

AMSER Case of the Month: November 2018

52 year old female with an abnormal screening mammogram



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Patient Presentation

- 52 year old asymptomatic female with abnormality noted in the left breast on screening mammography.
- Medical History: GERD, Grave's disease, HTN, IBS
- Surgical History: None
- Family History: Diabetes, HTN. No history of breast cancer or other cancer
- Social History: Married, physician, denies ETOH use, 3 children (breast fed each)

ACR Appropriateness Criteria for Screening Mammography in an average risk women

This imaging modality was ordered



**American College of Radiology
ACR Appropriateness Criteria®
Breast Cancer Screening**

Variant 1: Breast cancer screening. Average-risk women: women with <15% lifetime risk of breast cancer.

Procedure	Appropriateness Category	Relative Radiation Level
Mammography screening	Usually Appropriate	☼☼
Digital breast tomosynthesis screening	Usually Appropriate	☼☼
US breast	May Be Appropriate	○
MRI breast without and with IV contrast	Usually Not Appropriate	○
MRI breast without IV contrast	Usually Not Appropriate	○
FDG-PEM	Usually Not Appropriate	☼☼☼☼
Tc-99m sestamibi MBI	Usually Not Appropriate	☼☼☼

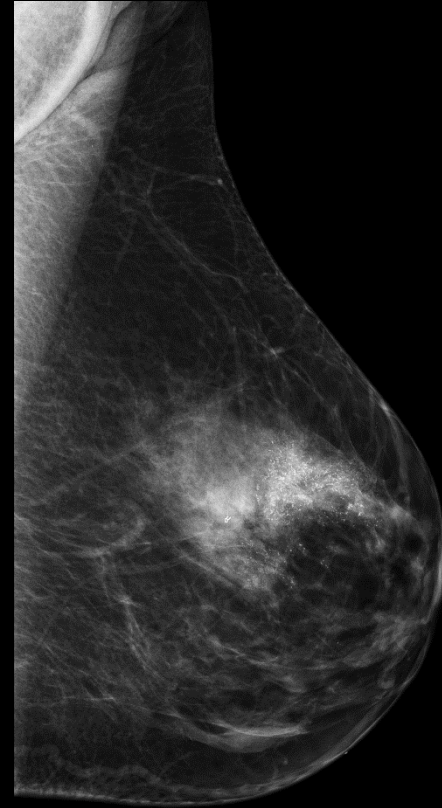
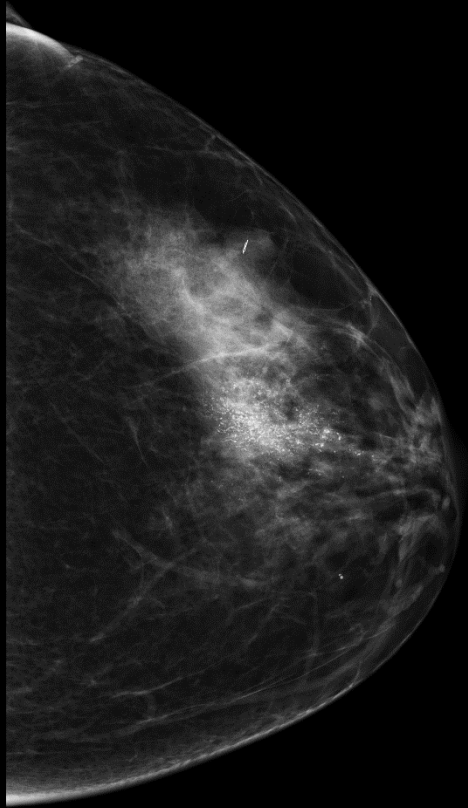
ACR PRACTICE PARAMETER FOR THE PERFORMANCE OF SCREENING AND DIAGNOSTIC MAMMOGRAPHY

