My patient has a breast lump

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Atlantic Medical Imaging

Breast Lump

- Any palpable abnormality detected by the patient or the physician*

*Not the same as a non-palpable mammographic abnormality

Breast Lump Evaluation

- Breast lumps are a major clinical problem because in the minds of most patients:

  Breast lump = Breast Cancer

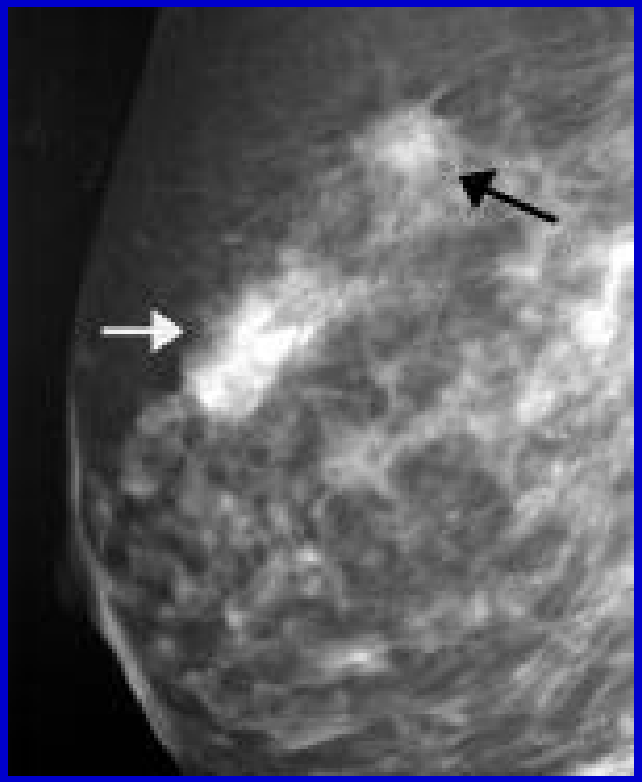
- 13% - 17% of women age 40 – 70 yrs present to their primary care physician complaining of breast symptoms within a 10 year period

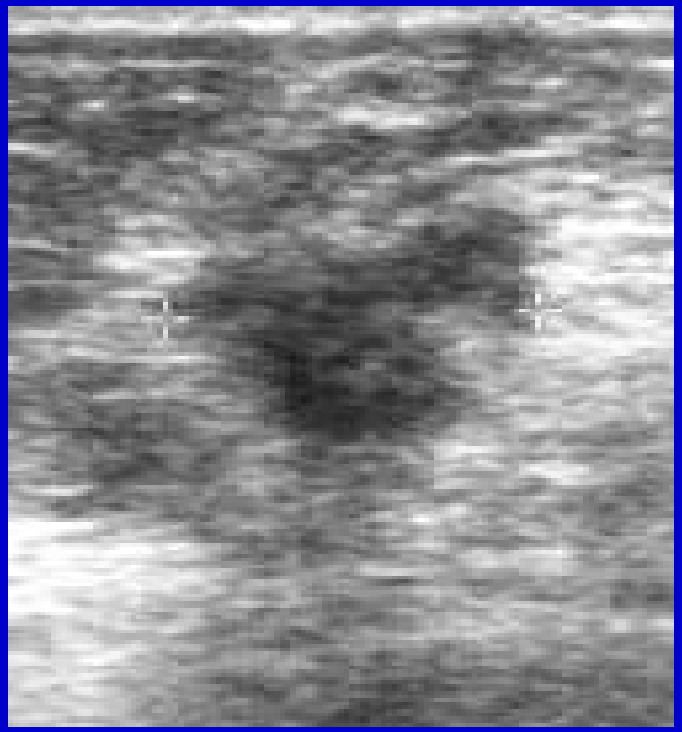
Breast Lumps

- Most result from non-cancerous (benign) causes:
  - Cysts
  - Fibrocystic breasts
  - Hamartoma
  - Injury or trauma
  - Mastitis
  - Fibroademona
  - Intraductal papilloma
  - Lipoma
  - Milk cyst (galactocele)

Breast Lump Causes

- 4% of these patients will have breast cancer





Breast Lump Evaluation

- Identify features which help distinguish benign from malignant lesions:
  - Mobile vs. fixed
  - Soft vs. hard
  - Associated findings:
    - Nipple Inversion
    - Skin thickening or dimpling
    - Nipple discharge
    - Non-cyclical pain

Breast Lump Evaluation

- Important considerations:
  - Age of patient
  - Onset and duration of symptoms
  - Risk factors:
    - Personal history of breast cancer or atypia
    - Prior radiation therapy
    - Family History
    - Estrogen exposure: early menarche, late menopause, HRT

Breast Cancer

- Common condition
- ACS: over 240,000 women are expected to develop breast cancer in 2007
  - 178,000 cases of invasive cancer (Stages I to IV)
  - 62,000 cases of carcinoma in situ (CIS)
  - > 40, 000 women will die from breast cancer (2nd leading cause of cancer deaths in American women.

Breast Cancer

- Chance of developing breast cancer increases with age
- Most cancer occurs in women over 50 y.o.
- Chance increases up to one-in-eight by age 85
- BUT 31% occurs in women younger than 50

Breast Cancer

- 80% of breast cancer occurs with NO family history
- In cases with a family history:
  - 55% have no known mutation
  - 30% BRCA 1
  - 15% BRCA 2

Breast Lump Evaluation

- Clinical history
- Physical exam
- Diagnostic Imaging:
  - Mammography
  - Ultrasound
  - MRI

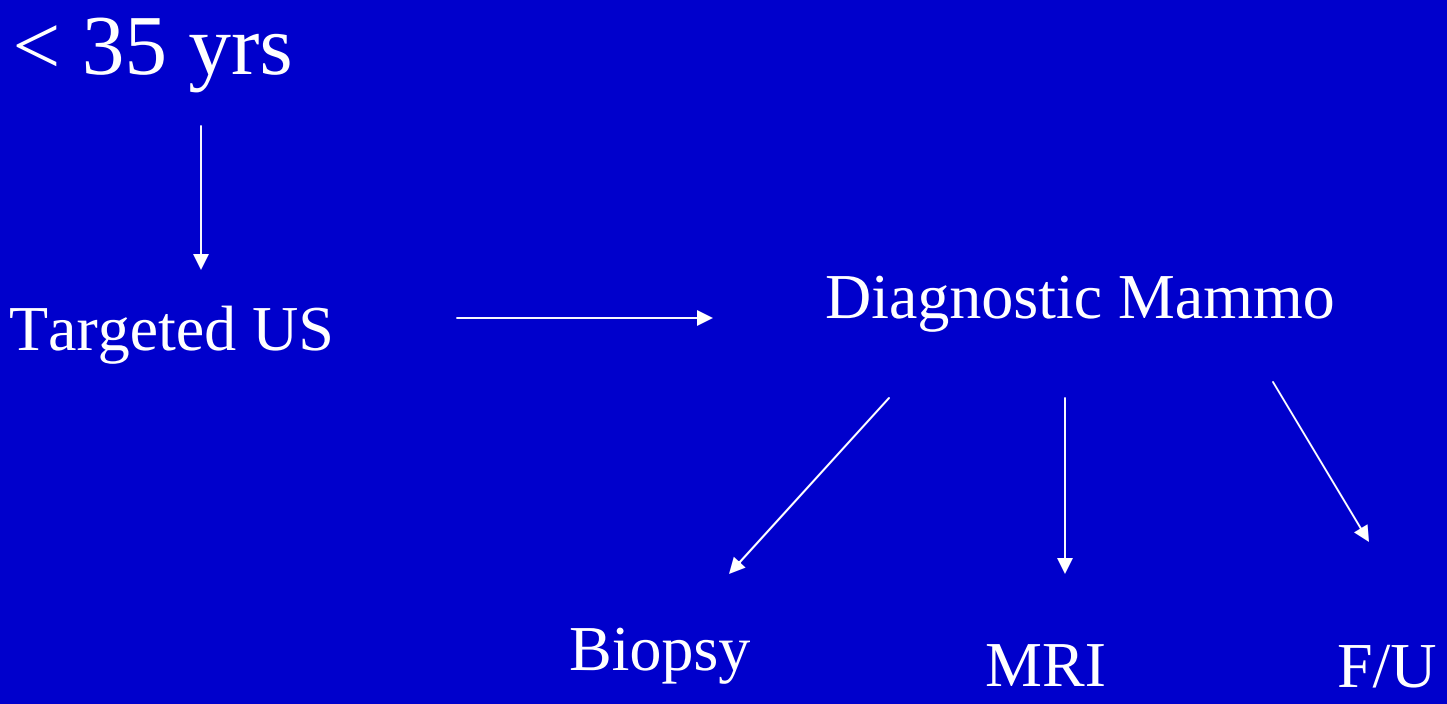
Breast Lump Evaluation

- Self-exam
  - ACS recommends breast self-exam as an option beginning at age 20
  - May help patient to detect early signs of cancer, such as a lump
- Clinical exam
  - Unless there is a family history of cancer or other high risk factor, ACS recommends clinical breast exams once every 3 years. After 40, a yearly exam

Breast Cancer Detection

- Physical exam is only 54% sensitive
- Mammography can detect up to 70%…
  - Therefore, large number of undetectable cases
- In imaging, we need all the help you can give us.
- Please provide script with LOCATION of the lump, and any other important factors

Breast Lump Imaging



Breast Lump Imaging

- > 35 yrs

Mammography

- Still the first line imaging examination for women > 35 years with a palpable lump
- It can clearly detect early, non-palpable breast cancer*

  * overall mortality is relatively stable
- ACS recommends screening mammography for all women over 40

Mammography

- Advantages
  - Quick, reliable, and proven
  - Relatively inexpensive and widely available
  - Good soft tissue characterization
  - Excellent detection of calcifications
  - Excellent negative predictive value when coupled with a negative ultrasound

Mammography

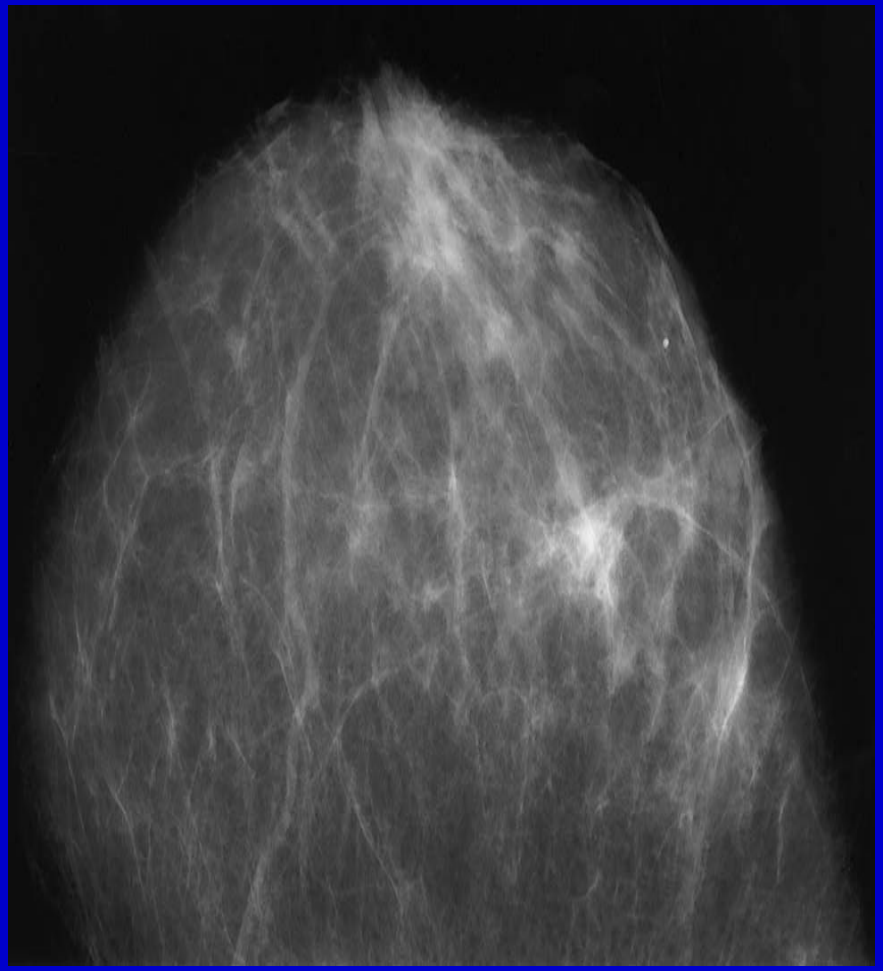
- Disadvantages
  - Reader dependent
  - Dense breast tissue (digital mammo helps)
  - Year to year variability
  - Even in the best hands, it can miss clinically palpable lumps
  - May lead to unnecessary tests and anxiety

