



X-Ray Associates of New Mexico, P.C.

HOW AND WHERE TO FIND BREAST CANCER

MICHAEL N. LINVER, MD, FACR



FINDING EARLY BREAST CANCER: THE GROUND RULES

- **PROBLEM:** There are only 5 **CANCERS** in every 1,000 screening mammograms!

→ **Easy to get complacent**

→ **Hard to stay focused**

→ **Must consider each potential lesion as “guilty until proven innocent”**

→ **Be more concerned with your **CANCER DETECTION RATE** than your **RECALL RATE**!**



FINDING EARLY BREAST CANCER: THE GROUND RULES (cont.)

Know the appearance of breast cancer in all of its
more obvious forms:

- Spiculated mass
- Irregular mass
- Linear branching calcifications

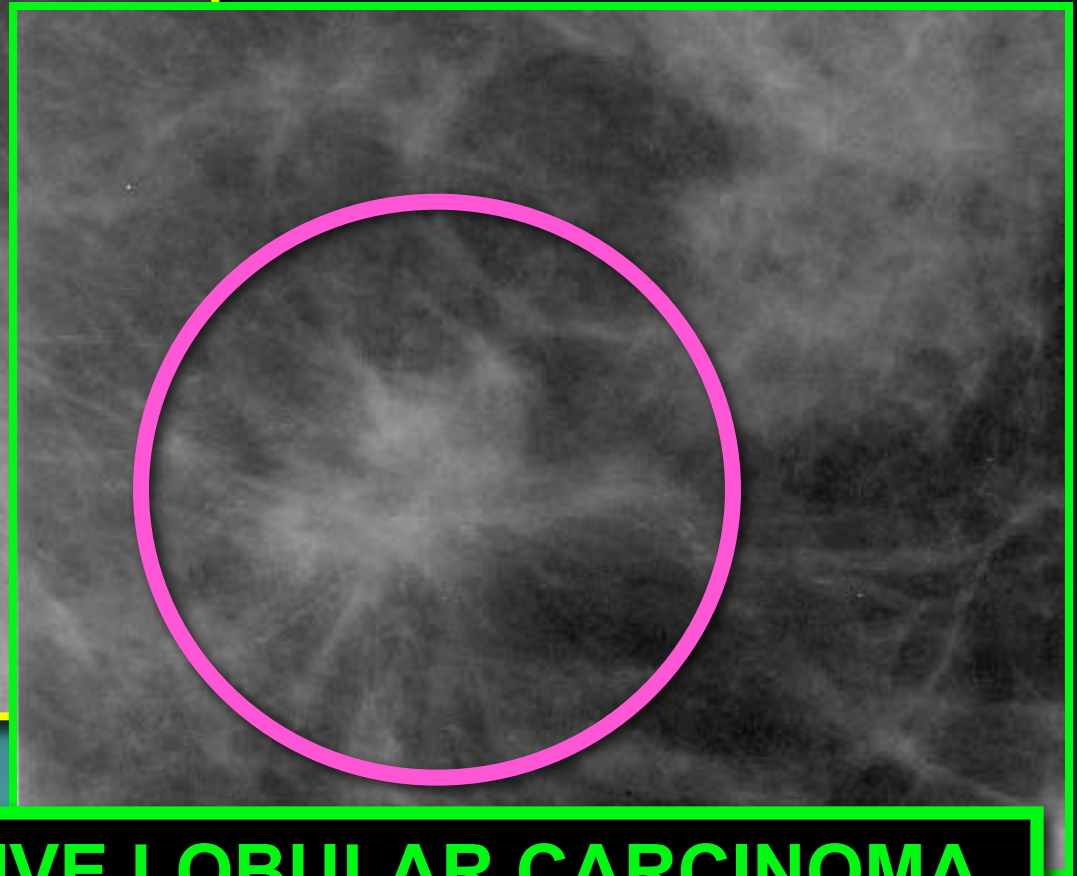
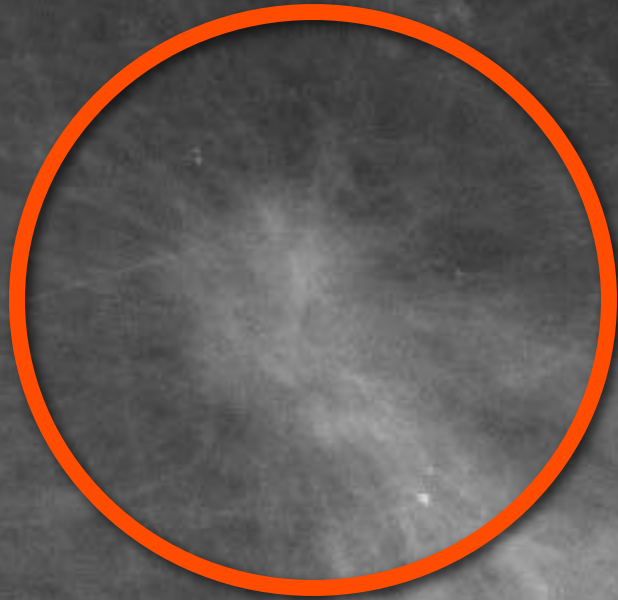


FINDING EARLY BREAST CANCER: THE GROUND RULES (cont.)

Know the appearance of breast cancer in all of its
more obvious forms:

→ Spiculated mass

INVASIVE DUCTAL CARCINOMA



INVASIVE LOBULAR CARCINOMA



FINDING EARLY BREAST CANCER: THE GROUND RULES (cont.)

Know the appearance of breast cancer in all of its
more obvious forms:

→ Irregular mass

CC

MLO

INVASIVE DUCTAL CARCINOMA



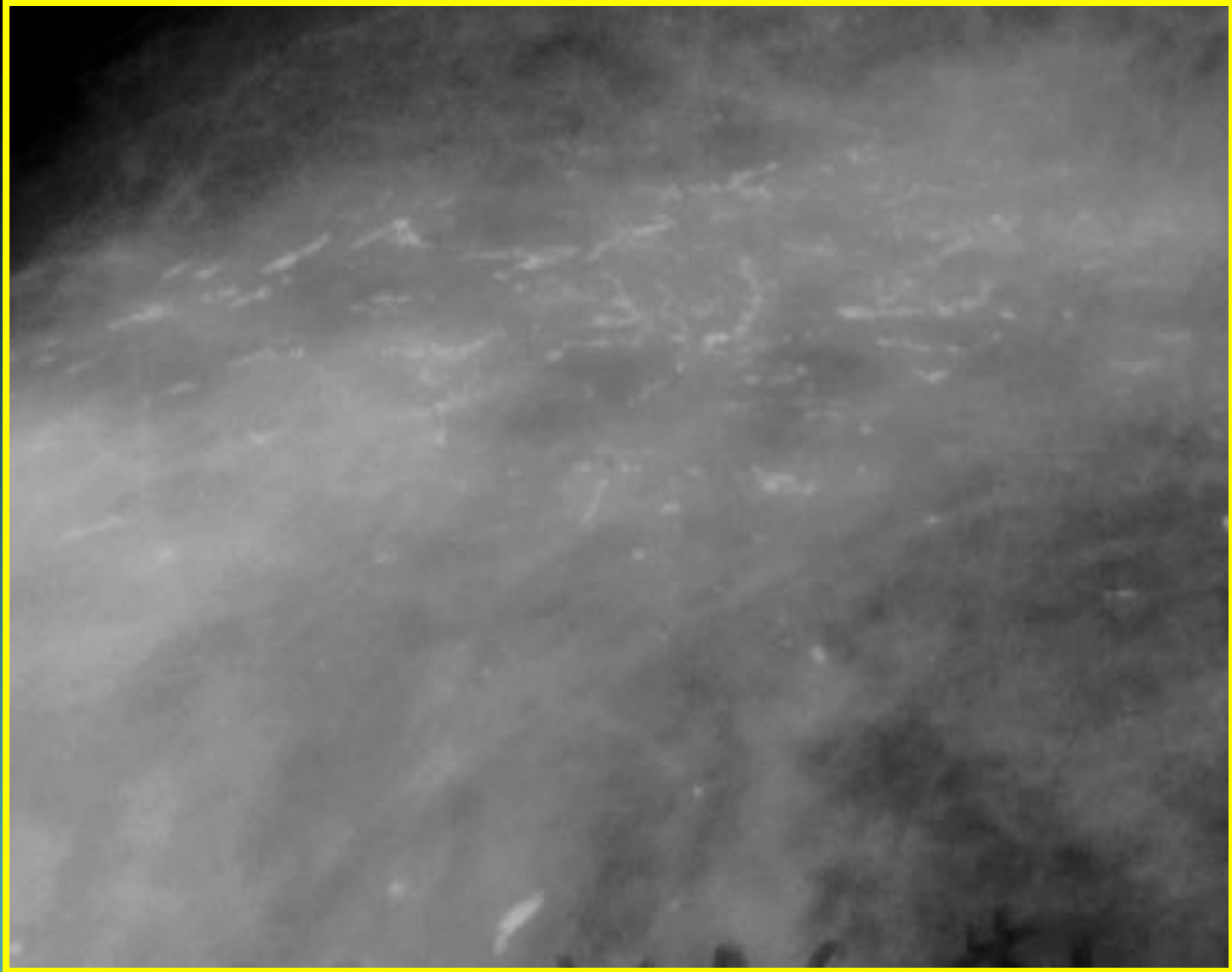


FINDING EARLY BREAST CANCER: THE GROUND RULES (cont.)

Know the appearance of breast cancer in all of its
more obvious forms:

→ Linear branching calcifications

HIGH-GRADE DCIS: COMEDOFORM



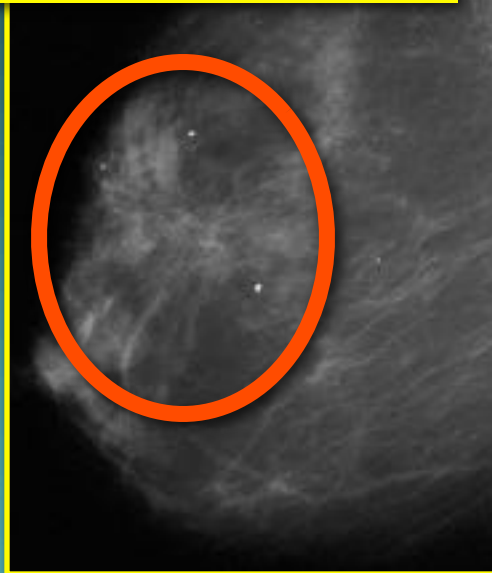
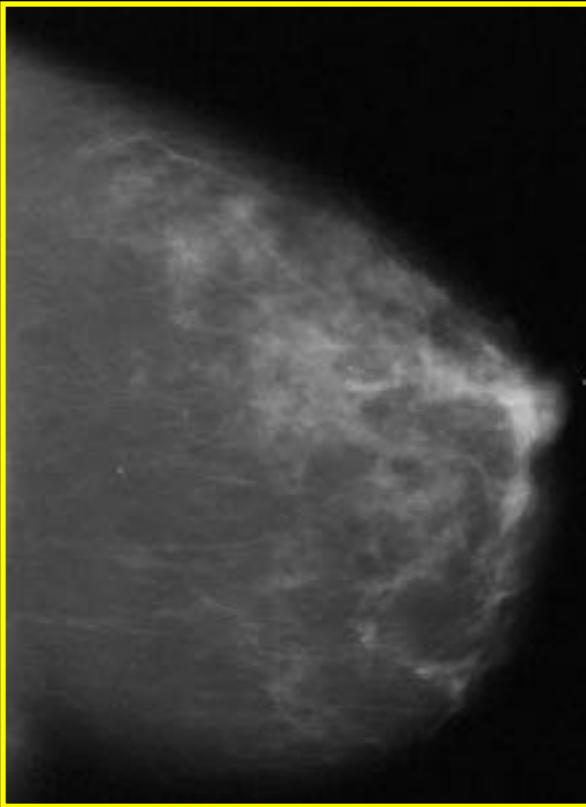


FINDING EARLY BREAST CANCER: THE GROUND RULES (cont.)

- Know the appearance of breast cancer in all of its more subtle guises:
 - ➔ Developing asymmetry
 - ➔ Ill-defined mass, even if stable!
 - ➔ Growing solid well-circumscribed mass
 - ➔ Architectural distortion
 - ➔ Subtle microcalcifications

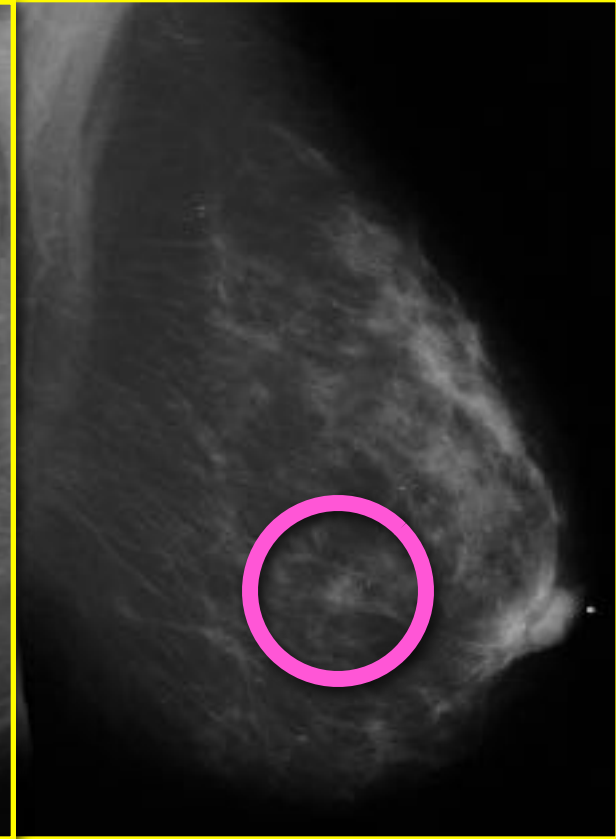
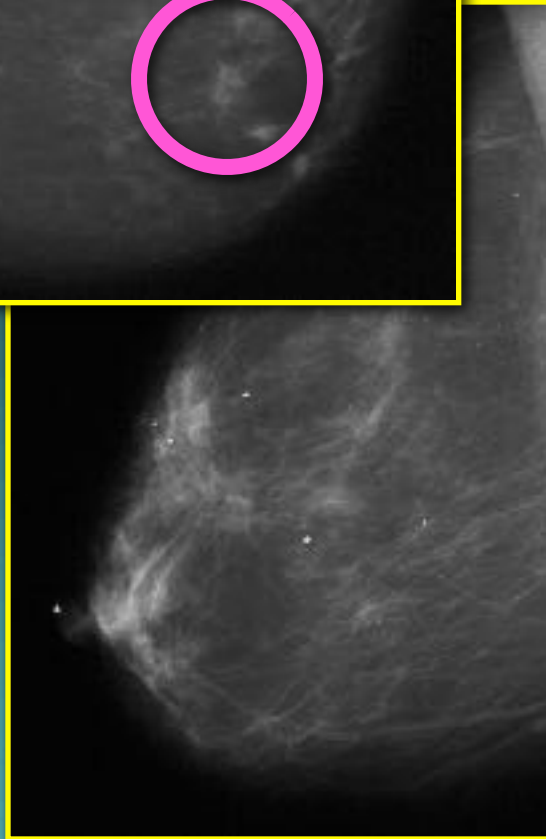
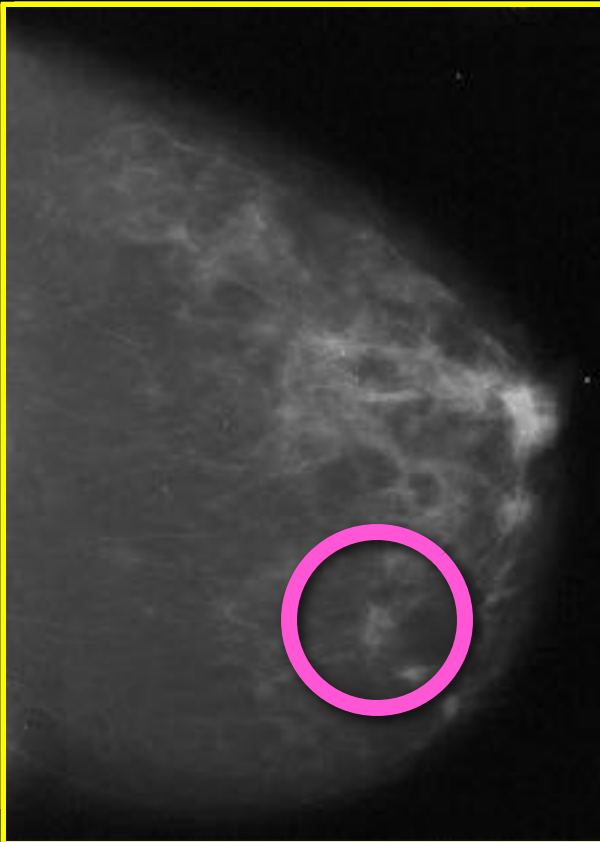
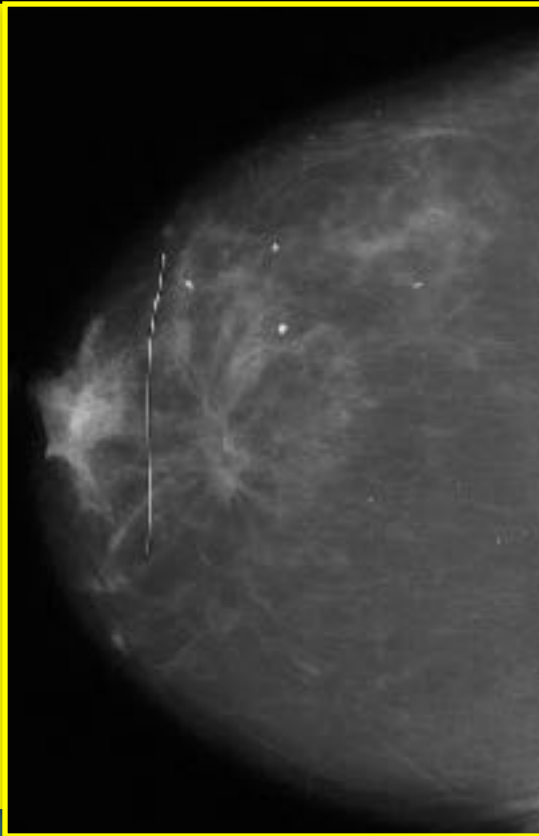
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**PREVIOUS RIGHT
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CARCINOMA IN
SITU 5 YEARS
EARLIER**

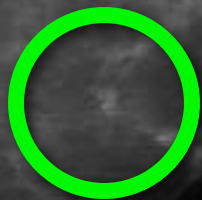


2005

**PREVIOUS RIGHT
DUCTAL
CARCINOMA IN
SITU 5 YEARS
EARLIER**



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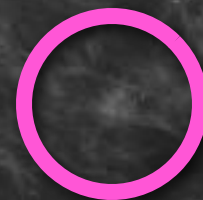
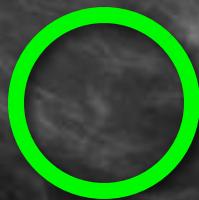


2005



**PREVIOUS RIGHT
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2004



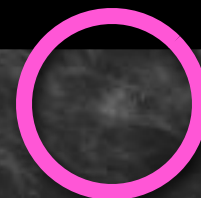
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OPTICAL MAGNIFICATION



2005



**PREVIOUS
DUCTAL
CARCINOMA
IN SITU 5 YEARS
EARLIER**

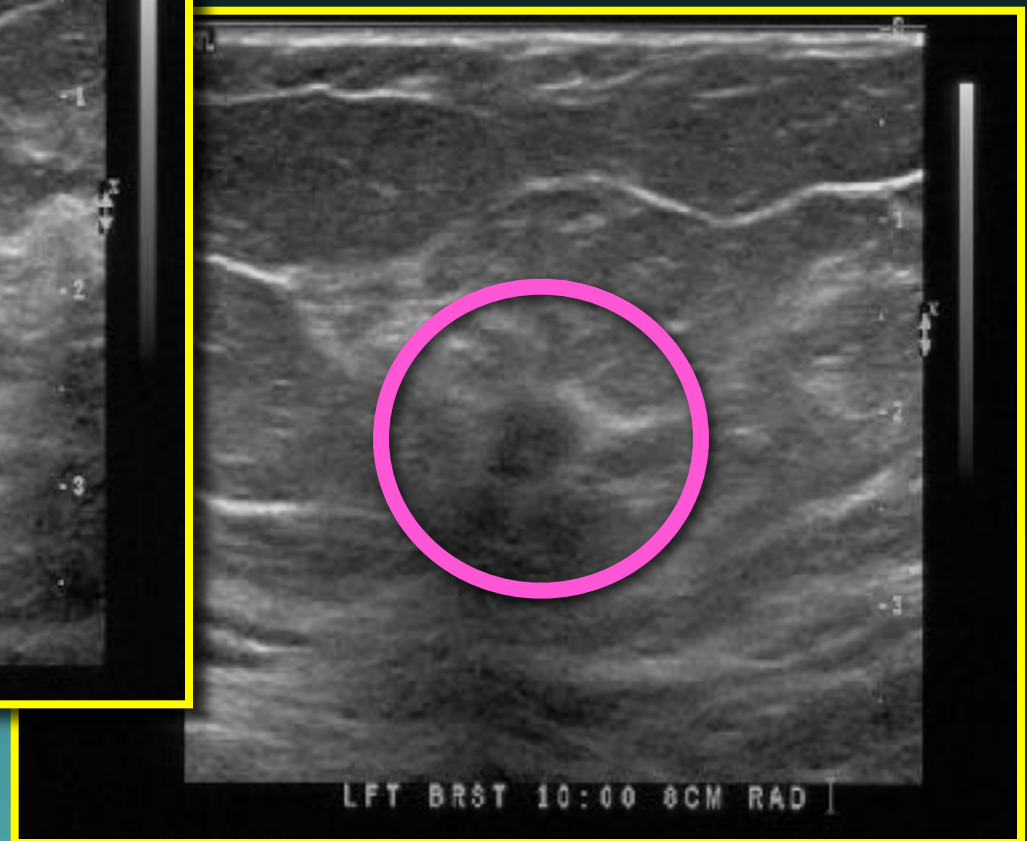
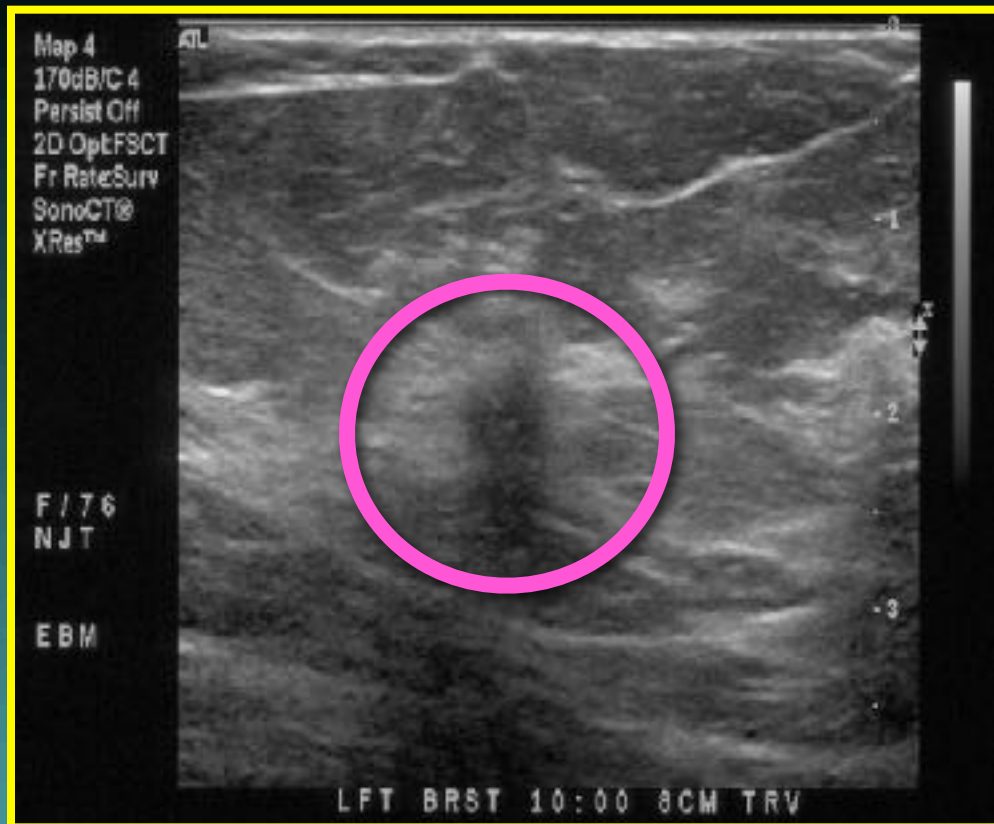
CC

**SPOT MAGNIFICATION
VIEWS**

MLO



ULTRASOUND





NEW INVASIVE LOBULAR CARCINOMA

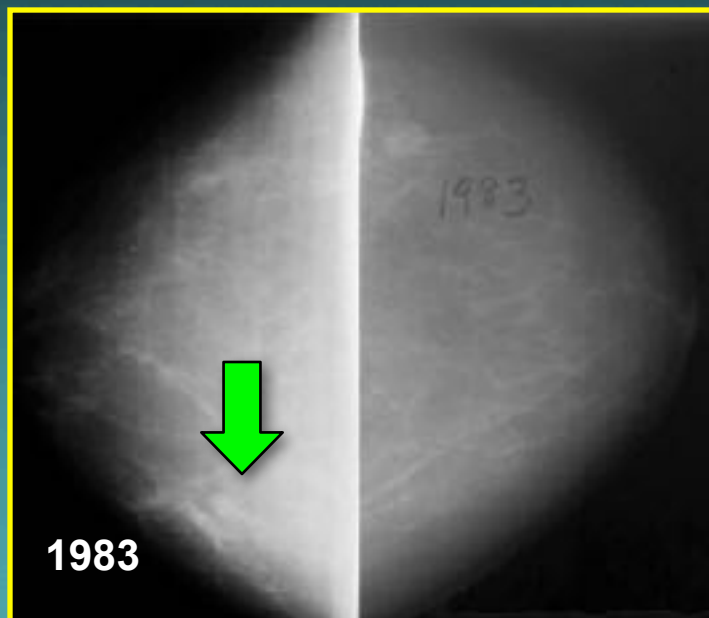
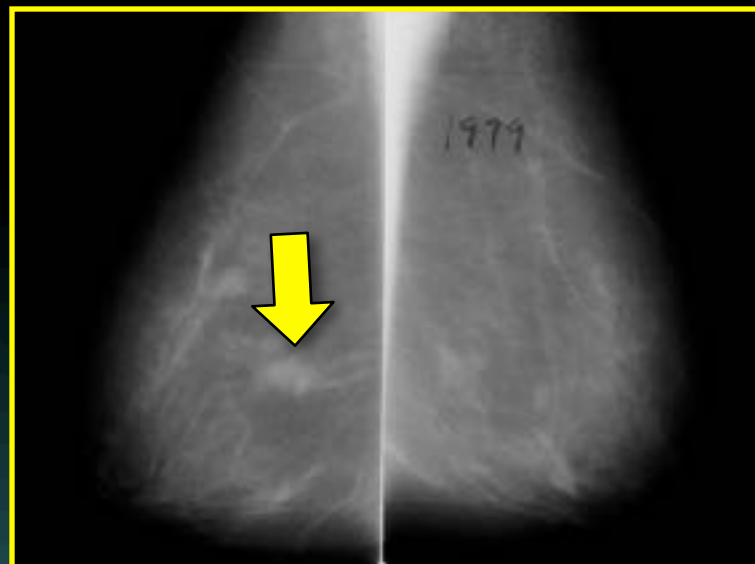
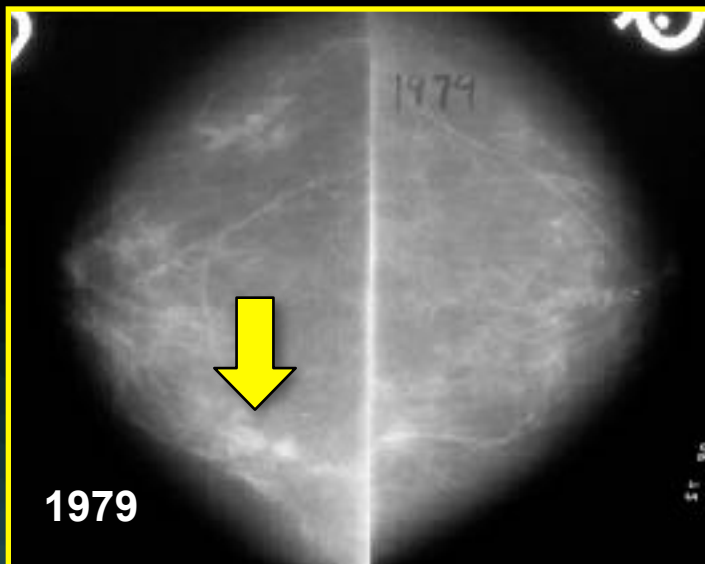


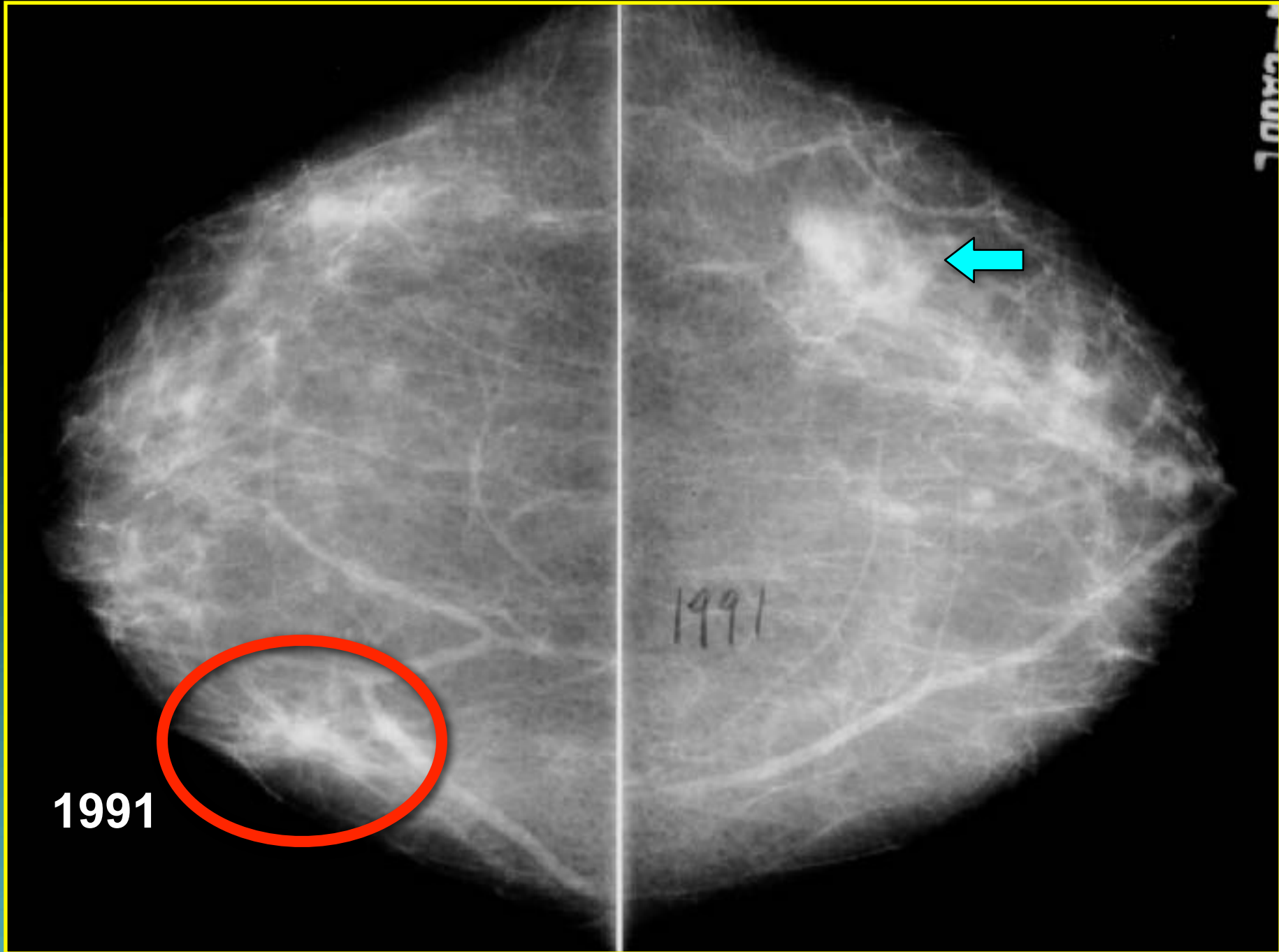


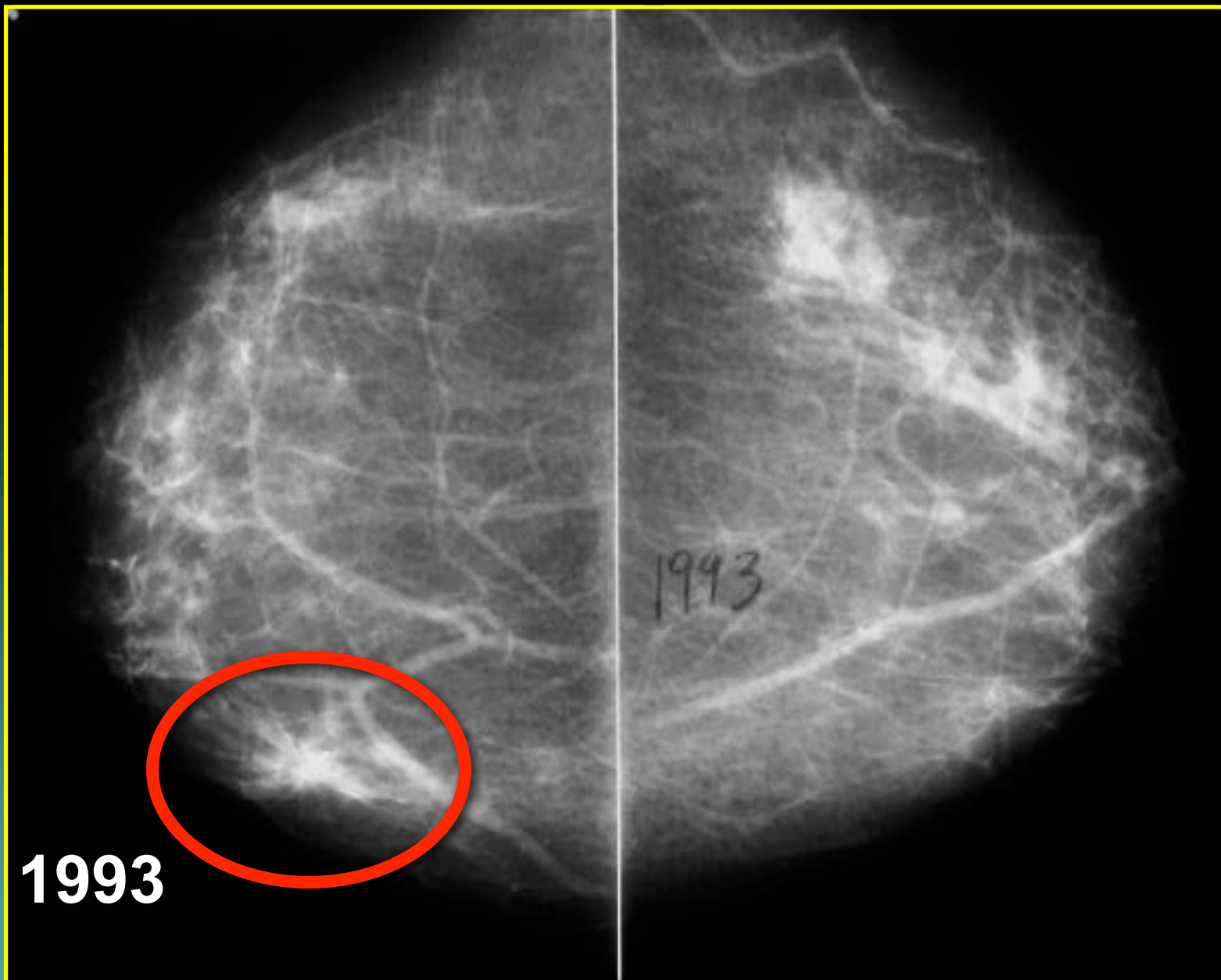
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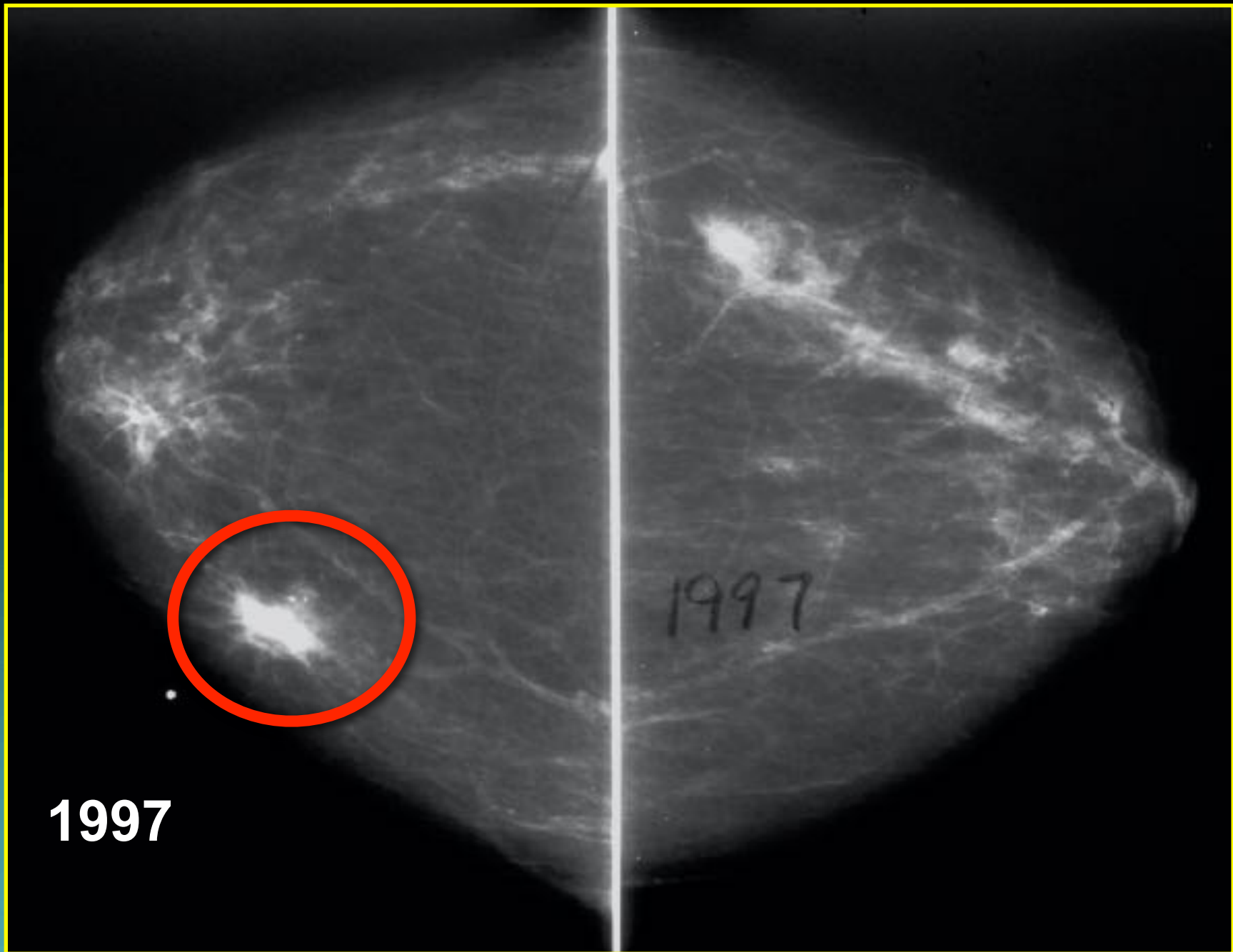
THE GROUND RULES (cont.)

