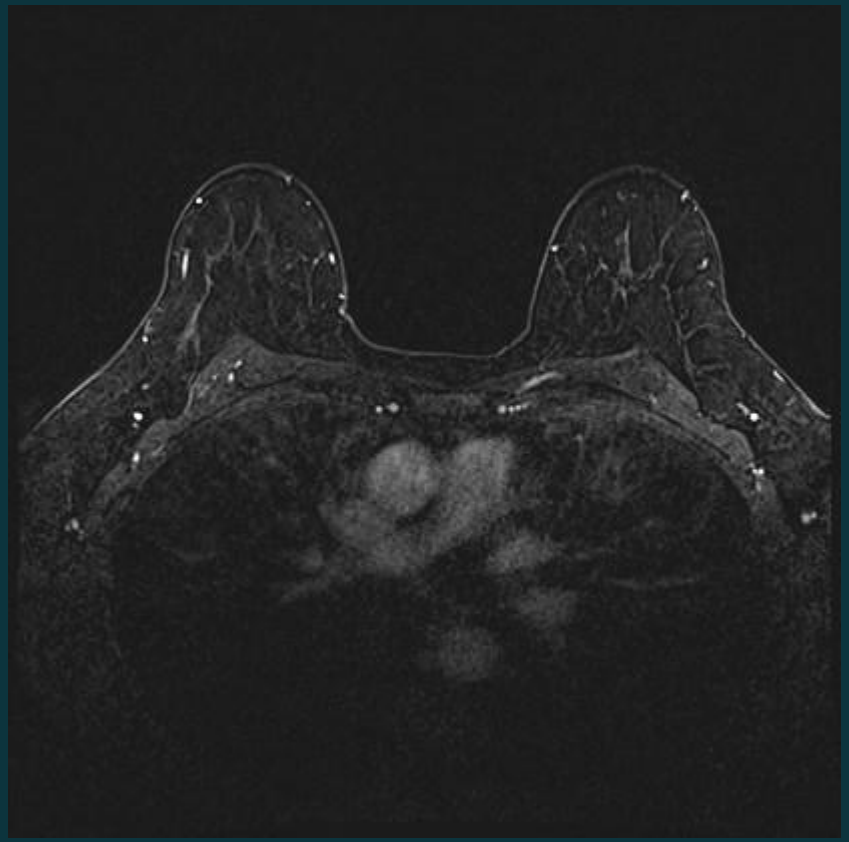





1.0
2.0
RT 10:00 6 cm fn RADIAL


1.0
2.0
RT 10:00 6 cm fn RADIAL





Case

Patient presented with right breast lump

IDC, not well seen by 2D mammography

Outside case, tomo not available