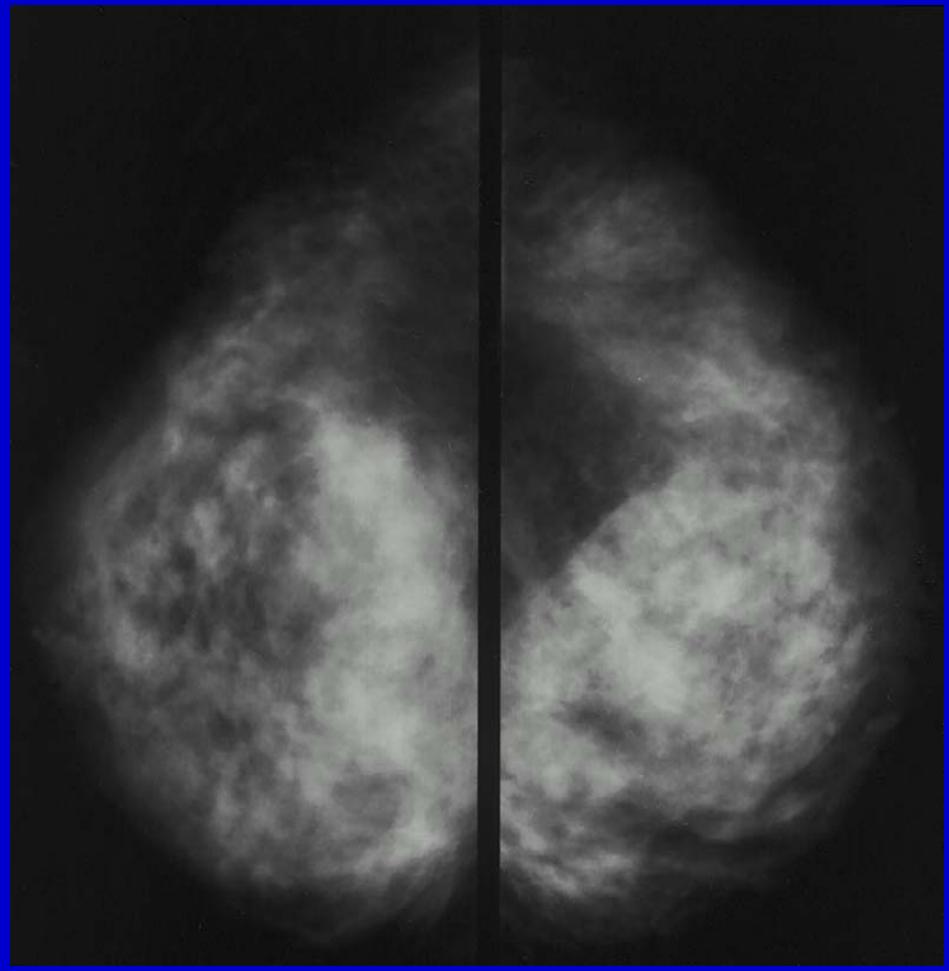
Mammography

- What are we looking for that may suggest malignancy:
  - Masses
  - Asymmetric density
  - Architectural distortion
  - Suspicious calcifications

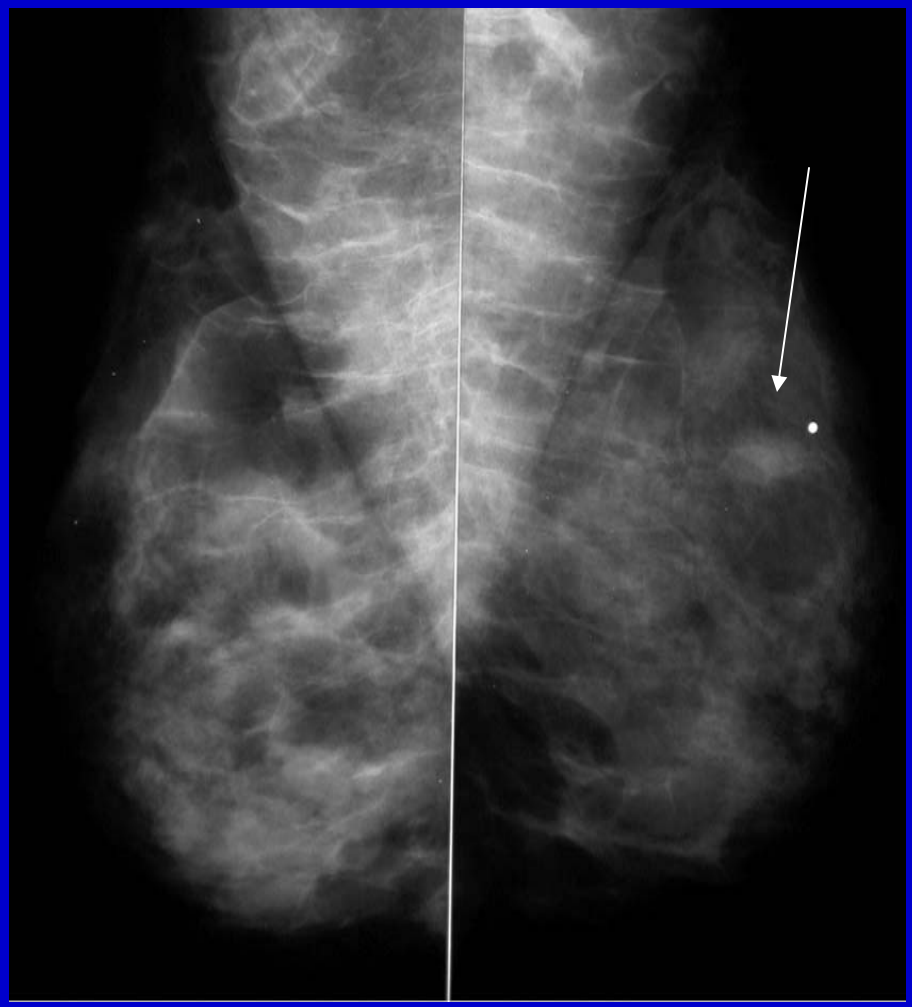
Breast Density

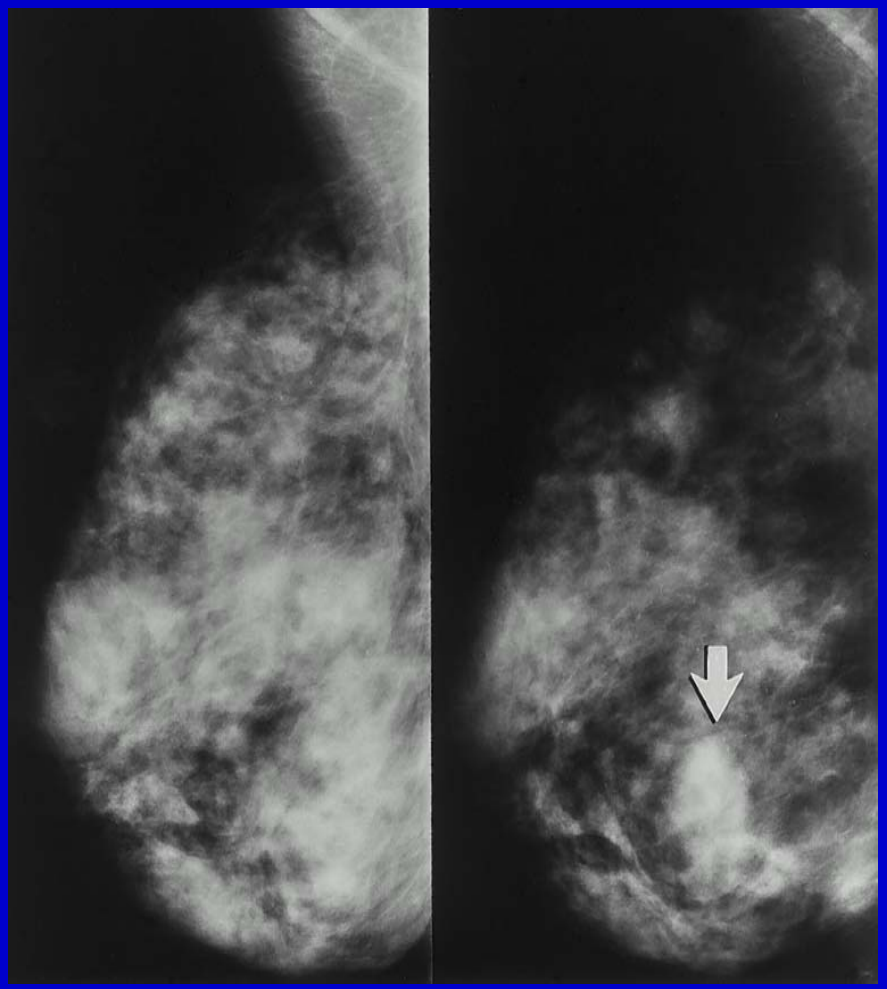
Varies from fat replaced to extremely dense; affects detection of an abnormality on mammography