- **Know the appearance of breast cancer in all its guises:**
 - **Developing asymmetry**
 - **Ill-defined mass, even if stable!**
 - **Growing solid well-circumscribed mass**
 - **Architectural distortion**
 - **Subtle microcalcifications**









1997

1997

INVASIVE DUCTAL CARCINOMA





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CC

MLO



2004



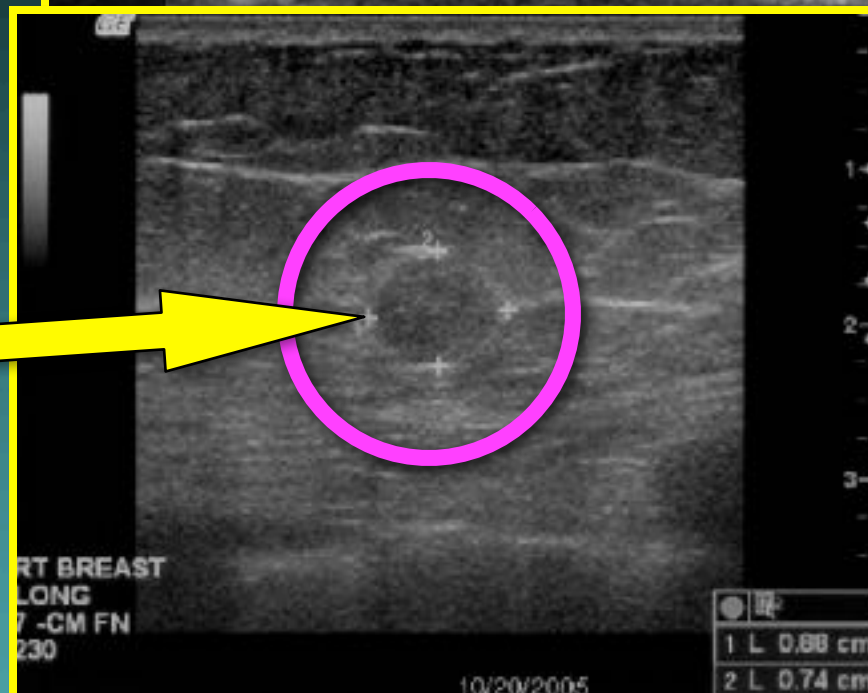
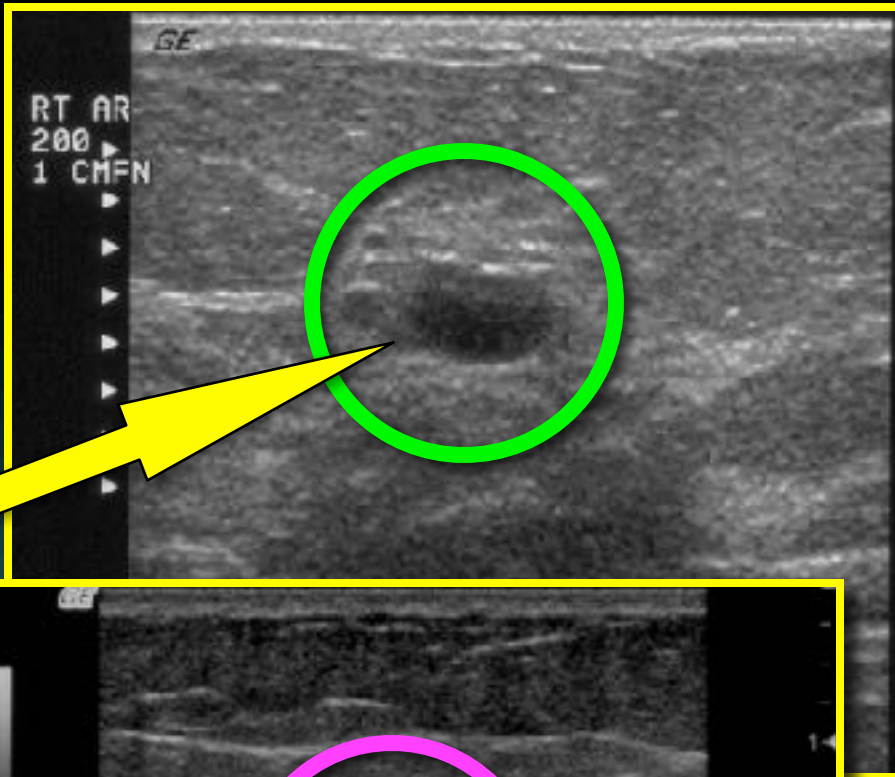
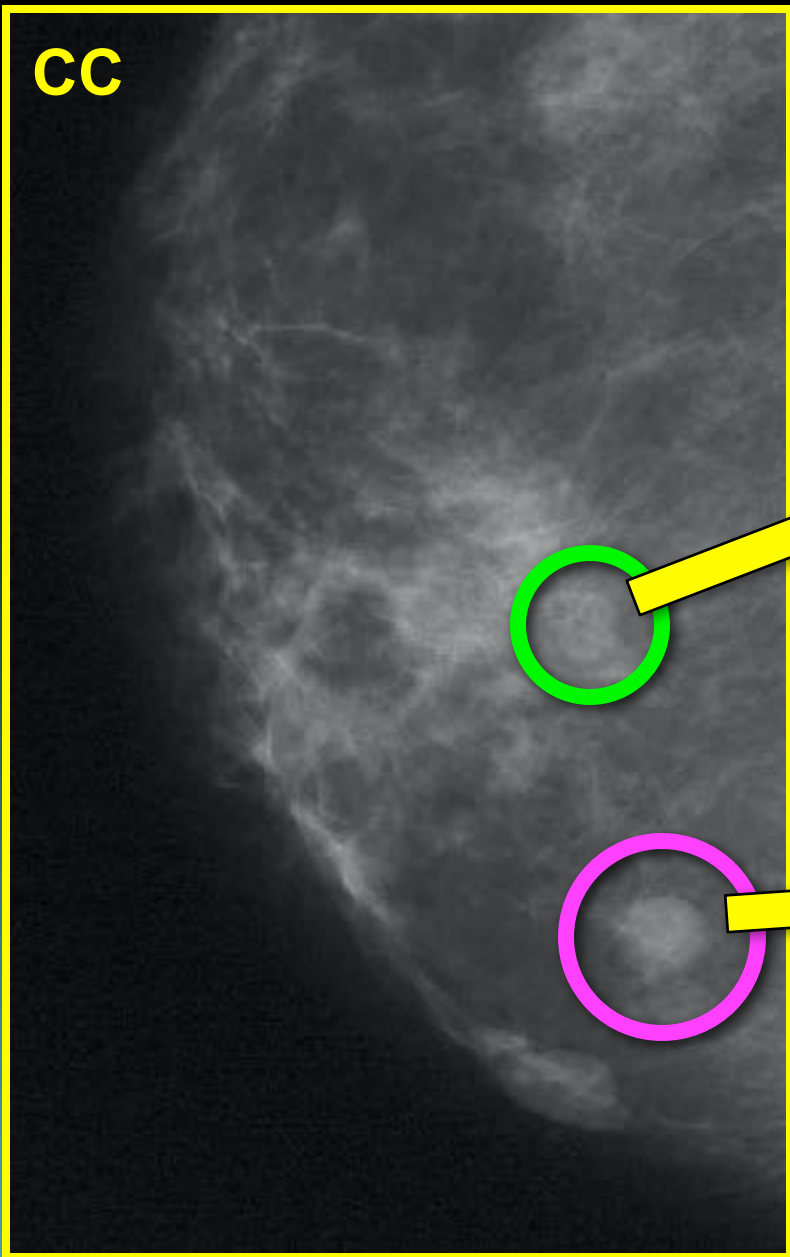
CC

MLO

2005



CC



MRI MIP IMAGE:



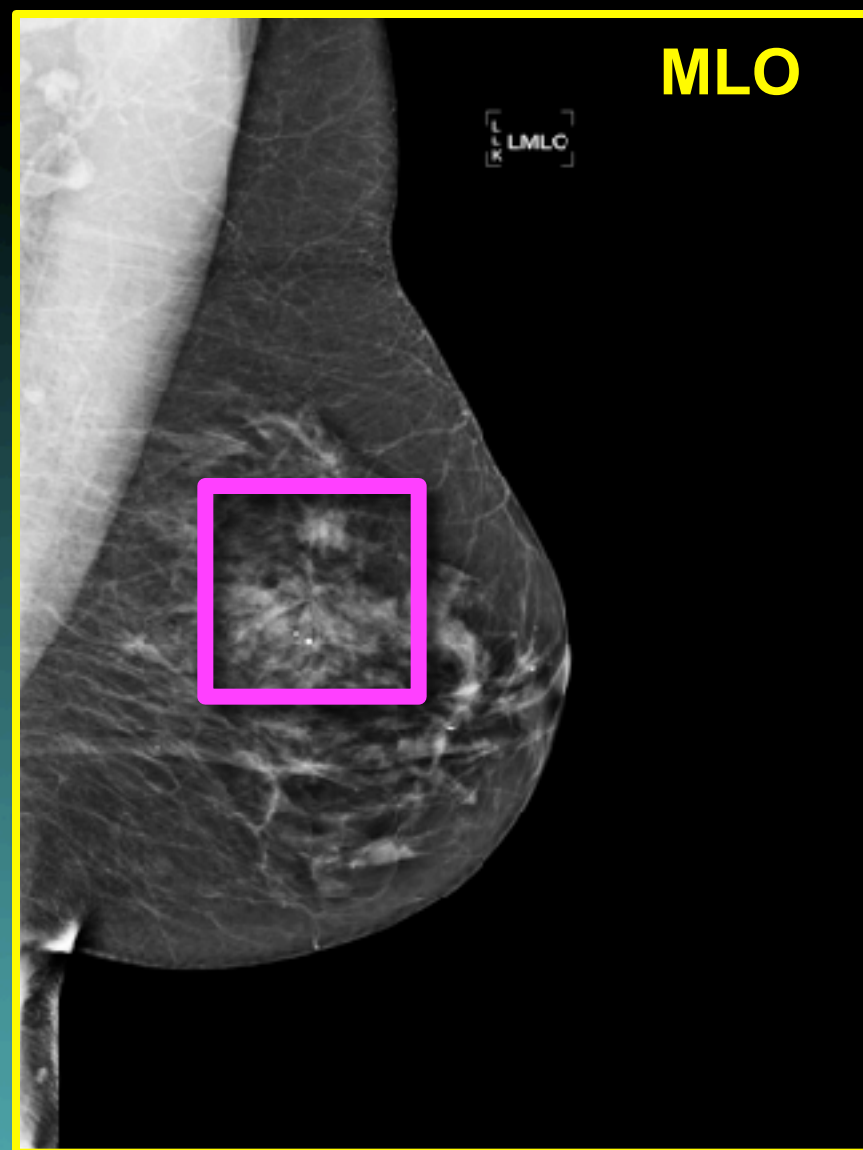
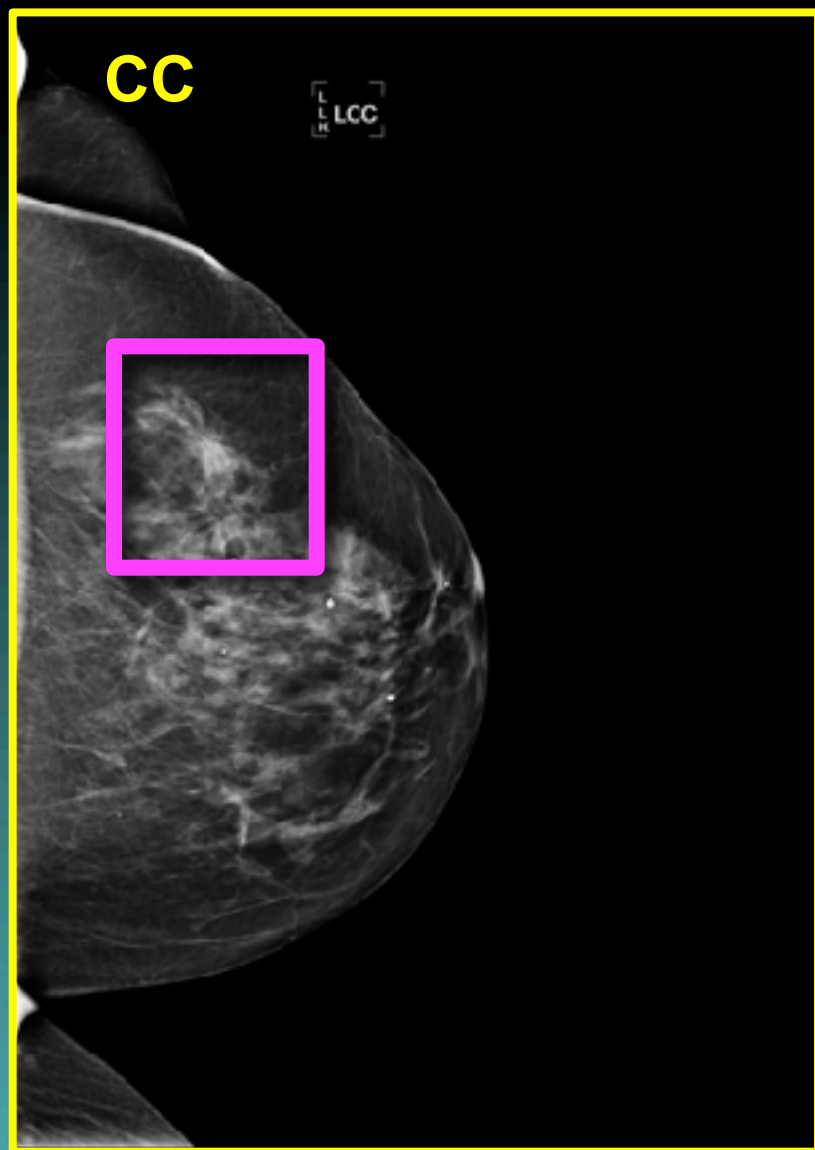
INVASIVE DUCTAL CARCINOMA, HIGH GRADE



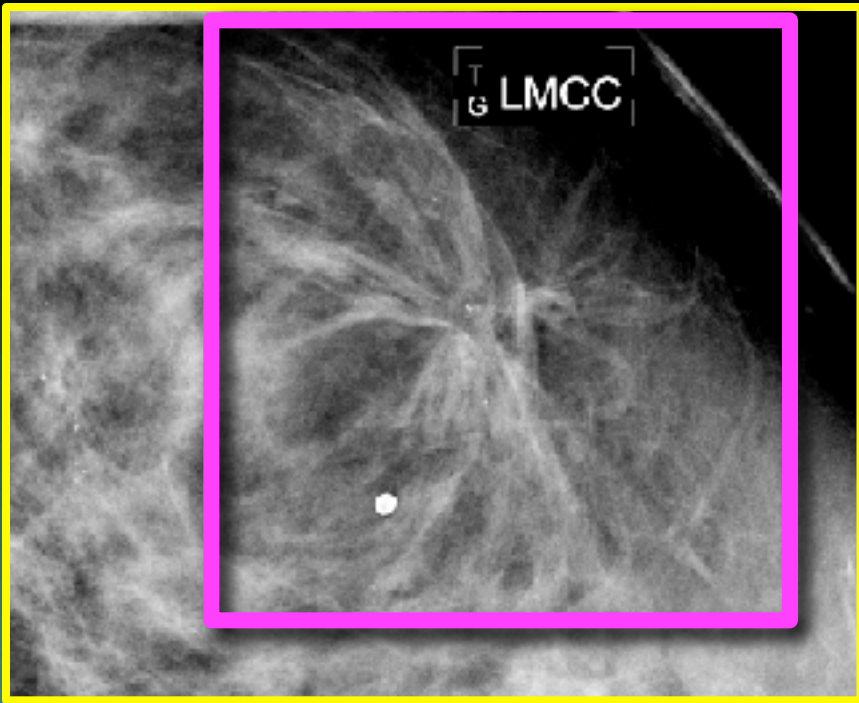
FINDING EARLY BREAST CANCER:

THE GROUND RULES (cont.)

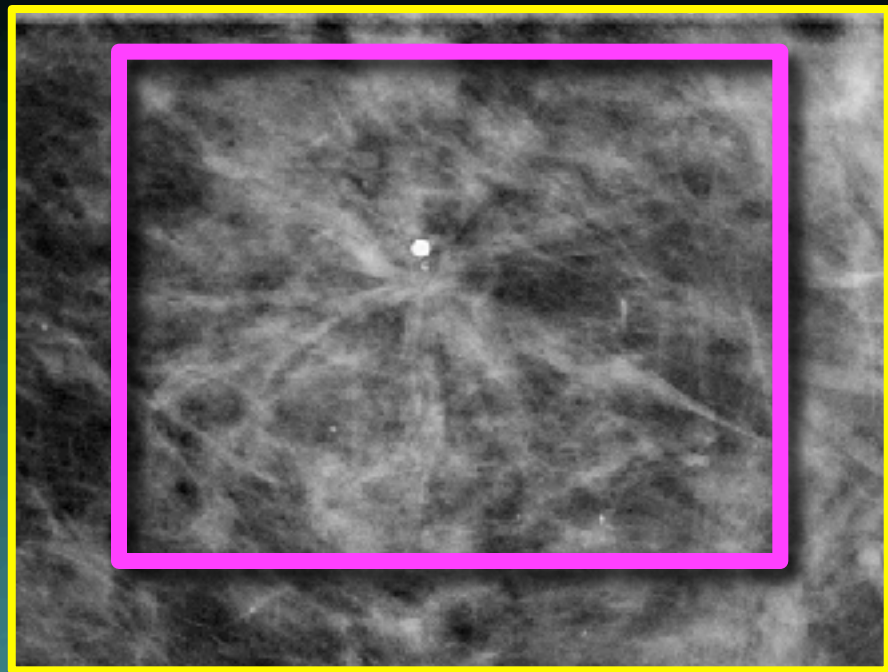
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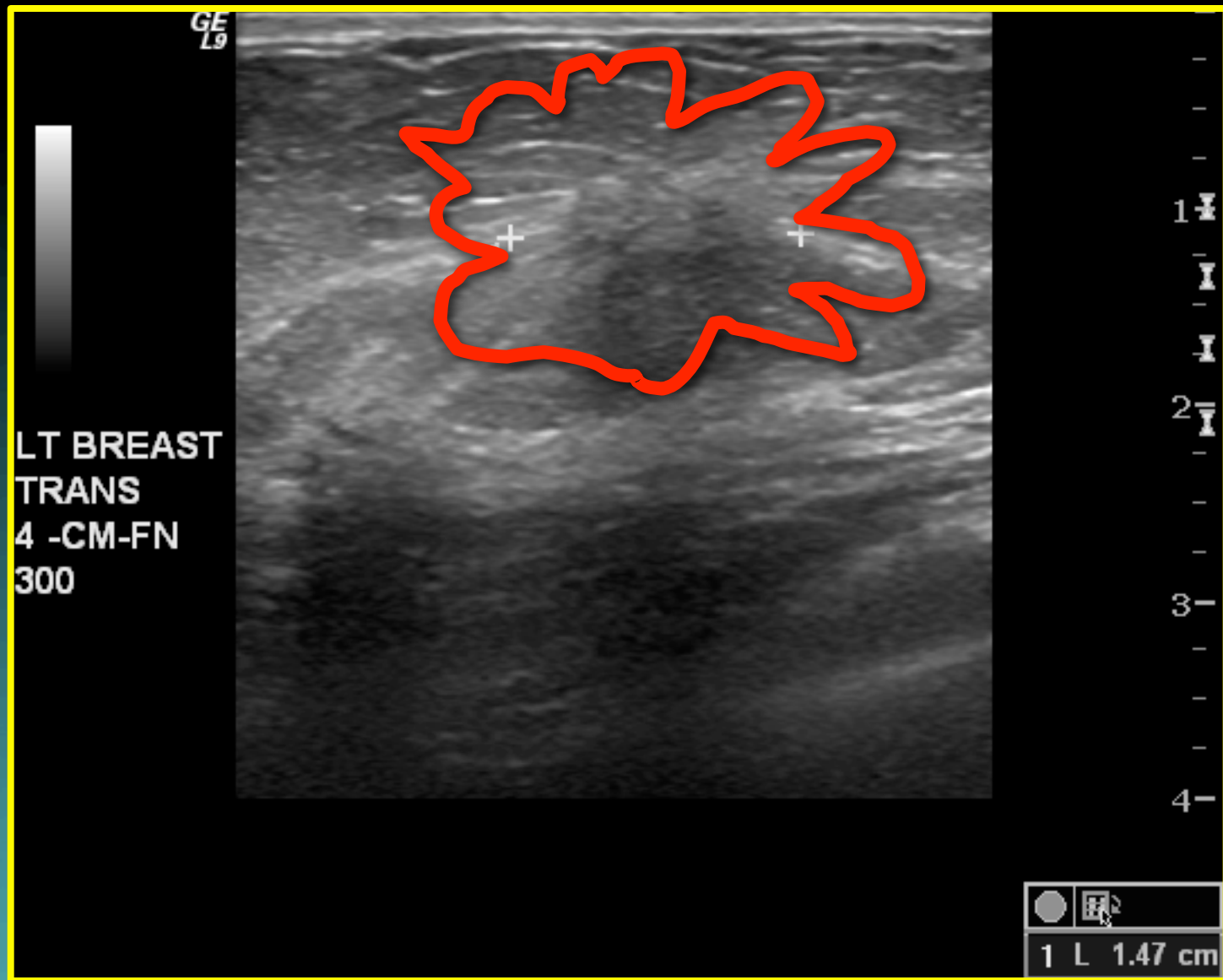


CC view, spot mag



MLO view, spot mag

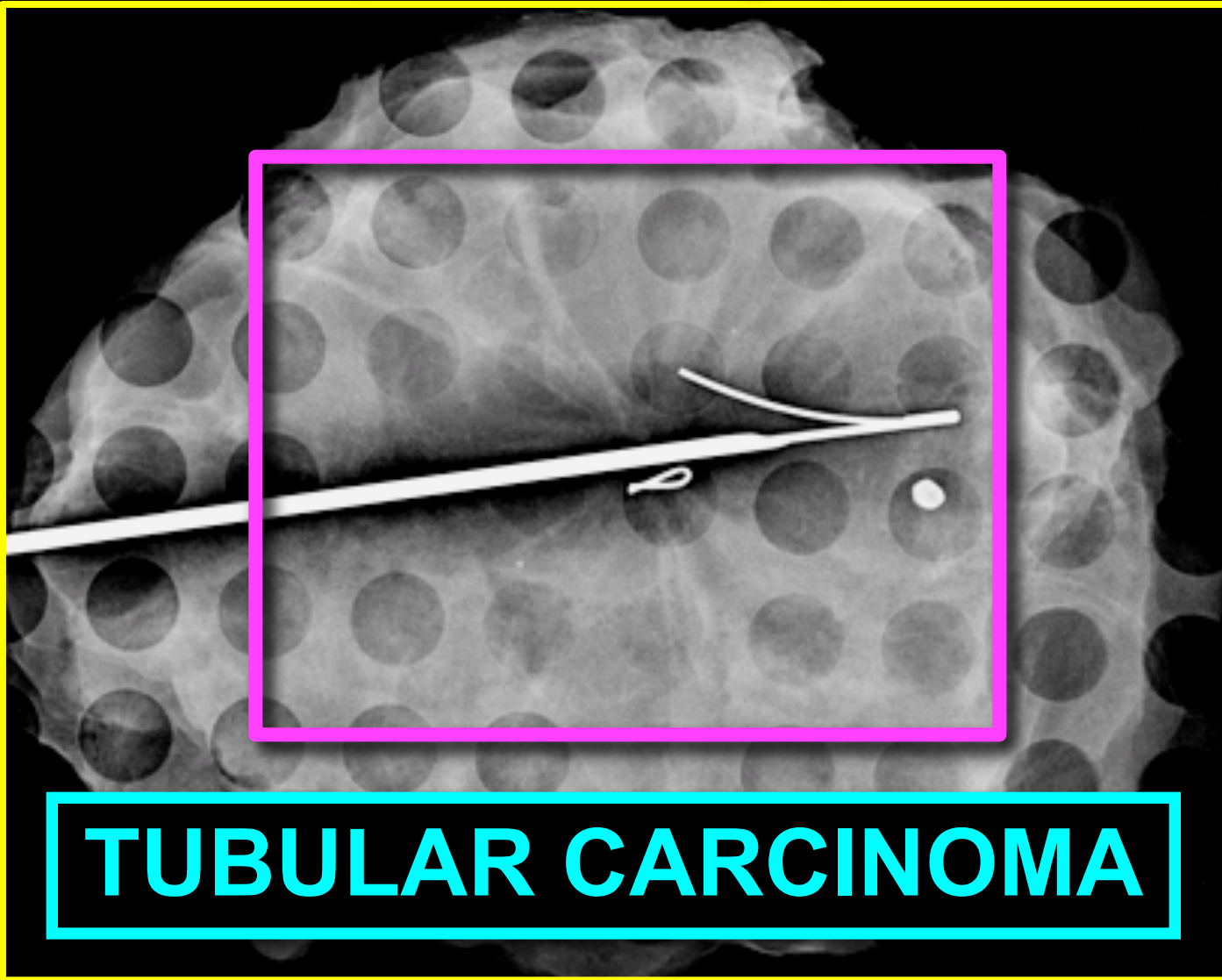




Left breast ultrasound, transverse image



Specimen radiograph

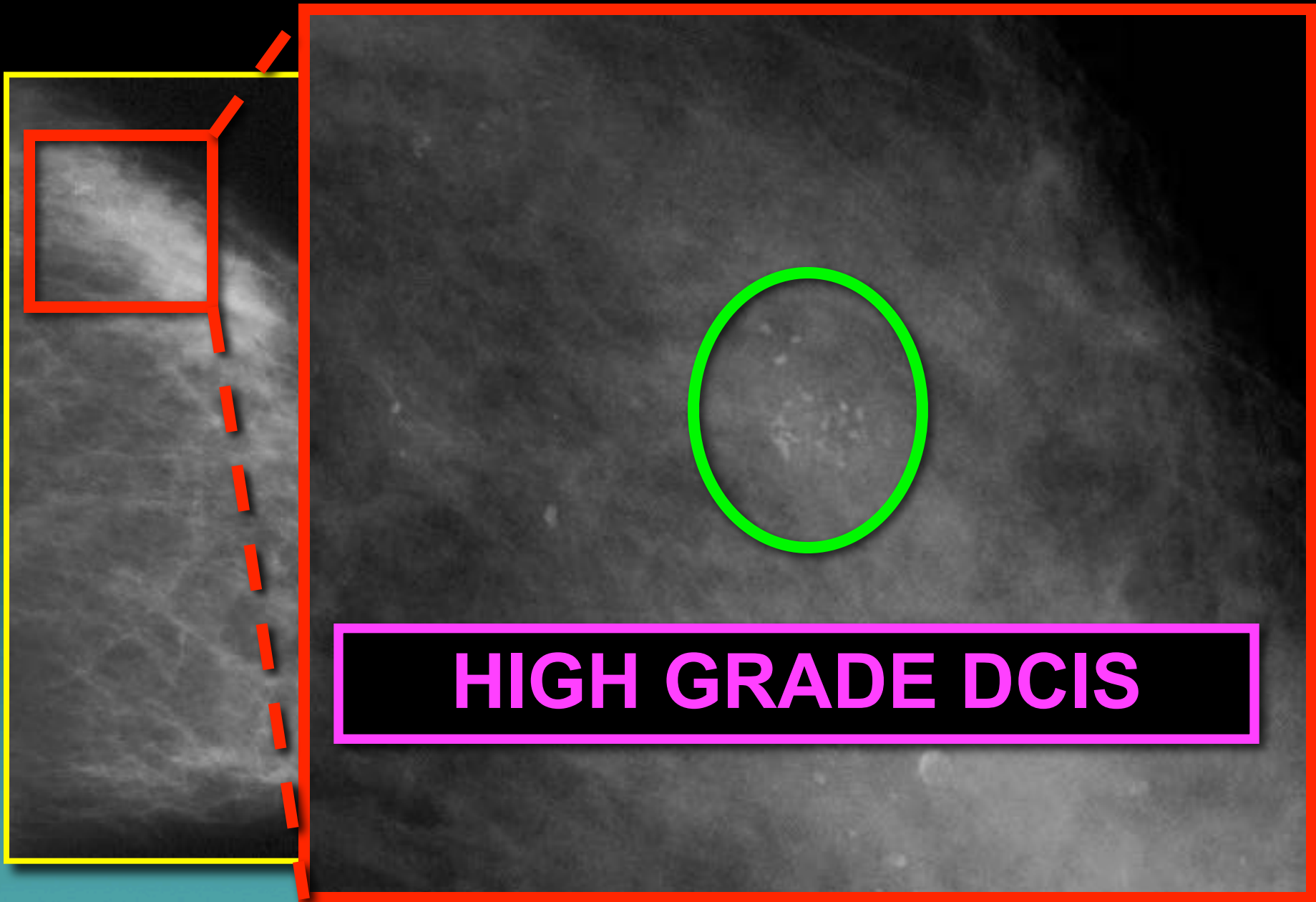




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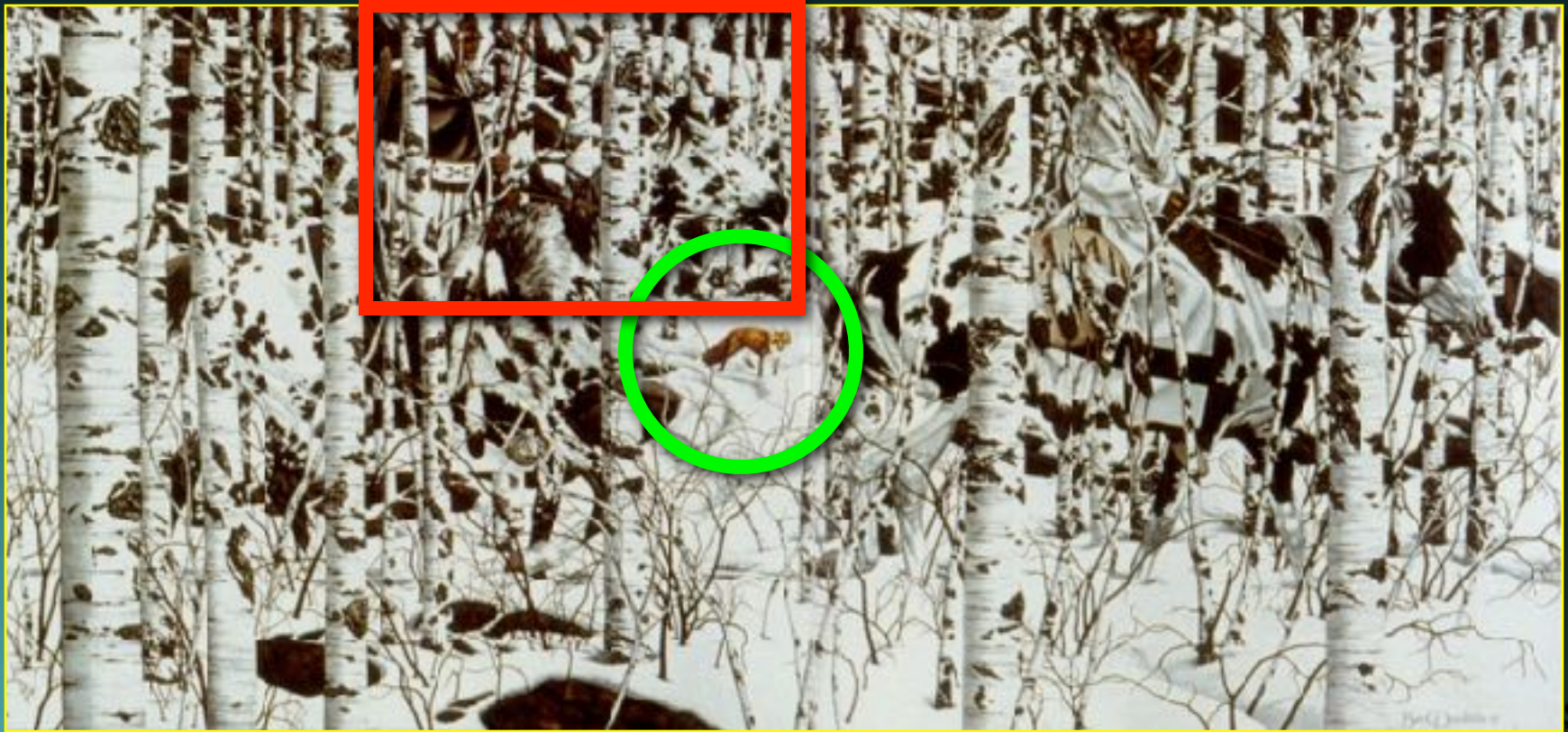


HIGH GRADE DCIS

**MOST EARLY BREAST CANCERS
ARE SUBTLE: ONCE YOU SEE THE
OBVIOUS, KEEP LOOKING!**



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ARE SUBTLE: ONCE YOU SEE THE
OBVIOUS, KEEP LOOKING!**







FINDING EARLY BREAST CANCER:

THE GROUND RULES (cont.)