II. INDICATIONS

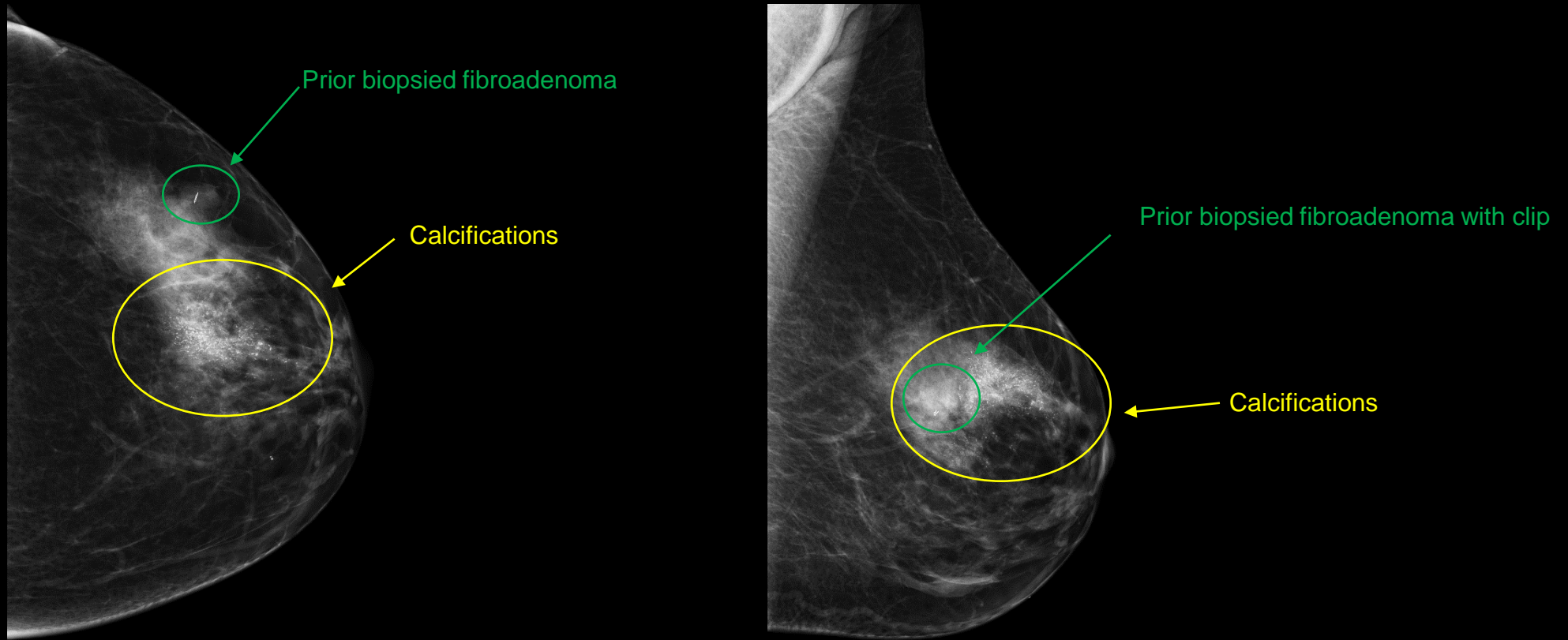
A. Screening Mammography [3,10-12]

1. Women undergoing screening mammography should be asymptomatic. If a woman has symptoms or clinical signs of breast disease, diagnostic mammography should be performed instead (see section II.B.).
2. For women at average risk for breast cancer, annual screening mammography starting at age 40 is recommended [1-6,13,14].

Screening Mammography



Screening Mammography



The screening mammogram demonstrates segmentally distributed **microcalcifications** in the left breast from 12-1 o'clock. Incidentally noted is a clip in the lateral breast from a prior benign biopsy for a **fibroadenoma**.

What additional imaging if any should we order next?

ACR Appropriateness Criteria

American College of Radiology ACR Appropriateness Criteria®

Clinical Condition:

Breast Microcalcifications — Initial Diagnostic Workup

Variant 1:

Pleomorphic, fine, linear, branching in any distribution.