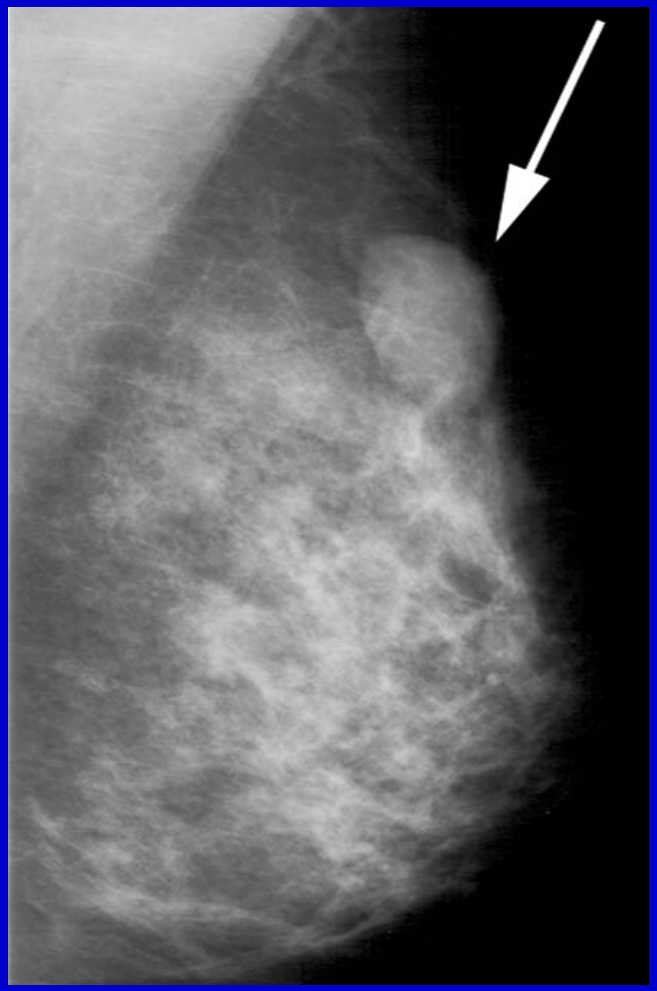


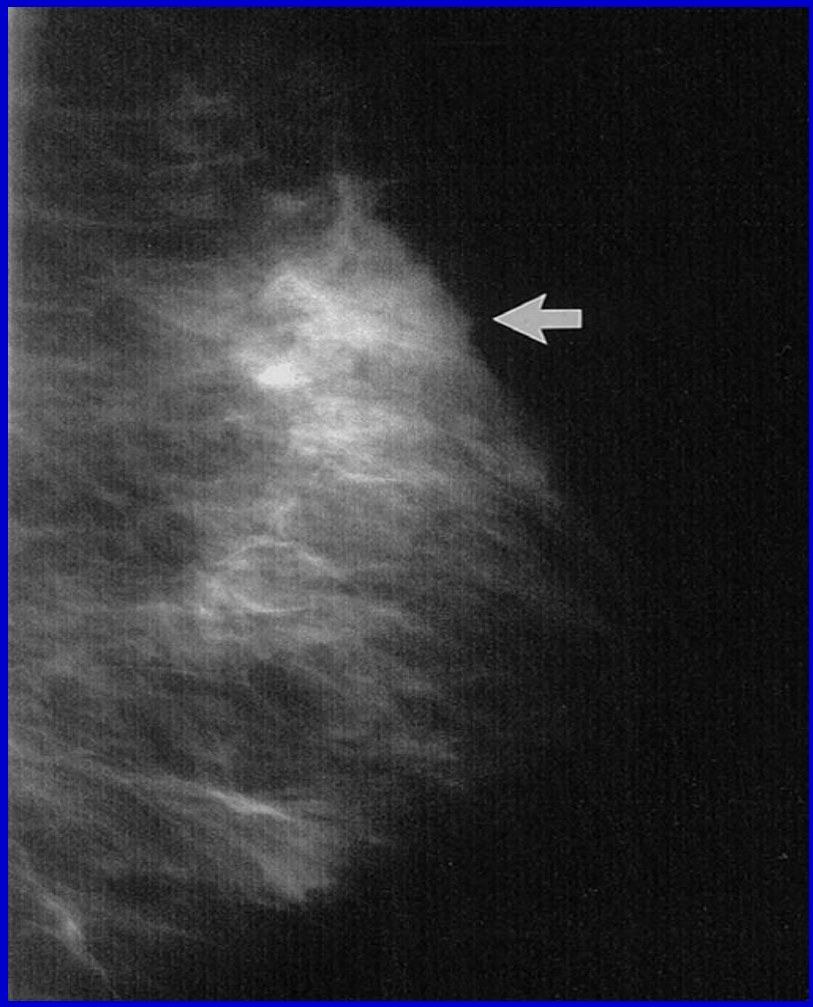
Masses



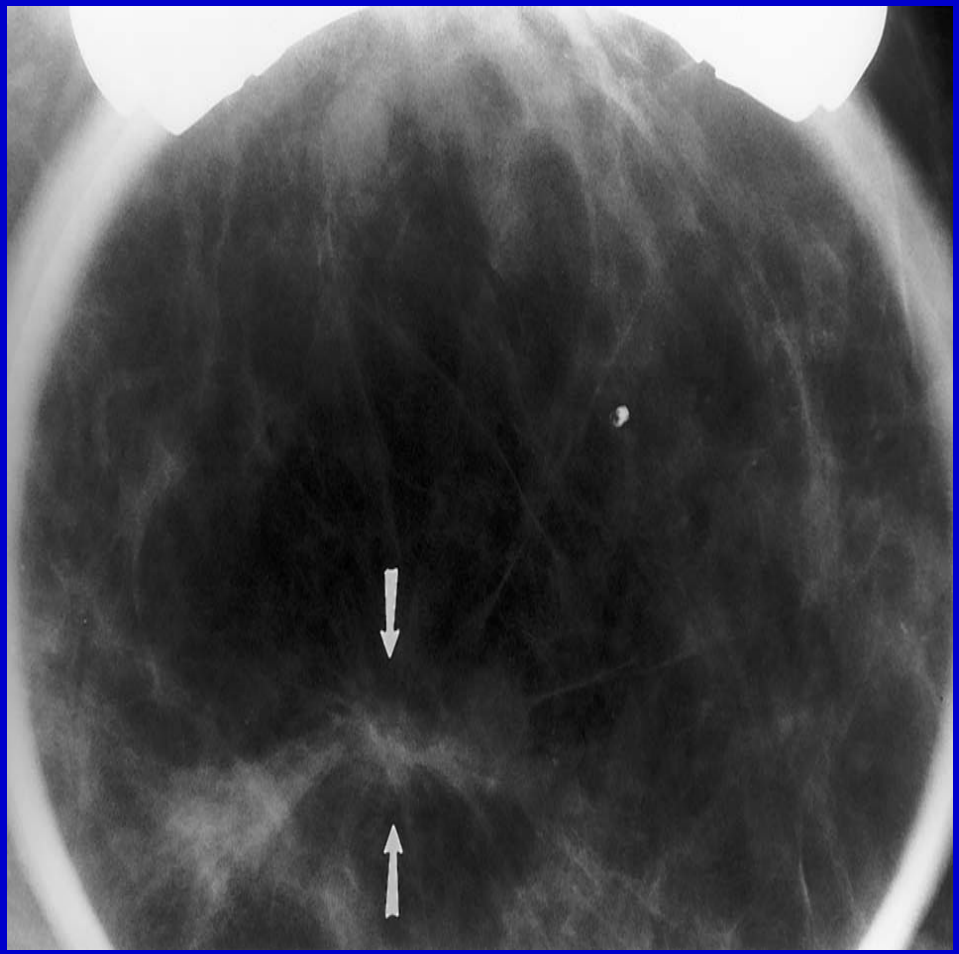


Masses

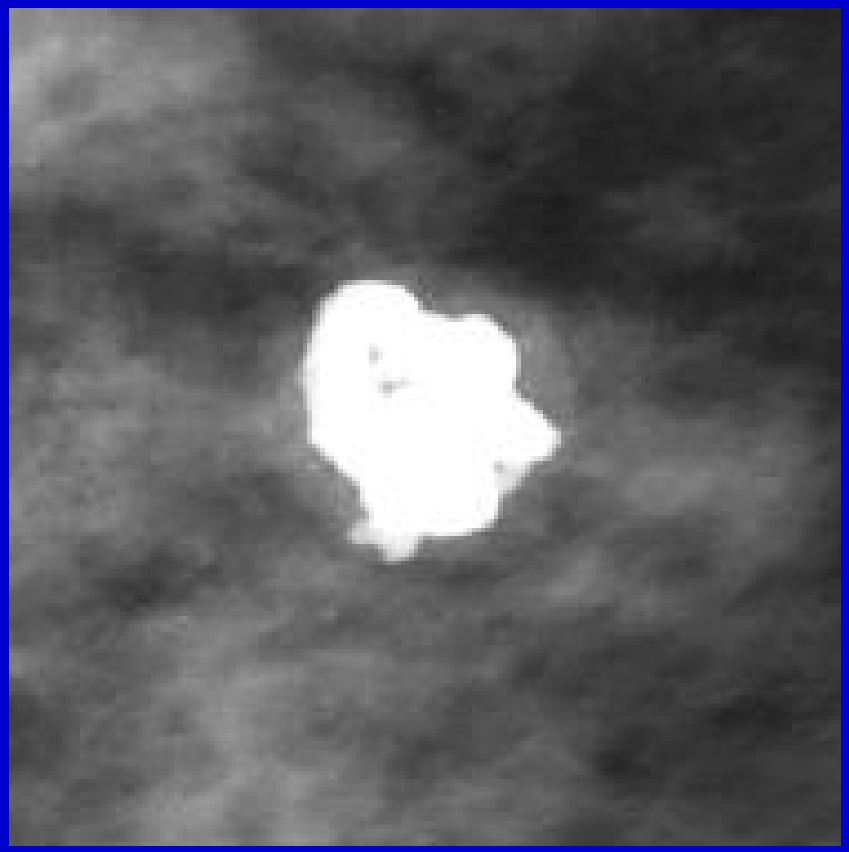




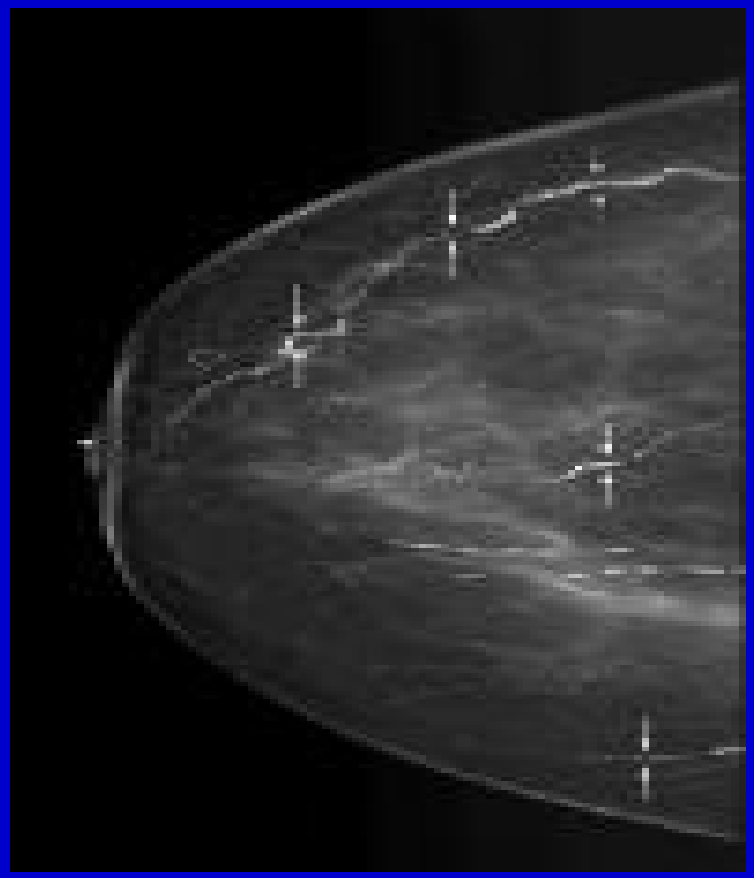
Architectural Distortion



Calcifications (Benign)



Fibroadenoma



Vascular

Calcifications (malignant)

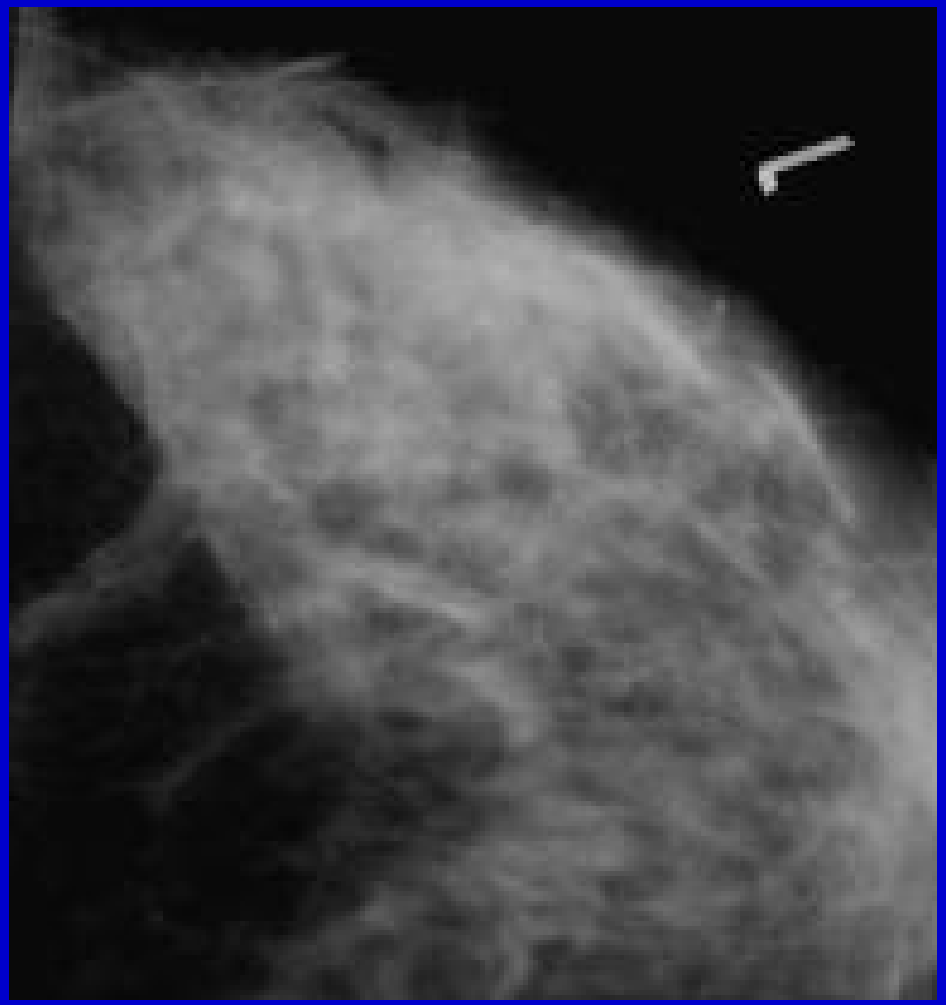
Findings suspicious for CA:

- Linear and irregular branching

- Pleomorphic: varying sizes and shapes

- Clustering

- Linear or segmental distribution



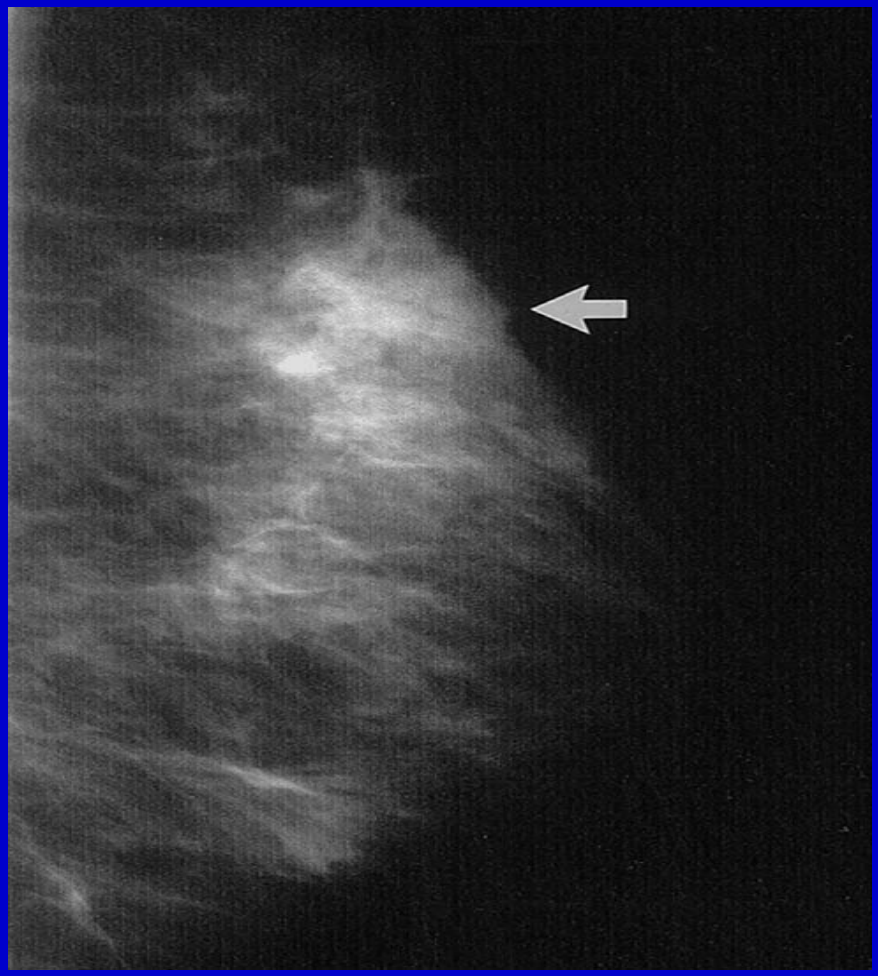
Ultrasound

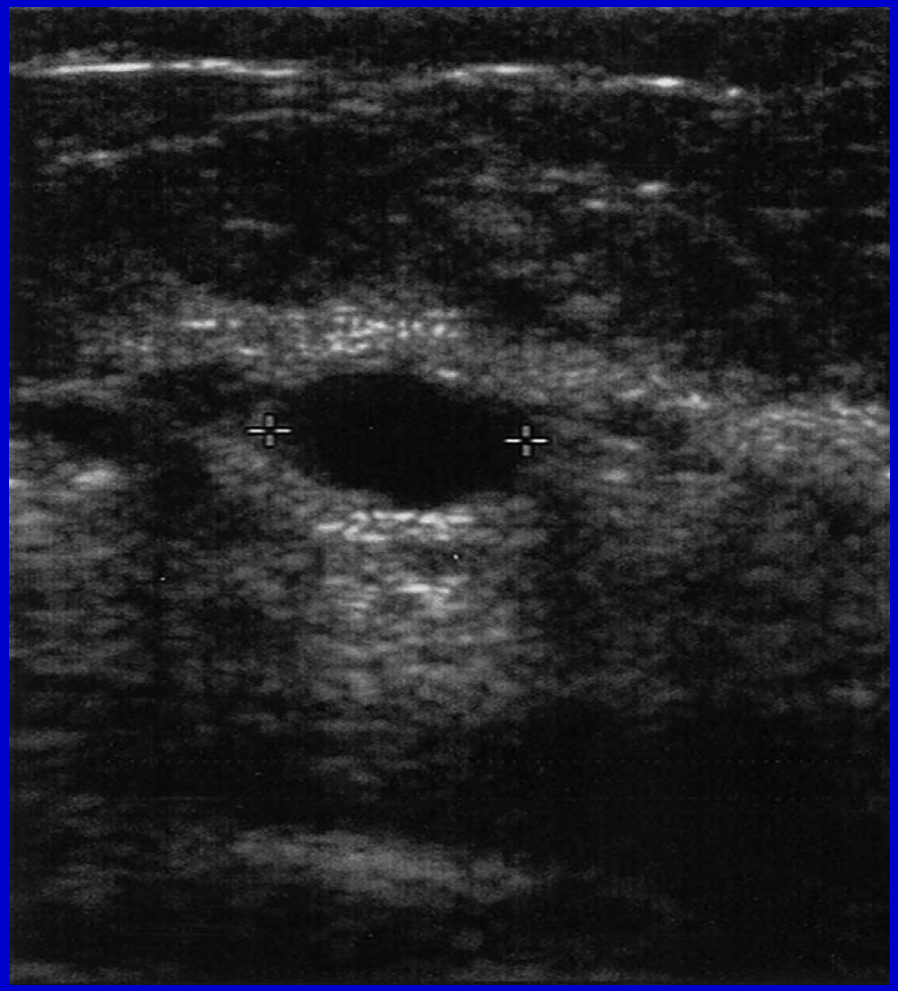
- Advantages:
  - Quick, reliable, and proven
  - Excellent supplement to an abnormal physical exam and/or abnormal mammogram
    - Relatively inexpensive and widely available
    - No radiation exposure; no contrast needed
    - Excellent soft tissue characterization
    - Can be coupled with Doppler evaluation

Ultrasound

- Disadvantages:
  - Benign and malignant lesions can have overlapping US features
  - Operator dependent
  - Can miss clinically palpable and mammographic masses.
- Not recommended to be used for screening exam

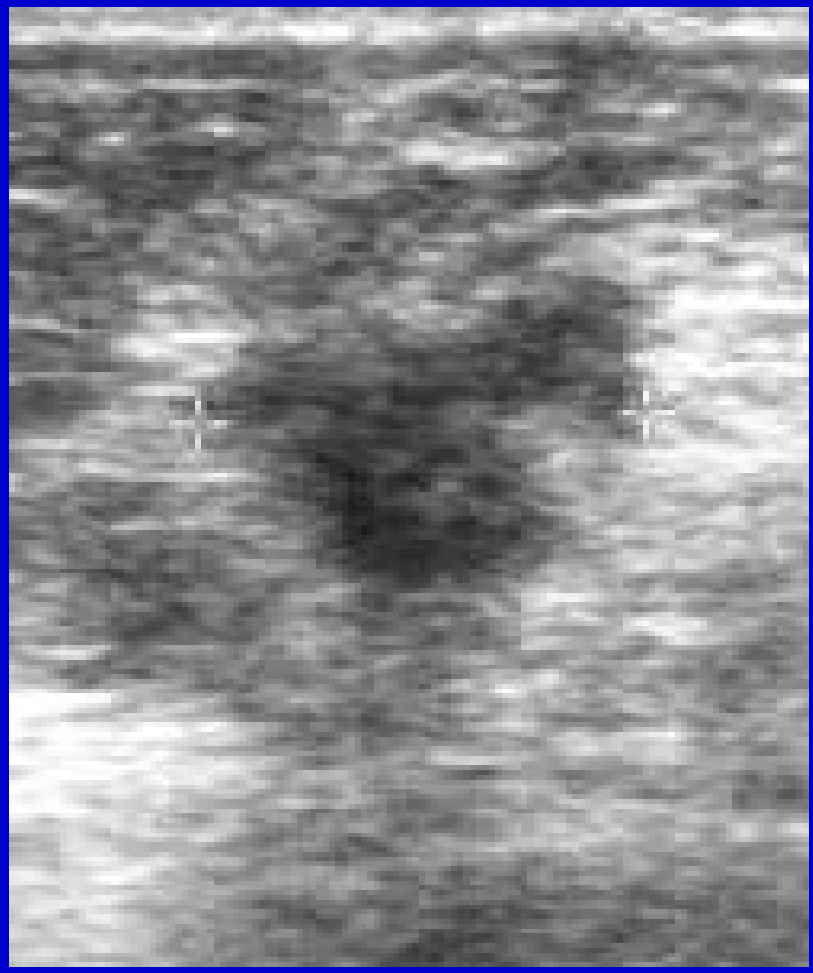
Focal breast mass on Mammogram, Benign cyst on US