- **Know where breast cancer lives: The Forbidden Zones**
 - ➔ **Milky Way**
 - ➔ **Lower Milky Way**
 - ➔ **No Man's Land**
 - ➔ **Medial aspect**
 - ➔ **Junctional region**
 - ➔ **Retroareolar region**
 - ➔ **Along fat-glandular borders**



WHERE BREAST CANCER LIVES: THE FORBIDDEN ZONES

- **The Milky Way** (upper pectoralis region on MLO)
- **Lower Milky Way** (lower posterior region on MLO)
- **Immediate retroareolar region**

MLO VIEW

[g RMLO]

MILKY WAY

RETROAREOLAR
REGION

LOWER
MILKY WAY





WHERE BREAST CANCER LIVES: THE FORBIDDEN ZONES

- **No Man's Land** (retroglandular region on cc view)
- **Medial Aspect** on cc view
- **The Junctional Zone** (post/medial on cc view)
- **All fat-glandular borders**

CC VIEW

T
G RCC

FAT-GLANDULAR
BORDERS

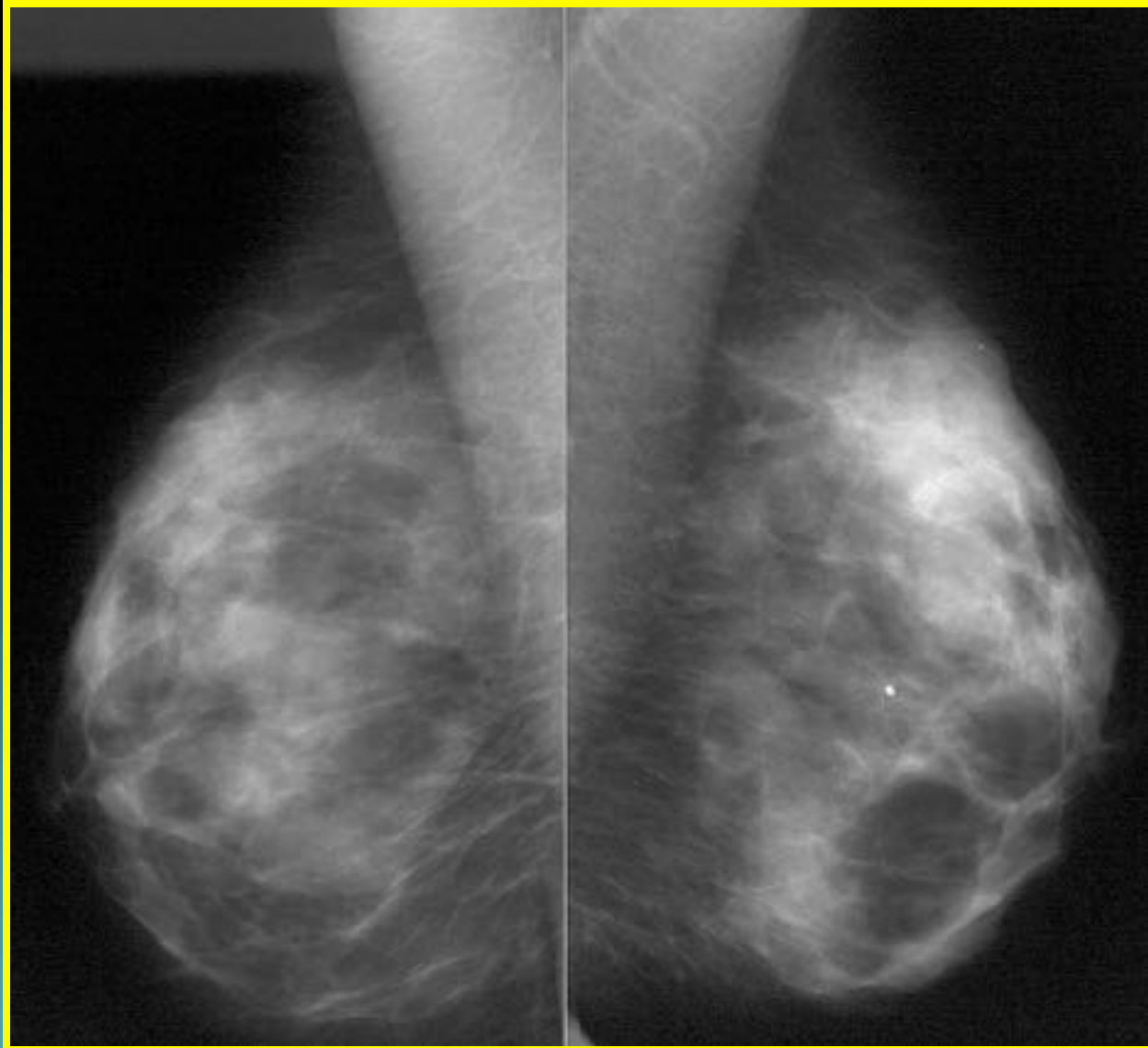
NO MAN'S
LAND

JUNCTIONAL ZONE

MEDIAL ASPECT

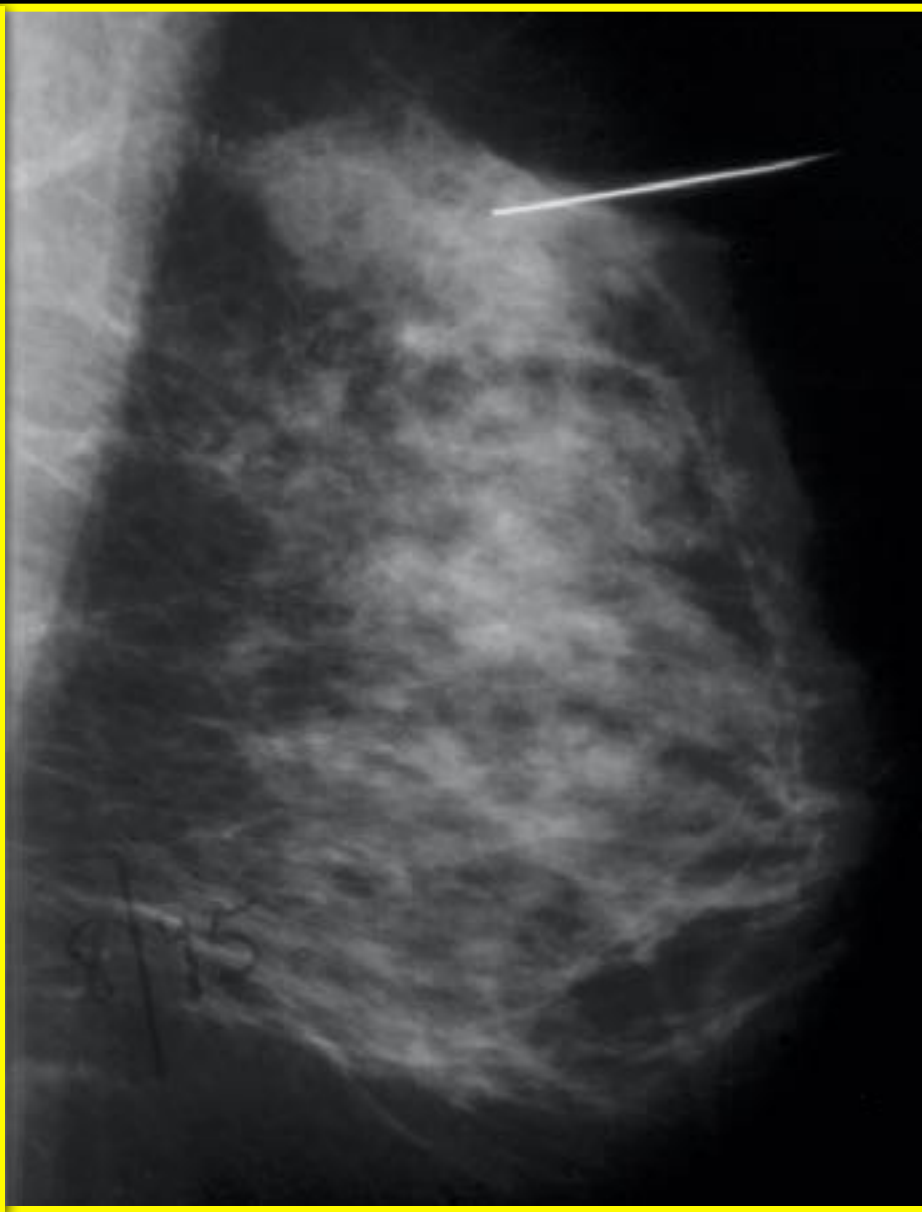
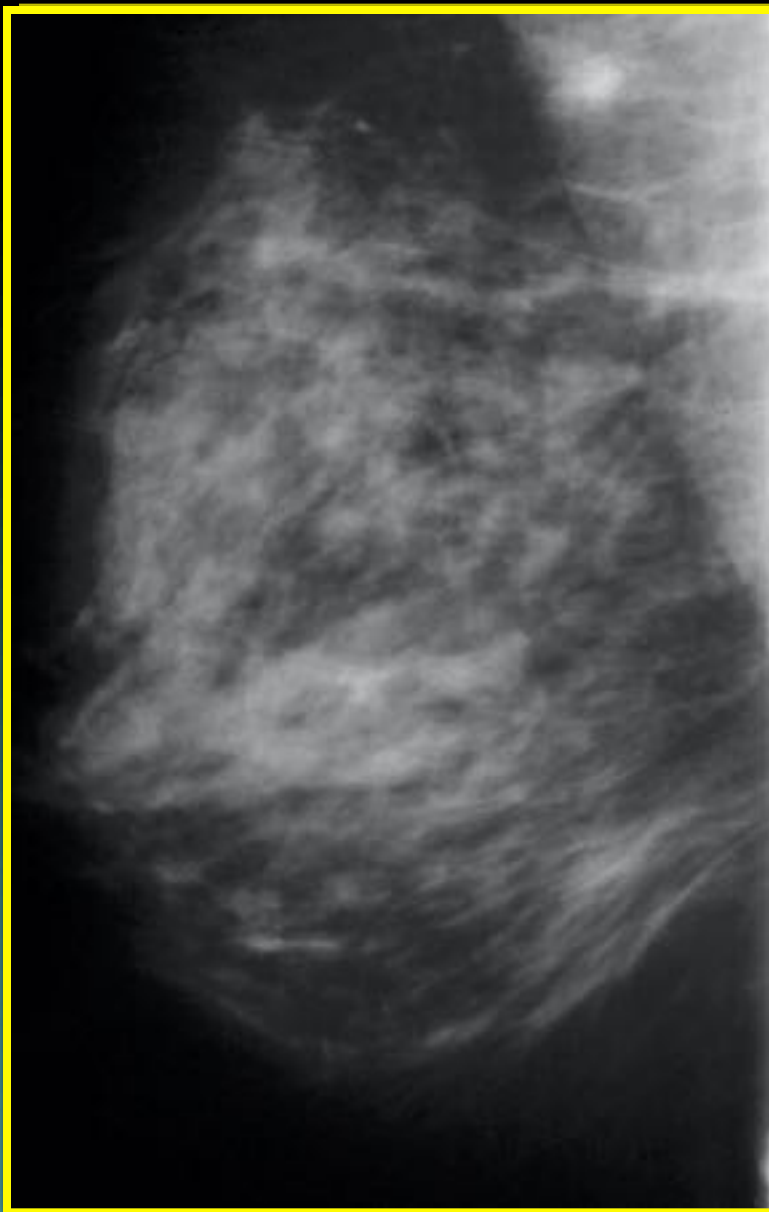


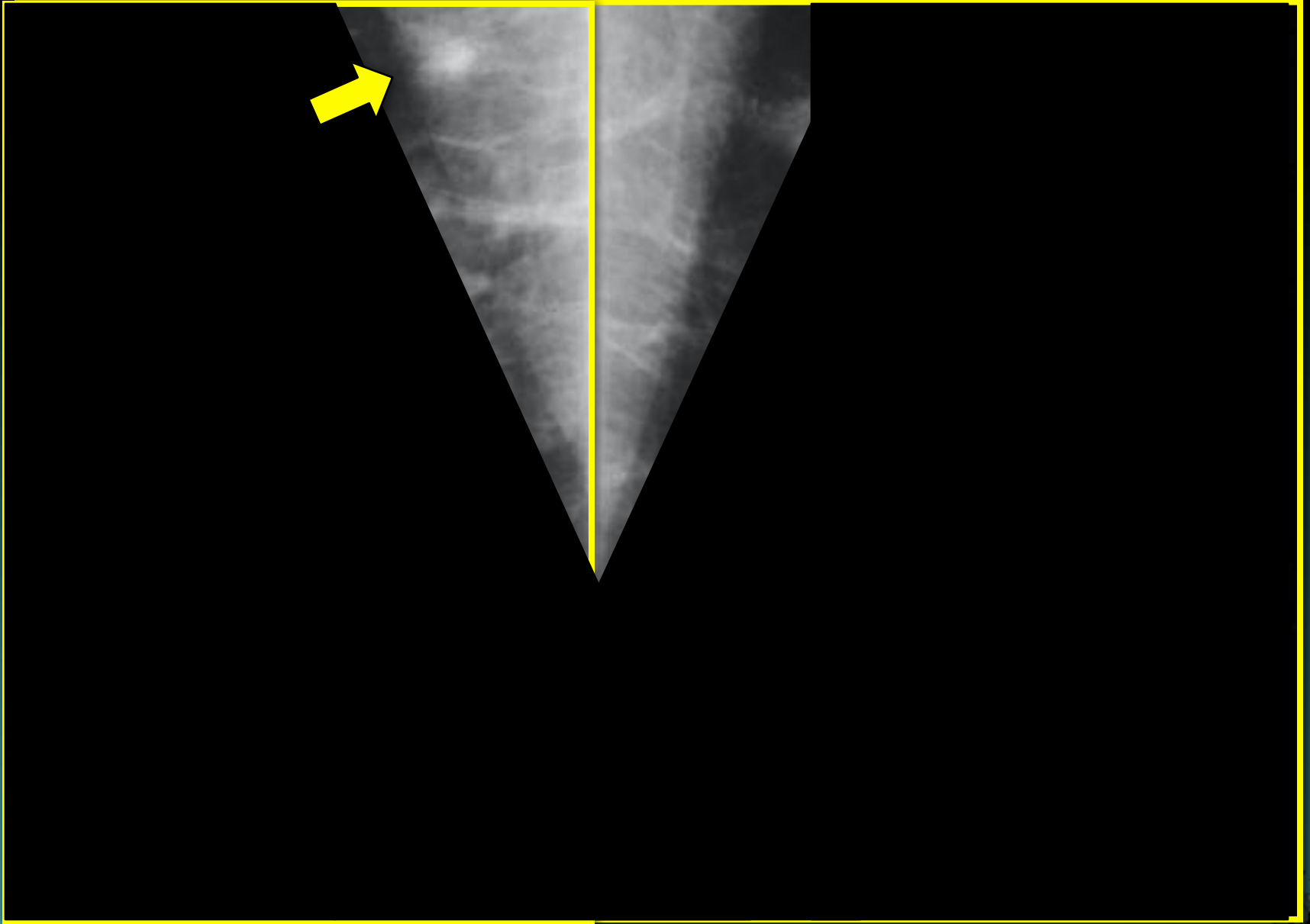
Masking Technique: “Forbidden Zones”



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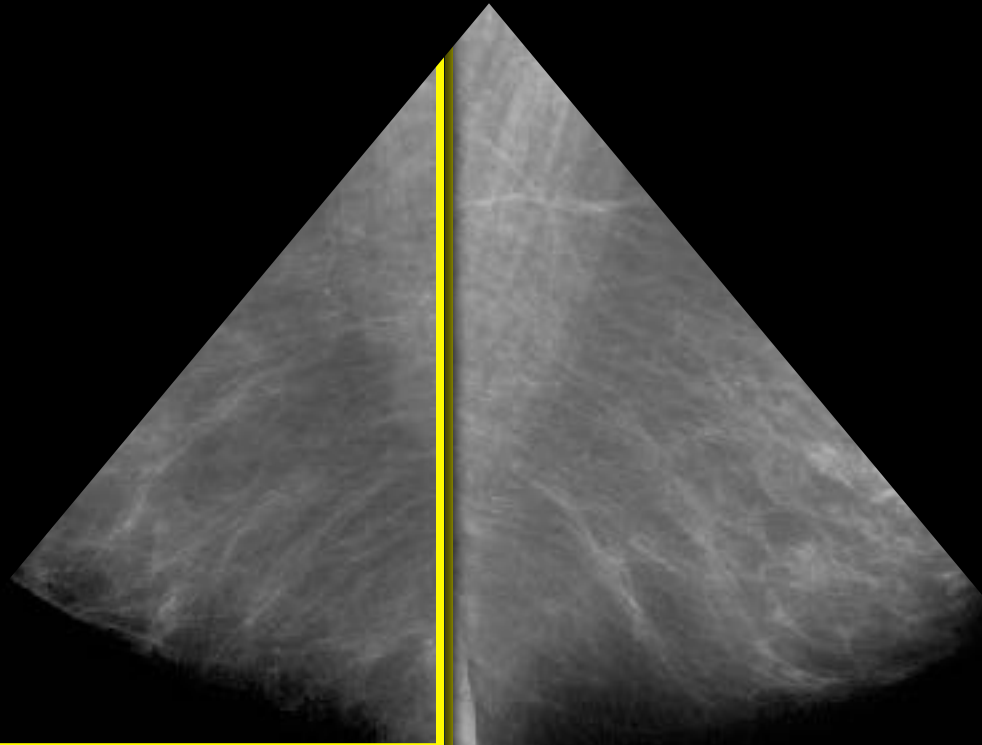


HIGH GRADE DCIS

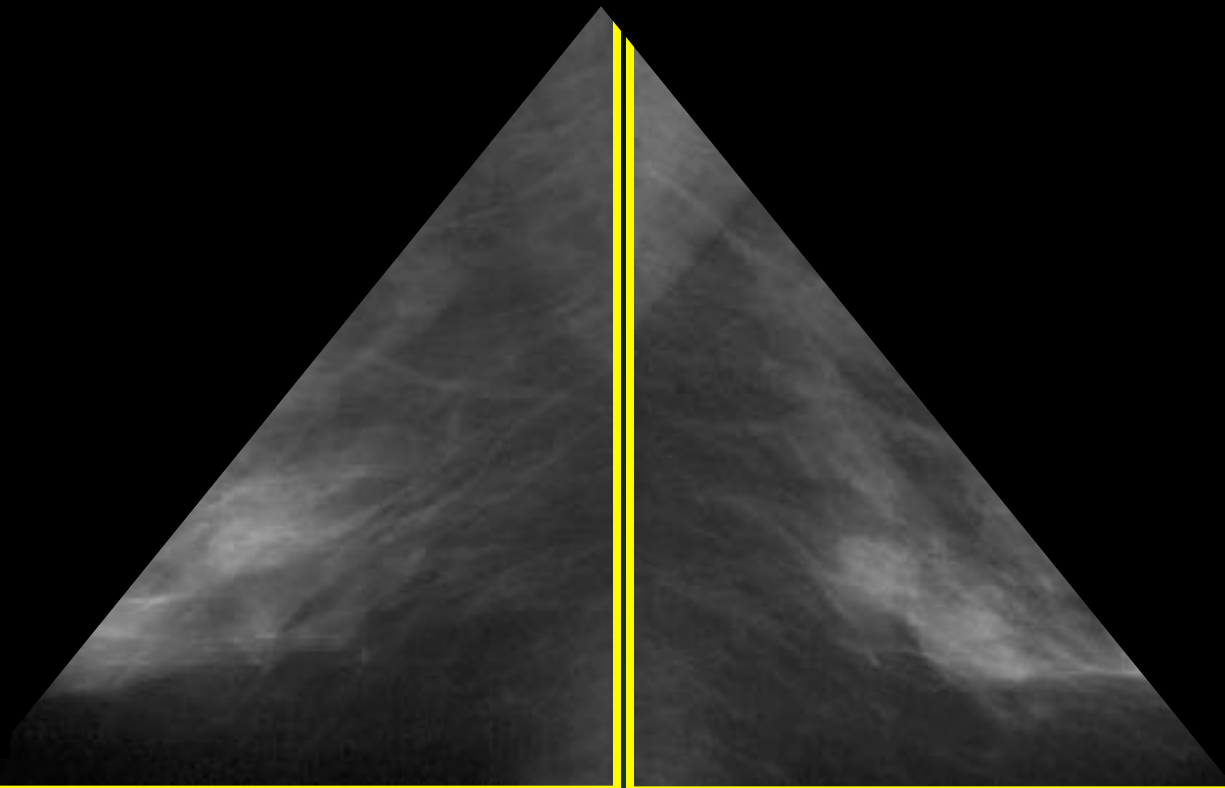


Masking Technique: “Forbidden Zones”

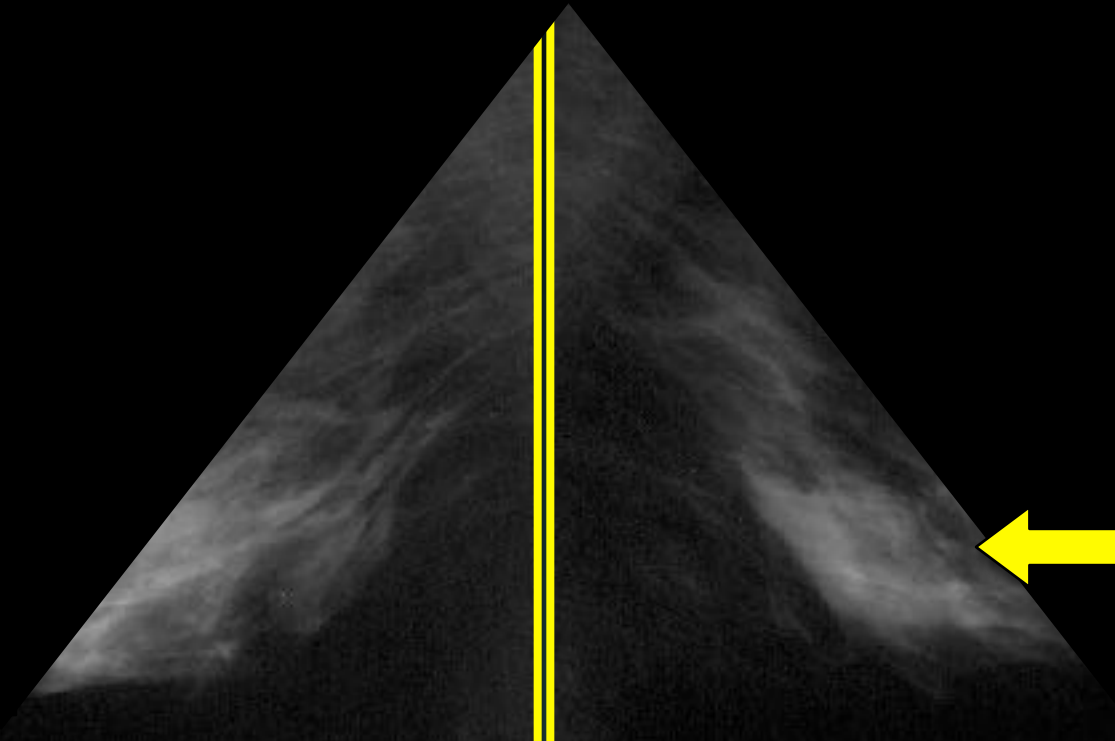
**“LOWER MILKY
WAY”**



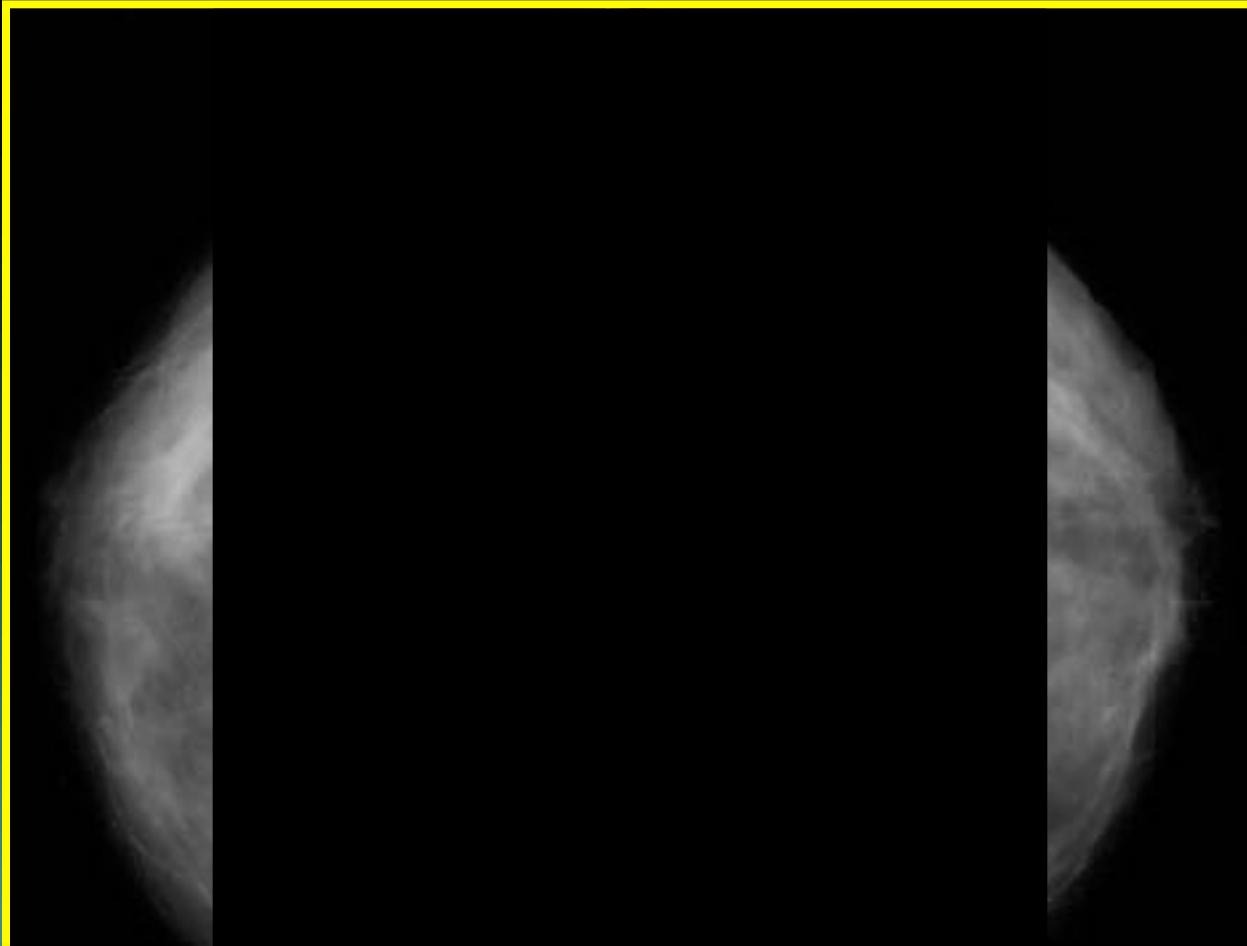
Baseline Screening



The next year:

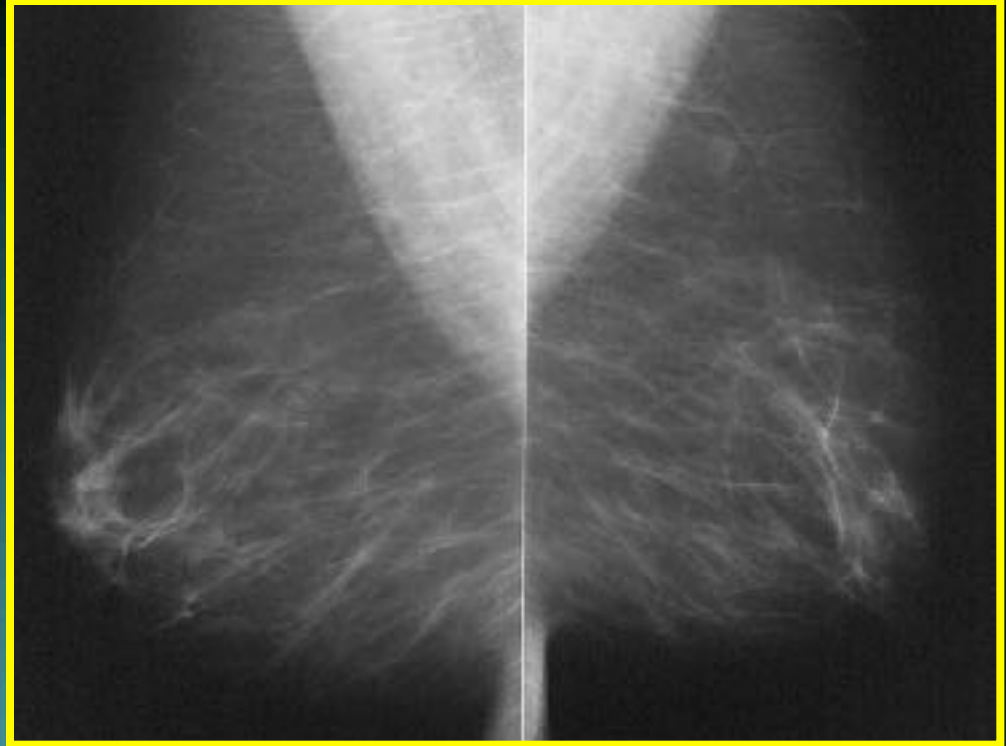
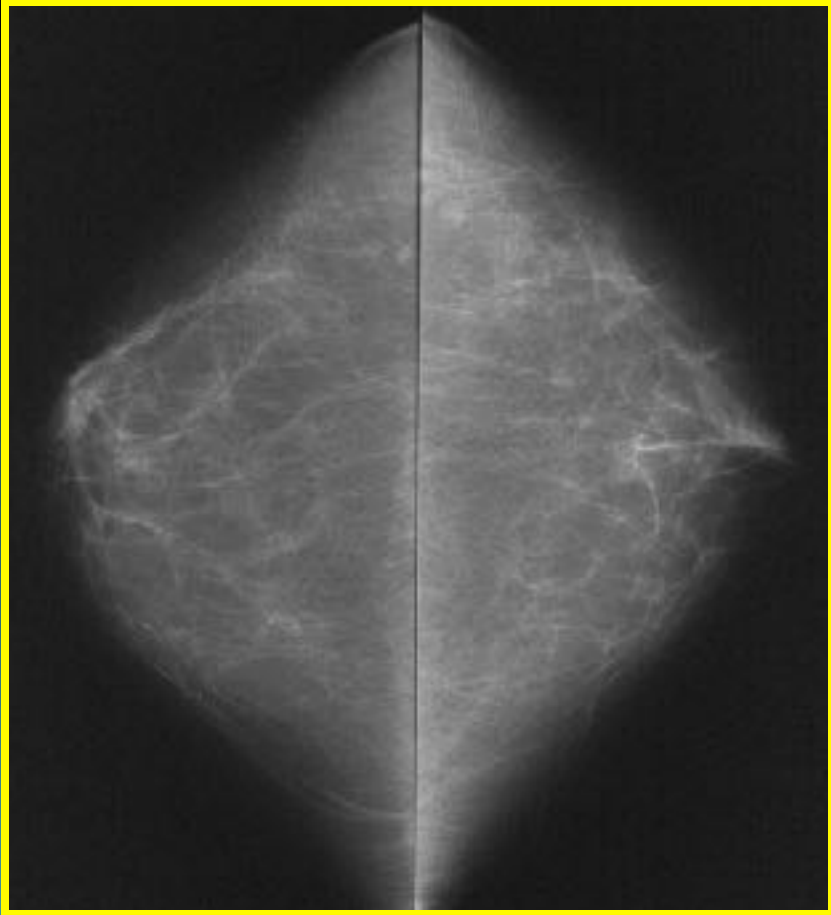


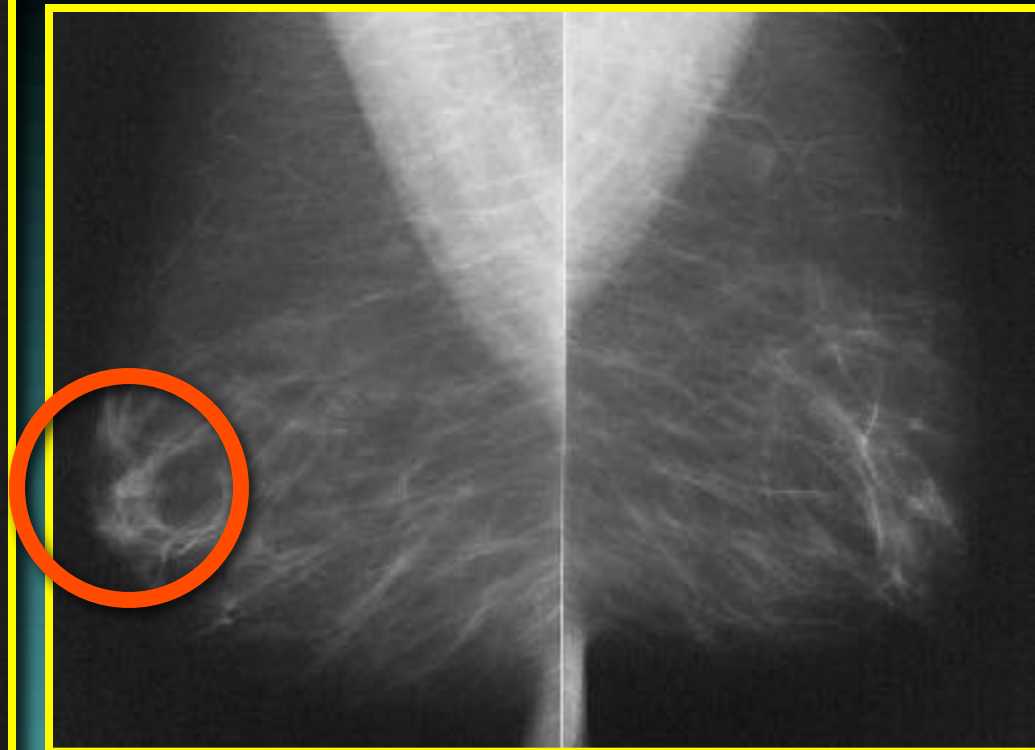
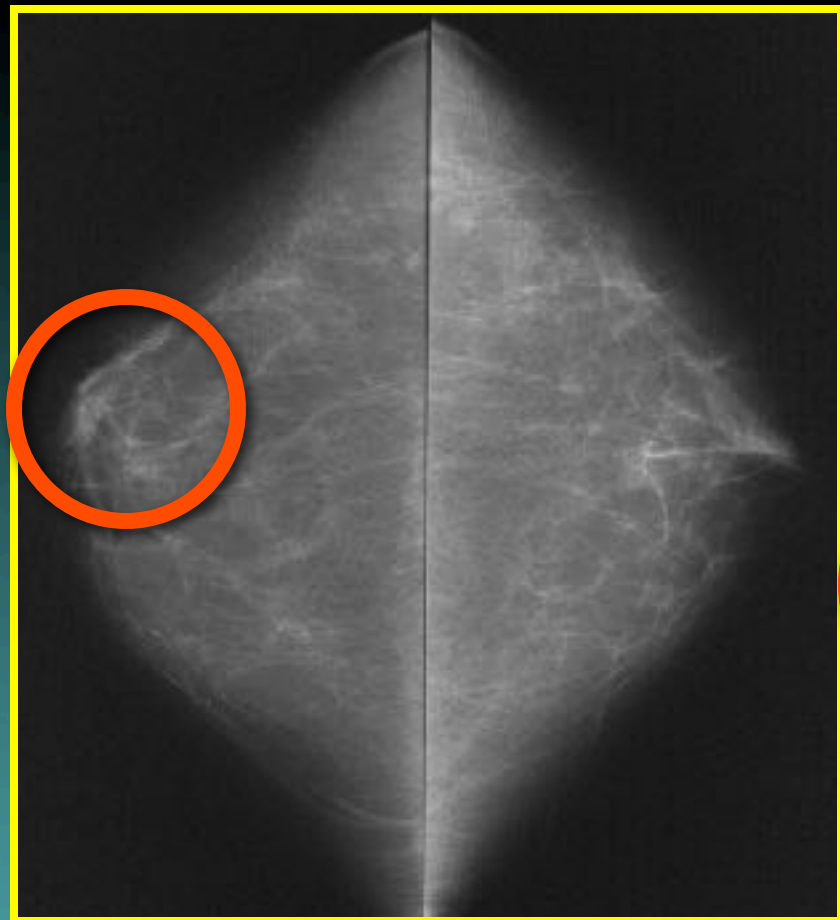
Masking Technique: “Forbidden Zones”