Only C-view

MRI shows extent of disease

Treatment: Mastectomy, chemotherapy, radiation

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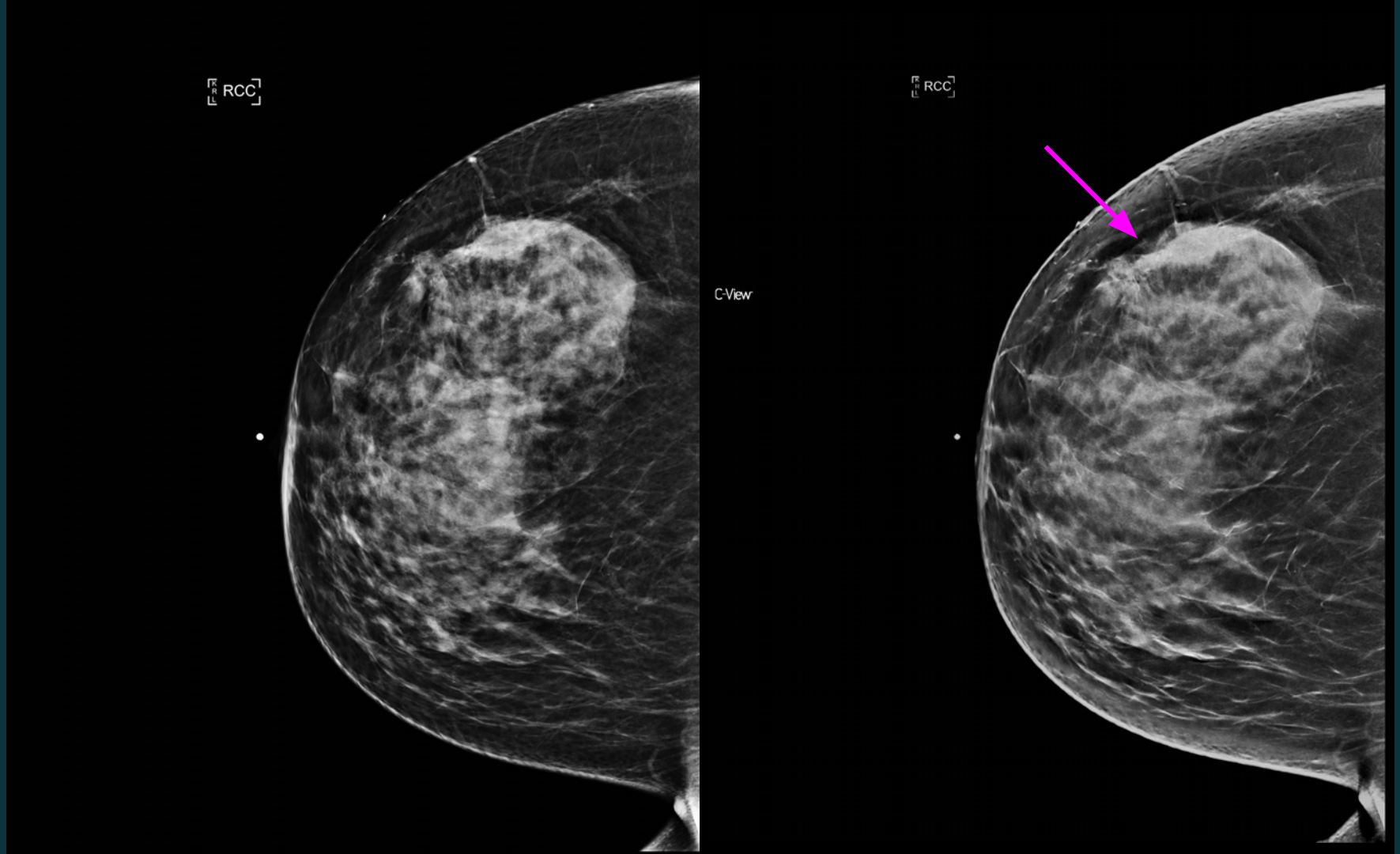
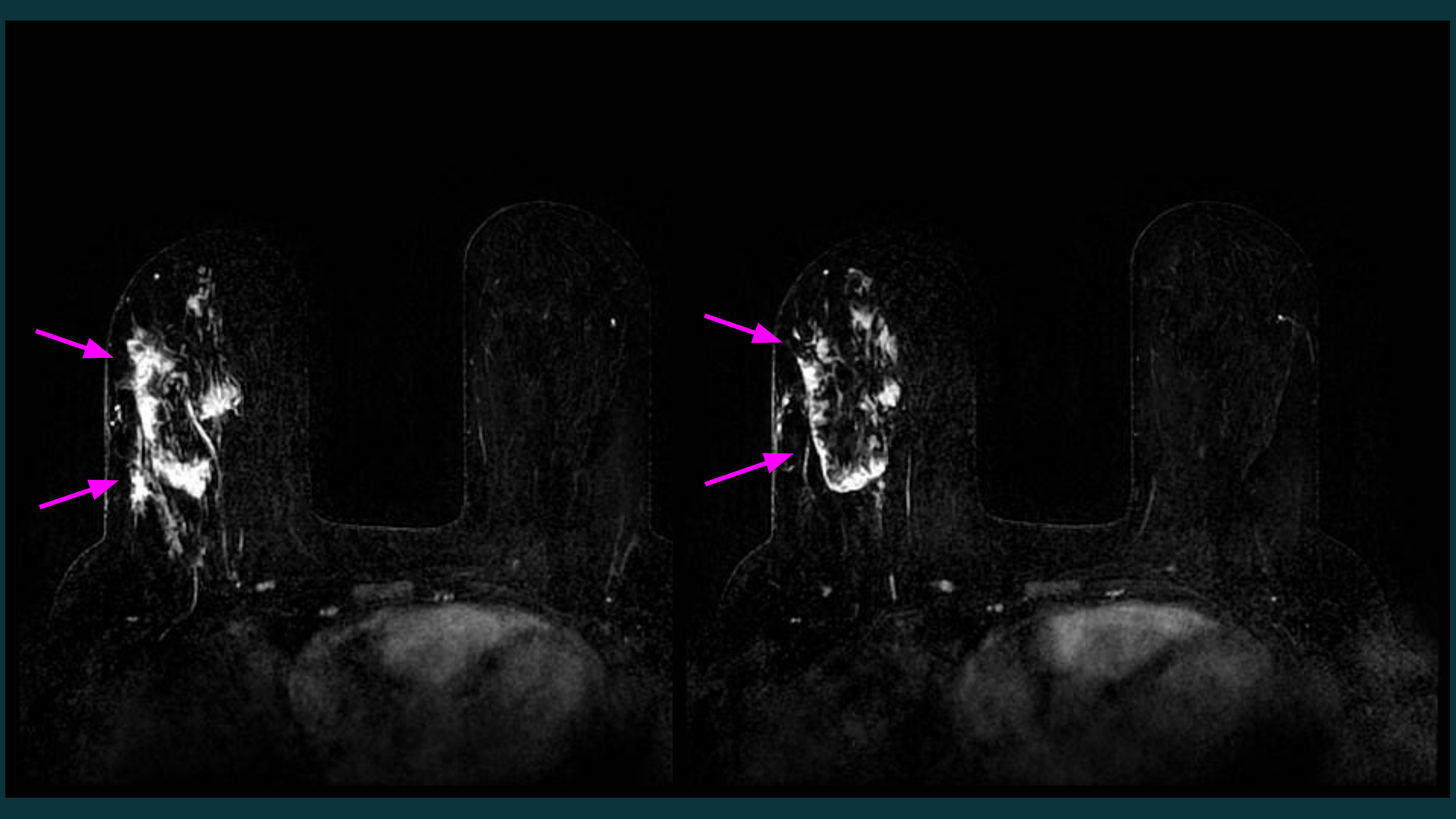
RMLO