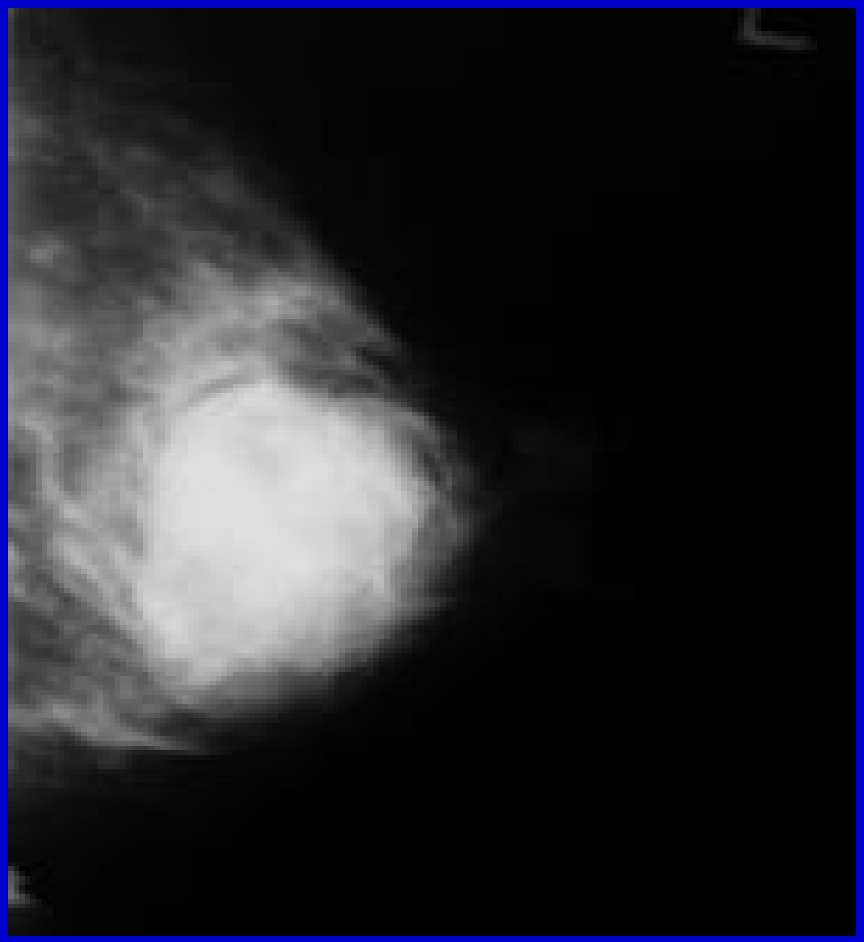


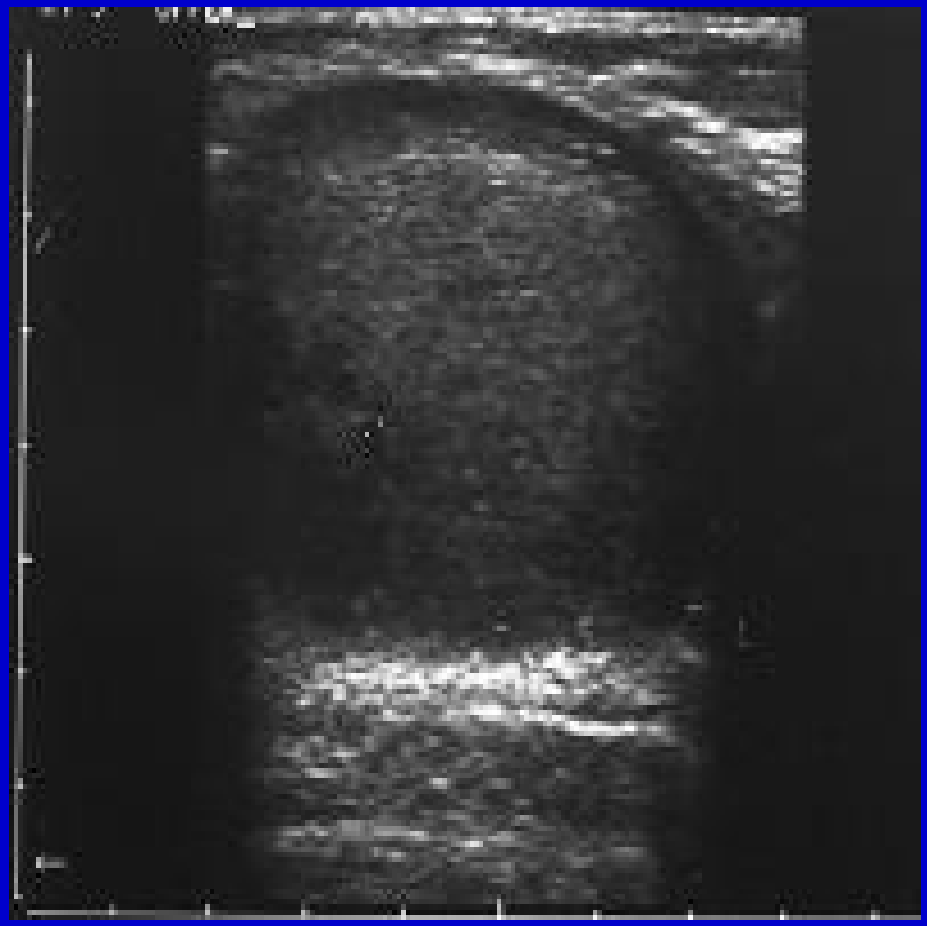
US findings suspicious for CA

- Echogenic appearance (hypo- to hyperechoic)
- Vertical (“taller than wide”)
- Irregular / ill-defined edges
- Posterior shadowing



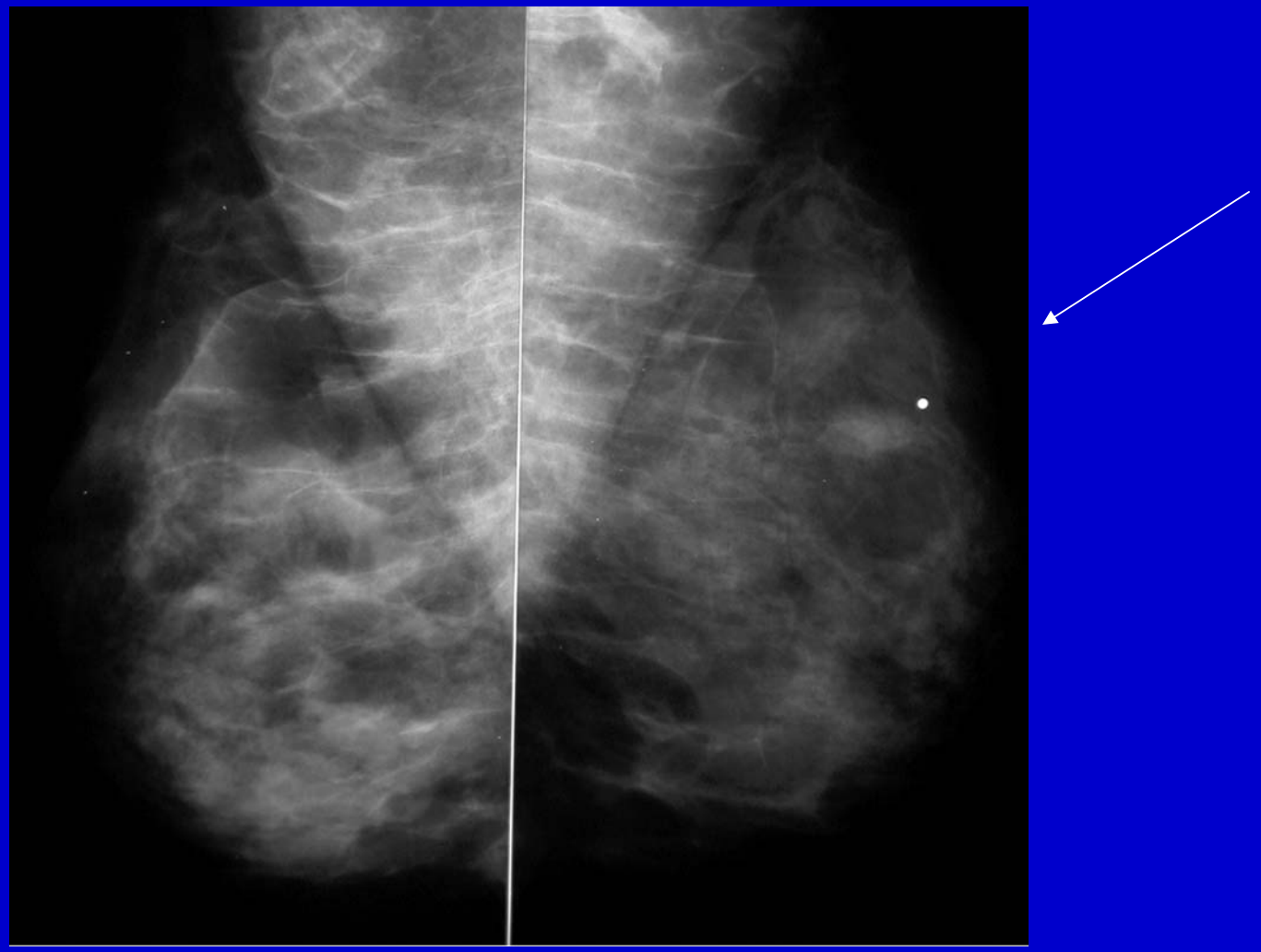
Focal mass on mammogram solid process on US