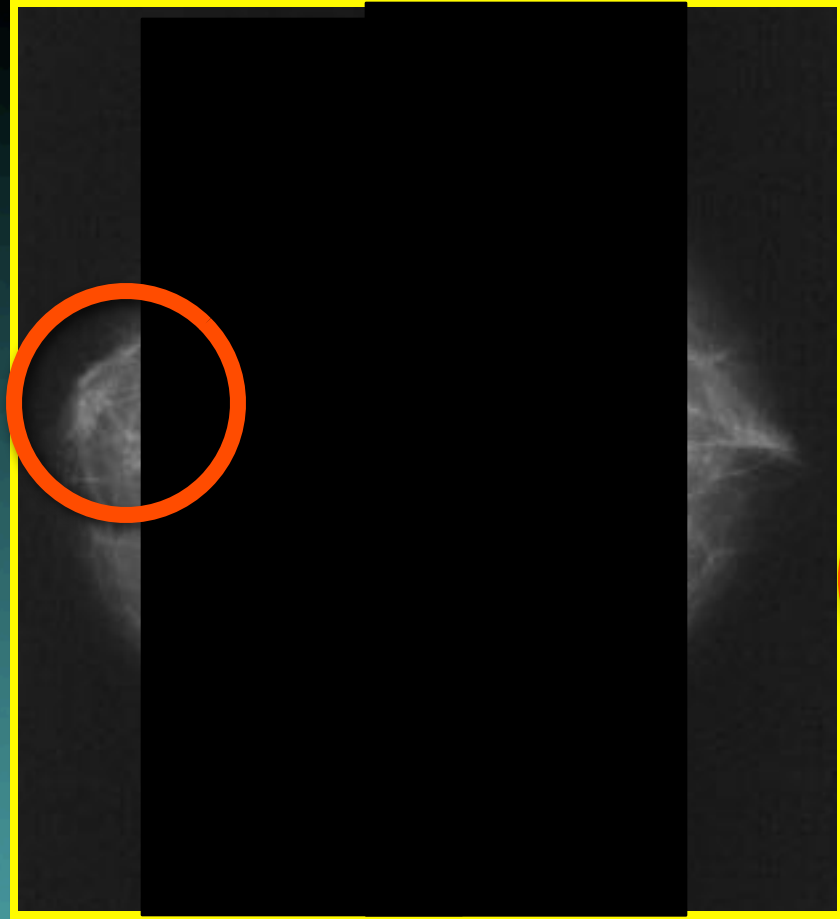


RETROAREOLAR AREA

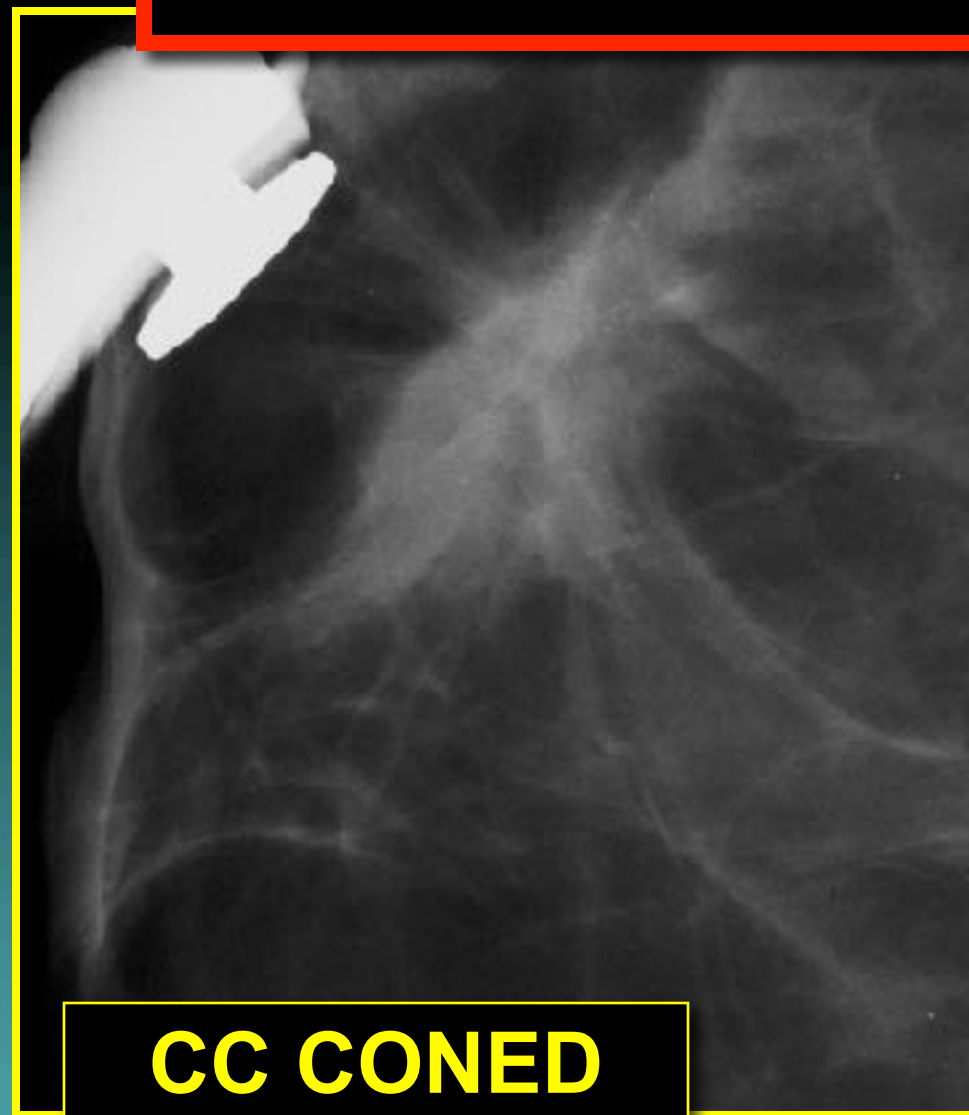




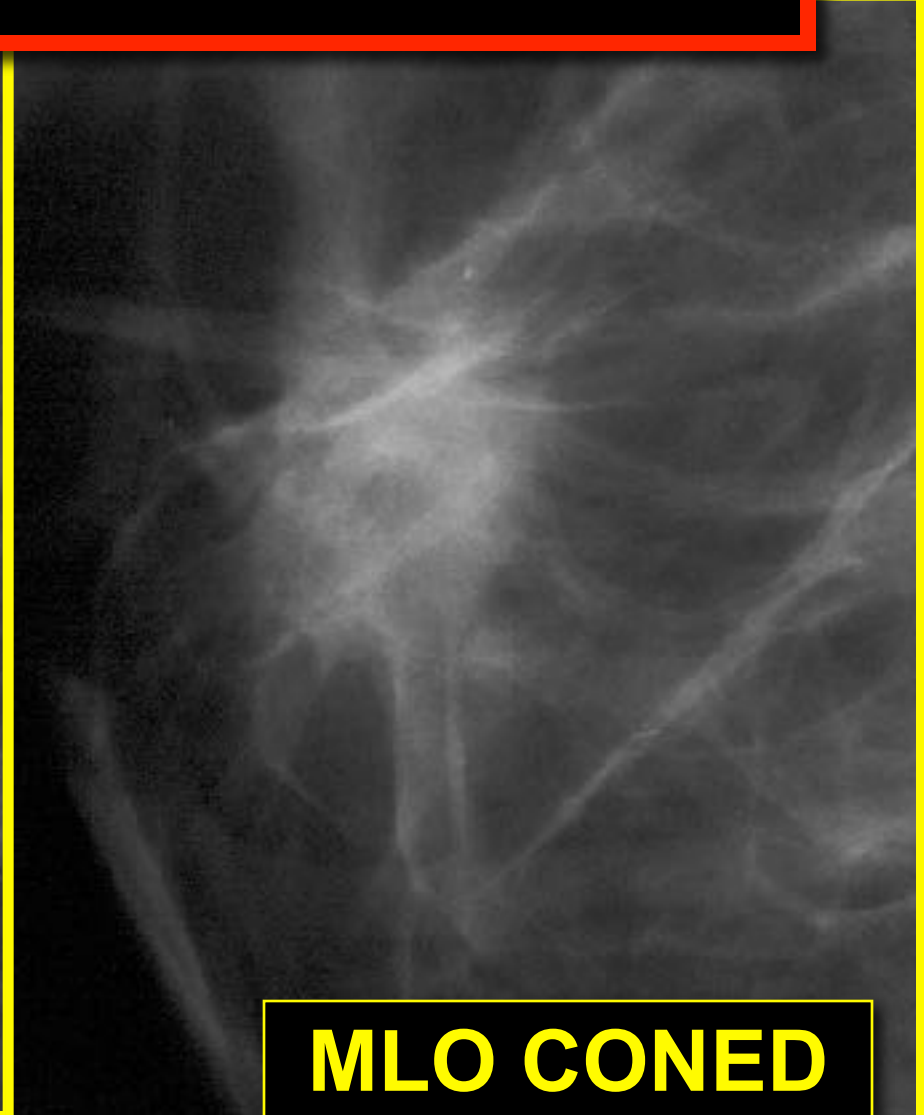




INVASIVE DUCTAL CARCINOMA



**CC CONED
MAG.**

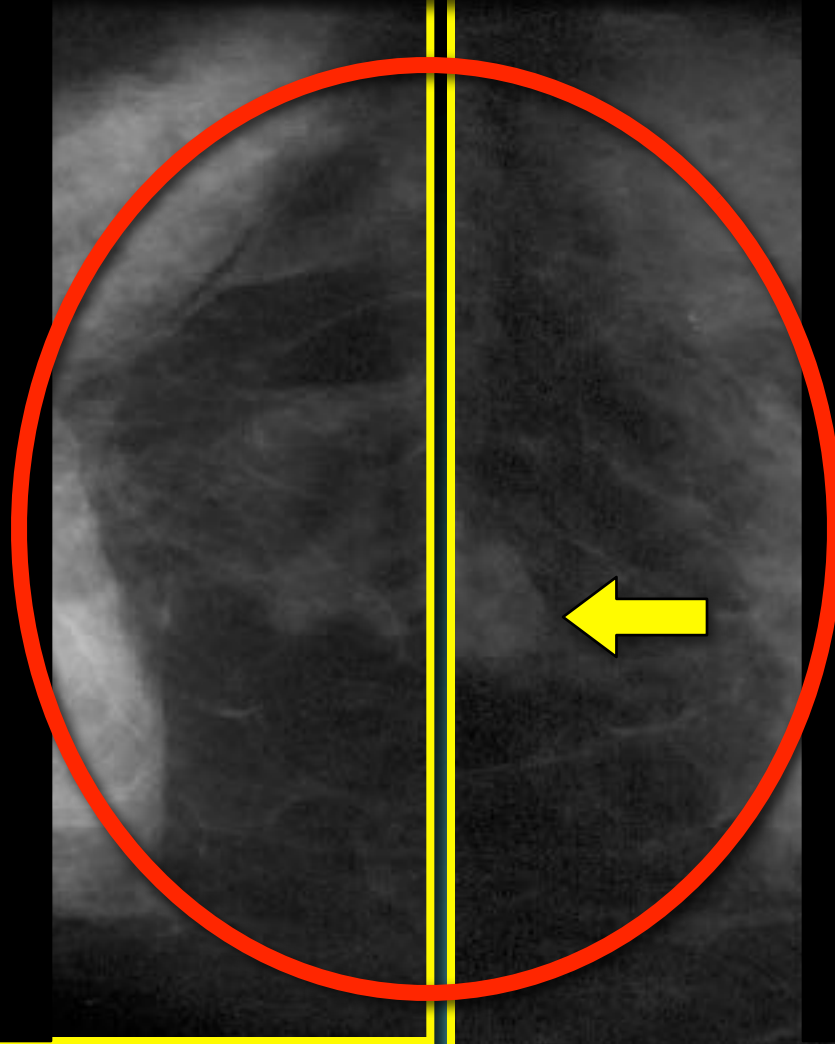


**MLO CONED
MAG.**

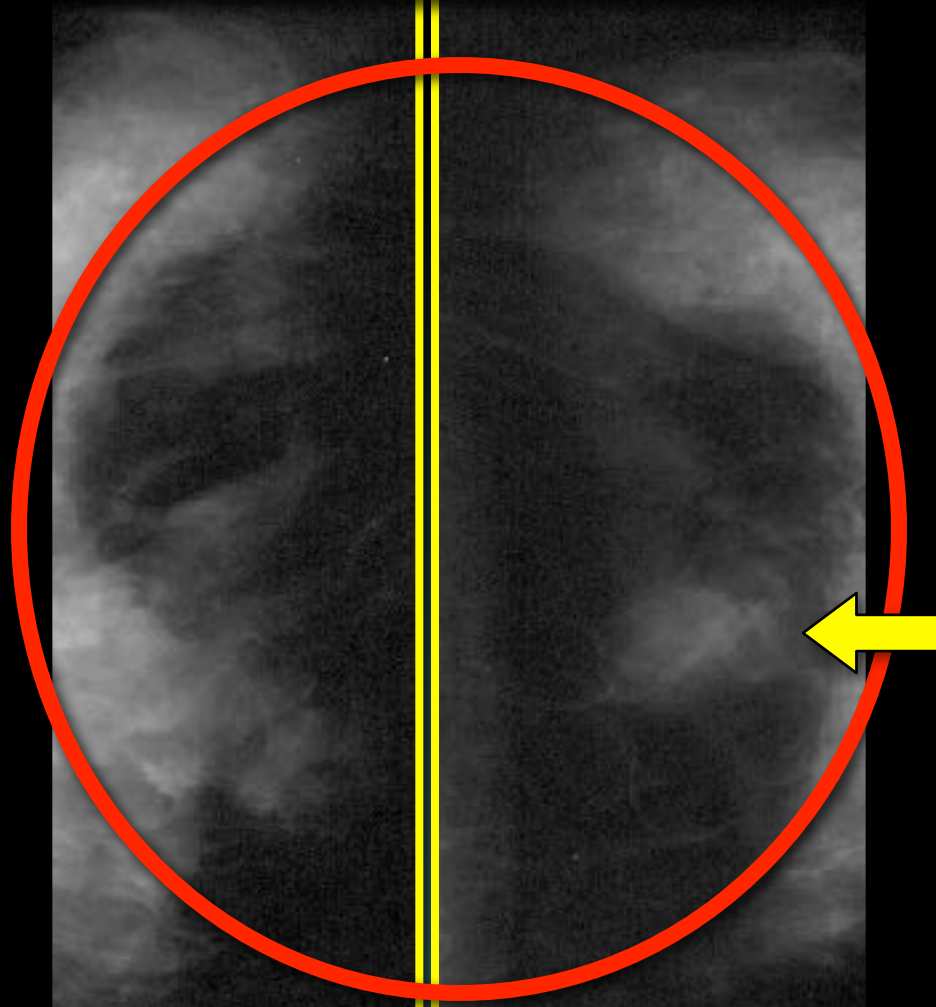
Masking Technique: “Forbidden Zones”



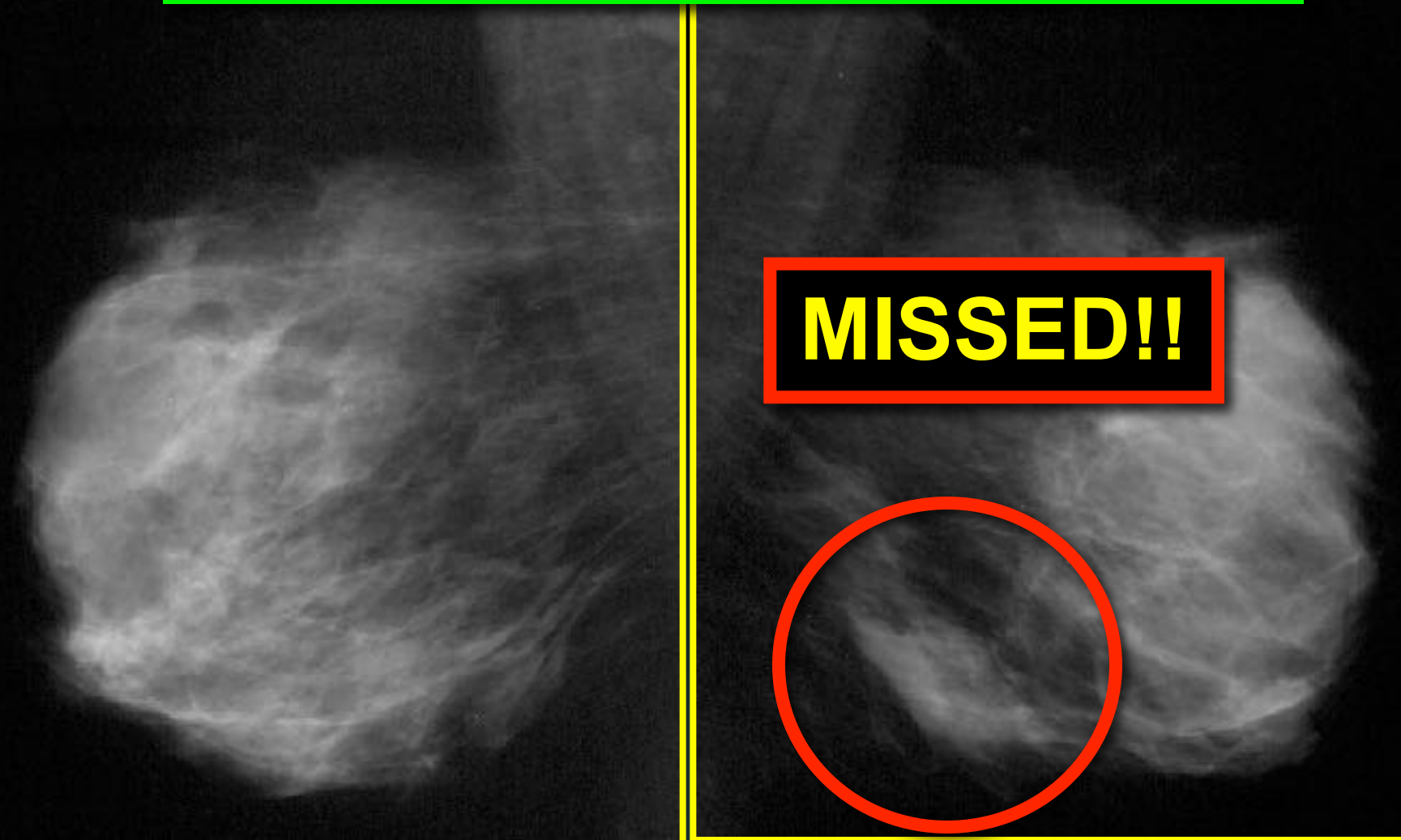
First screen:



The Next Year:



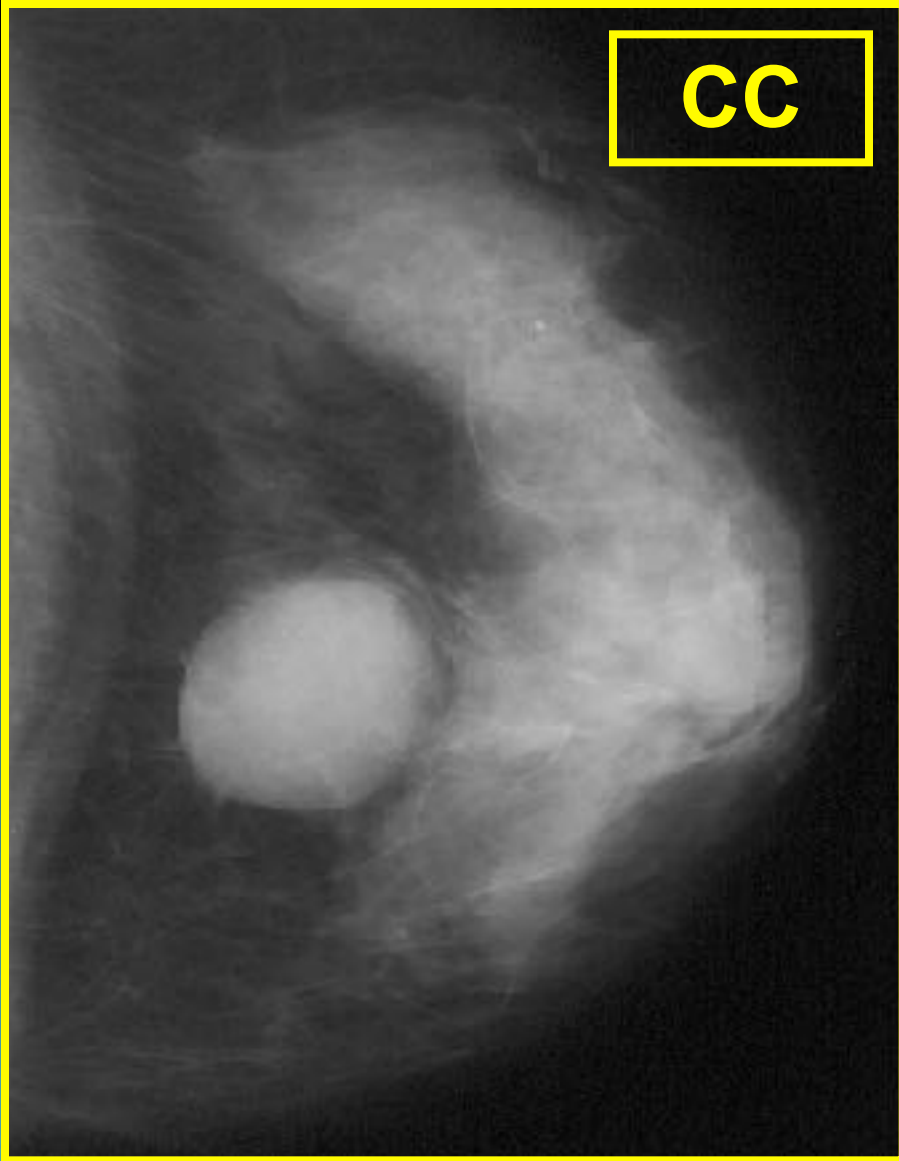
MLO view: Look familiar?



MISSED!!

1 more year:

CC



MLO

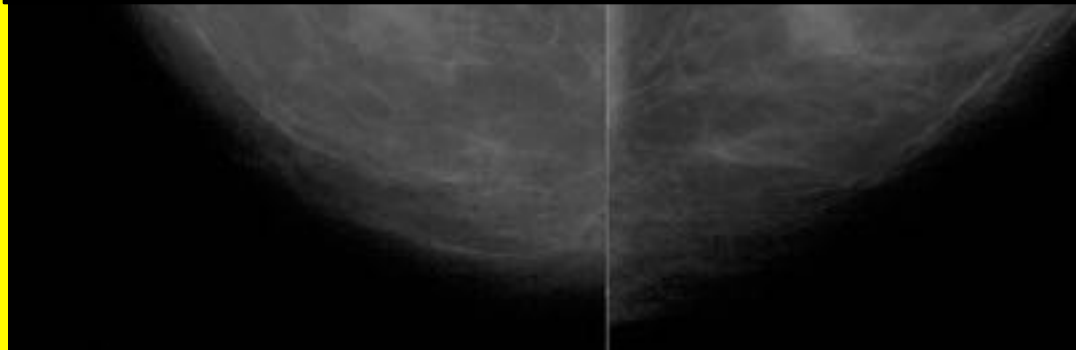


PAPILLARY CARCINOMA

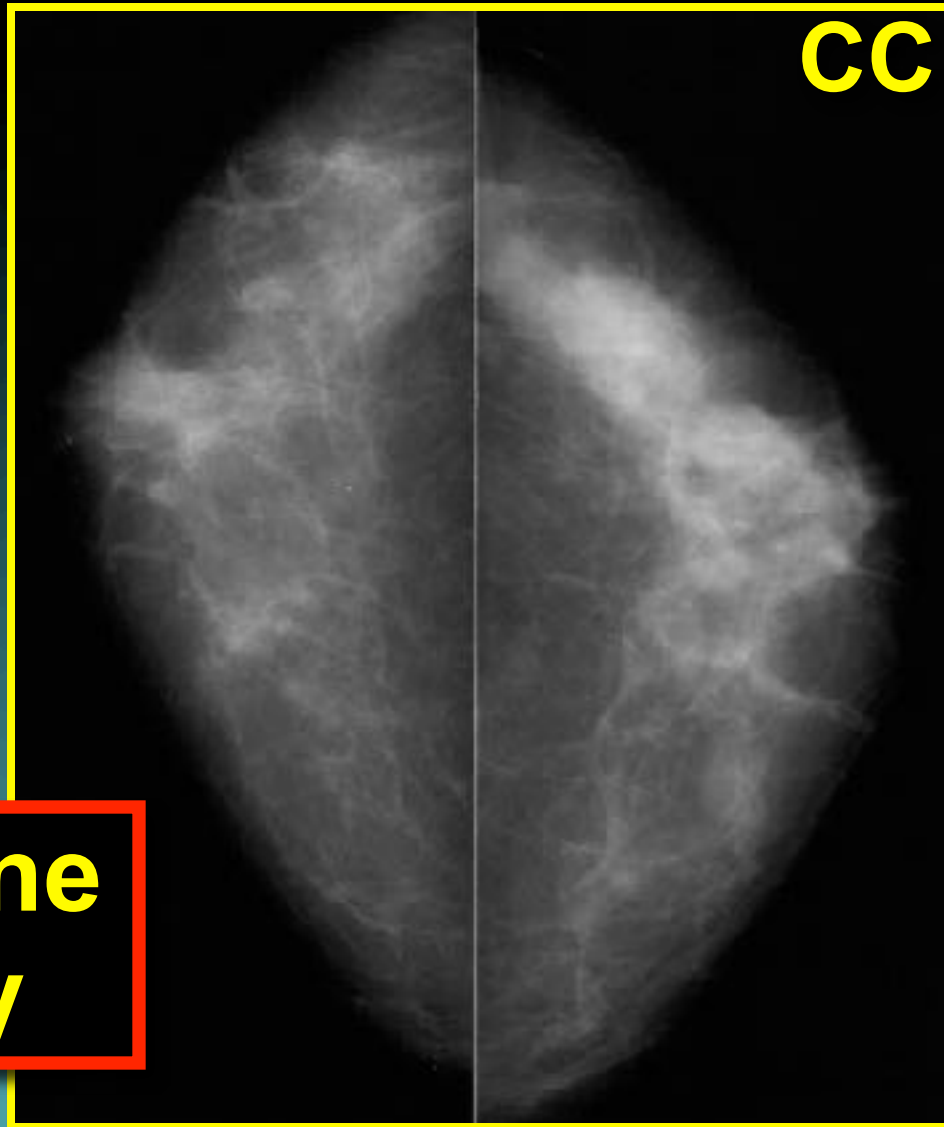


Masking Technique: “Forbidden Zones”

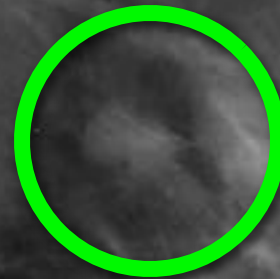
MEDIAL ASPECT



**Baseline
study**



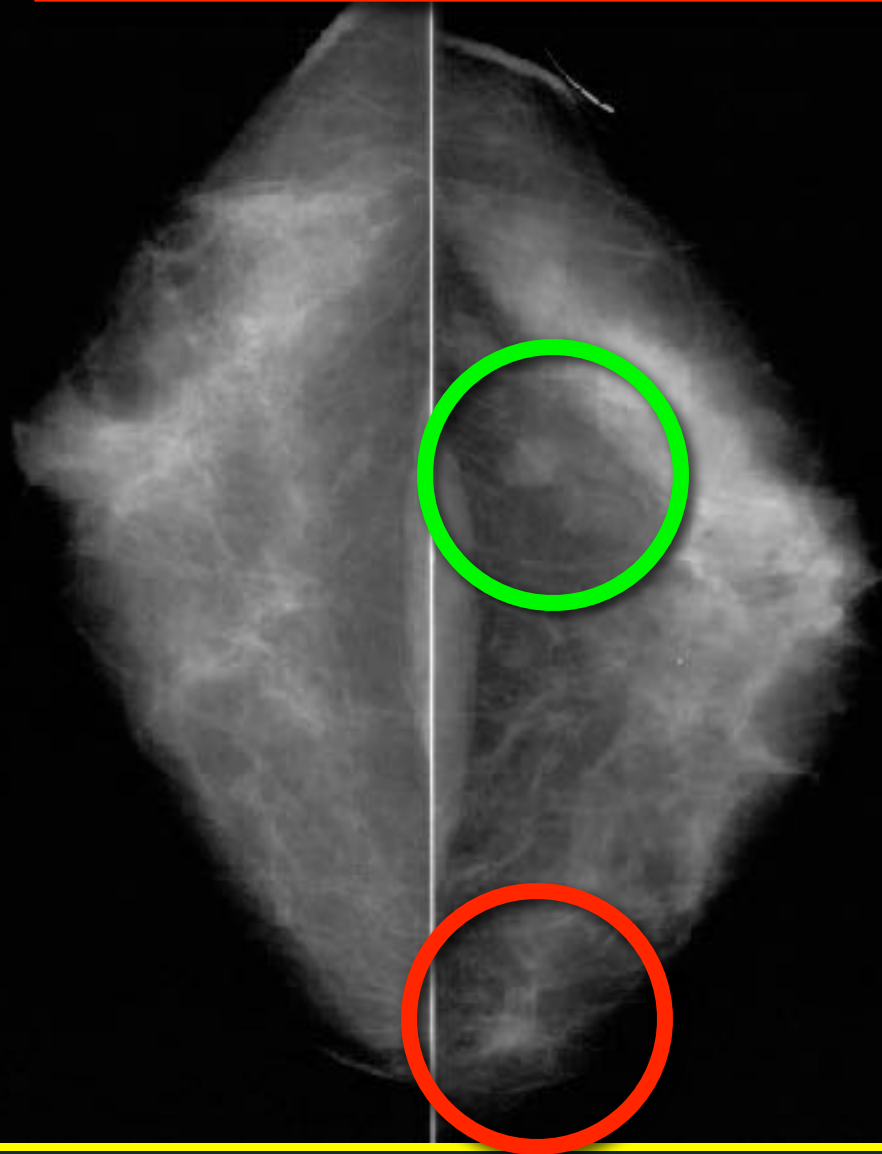
MLO



Baseline study



One year later



CC



One year later

MISSED!

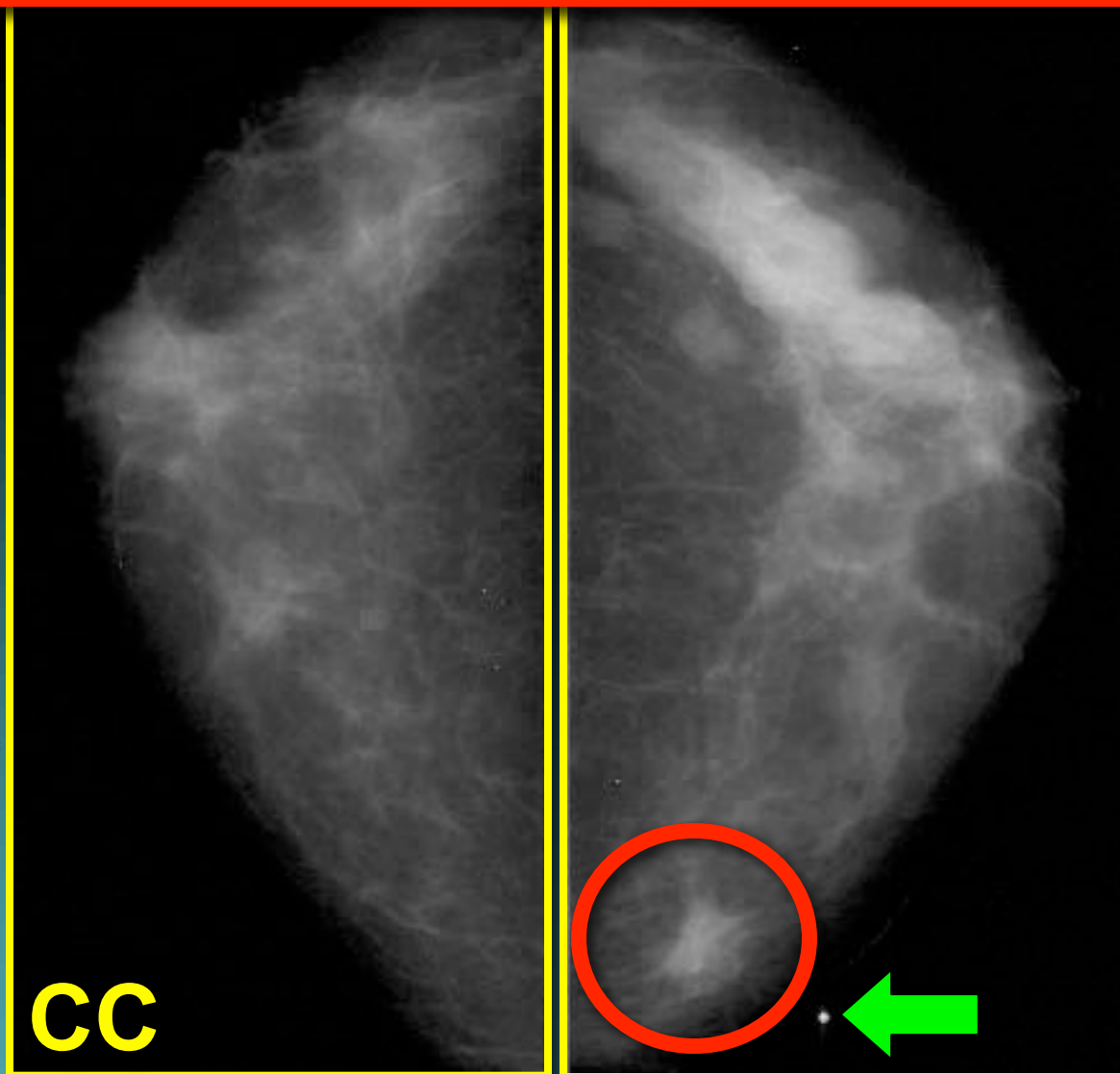
**1 year
earlier**



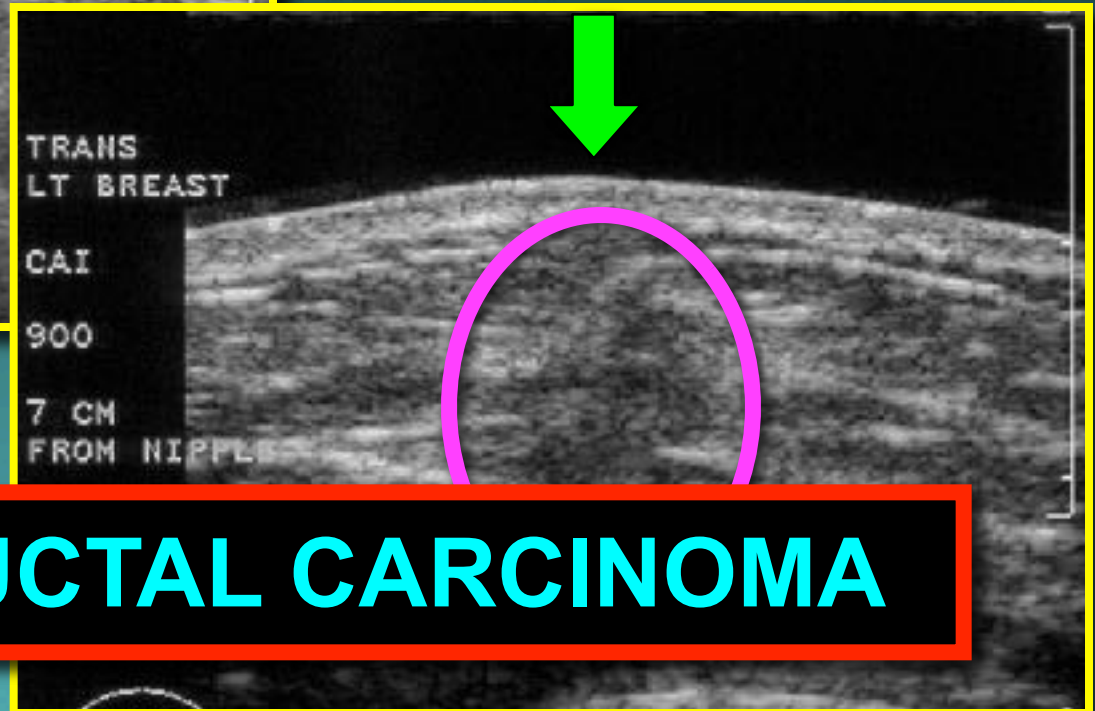
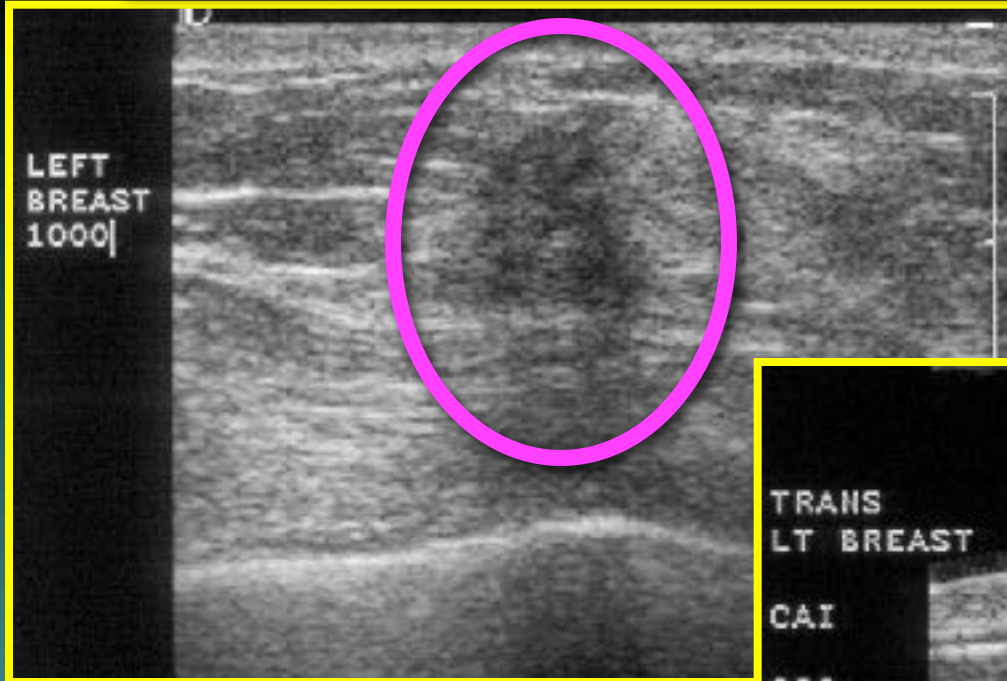
CC



Two more **years** later

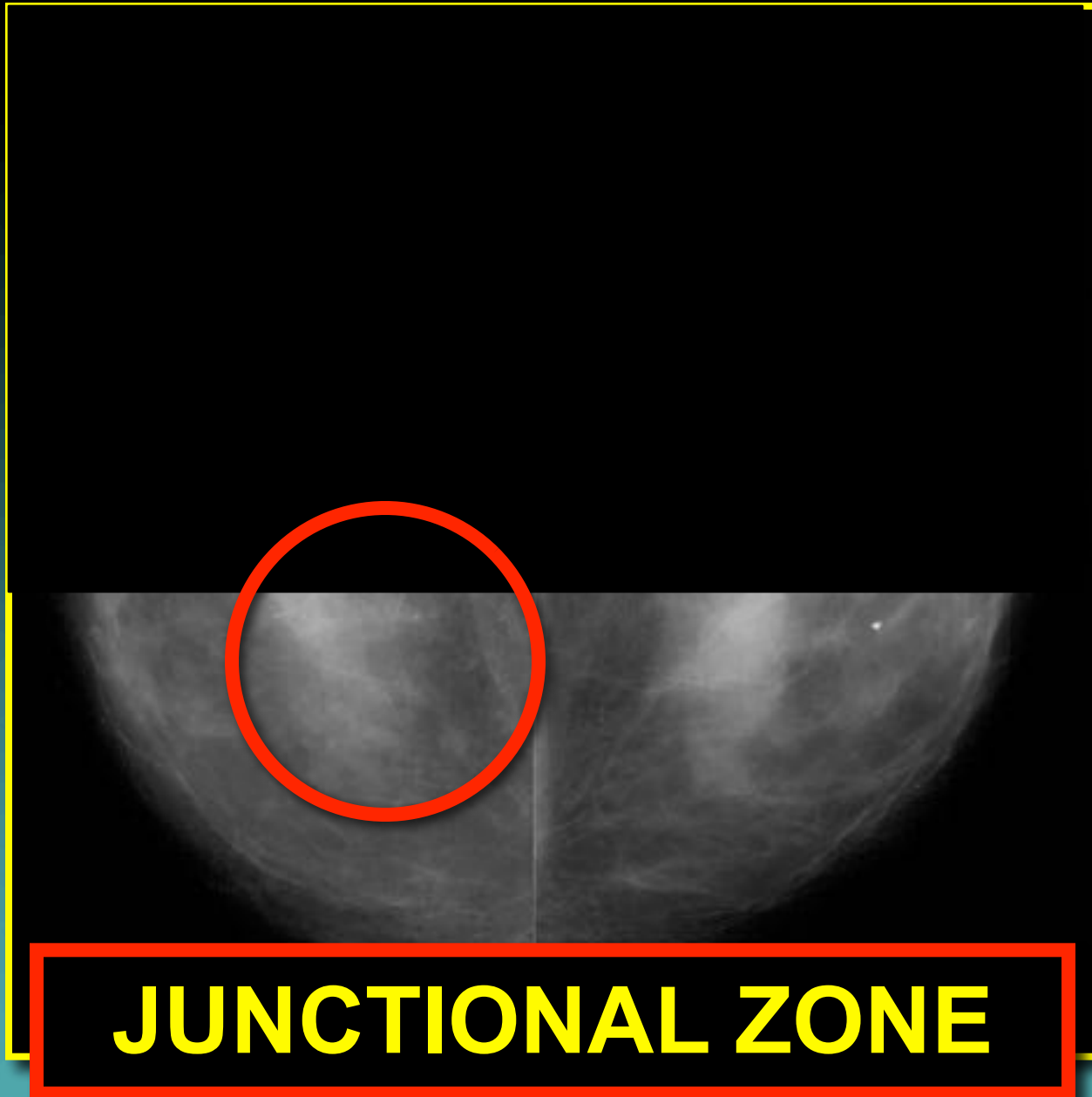


Left breast Ultrasound over Palpable Lump



INVASIVE DUCTAL CARCINOMA

Masking Technique: “Forbidden Zones”