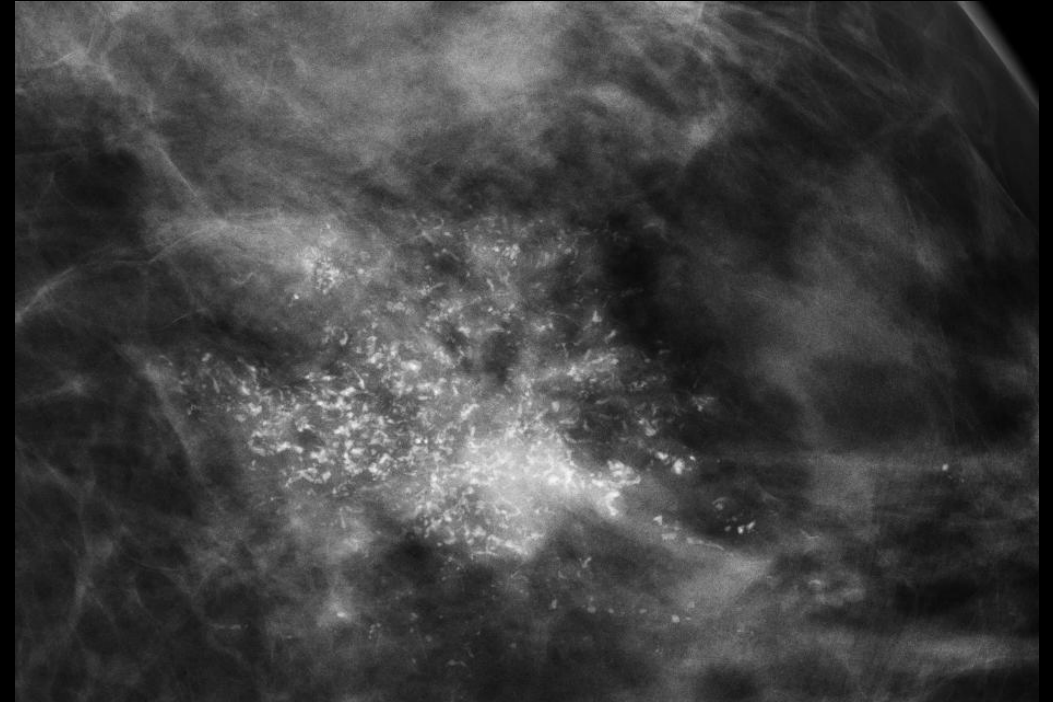
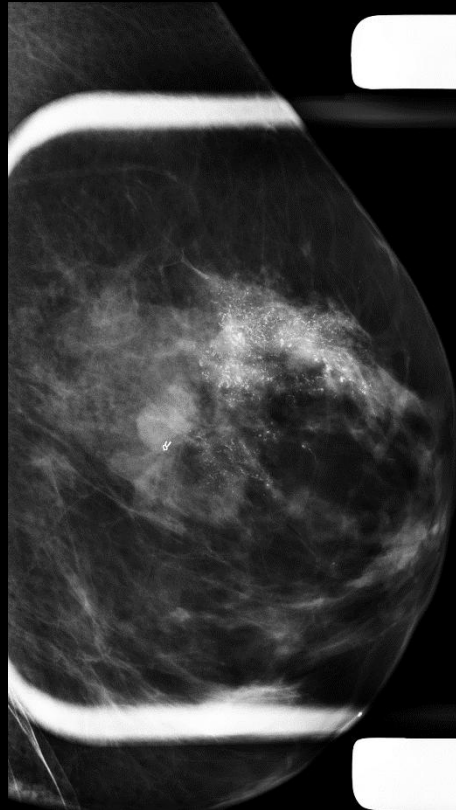
Radiologic Procedure	Rating	Comments	<u>RRL</u> [±]
Mammography diagnostic	9		⊕ ⊕
US breast	4	Only after diagnostic mammographic workup demonstrates suspicious microcalcifications with an associated mass/focal asymmetry or having an extensive distribution, and an underlying invasive component is suspected.	○
Mammography short interval follow-up	1		⊕ ⊕
MRI breast without and with contrast	1		○
FDG-PEM	1		⊕ ⊕ ⊕ ⊕
Tc-99m sestamibi BSGI	1		⊕ ⊕ ⊕ ⊕
Core biopsy breast	1		Varies
Fine needle aspiration breast	1		Varies
Imaging localization for surgical excision breast	1		Varies
<u>Rating Scale:</u> 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate			*Relative Radiation Level



This imaging modality was performed

On magnification images, additional calcifications may be apparent, the morphology of individual calcifications can be characterized, and the distribution of calcifications can be better determined.

Diagnostic Mammography – magnification views



The diagnostic spot magnification mammographic views confirm segmentally distributed fine linear branching calcifications from 12-1 o'clock.

Next Step?