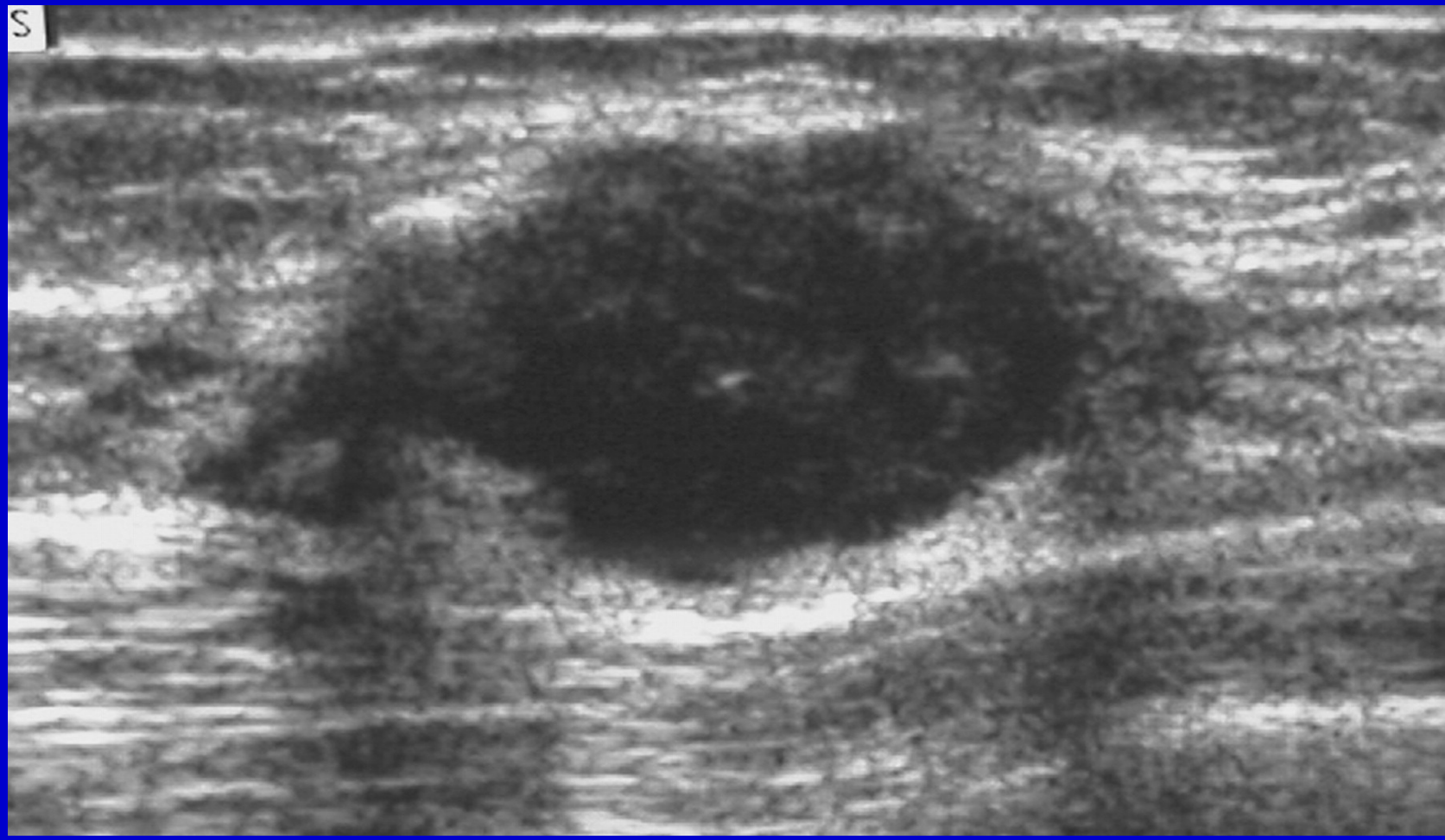


Fibroadenoma

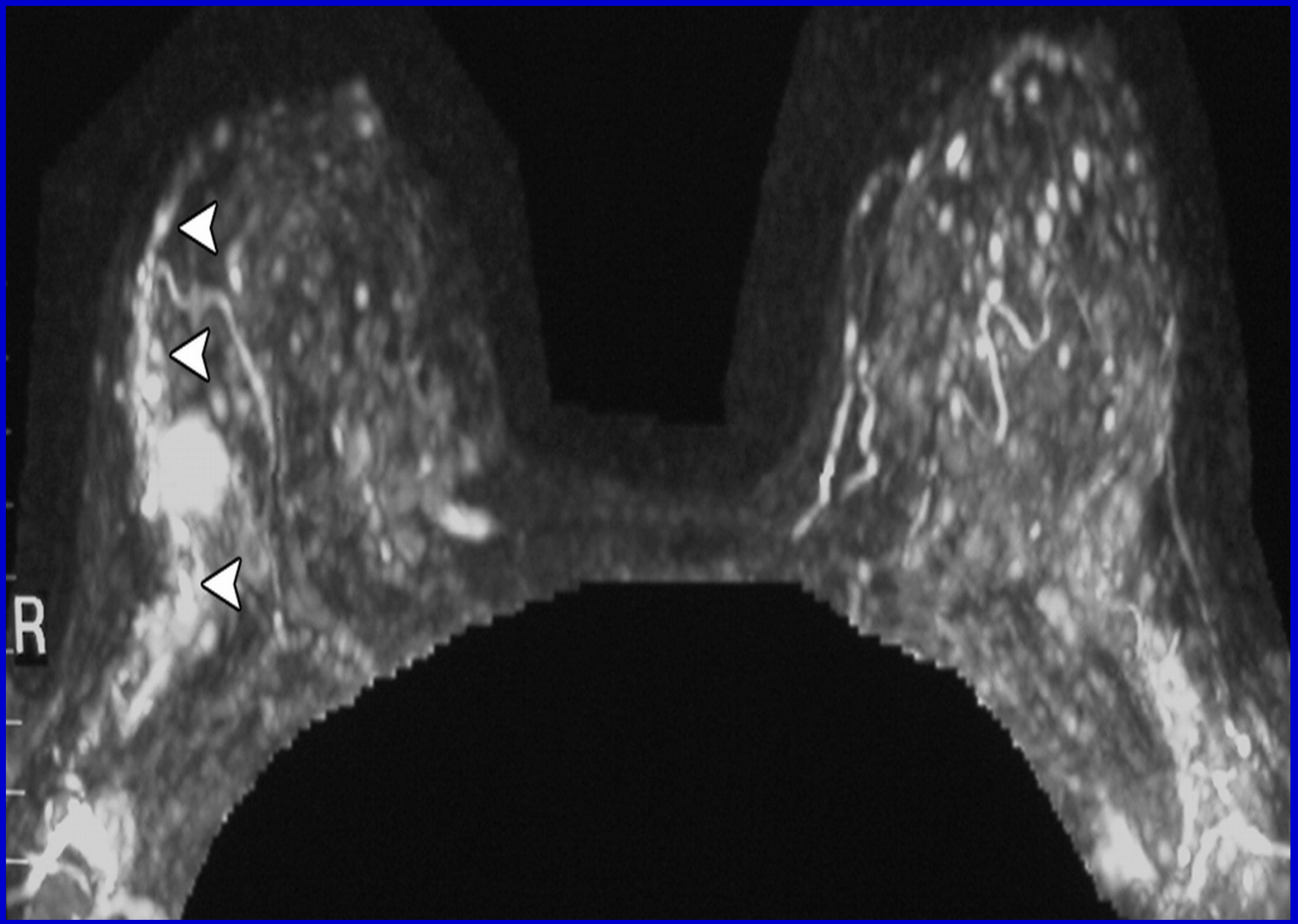
44 y.o. with right breast lump



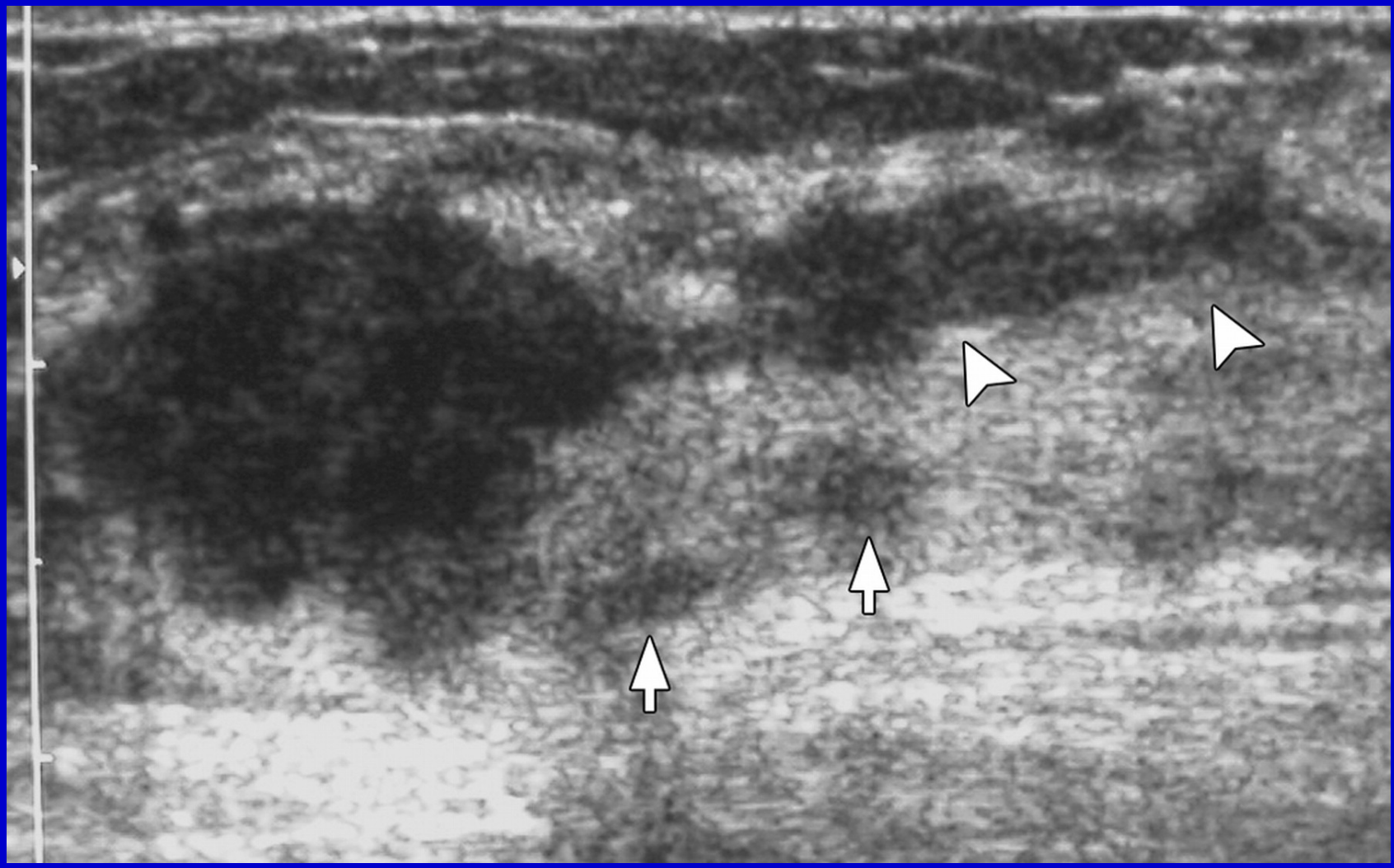
44 y.o. patient with right breast mass, US



Patient with right breast mass, MRI C+ image



2nd Focused US of right breast



MRI

- Advantages:
  - 3D imaging
  - Excellent supplement to equivocal mammo/ US/physical exam
  - Use of IV contrast; dynamic imaging can help distinguish between benign and malignant lesions

MRI

- Disadvantages:
  - Expensive, and not widely available
  - High sensitivity (86 – 100%), but low specificity (47 – 67%) in detection of malignancy, hence high rates of false positive results.
  - Inferior to mammography in detection of carcinoma in situ (CIS)

MRI

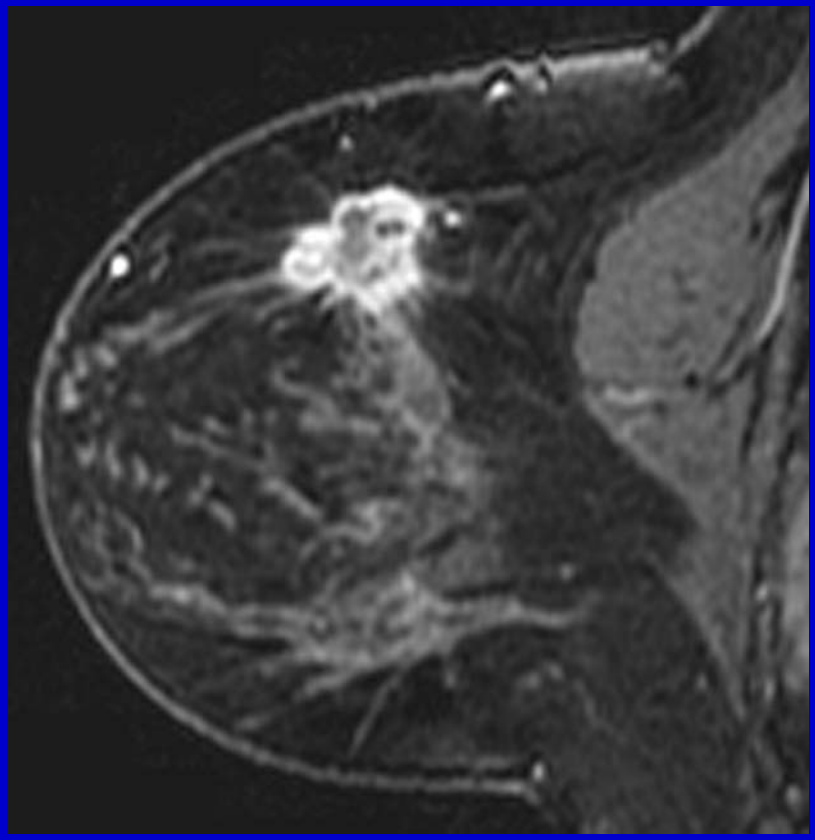
- Indications remain to be defined
- Should not be used in place of full mammographic and US work-up
- Current indications:
  - Equivocal mammo/ US/ physical exam results
  - Axilliary node malignancy with unknown, but suspected breast cancer
  - Follow-up during chemotherapy