FIRST SCREENING MAMMOGRAM

CC



MLO

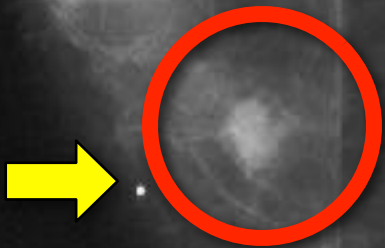


READ AS NORMAL



NEXT YEAR: PALPABLE LUMP

CC



MLO

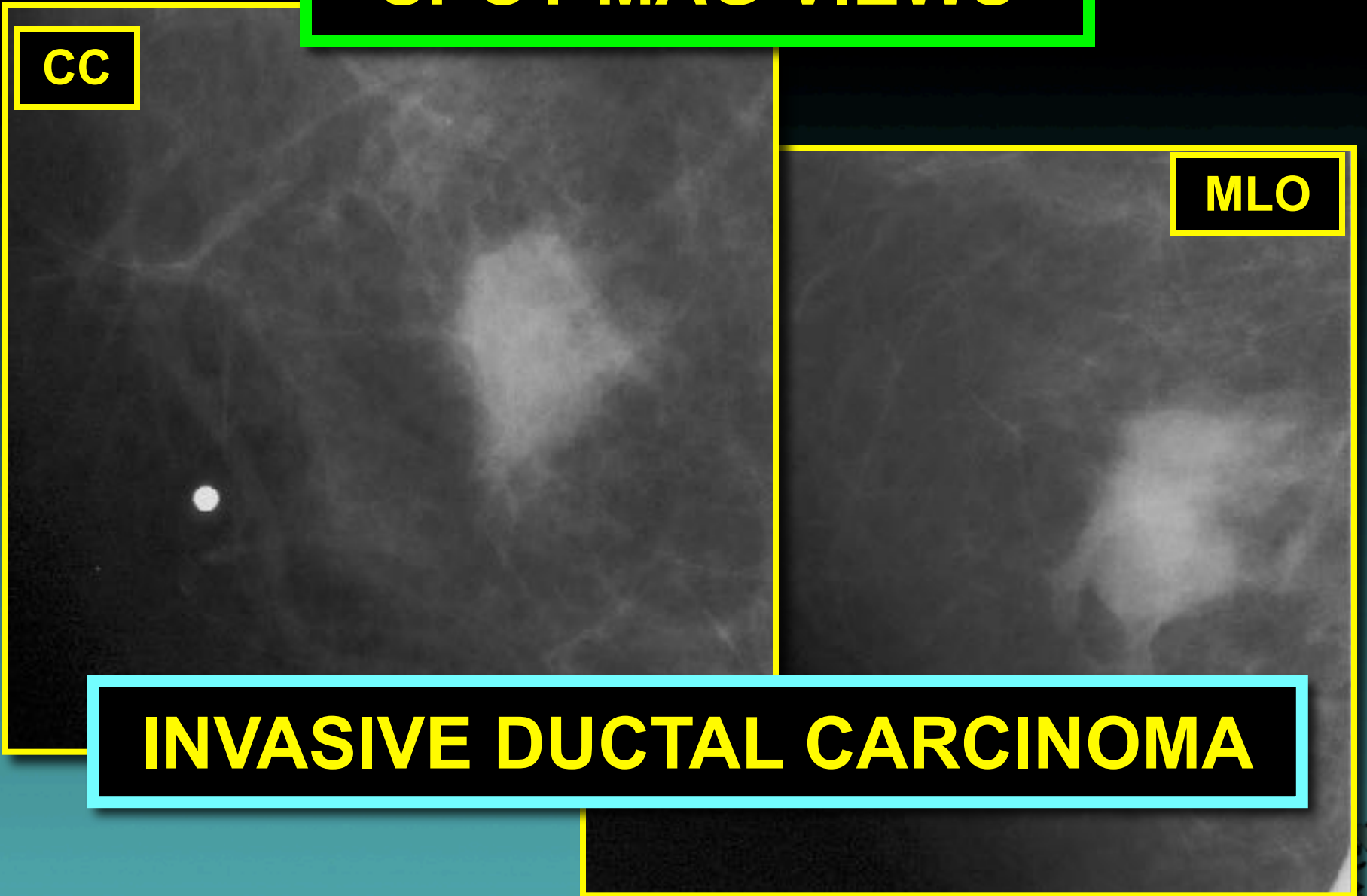


SPOT MAG VIEWS

CC

MLO

INVASIVE DUCTAL CARCINOMA



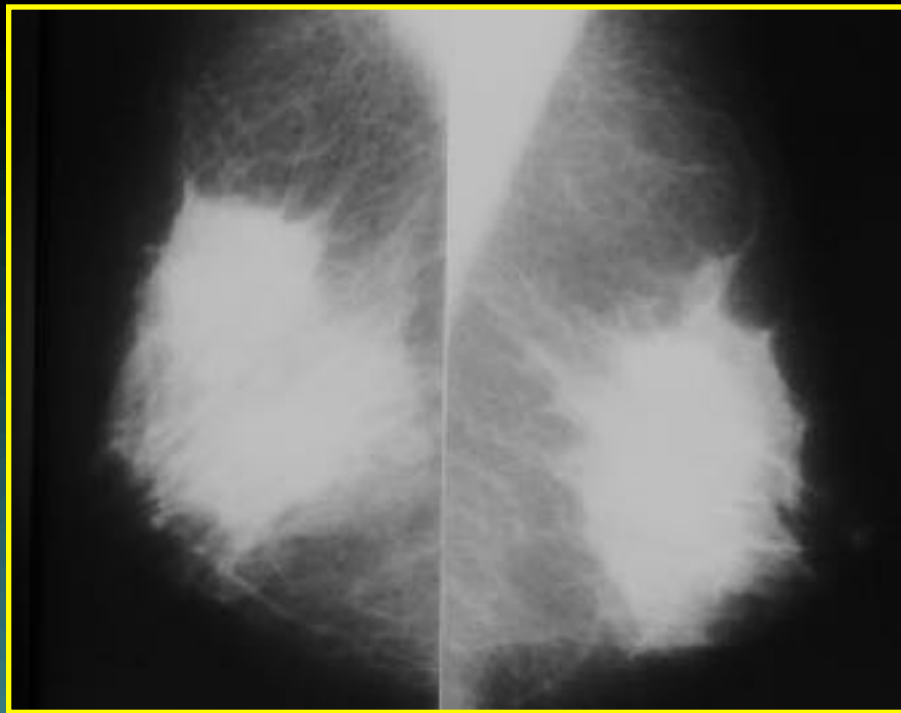
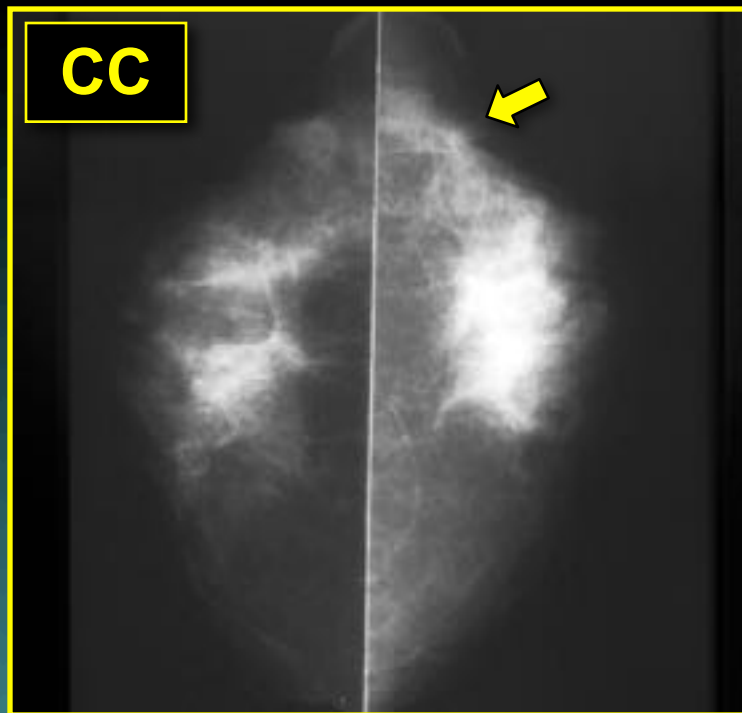


FINDING EARLY BREAST CANCER:

THE GROUND RULES (cont.)

- **Look at fat-glandular borders very carefully for loss of normal “harmonic” appearance:**
 - ➔ **Focal asymmetry**
 - ➔ **Tent sign**
 - ➔ **Bulge sign**
 - ➔ **Architectural distortion**

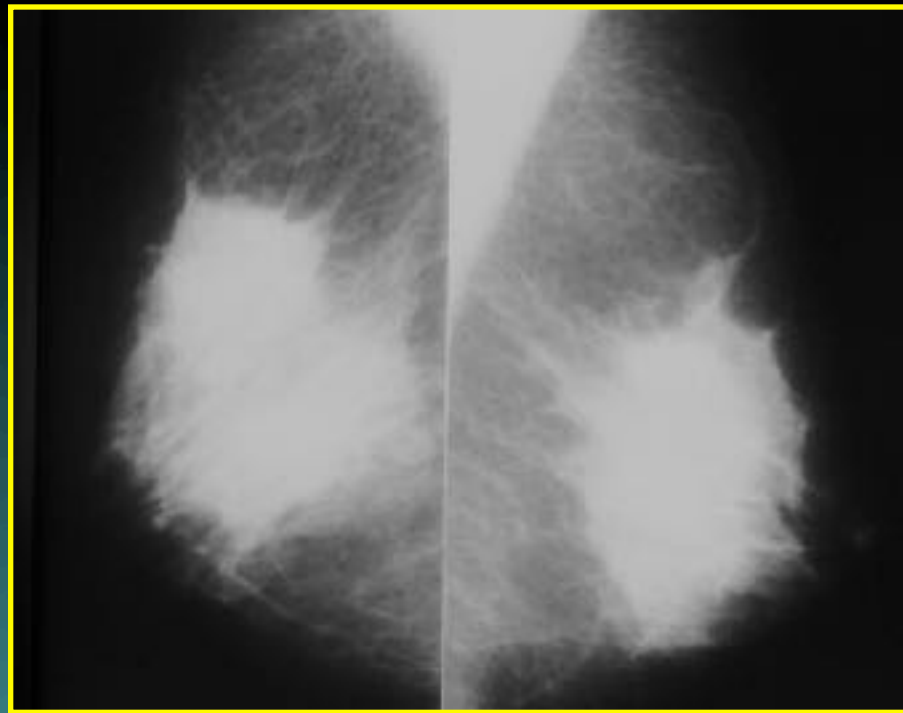
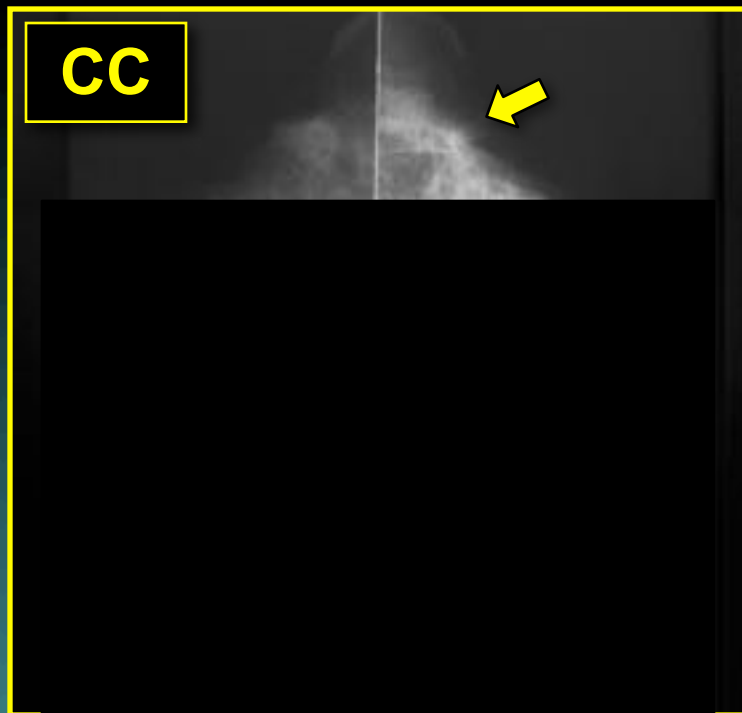
MLO: No Help



**OPTICAL
MAGNIFICATION**

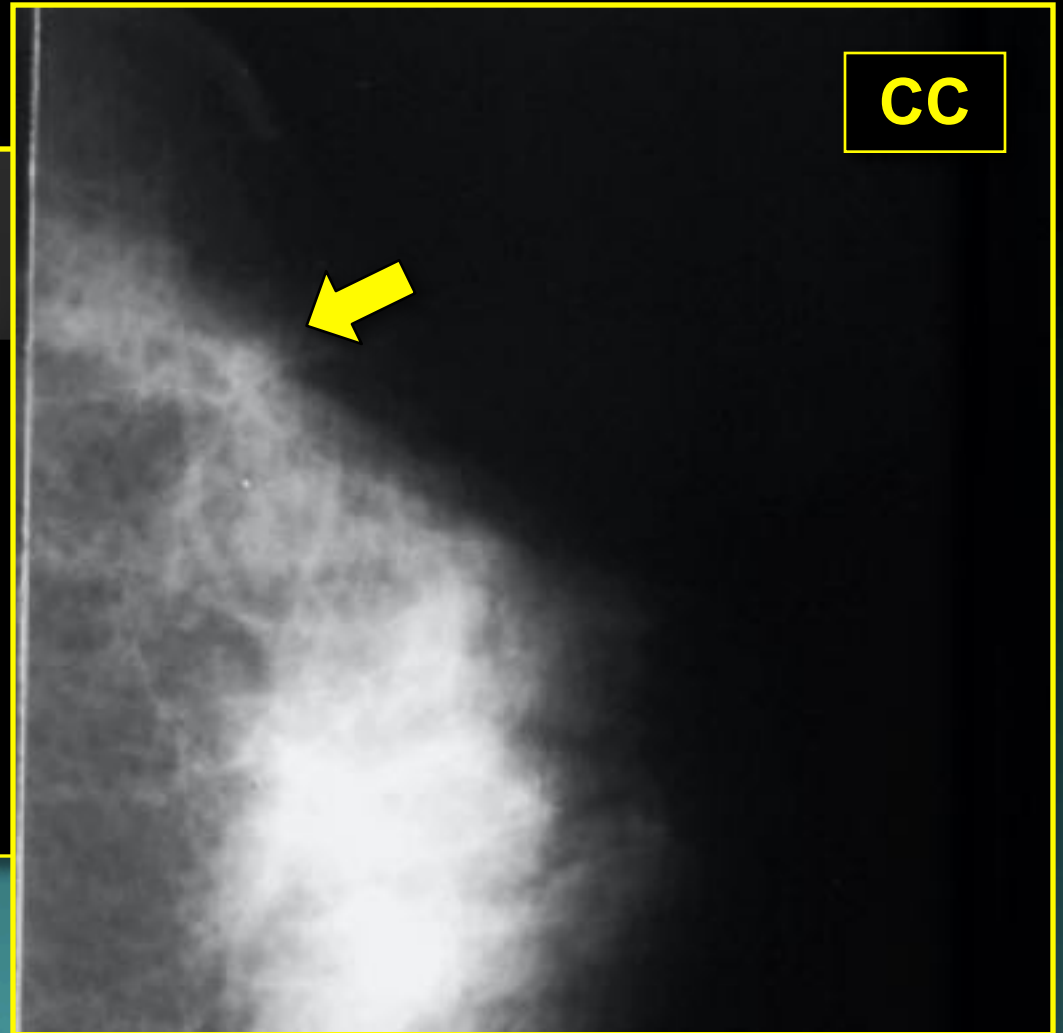
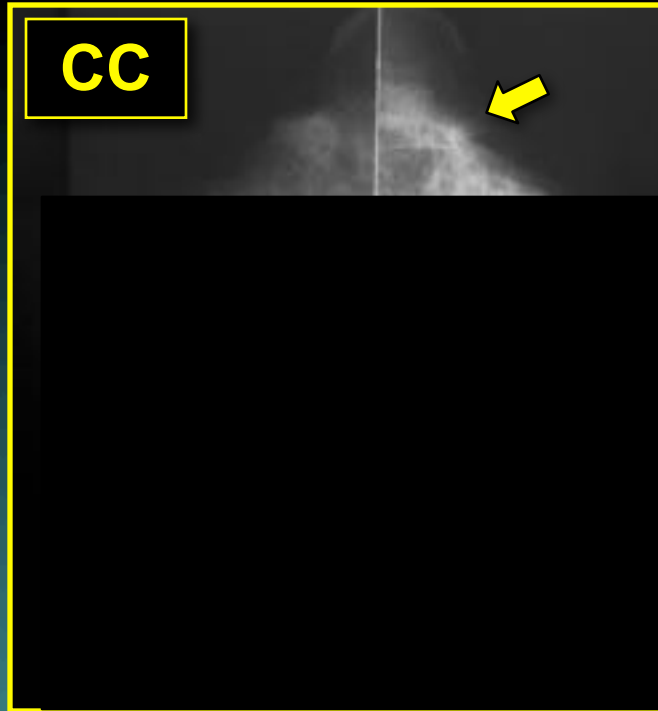


MLO: No Help



**OPTICAL
MAGNIFICATION**

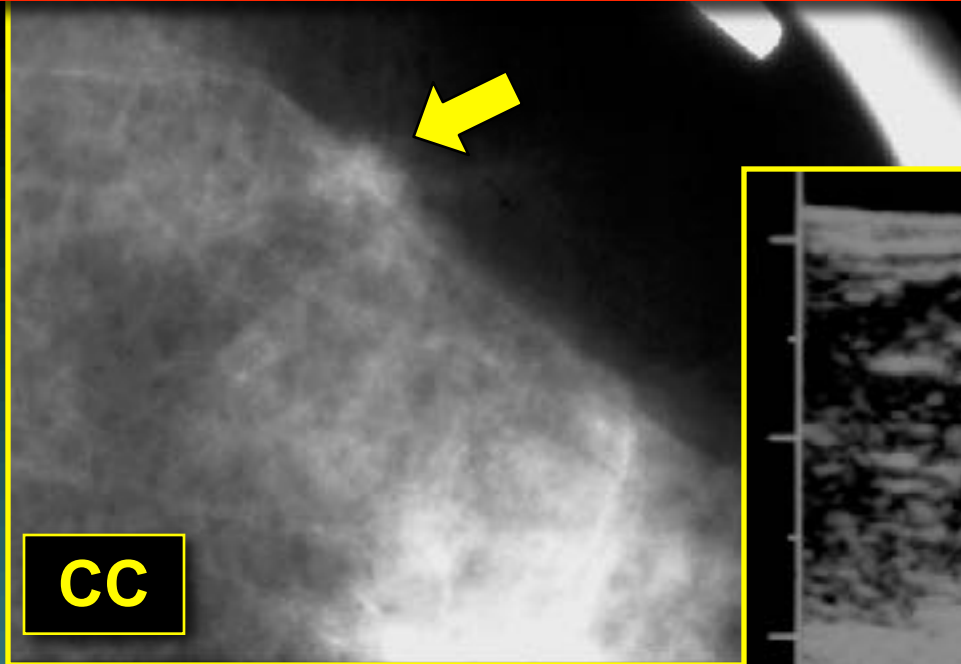




**OPTICAL
MAGNIFICATION**

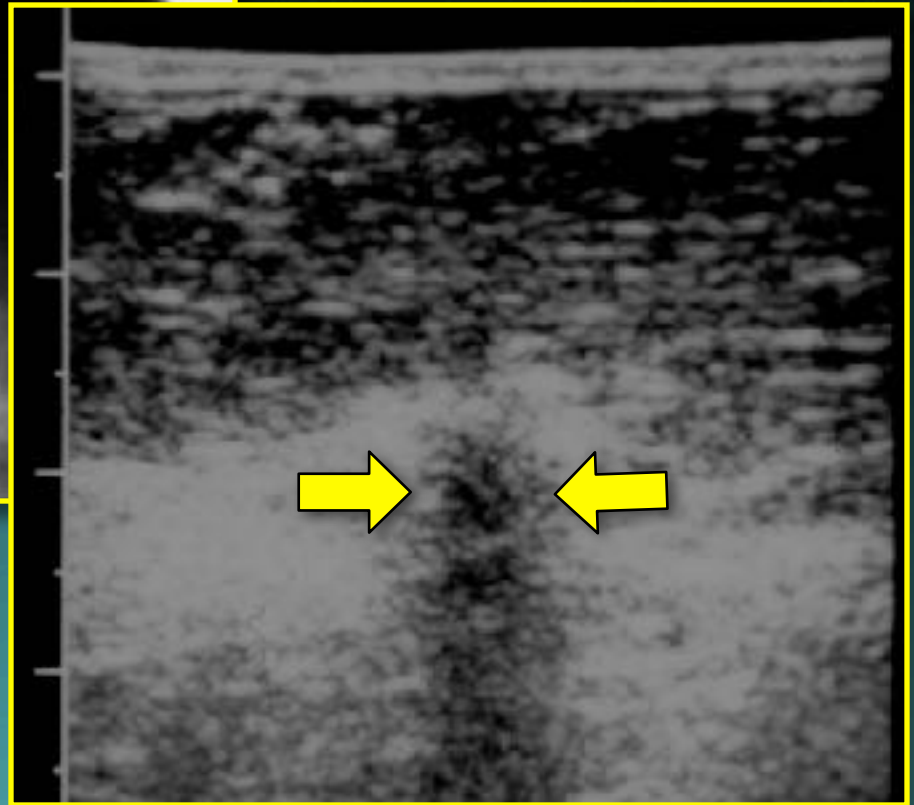


INVASIVE DUCTAL CARCINOMA



**SPOT
MAMMOGRAPHIC
MAGNIFICATION**

ULTRASOUND



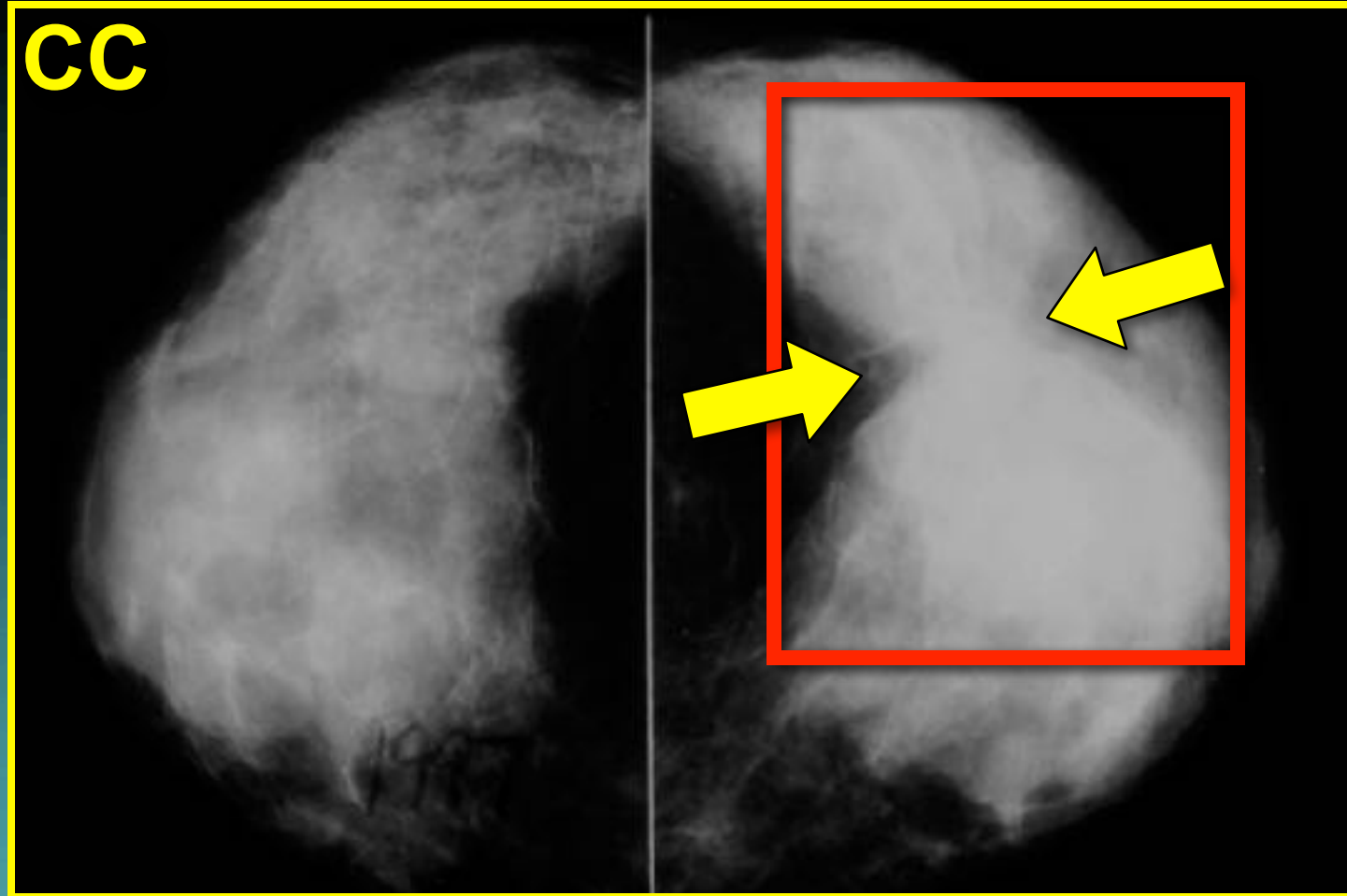


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INVASIVE DUCTAL CARCINOMA



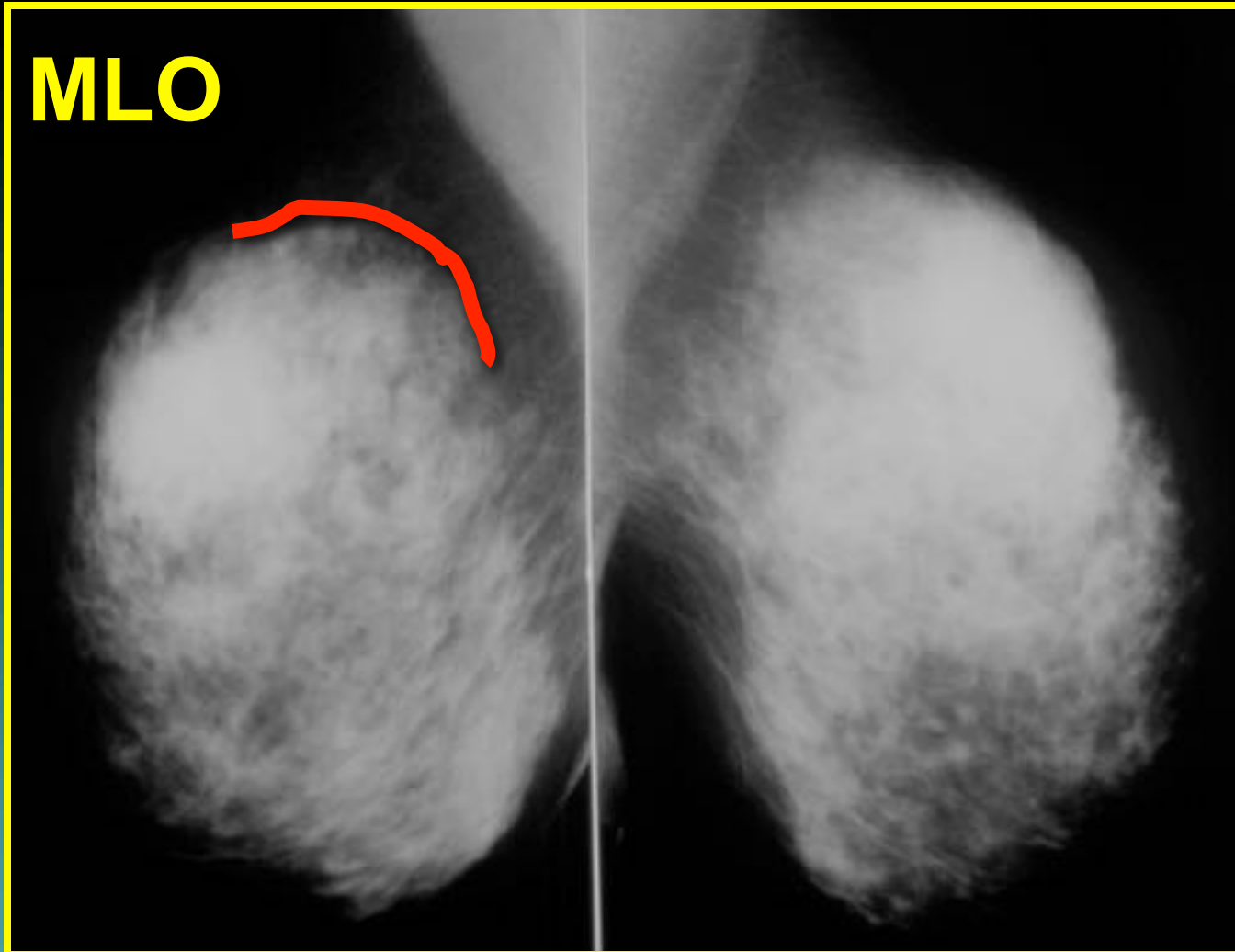


FINDING EARLY BREAST CANCER:

THE GROUND RULES (cont.)

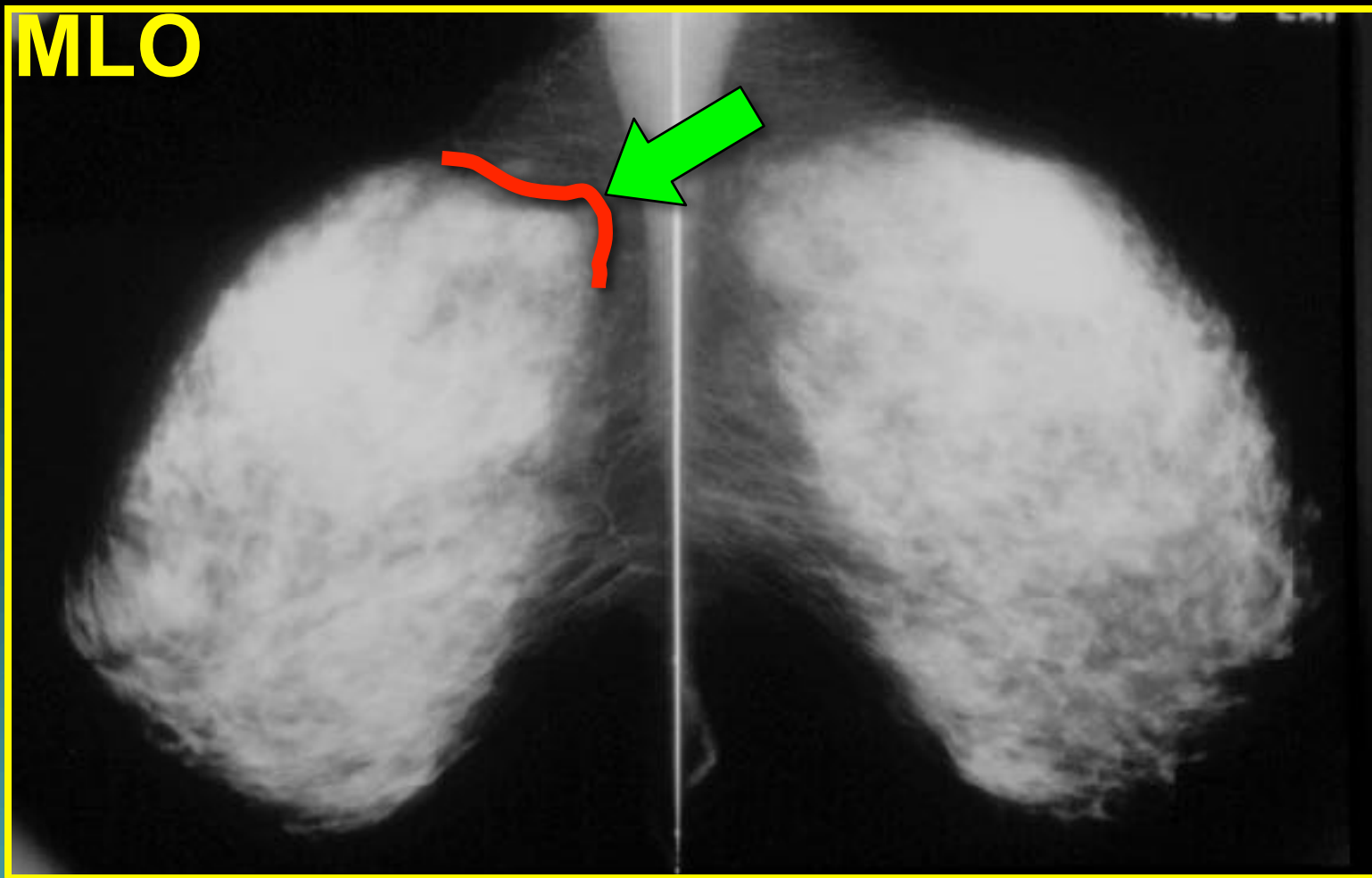
- **Look at fat-glandular borders very carefully for loss of normal “harmonic” appearance:**
 - ➔ **Focal asymmetry**
 - ➔ **Tent sign**
 - ➔ **Bulge sign**
 - ➔ **Architectural distortion**

MLO

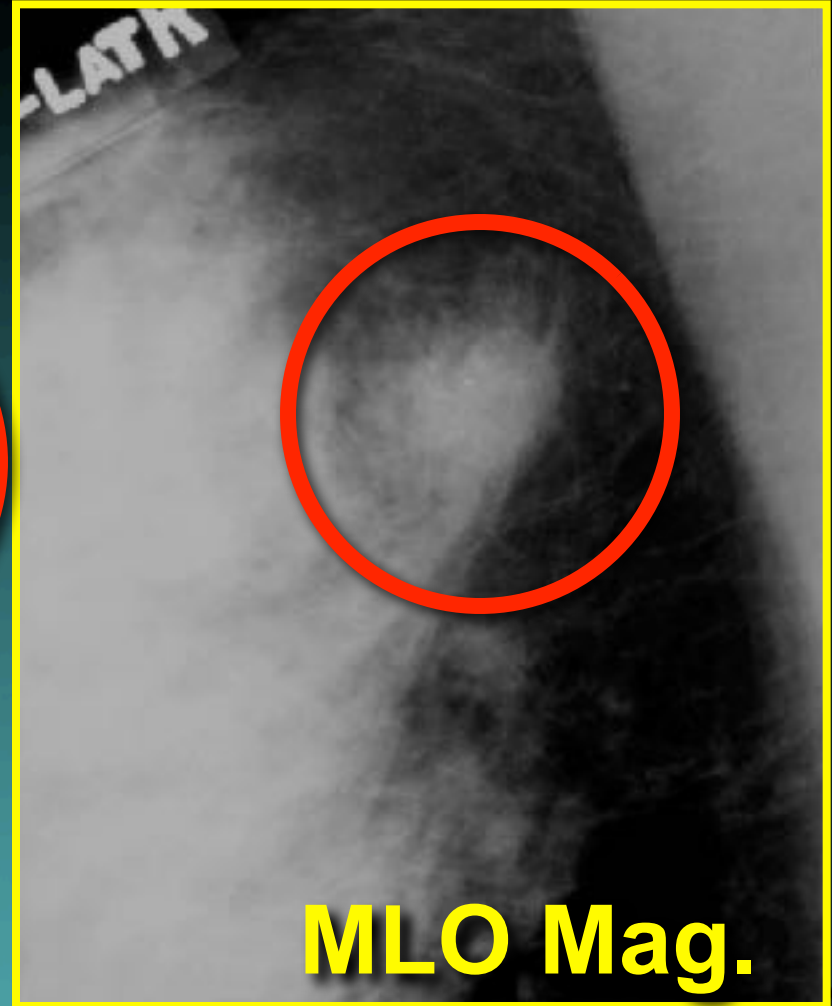
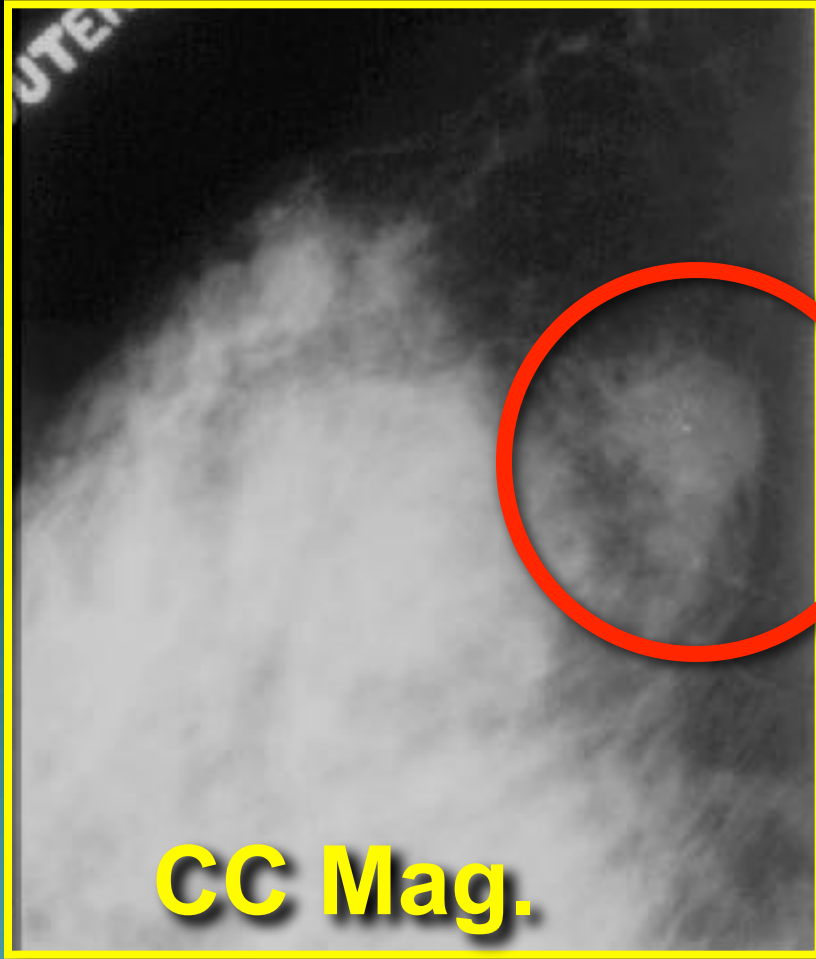