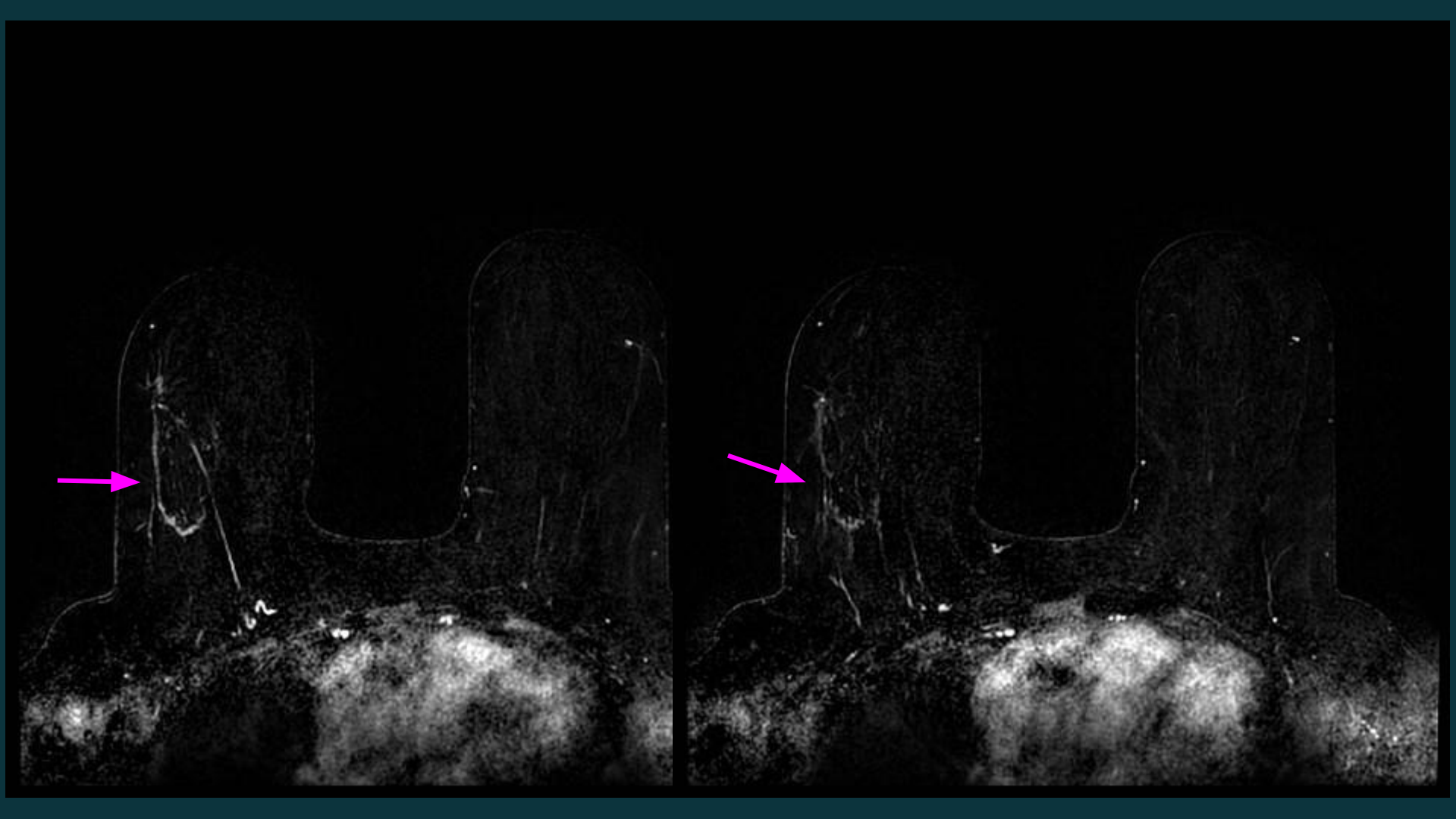

RMLO
C-View


RCC
C-View
RCC


RT BREAST 9:00 3CMFN
4.0


RT BREAST 9:00 3CMFN
4.0





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Facts

Women 40-44 twice as like to get cancer than 35-39

Almost as many women in their 40's diagnosed as those in their 50's

More than 75% of women in their 40's have no family history or other factors

40% years of life save are for women in their 40's

ACS predicts their guidelines would allow 6540 extra deaths

USPSTF allows 13770 deaths a year

SBI/ACR/ACS/USPSTF all agree the most lives and yol saved is from screening at 40

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Facts

Annual vs biennial screening saves 40% more lives and 40% more years

Biennial has 81% benefit, meaning if you had a population large enough to save 100 lives you would only save 81 (CISNET)

1 2-view mammogram is about 2 months background radiation

Yaffe et al. Health Reports, Vol. 26 (12), 9-15; 2015

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