MRI

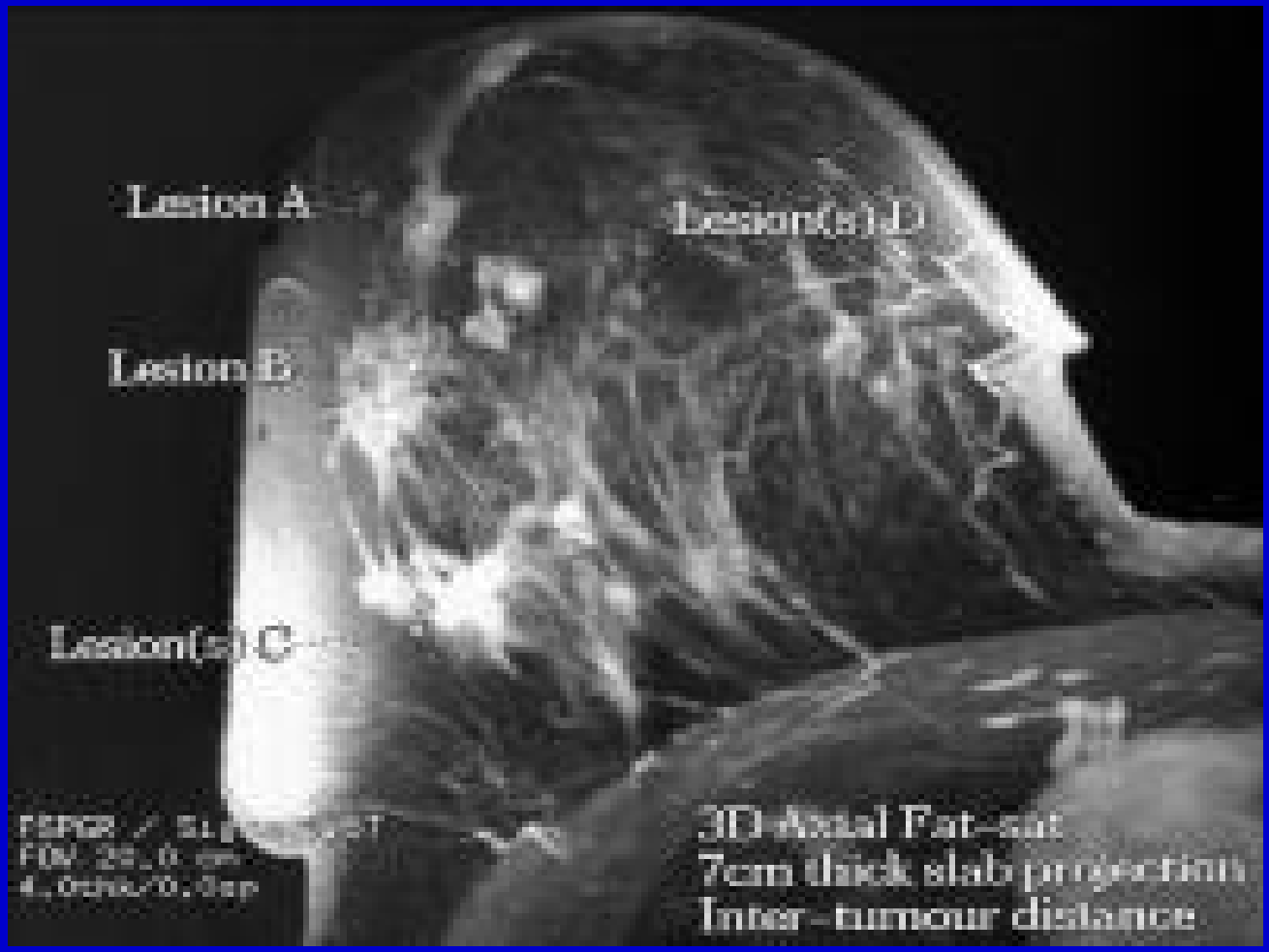
- Current indications:
  - Ipsilateral breast cancer staging
  - Contralateral breast cancer screening in newly diagnosed cancer cases
  - High risk screening
  - BRCA 1 and 2
  - Chest XRT exposure between ages 10 and 30
  - > 20% lifetime risk of developing breast cancer

MRI findings suspicious for CA

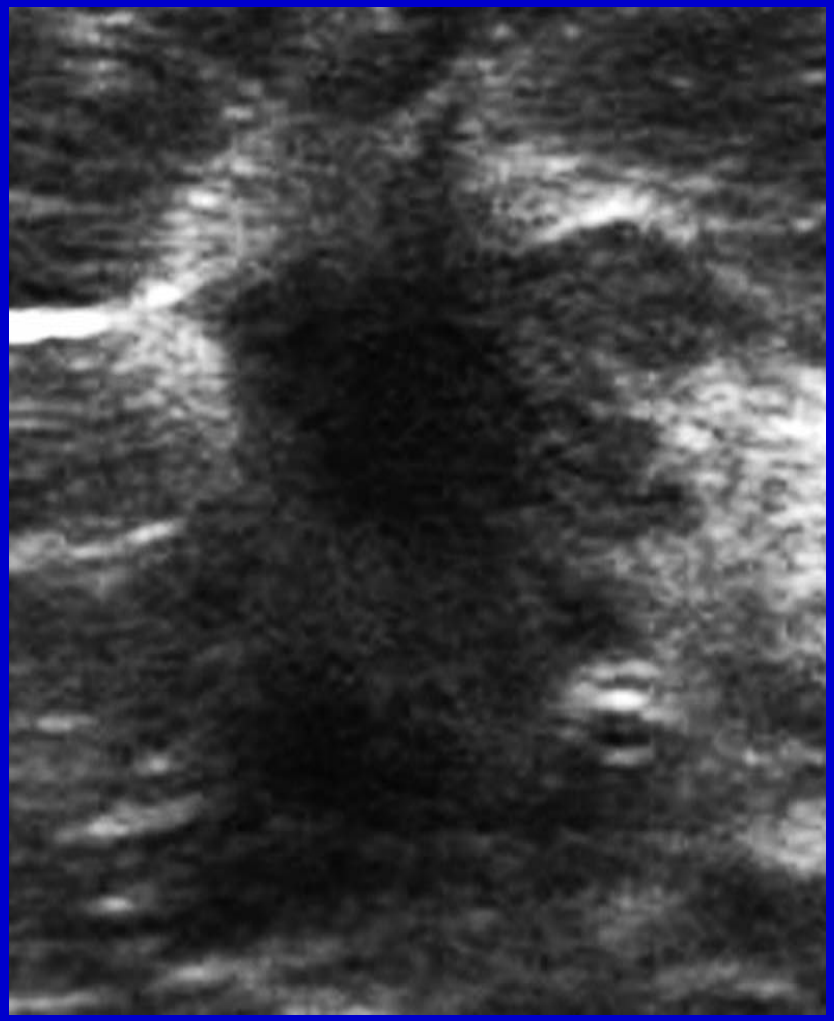
- Focal area(s) of signal abnormality
- Irregular, spiculated appearance
- Enhancement pattern:
- Clumped
- Rim-enhancement