The Next Year:

MLO



Invasive Ductal Carcinoma



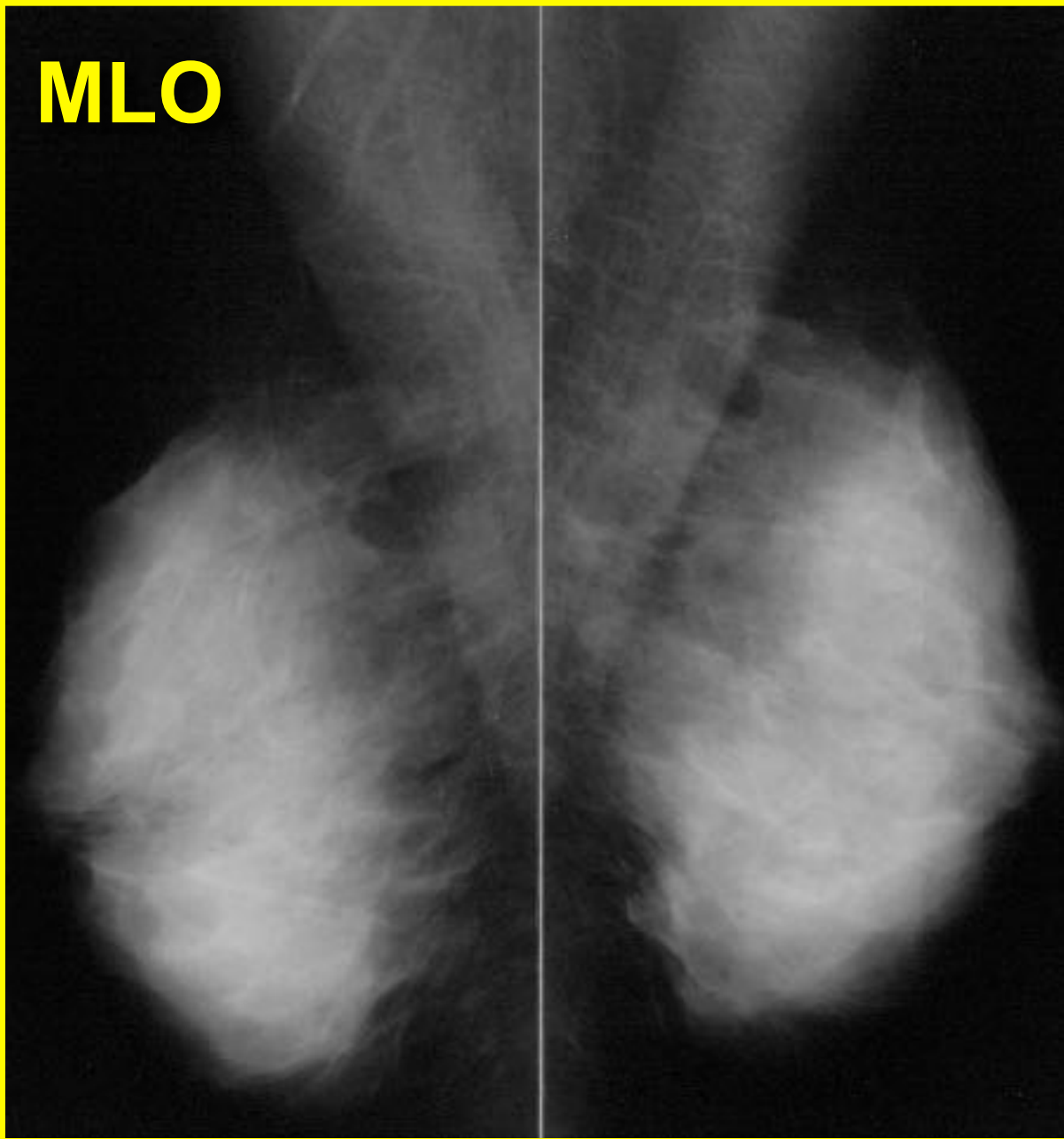


FINDING EARLY BREAST CANCER:

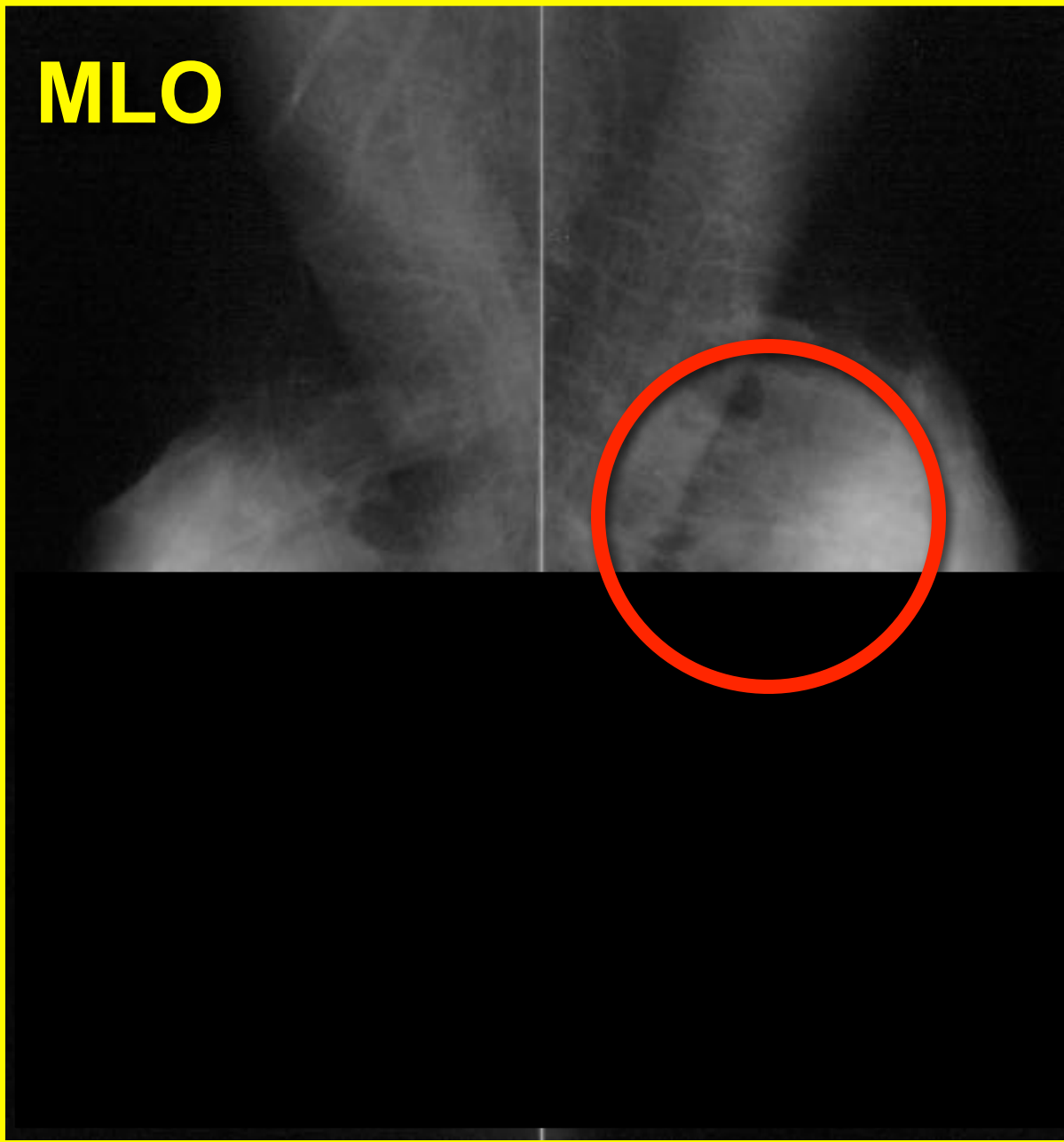
THE GROUND RULES (cont.)

- **Look at fat-glandular borders very carefully for loss of normal “harmonic” appearance:**
 - ➔ **Focal asymmetry**
 - ➔ **Tent sign**
 - ➔ **Bulge sign**
 - ➔ **Architectural distortion**

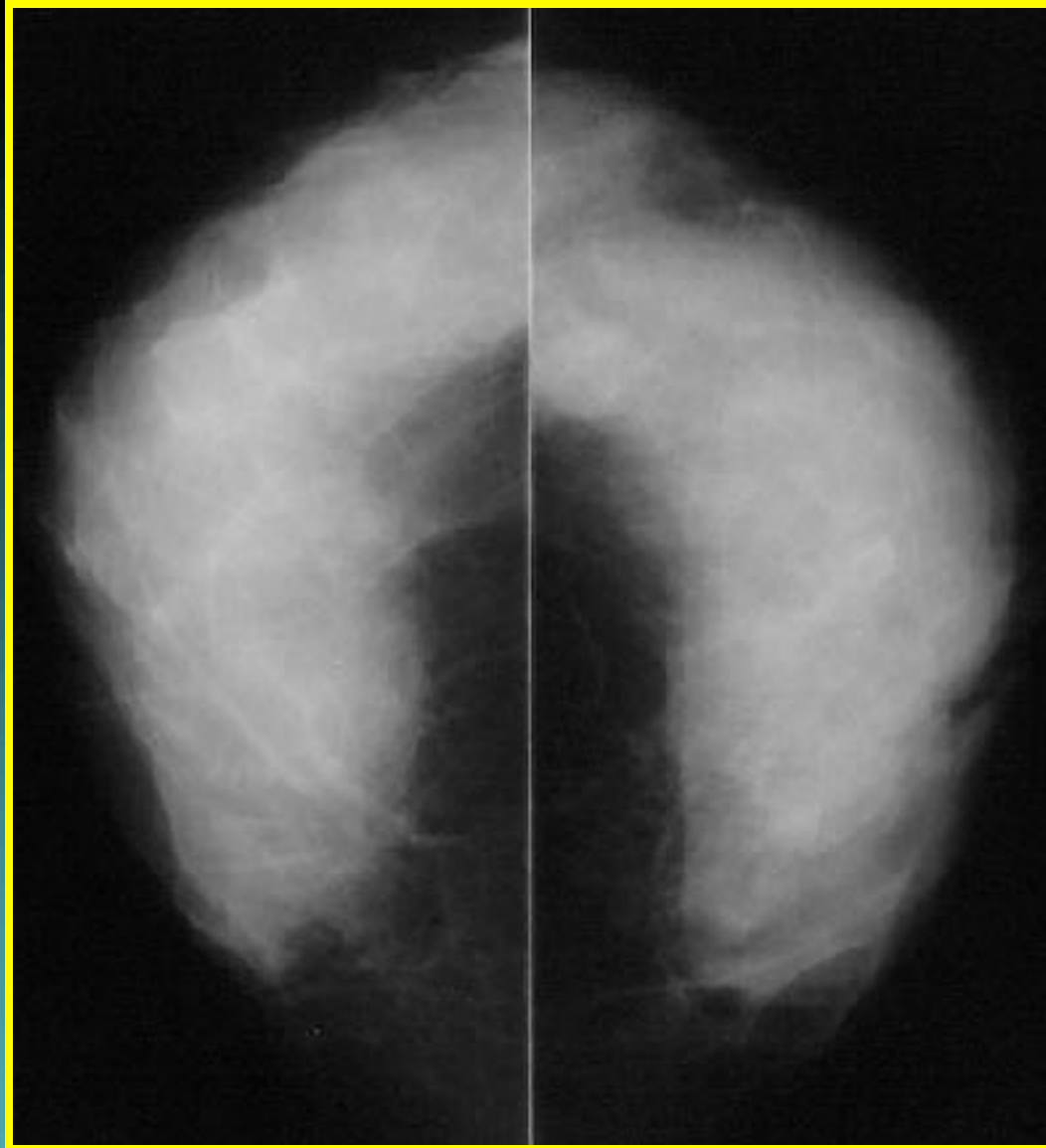
MLO



MLO



CC view no help



Tubular Carcinoma



MLO Mag.



CC Mag.



FINDING EARLY BREAST CANCER:

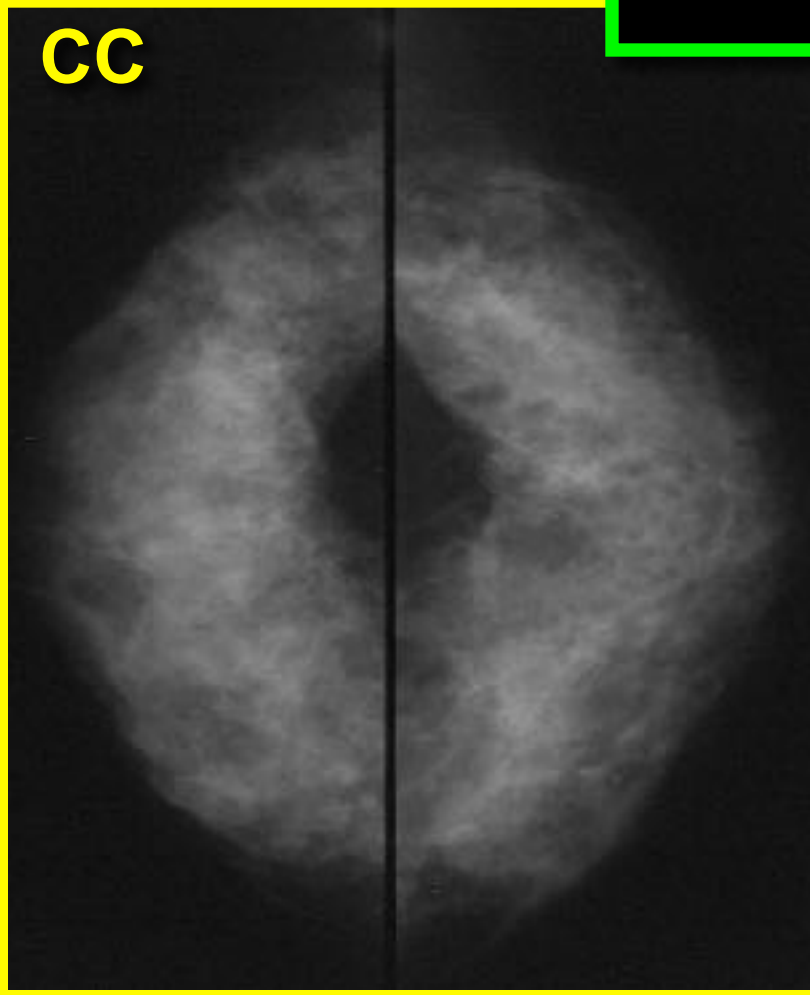
THE GROUND RULES (cont.)

- **Other helpful hints:**

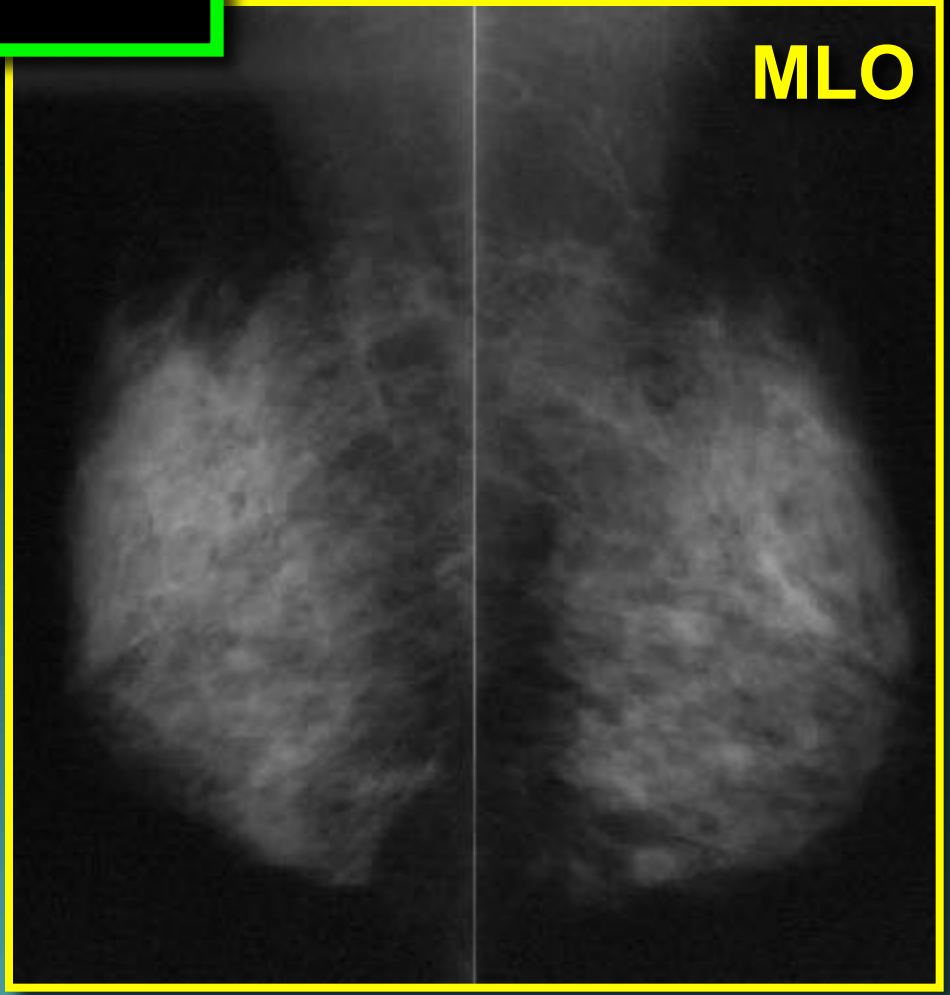
- **Look at densest area of the image one more time: if still bothers you, work it up!**
- **Don't ignore lesion seen on one view only**
- **Beware of multifocal or bilateral cancers**
- **Don't accept bad images: Russian roulette!**
- **Don't forget about Invasive Lobular Ca**
- **Look at image corners, especially axillae!**

2006

CC

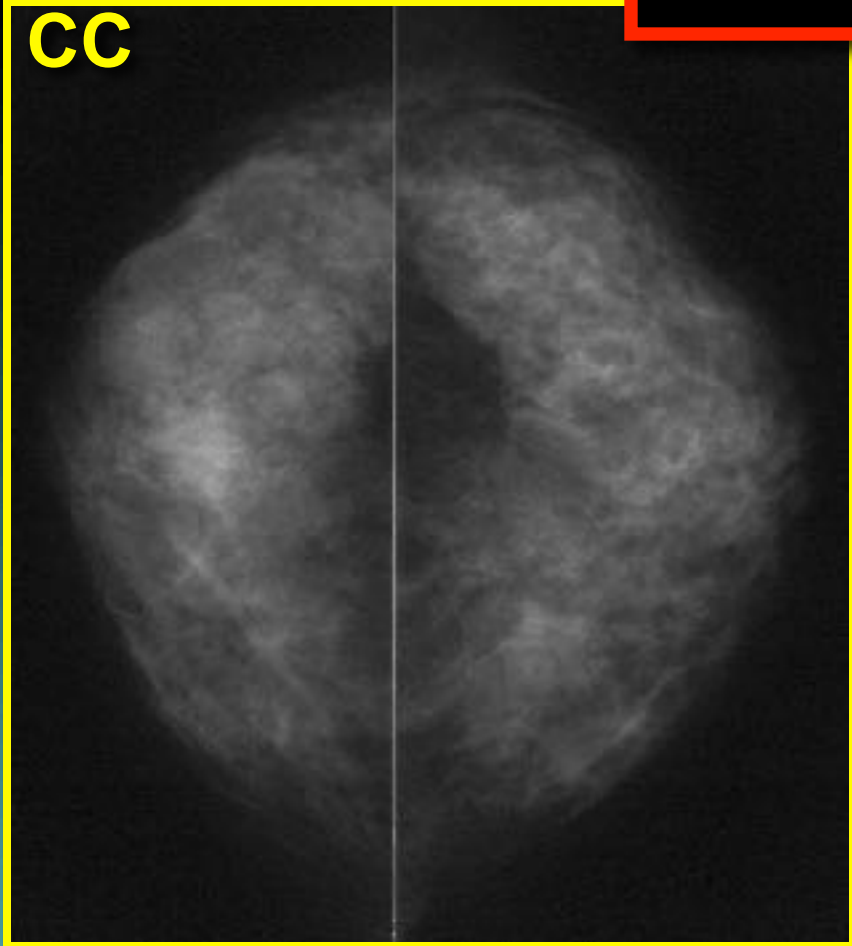


MLO

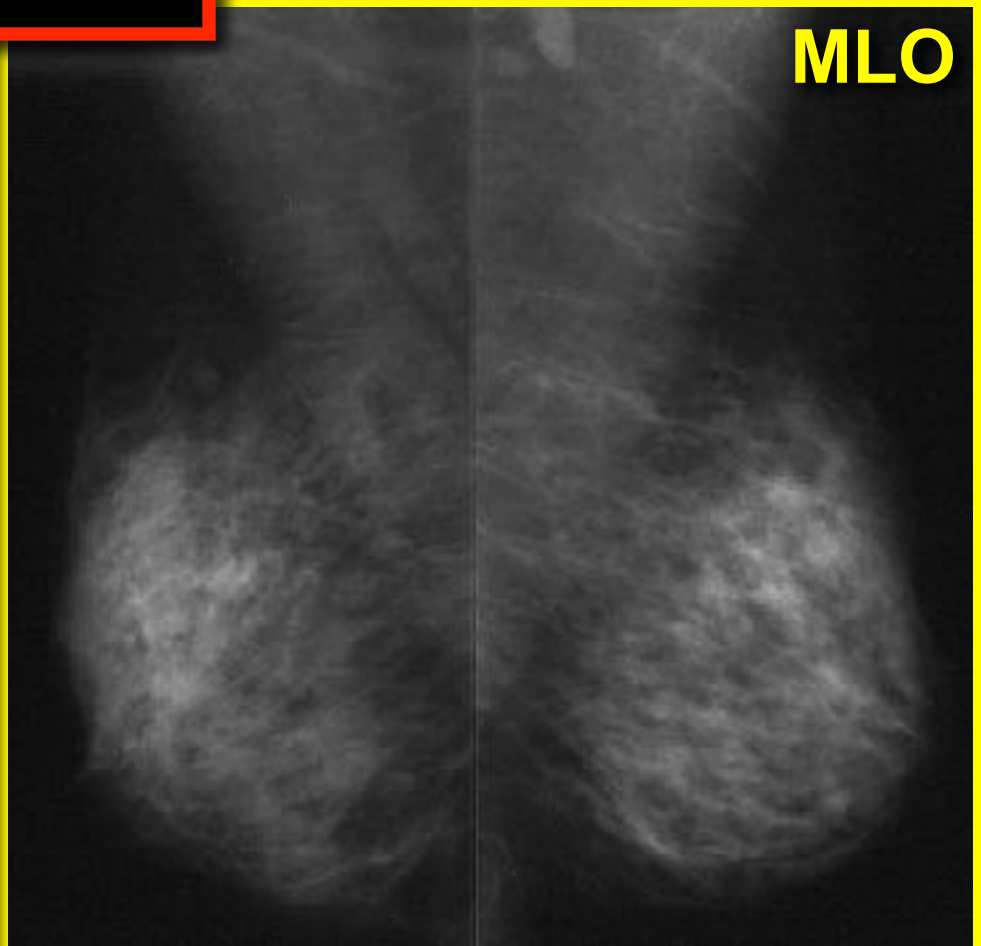


2007

CC



MLO



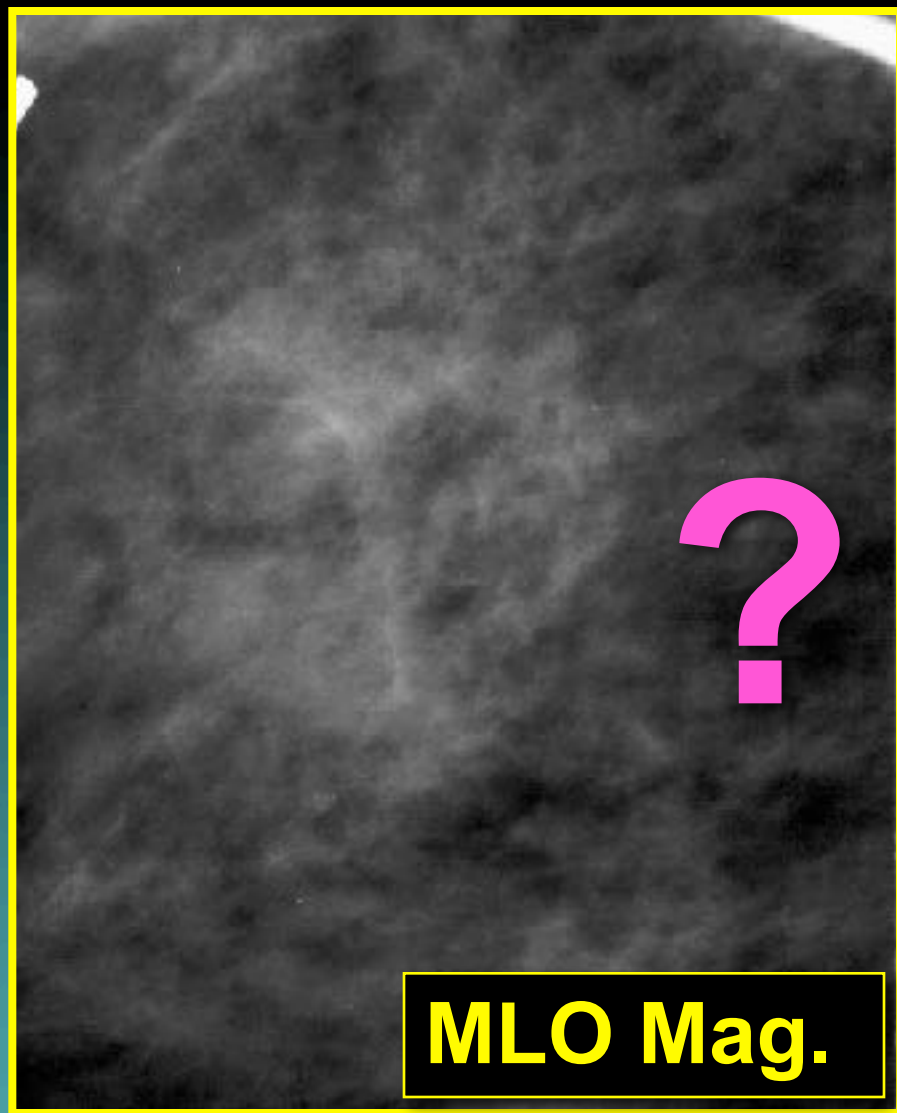
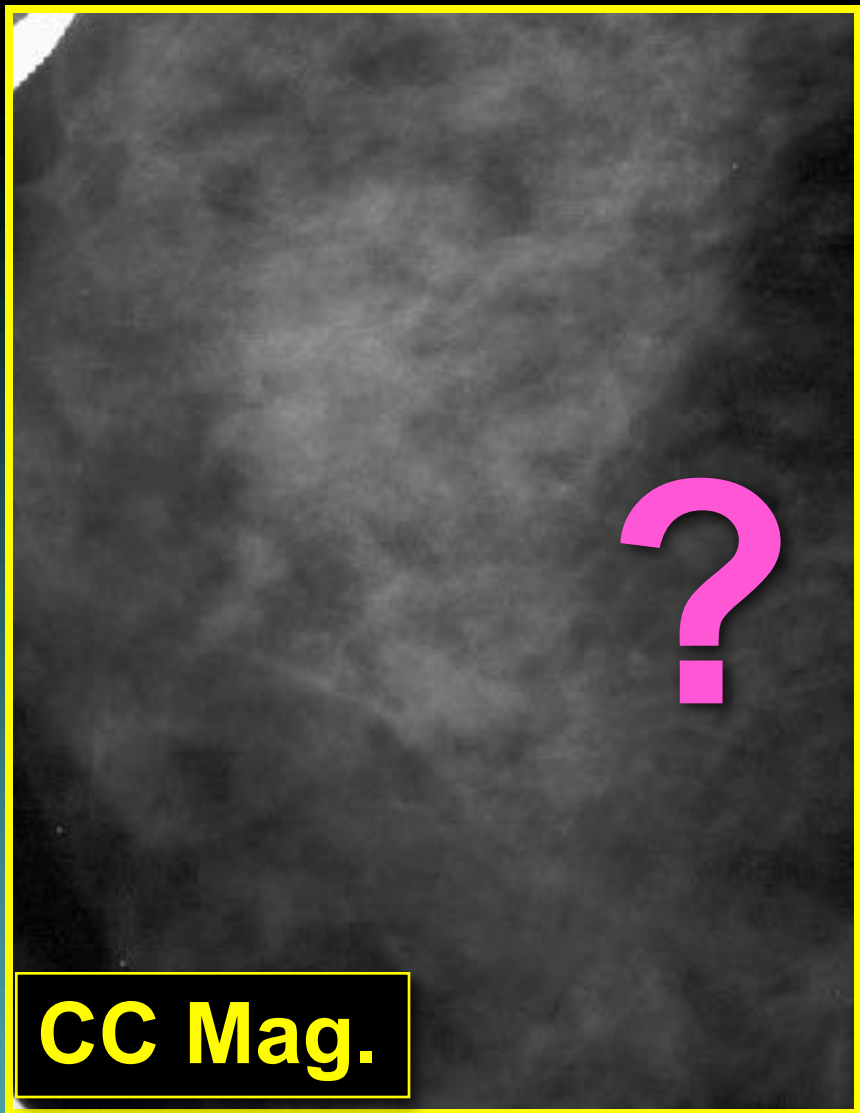
2007