Core Biopsy was performed



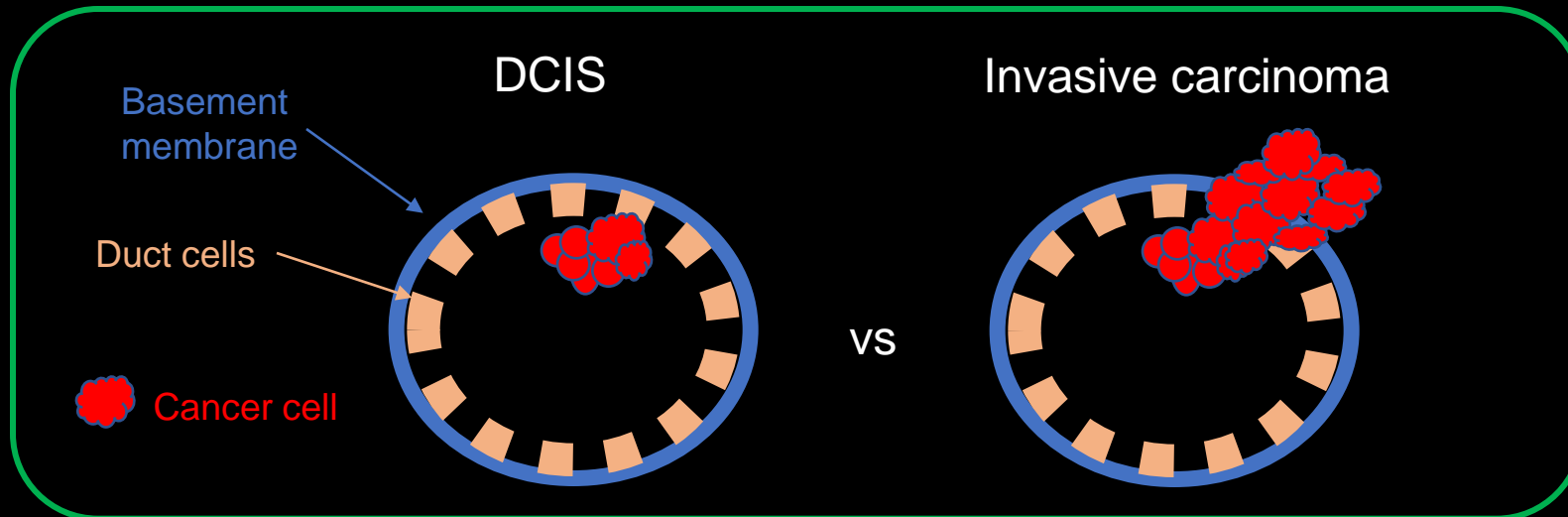
Multiple Core
biopsy samples
demonstrate
calcifications

Final Dx:

Ductal Carcinoma In Situ (DCIS)
Grade 3 with possible microinvasion

Ductal Carcinoma In Situ (DCIS)

- Ductal Carcinoma in Situ (DCIS) is the clonal proliferation of malignant epithelial cells originating in the terminal ducts with **no extension** beyond the basement membrane
- Invasive carcinoma: cancer cells **grow through** the basement membrane
 - Microinvasion: cancer cells extend beyond the basement membrane with no focus > 0.1 cm.



Ductal Carcinoma In Situ (DCIS)

- Clinical Presentation
 - Usually asymptomatic
 - Most discovered by screening mammography
- Imaging Findings:
 - Mammography
 - Microcalcifications - most common (80%)
 - Mass with calcifications (10%); Mass alone (10%)
 - MRI - linear or segmental clumped enhancement
 - Ultrasound (least sensitive)
 - Dilated ducts, +/- calcifications; Mass
- Treatment:
 - Lumpectomy with negative margins or mastectomy (for more extensive disease)
 - Radiation therapy following lumpectomy
 - Tamoxifen for estrogen receptor positive cancers

ACR BI-RADS Classification of Breast Calcifications

- The BI-RADS[®] atlas provides standardized breast imaging terminology for mammography
 - The morphology and distribution of mammographic calcifications should be described using BIRADS terms.
- Fine Linear Branching Morphology (our case)
 - Thin, linear, irregular calcifications, which may be discontinuous with branching forms, and <0.5 mm in caliber
 - Suggests filling of the lumen of a duct or ducts involved irregularly by breast cancer, with a PPV of 70%
- Segmental distribution (our case)
 - Calcifications in segmental distribution are of concern because they suggest deposits in a duct or ducts and their branches which raises the possibility of extensive or multifocal breast cancer in a lobe or segment of the breast, with a PPV of 62%

BIRADS Calcification Descriptors

Typically benign	Skin
	Vascular
	Coarse or "popcorn-like"
	Large rod-like
	Round
	Rim
	Dystrophic
	Milk of calcium
	Suture
Suspicious morphology	Amorphous
	Coarse heterogeneous
	Fine pleomorphic
	Fine linear or fine-linear branching
Distribution	Diffuse
	Regional
	Grouped
	Linear
	Segmental

References:

1. ACR Appropriateness Criteria: Breast Cancer Screening.
2. ACR Practice Parameters for the performance of Screening and Diagnostic Mammography. <https://www.acr.org/-/media/ACR/Files/Practice-Parameters/Screen-Diag-Mammo.pdf>
3. ACR Appropriateness Criteria for Breast Microcalcifications. Date of origin 1996. Last reviewed 2005.
4. ACR BI-RADS Atlas 5th edition. <https://www.acr.org/Clinical-Resources/Reporting-and-Data-Systems/Bi-Rads>
5. Radiopedia.
6. Stat DX.
7. Berg, Wendie et al. 2006. Diagnostic Imaging: Breast. Salt Lake City, Utah. Amirsys.