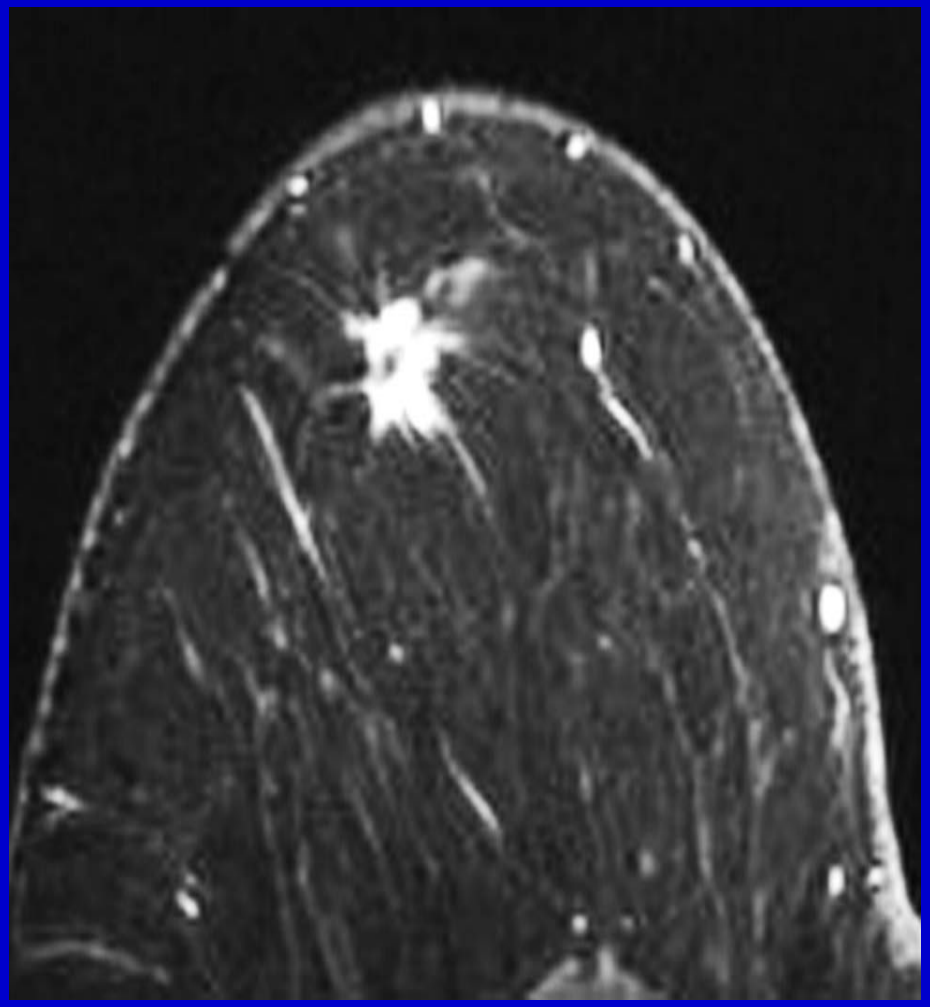
MRI Breast Cancer, Multi-focal



MRI Breast Cancer, ILC

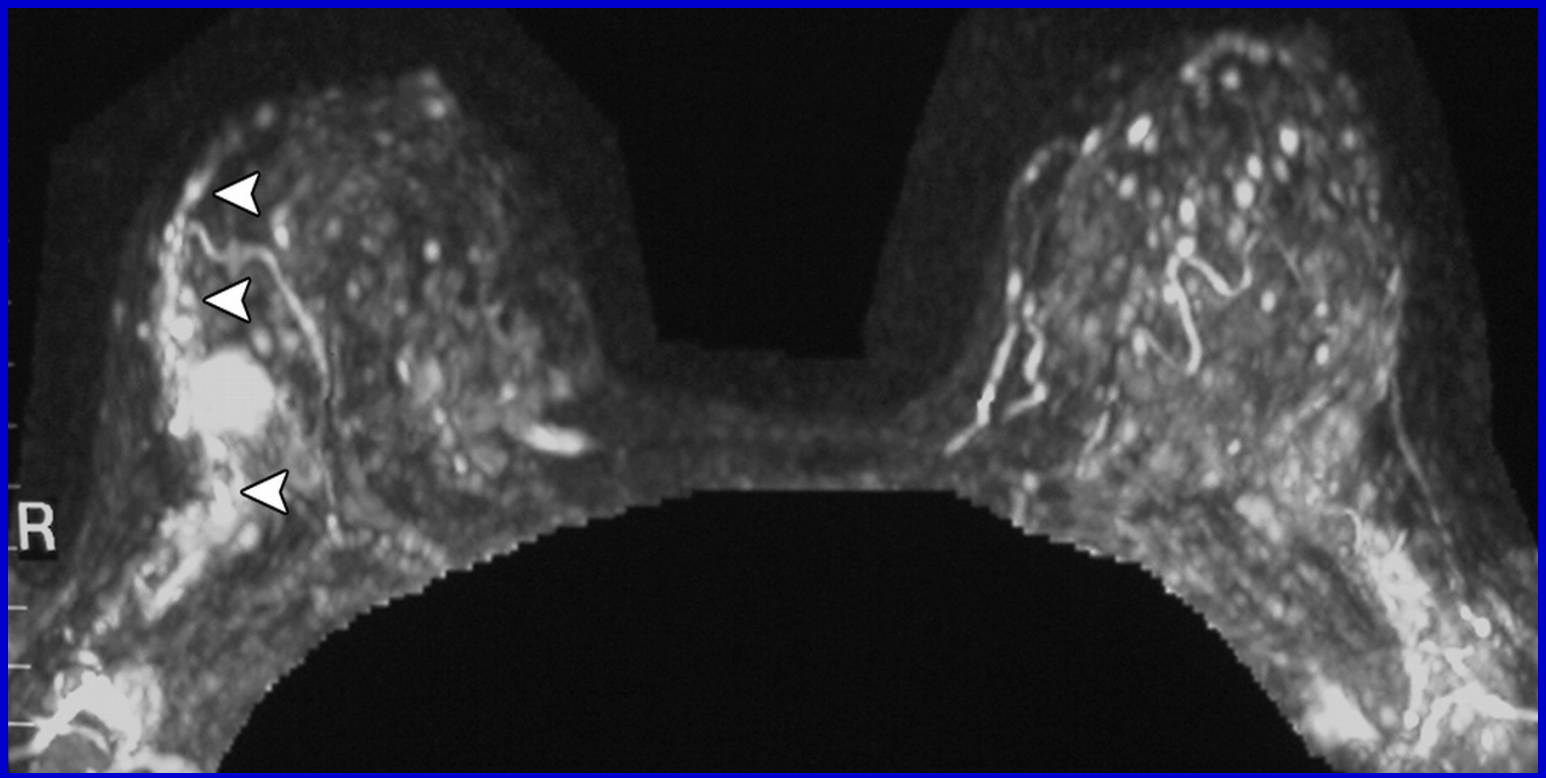


US

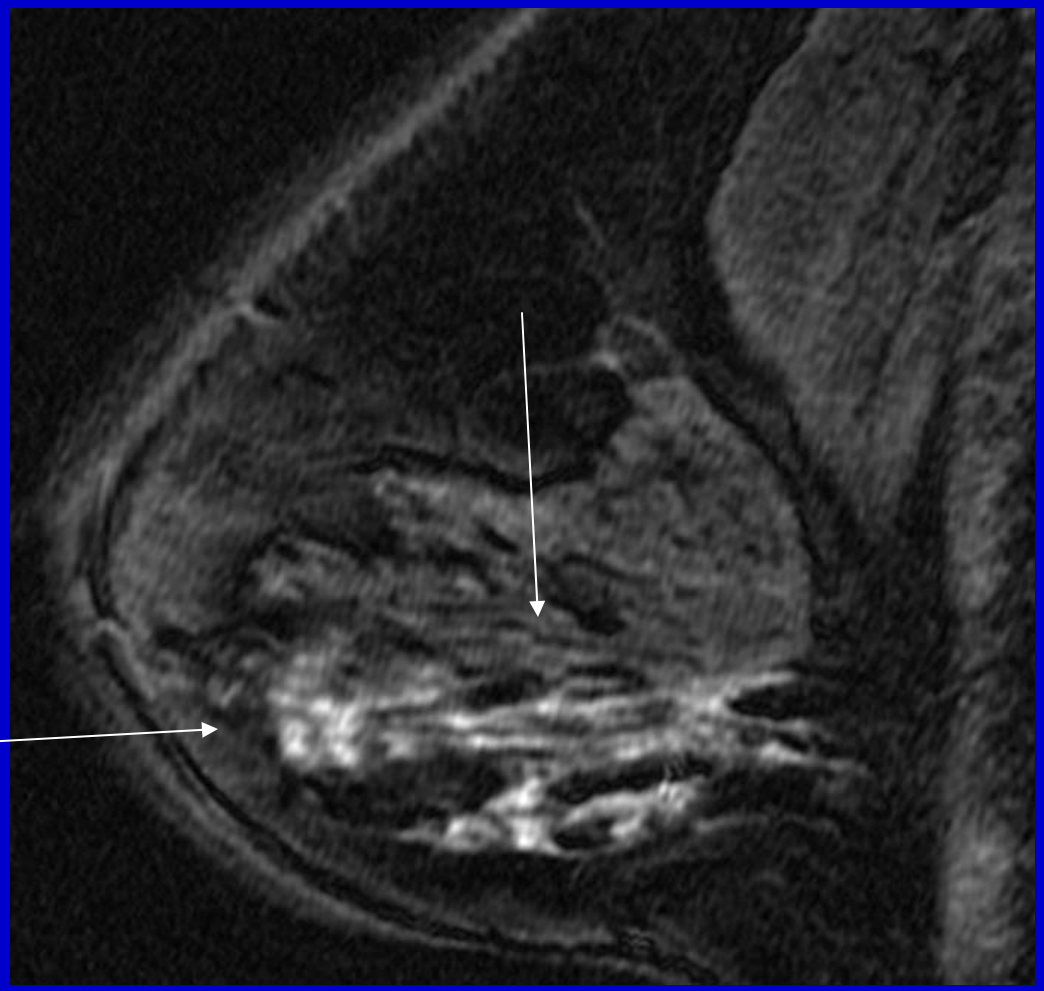


MRI, contrasted-enhanced T1

MRI breast cancer showing greater extent of ipsilateral disease than noted by mammography and US

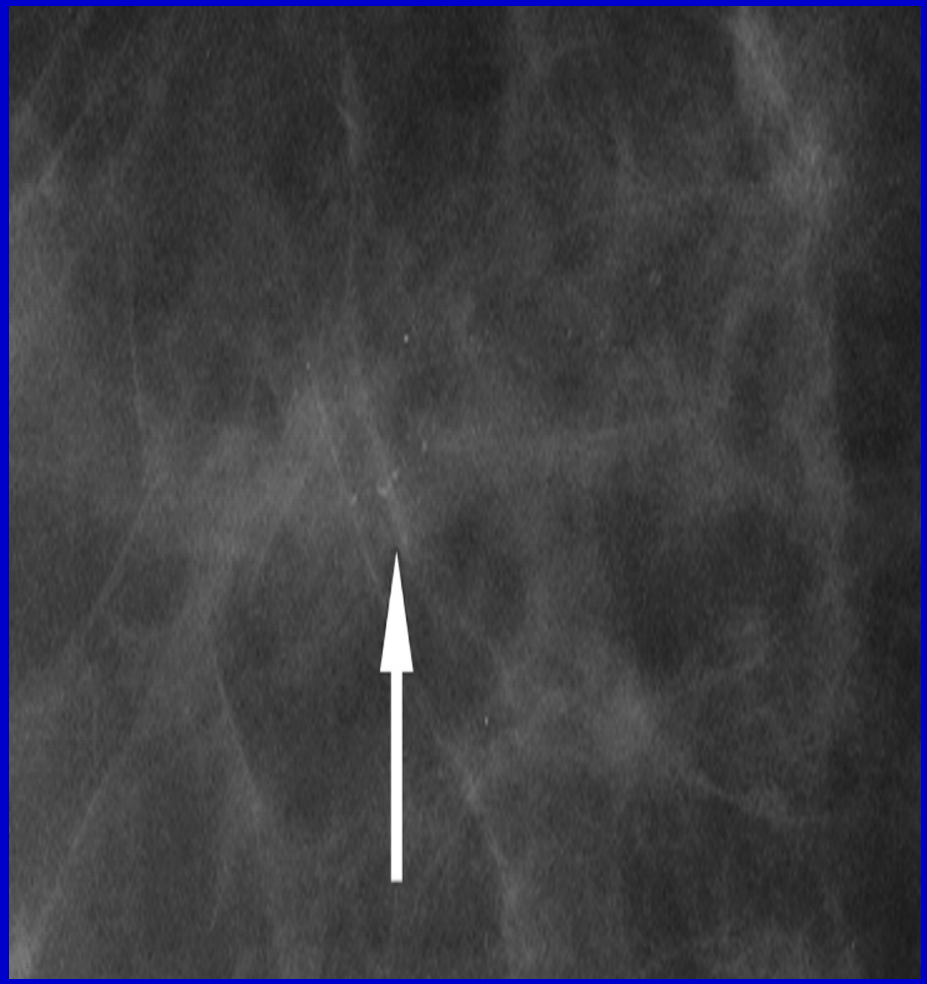


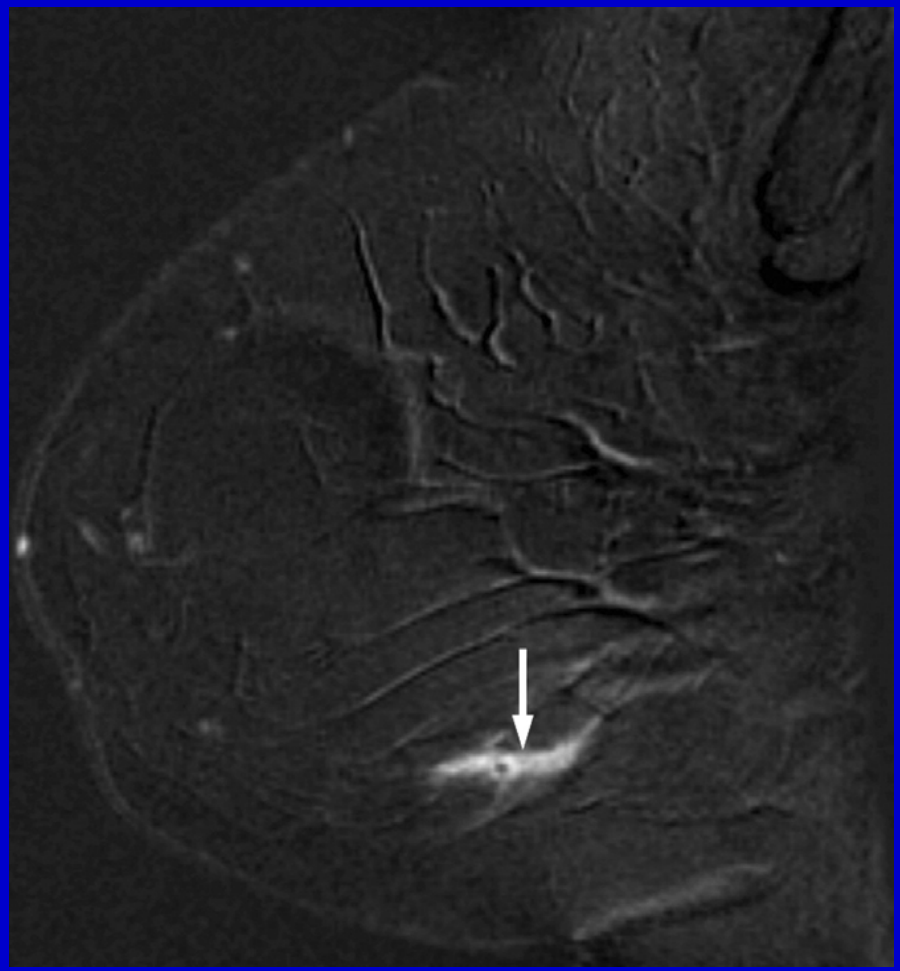
DCIS detected only on contrasted-enhanced MRI



Clumped pattern of enhancement

DCIS in BRCA1 patient detected at mammography and MRI





AMI Breast Services

- Digital mammography
- High-resolution breast US
- 3T dual breast MRI
- US- guided cyst aspiration
- US-guided core biopsy
- Stereotactic core biopsy
- MRI- guided core biopsy

AMI Breast Services

- The AMI - Somers Point office recently was designated by the American College of Radiology as a ***Breast Imaging Center of Excellence***

Breast Imaging Center of Excellence

- Voluntary accreditation program
- Center is fully accredited in:
  - Mammography
  - Stereotactic breast biopsy
  - Breast US
  - US-guided breast biopsy

Breast Imaging Center of Excellence

Breast Imaging Center of Excellence Requirements

ACR®
AMERICAN COLLEGE OF RADIOLOGY

Overview

The American College of Radiology will recognize breast imaging centers that achieve excellence by seeking and earning accreditation in all of the ACR's voluntary breast imaging accreditation programs and modules in addition to the mandatory Mammography Accreditation Program by providing them a certificate that identifies them as a Breast Imaging Center of Excellence. The College will award the designation and certificate at no additional fee to acknowledge these centers' dedication to improving women's health by participating in these rigorous quality assurance programs. All Breast Imaging Center of Excellence facilities will be identified by the symbol shown below on the ACR's "Accredited Facility Search" Web page. (Visit www.acr.org/accreditation.aspx and click on "Accredited Facility Search.")

In order to receive the ACR's Breast Imaging Center of Excellence designation, a center must be fully accredited in:

- Mammography by the ACR (or an FDA-approved state accrediting body),
- Stereotactic Breast Biopsy by the ACR, and
- Breast Ultrasound by the ACR (including the Ultrasound-Guided Breast Biopsy module)

The ACR is the leader in quality programs for breast imaging. As such, it is developing new initiatives to stay current with the science and technology that drive radiology practice as well as the clinical needs of the profession. In the future, centers may need to meet more rigorous requirements, such as performing expanded audits, to maintain their designation as Breast Imaging Centers of Excellence.

Certificates

The ACR will send a Breast Imaging Center of Excellence certificate to each center which fulfills the above requirements. A facility's BICOE designation will remain in effect as long as the center remains accredited in all required breast imaging services. If the center neglects to renew any of its accreditations or fails during renewal, the ACR will notify the center that it no longer has the BICOE designation and that the ACR BICOE certificate must be removed from public display.

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