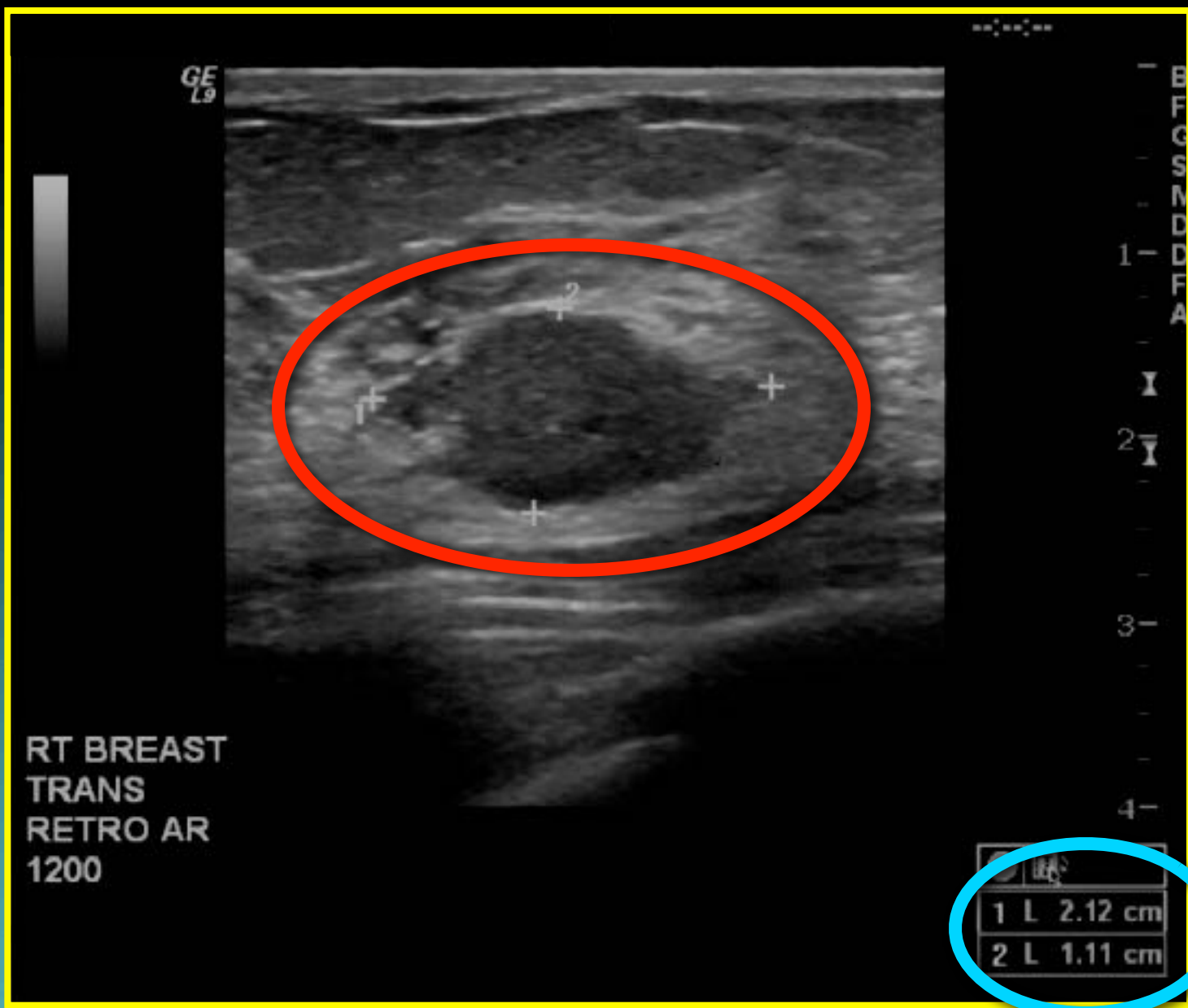
CC



MLO





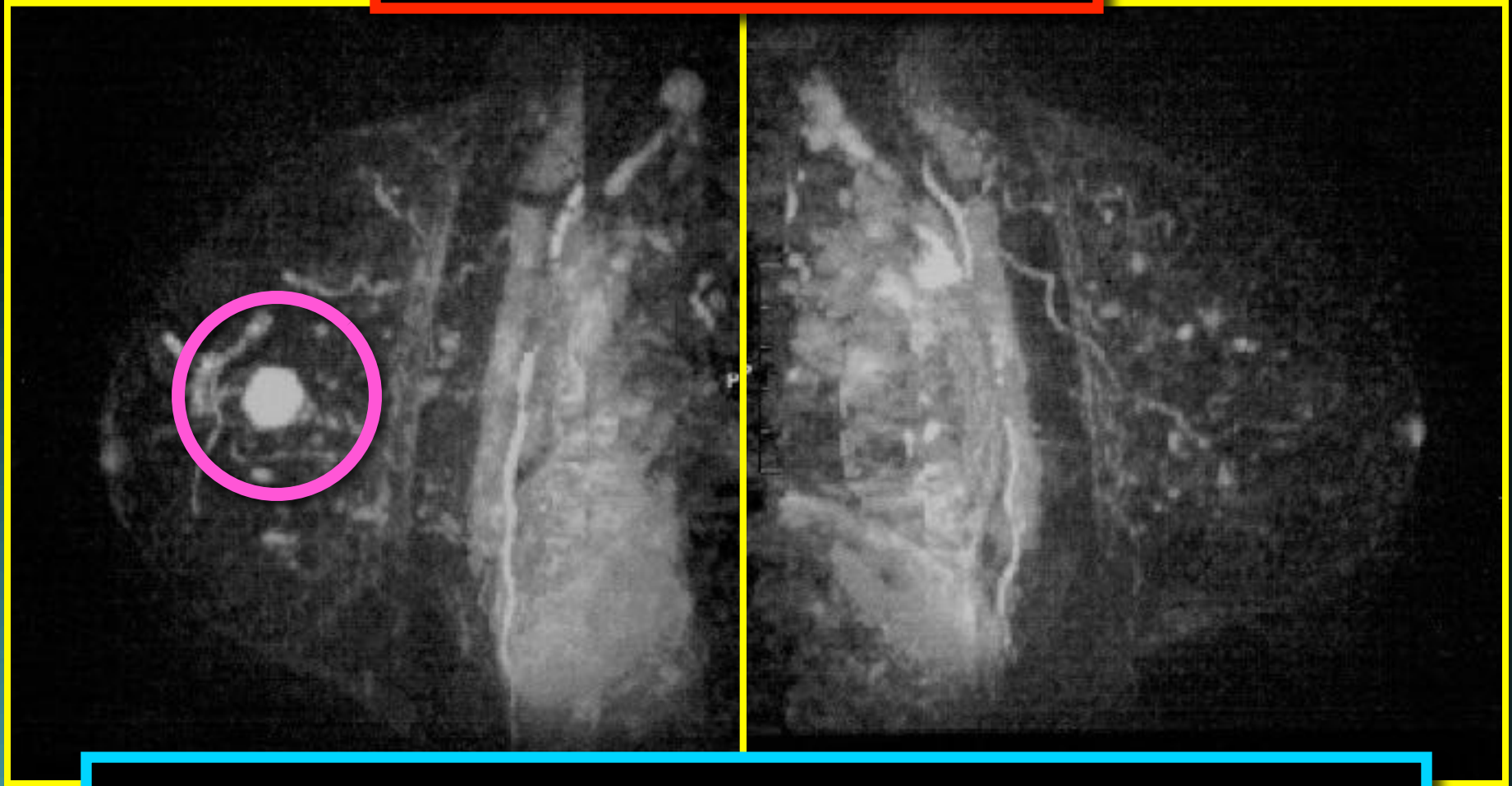




**AXIAL
MIP'S**



SAGITTAL MIP'S



**INVASIVE DUCTAL CARCINOMA,
HIGH GRADE**

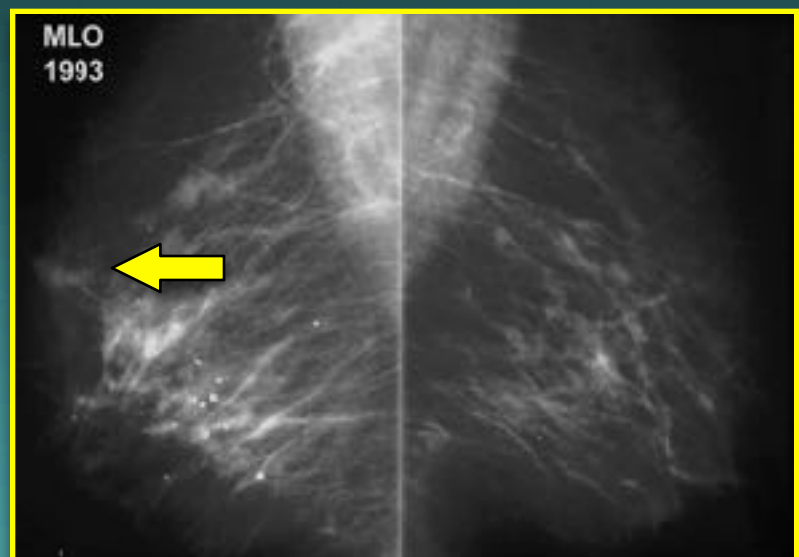
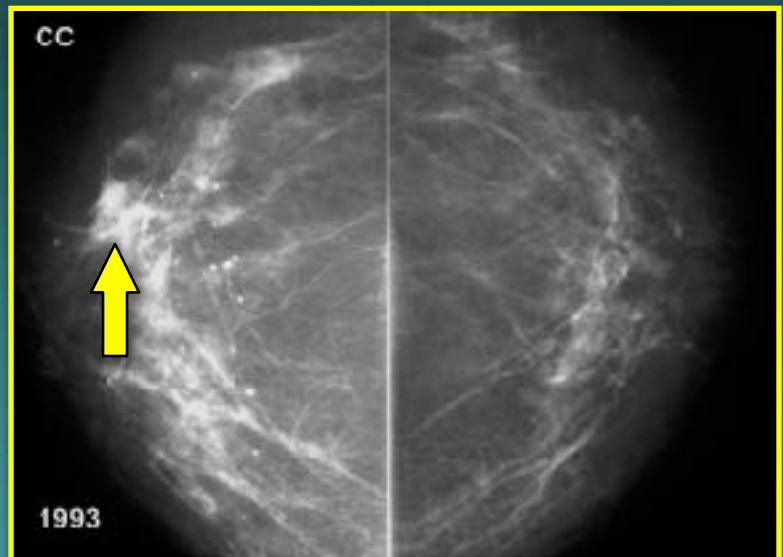
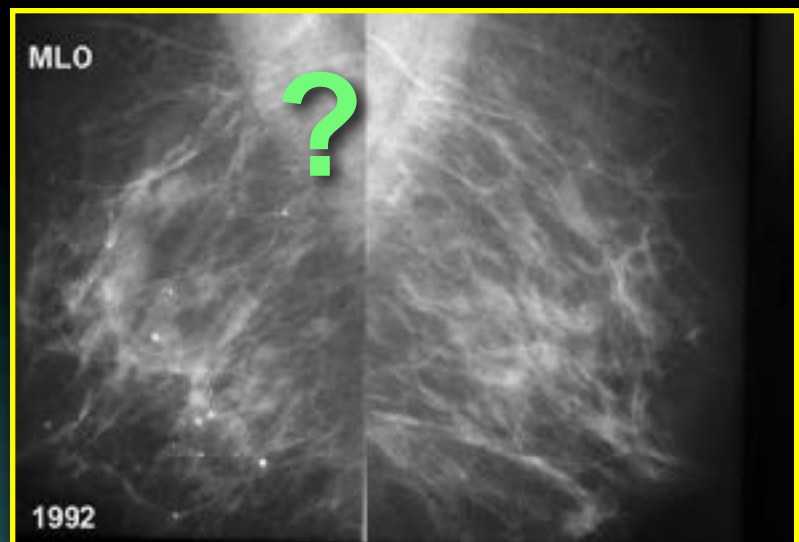
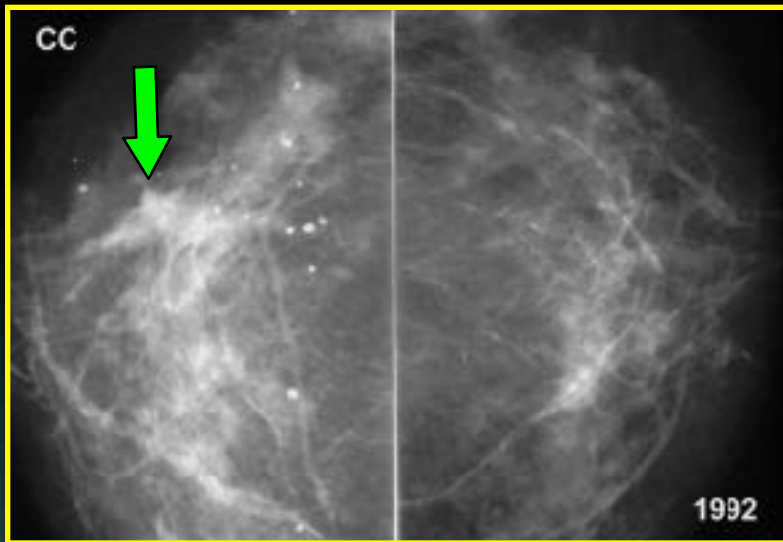


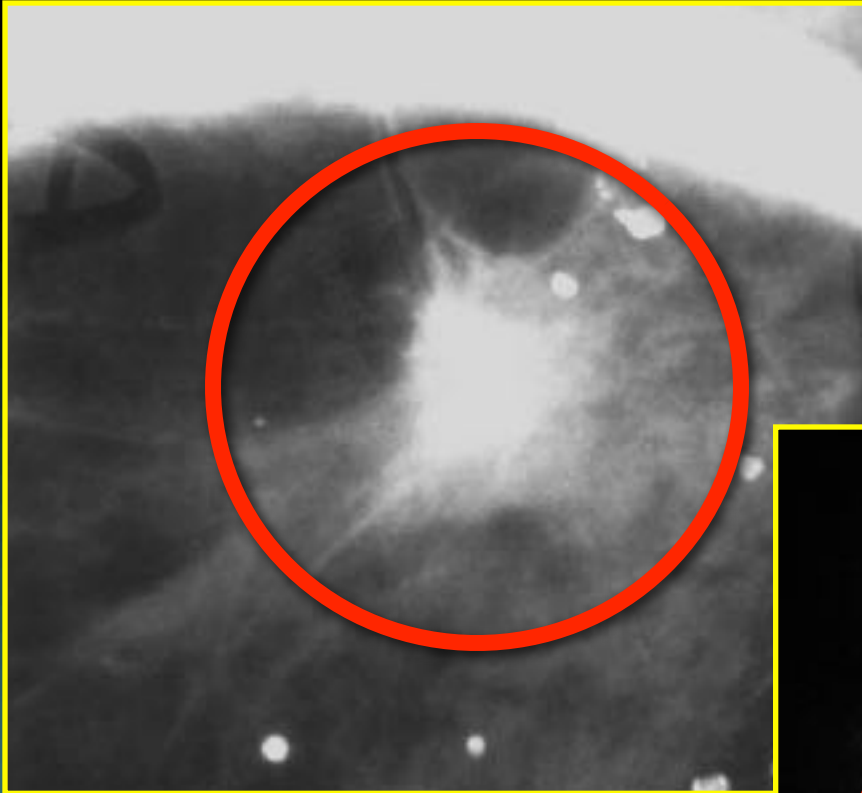


FINDING EARLY BREAST CANCER:

THE GROUND RULES (cont.)

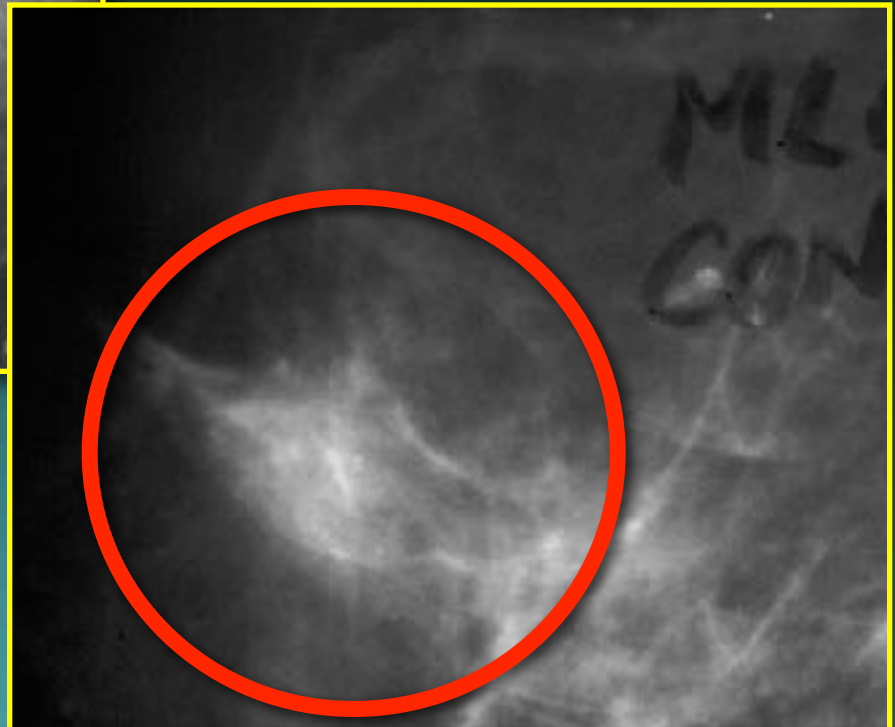
- **Other helpful hints:**
 - **Look at densest area of the image one more time: if still bothers you, work it up!**
 - **Don't ignore lesion seen on one view only**
 - **Beware of multifocal or bilateral cancers**
 - **Don't accept bad images: Russian roulette!**
 - **Don't forget about Invasive Lobular Ca**
 - **Look at image corners, especially axillae!**





MLO

CC



INVASIVE DUCTAL CARCINOMA





FINDING EARLY BREAST CANCER:

THE GROUND RULES (cont.)

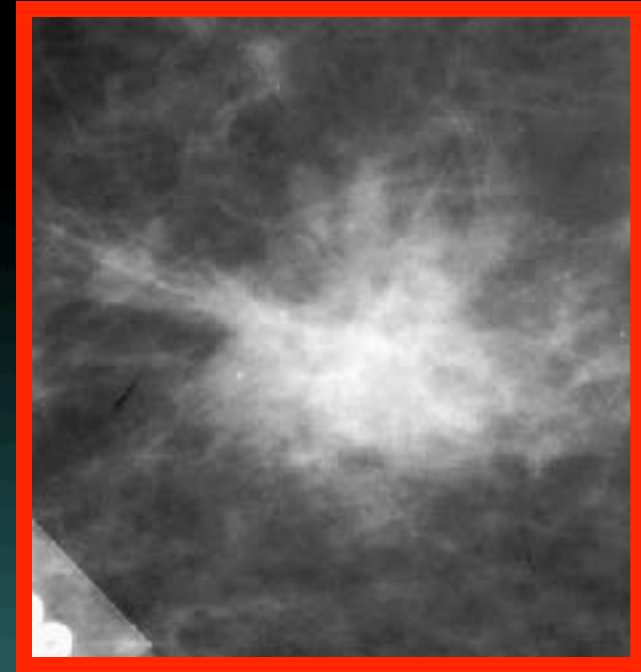
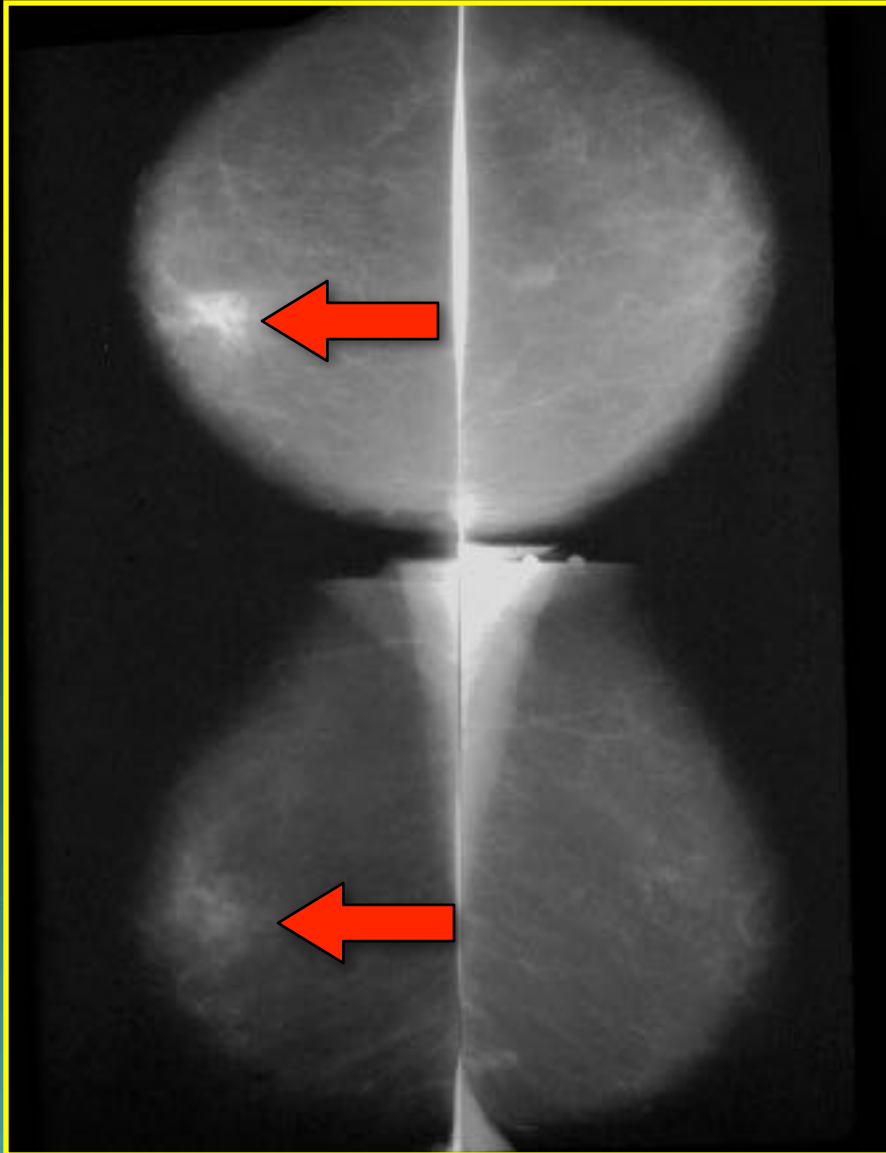
- **Other helpful hints:**
 - ➔ **Look at densest area of the image one more time: if still bothers you, work it up!**
 - ➔ **Don't ignore lesion seen on one view only**
 - ➔ **Beware of multifocal or bilateral cancers: find the obvious, then keep looking!**
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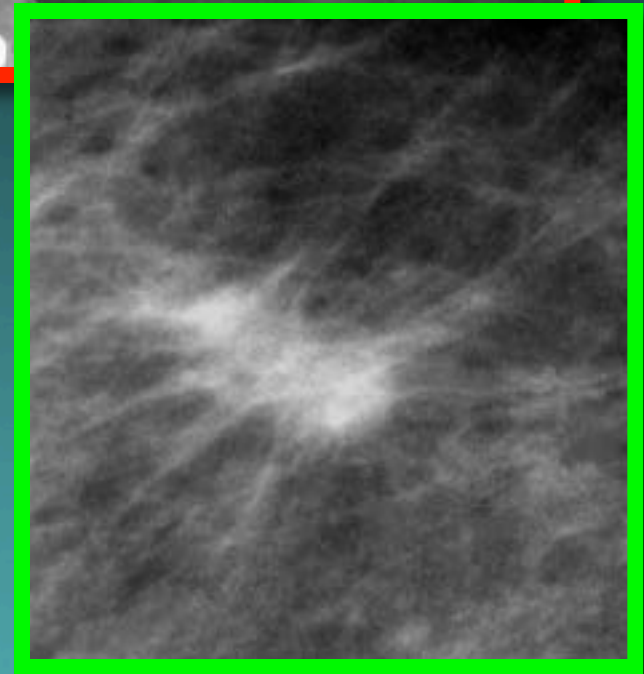
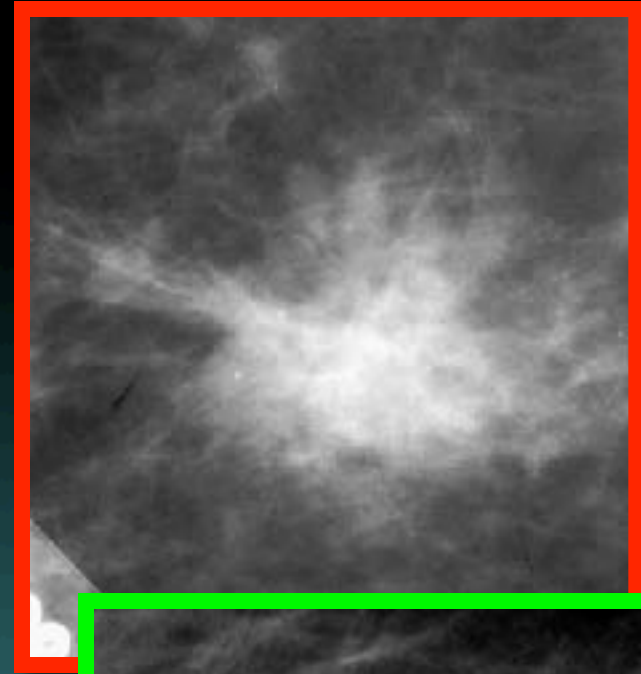
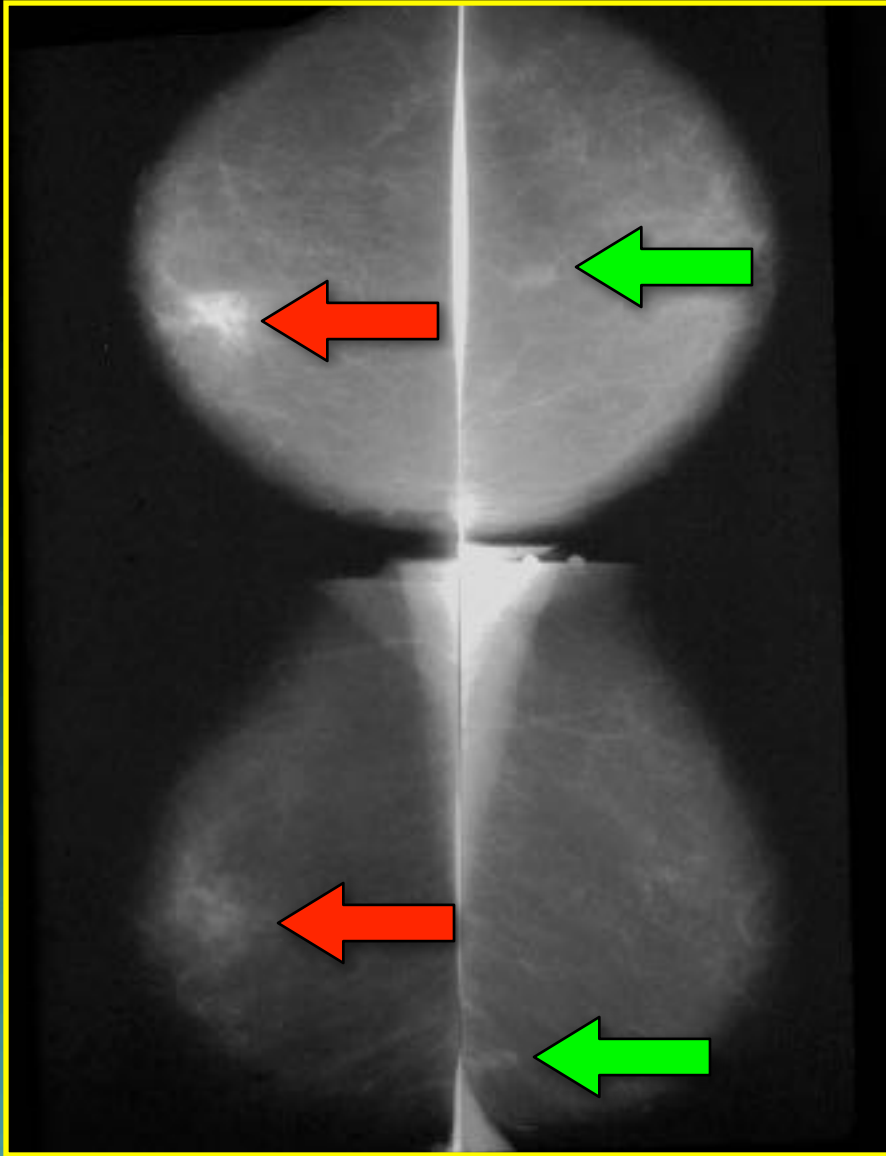






Chobe National Park, Botswana





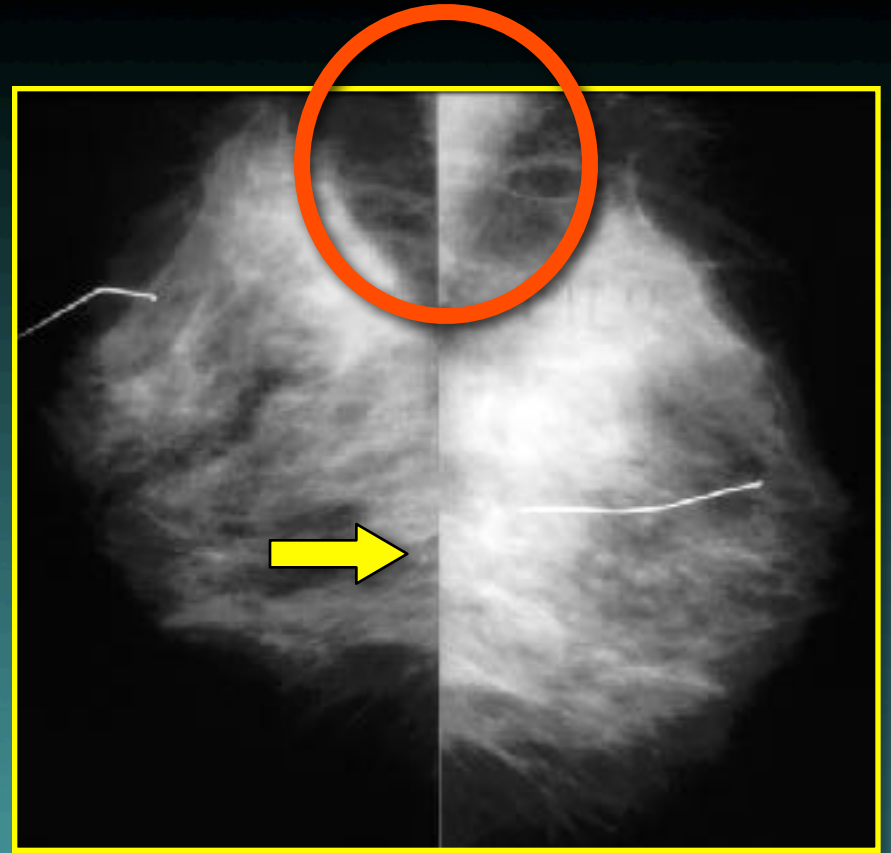
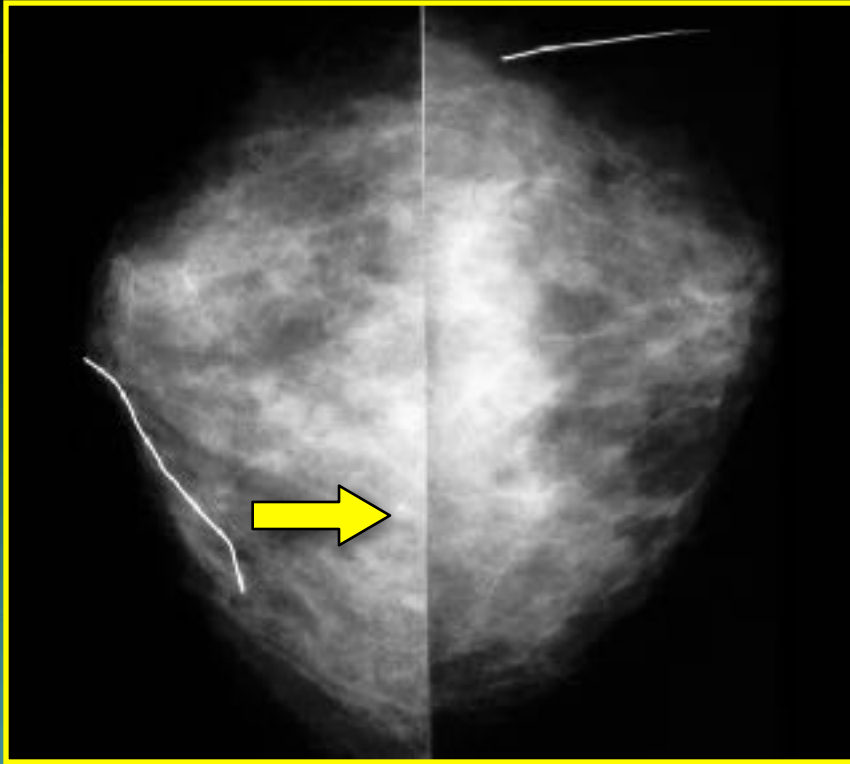


FINDING EARLY BREAST CANCER:

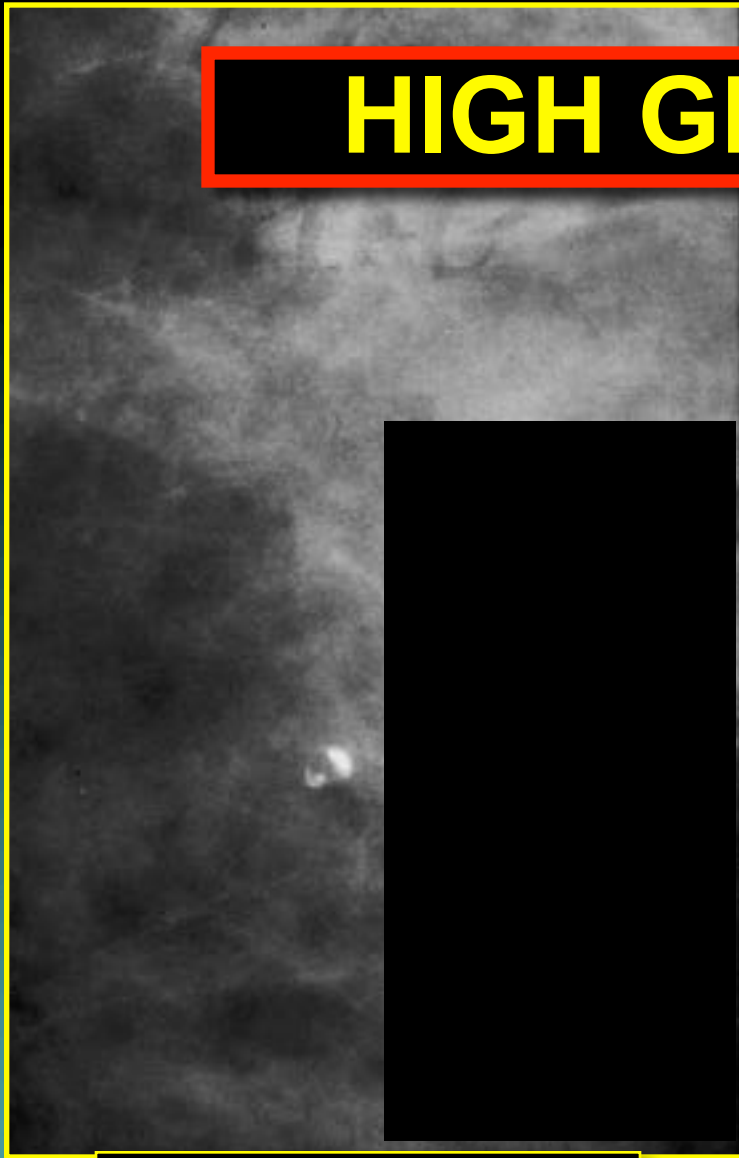
THE GROUND RULES (cont.)

- **Other helpful hints:**

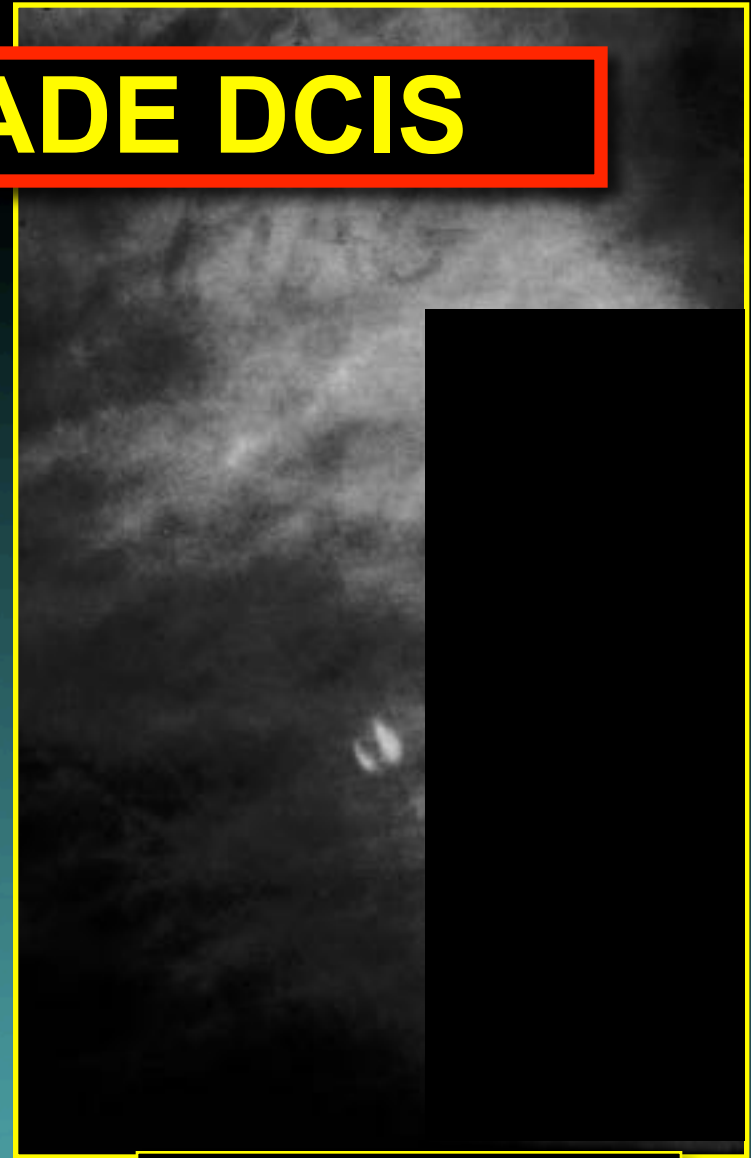
- ➔ **Look at densest area of the image one more time: if still bothers you, work it up!**
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- ➔ **Beware of multifocal or bilateral cancers: find the obvious, then keep looking!**
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HIGH GRADE DCIS



CC Mag.



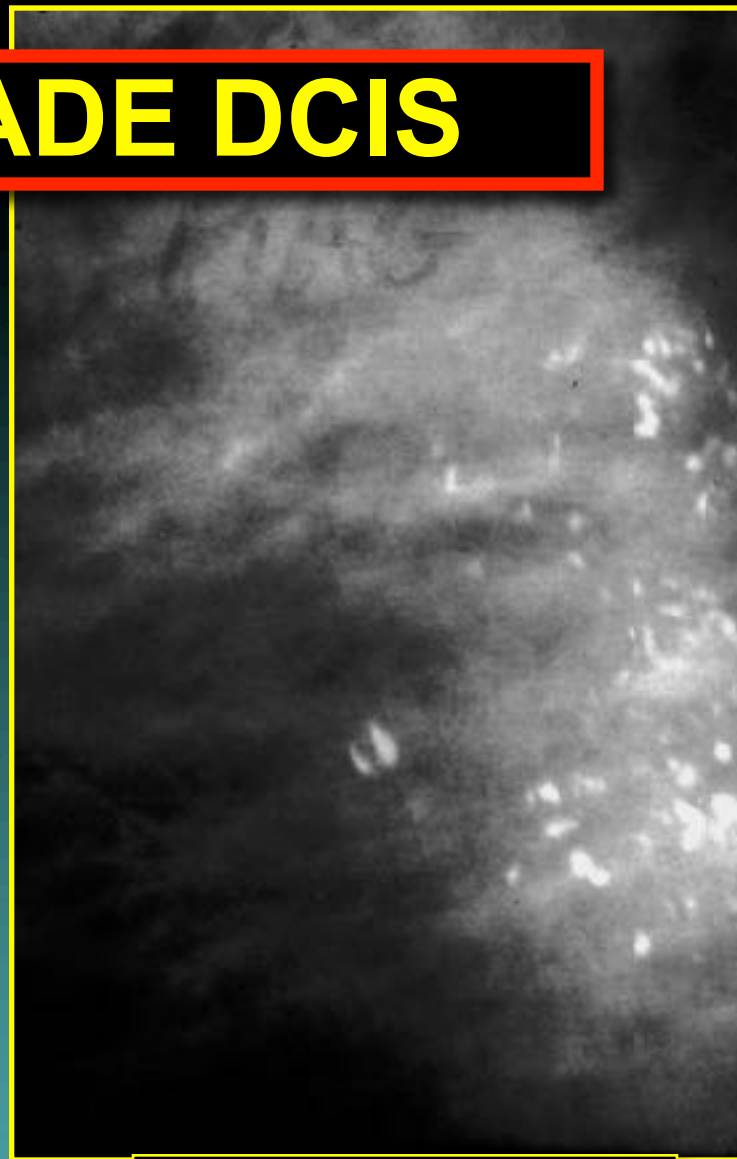
90 Mag.



HIGH GRADE DCIS



CC Mag.



90 Mag.





FINDING EARLY BREAST CANCER:

THE GROUND RULES (cont.)

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 - ➔ **Don't ignore lesion seen on one view only**
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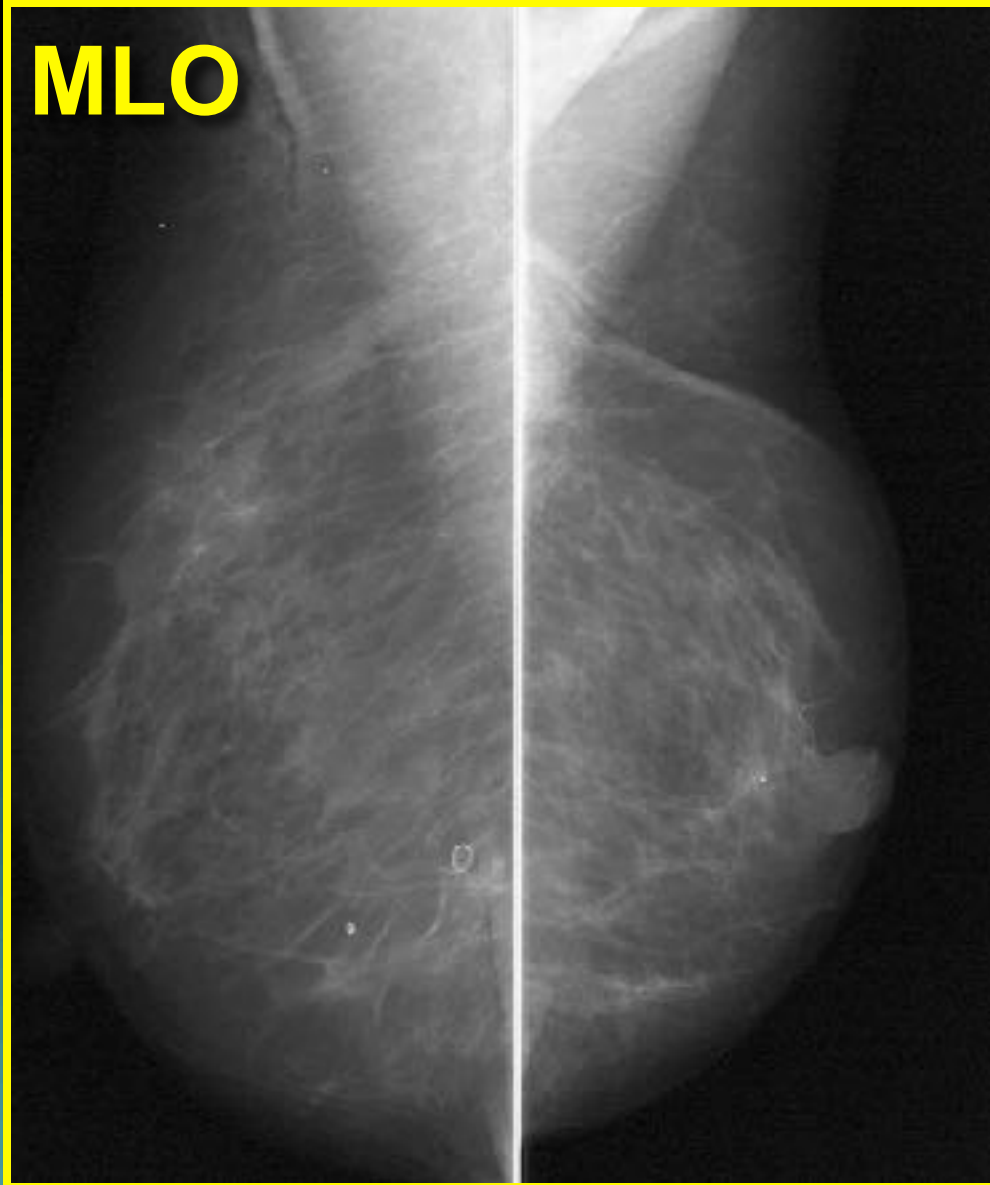
CC



BASELINE



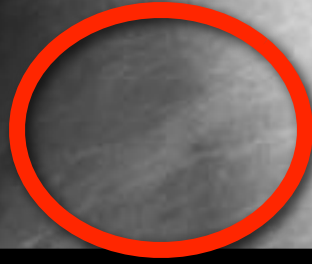
MLO



BASELINE



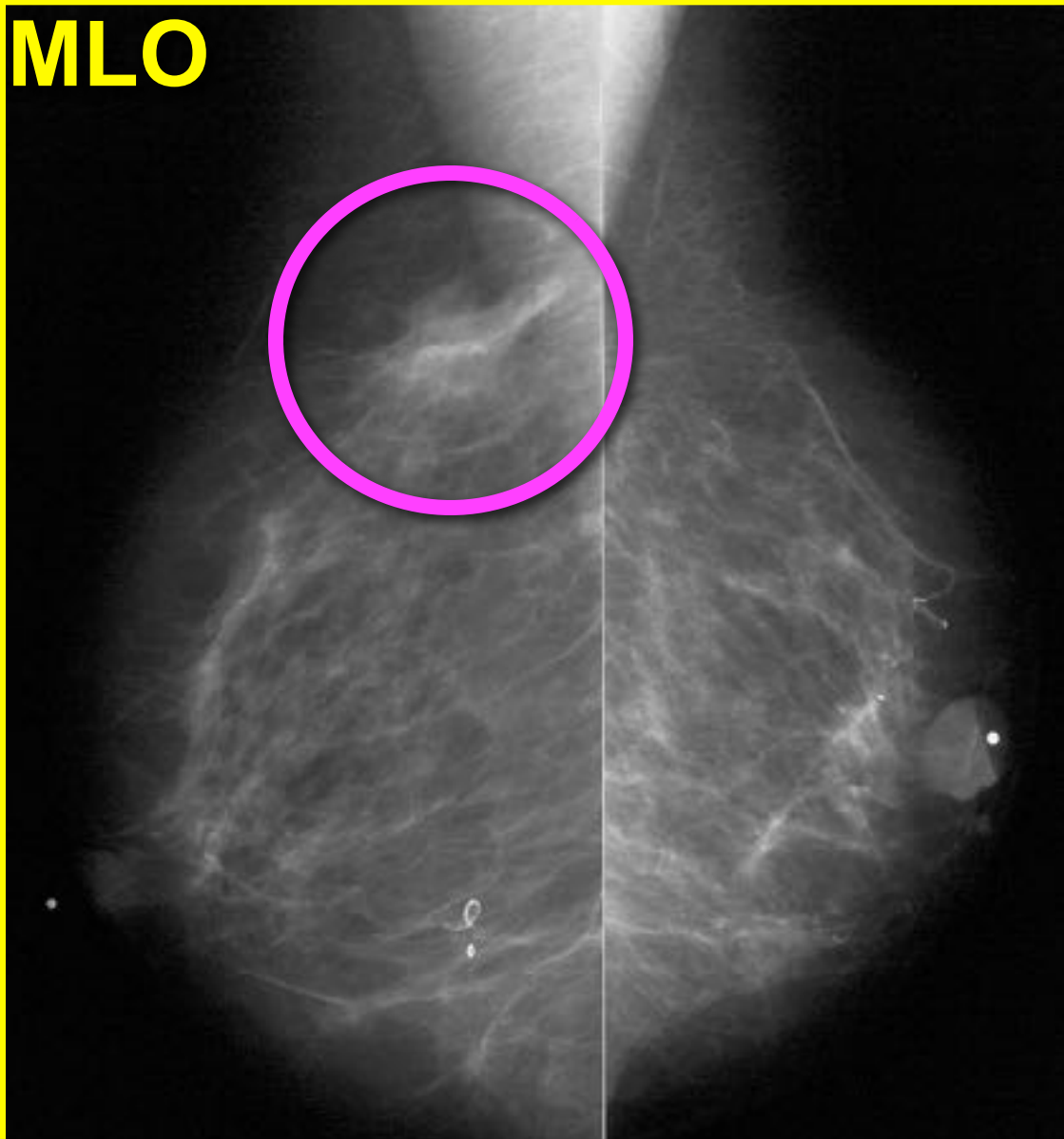
MLO



BASELINE

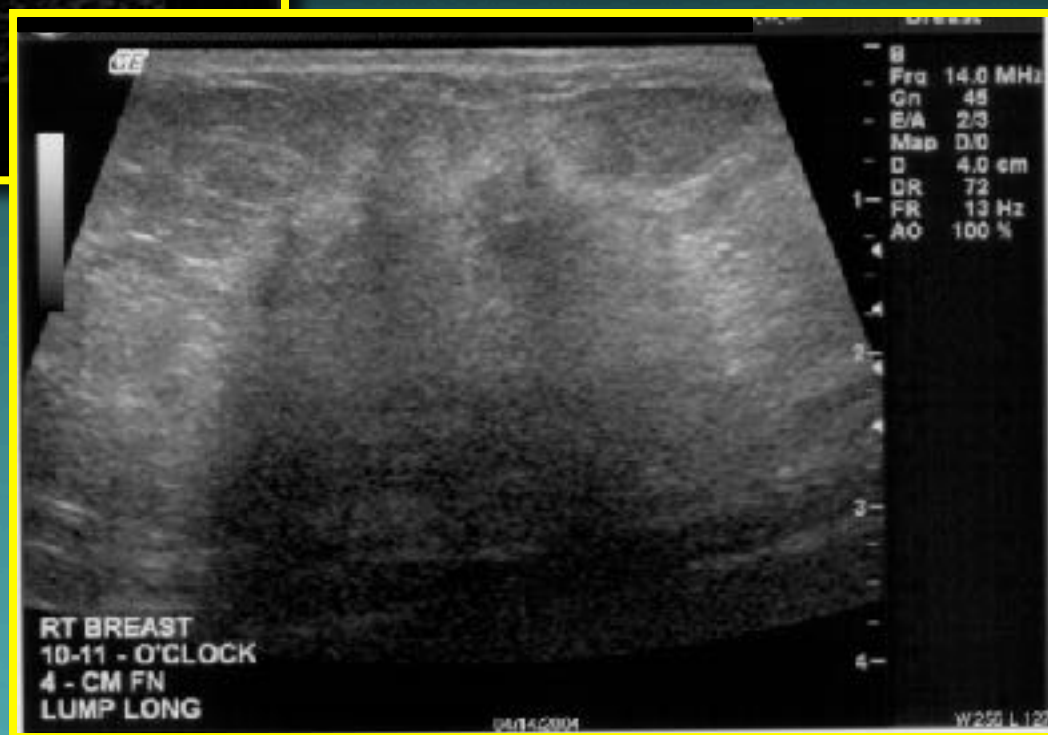
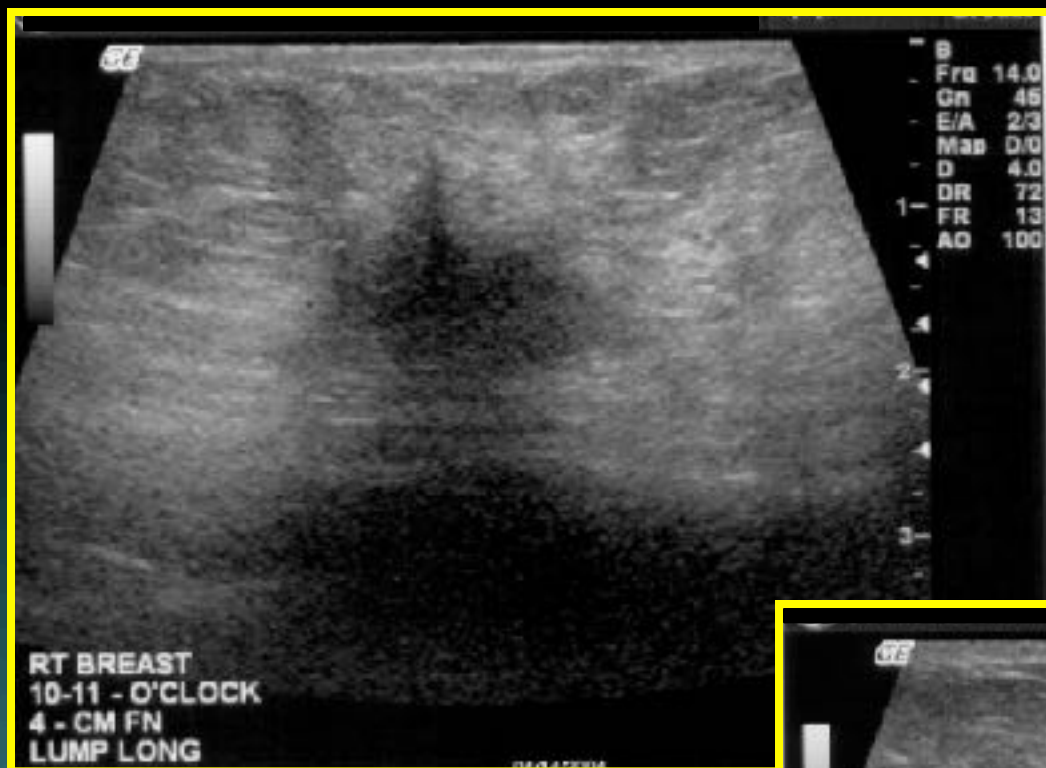


MLO



THE NEXT YEAR









FINDING EARLY BREAST CANCER:

THE GROUND RULES (cont.)

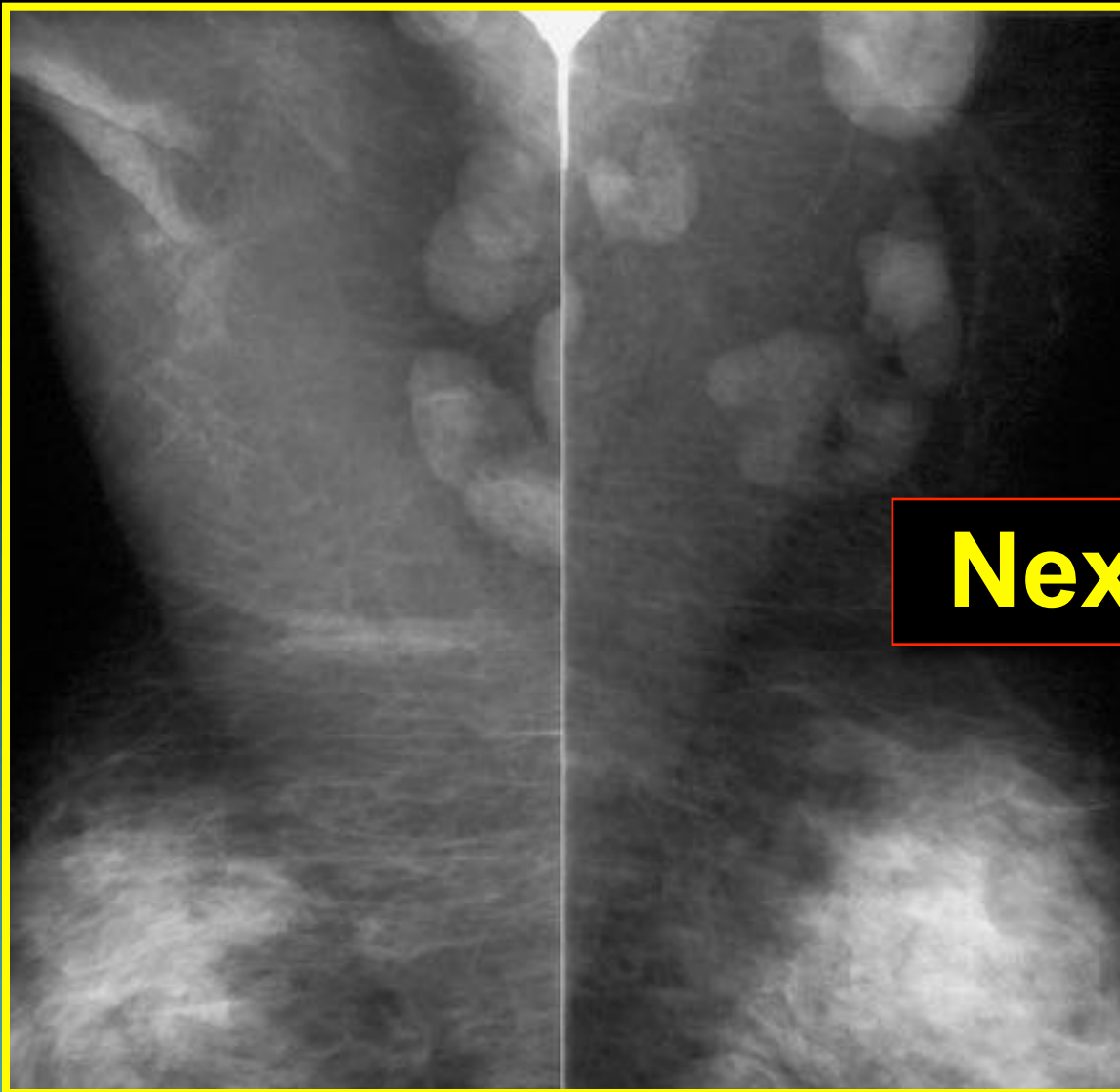
- **Other helpful hints:**

- ➔ **Look at densest area of the image one more time: if still bothers you, work it up!**
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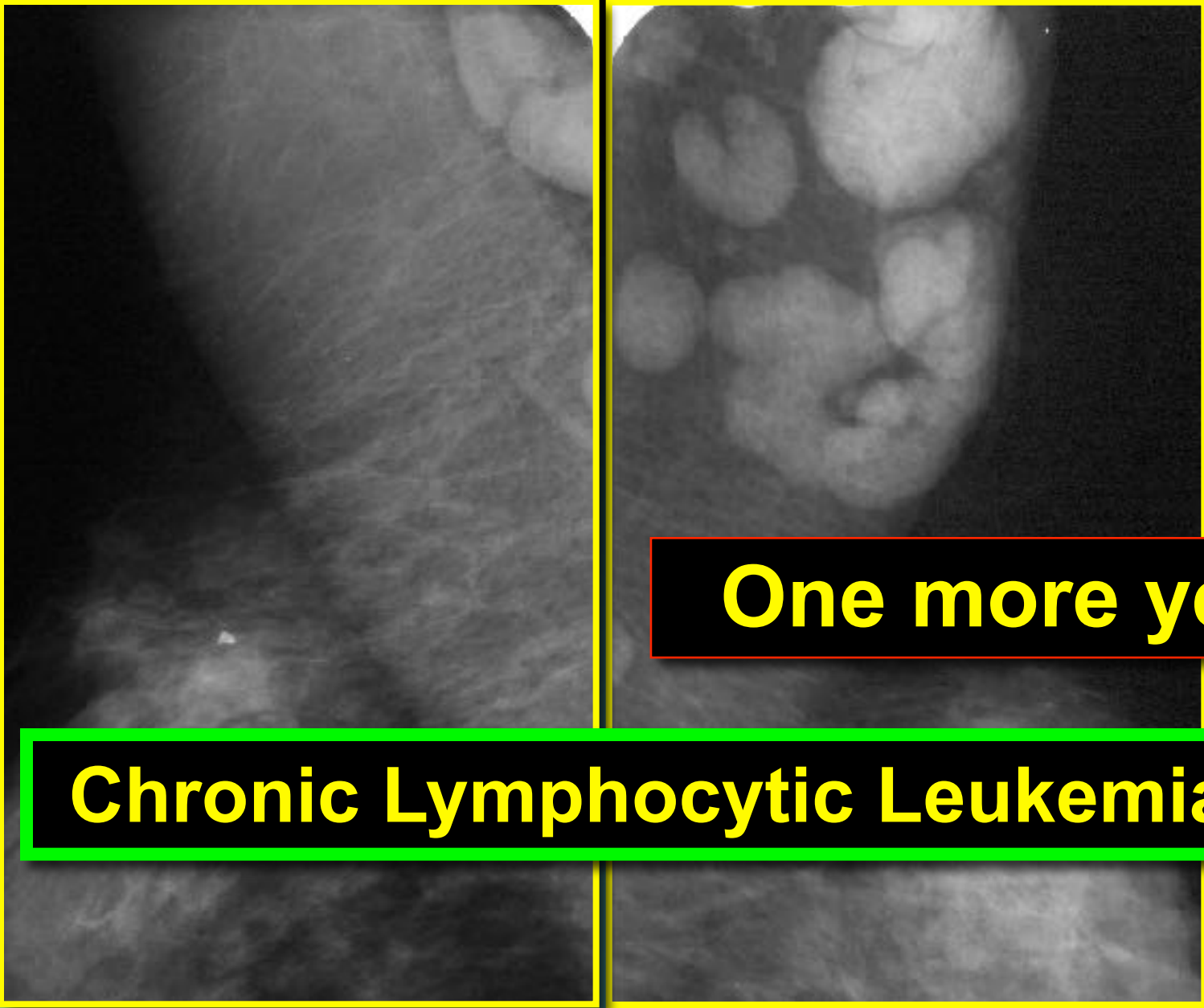
First screen





Next Year





One more year

Chronic Lymphocytic Leukemia





FINDING EARLY BREAST CANCER:

THE GROUND RULES (cont.)

- **BEWARE THE SEDUCTION OF STABILITY:**
if it looks bad, **ALWAYS WORK IT UP!**
- **Never send patient directly to biopsy from screening: ALWAYS work up first!**
 - ➔ **Show FULL EXTENT OF DISEASE** (60% are multifocal, multicentric, &/or bilateral!)
 - ➔ **The most likely patient to have a breast cancer is the one who already has one!**
 - ➔ **Better characterize lesion for best decision on whether to biopsy or not**



FINDING EARLY BREAST CANCER:

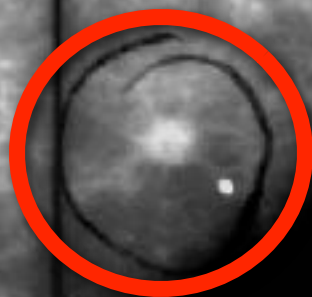
THE GROUND RULES (cont.)

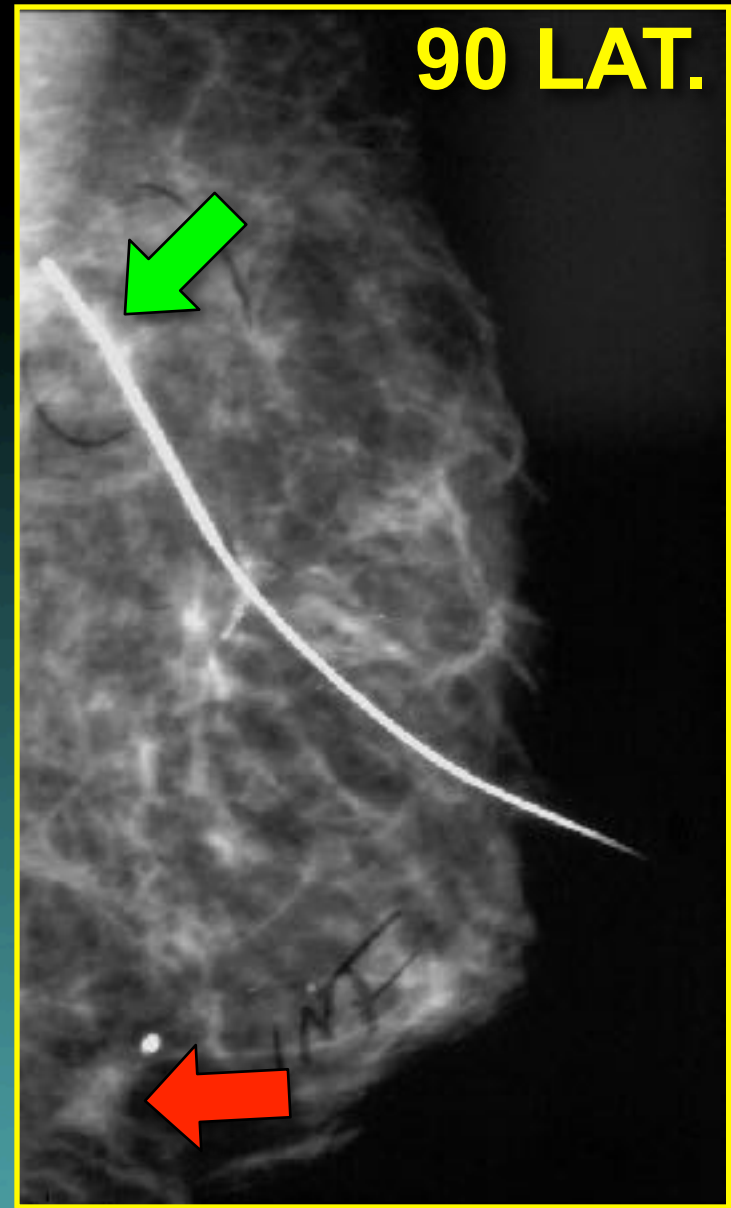
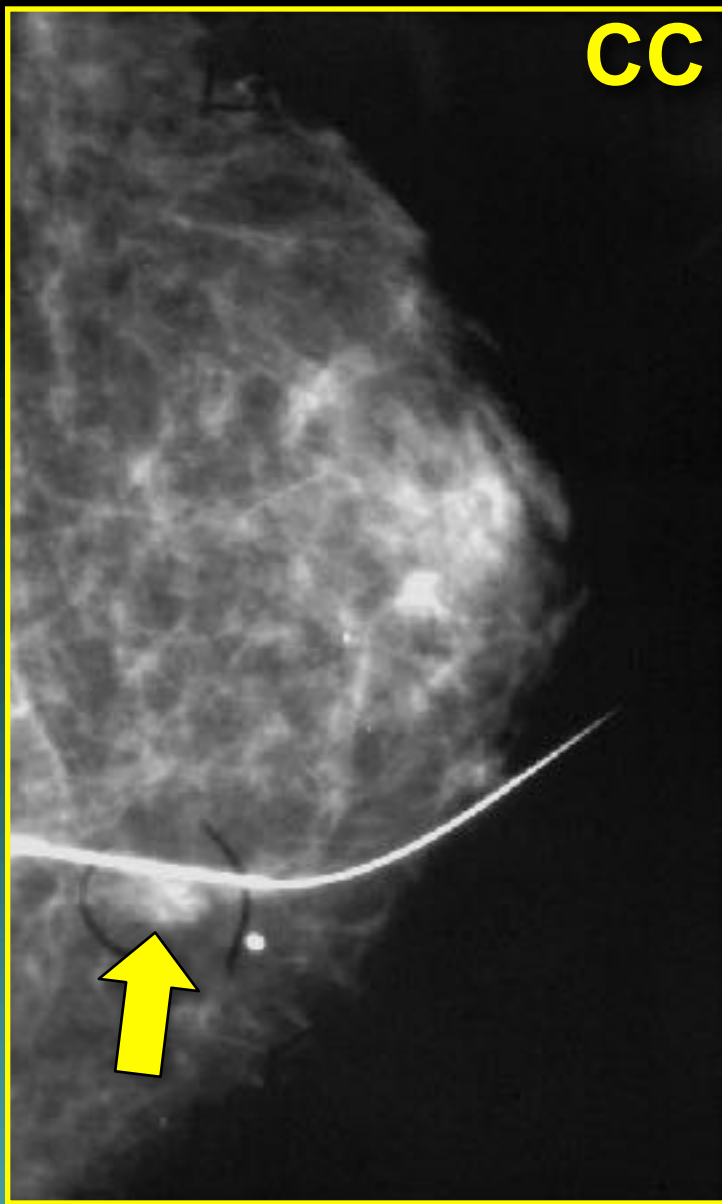
- **Never send patient directly to biopsy from screening: ALWAYS work up first!**

CC

MLO

**NO WORKUP DONE: PT. WENT
DIRECTLY TO SURGICAL BIOPSY**

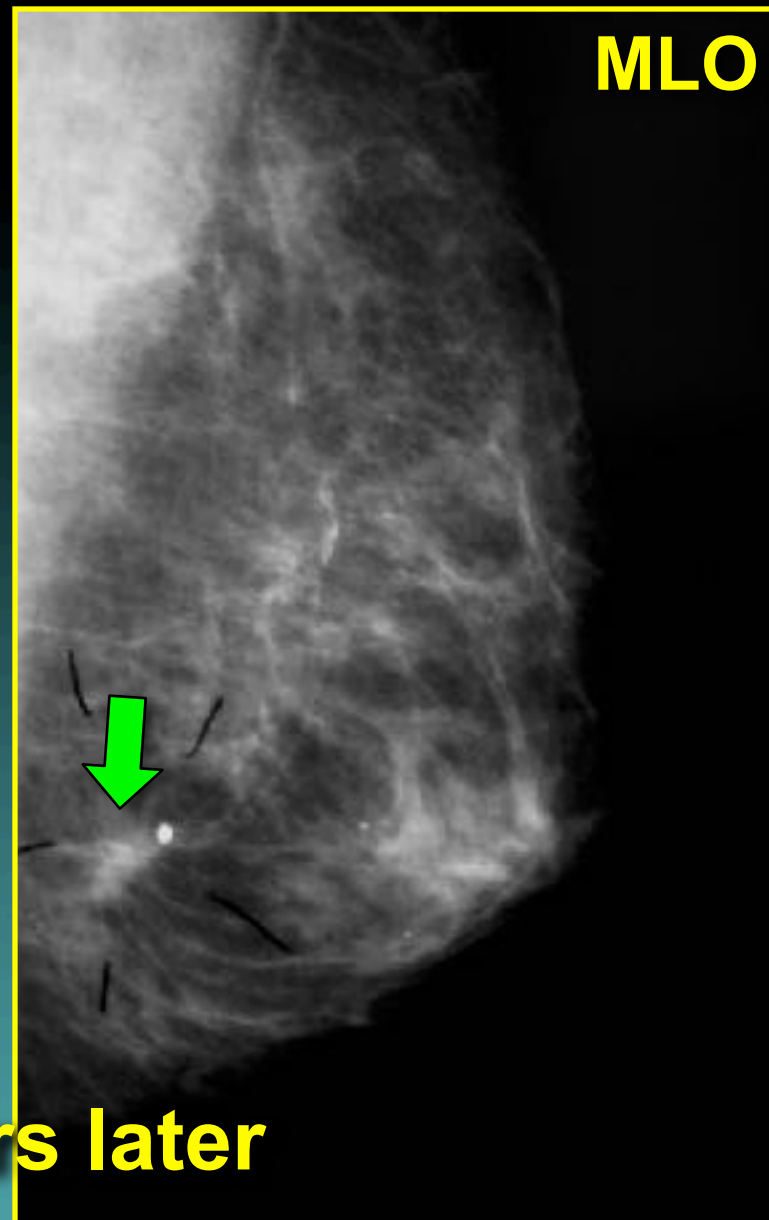
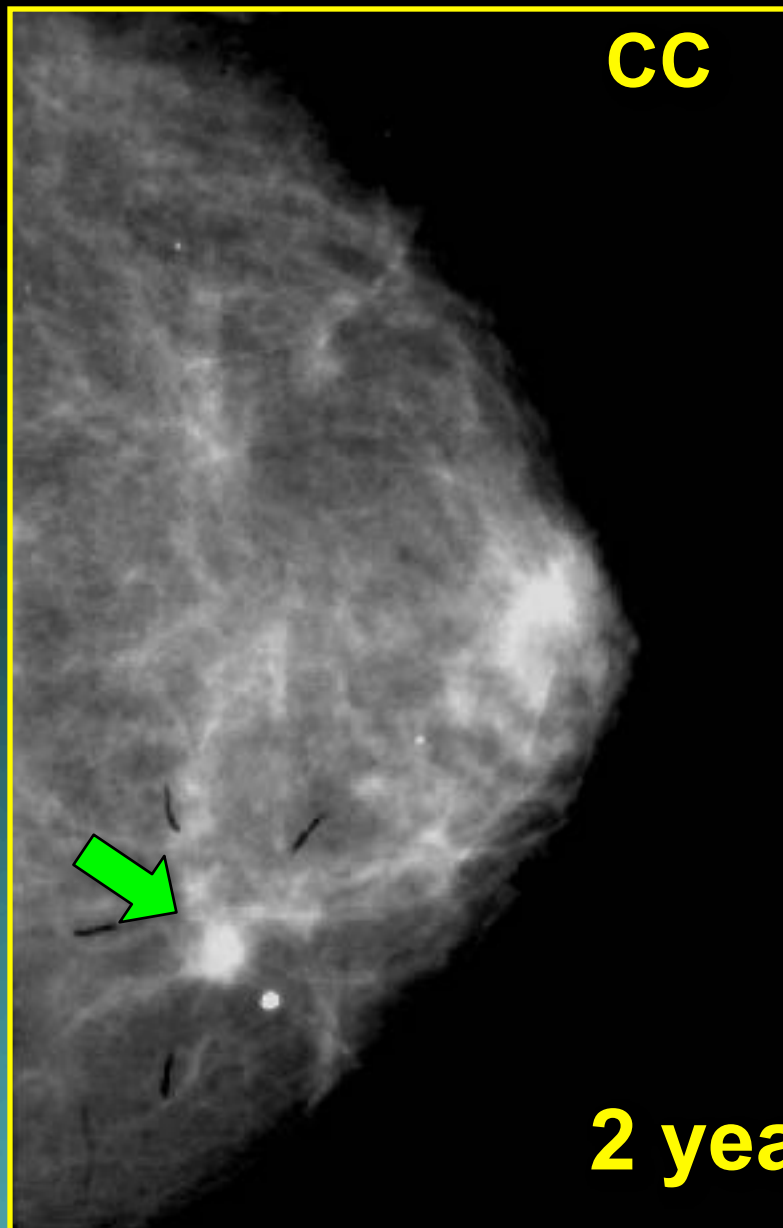


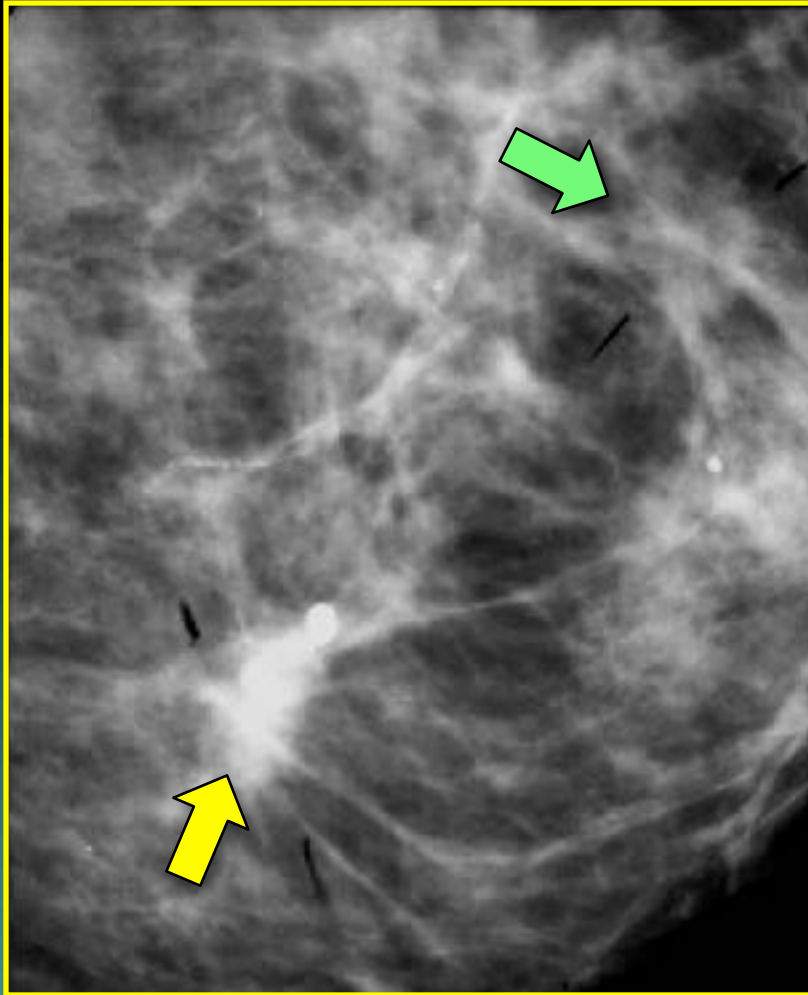




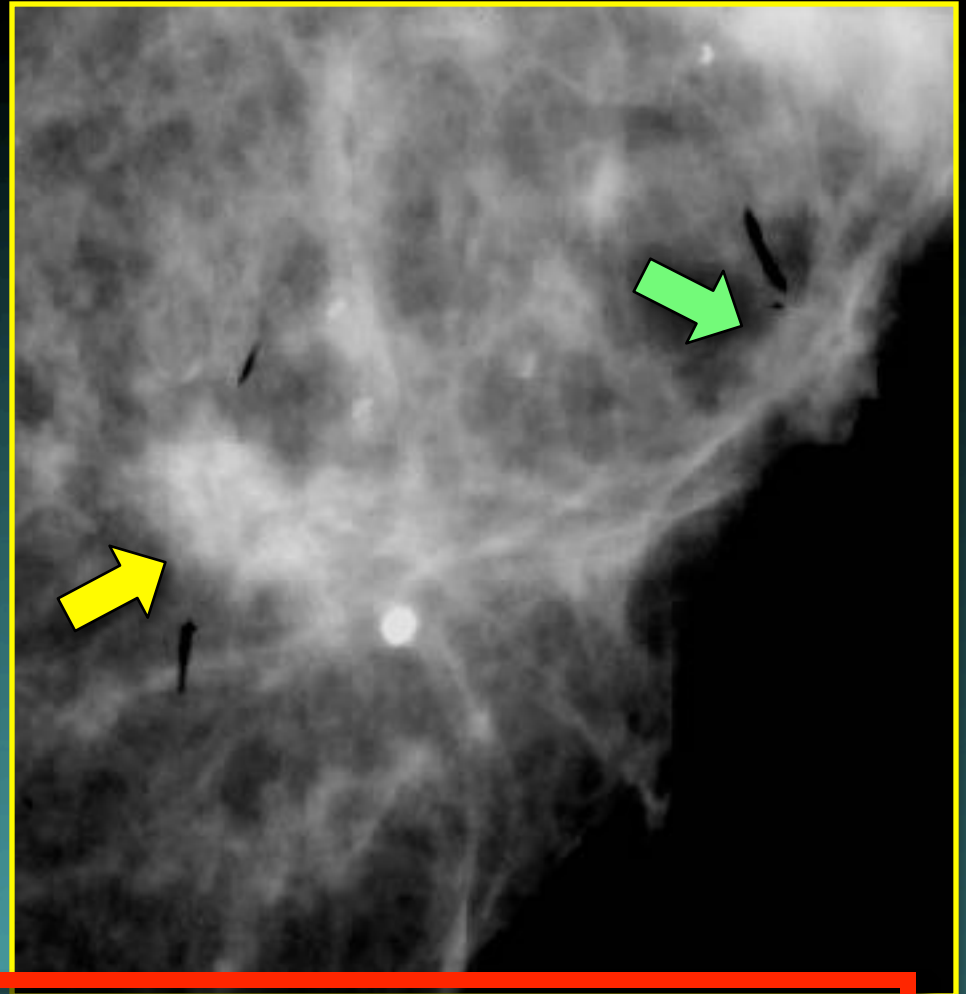
**PATH REPORT:
“FIBROCYSTIC CHANGES”**







CC MAG



MLO MAG

2 INVASIVE DUCTAL CARCINOMAS



SUMMARY: APPROACH TO SCREENING

- **Screening is not diagnosis!**
 - **Screening is about PERCEPTION, not ANALYSIS**
- **Know and follow the “ground rules” for doing screening, and be consistent!**
 - **Know what cancer looks like (in all its guises), and where it lives**
 - **Don't accept bad images**
 - **Screen under the best circumstances**

QUESTIONS OR INFORMATION :

**Email address:
MAMMOMIKE@AOL.COM**



