AMSER Case of the Month
July 2024

42-year-old female presenting with abnormal high risk screening breast MRI

Viet Le, MS3
Penn State College of Medicine

Rebecca T. Sivarajah, MD
Penn State Health Milton S. Hershey Medical Center

PennState College of Medicine

AMSER

Patient Presentation

- HPI: 42 year old woman who presents for high risk breast cancer screening. Patient has an IBIS lifetime risk of developing breast cancer of 34%.
- FHx: Mother was diagnosed with breast cancer at 48 and had recurrence at age 69. Mother also diagnosed with endometrial cancer at 61.
- Relevant PMH and Meds: None

What Imaging Should We Order?

ACR Appropriateness Criteria

Variant 3: **Adult female. Breast cancer screening. High risk.**

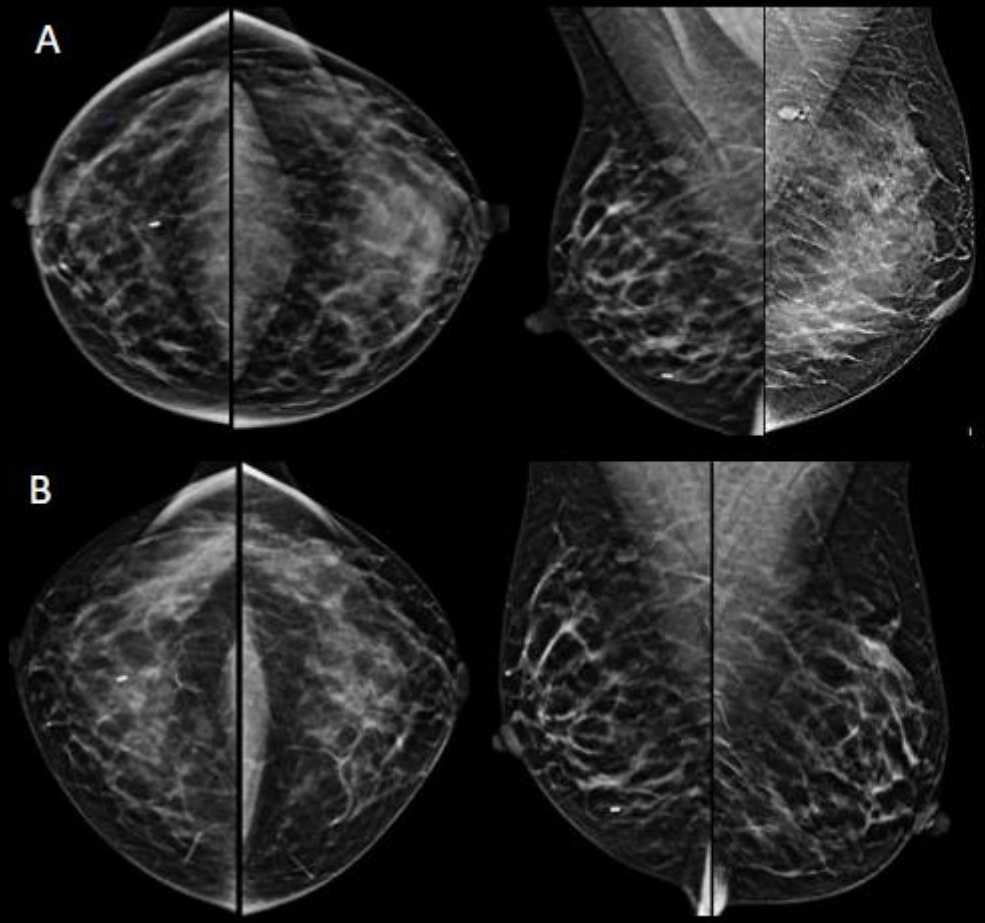
Procedure	Appropriateness Category	Relative Radiation Level
Digital breast tomosynthesis screening	Usually Appropriate	☢☢
Mammography screening	Usually Appropriate	☢☢
MRI breast without and with IV contrast	Usually Appropriate	O
MRI breast without and with IV contrast abbreviated	Usually Appropriate	O
US breast	May Be Appropriate (Disagreement)	O
Mammography with IV contrast	May Be Appropriate (Disagreement)	☢☢
MRI breast without IV contrast	Usually Not Appropriate	O
MRI breast without IV contrast abbreviated	Usually Not Appropriate	O
Sestamibi MBI	Usually Not Appropriate	☢☢☢

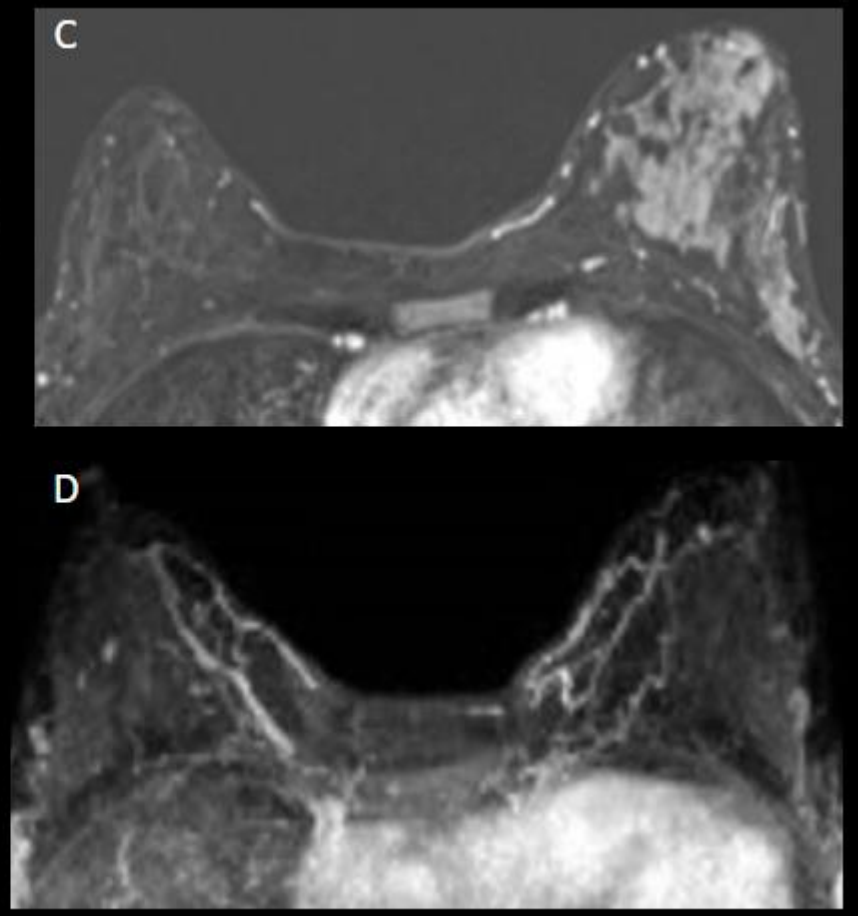
These two imaging modalities were ordered due to the patient's high lifetime risk of breast cancer

Findings (unlabeled)

Original exams

One year later

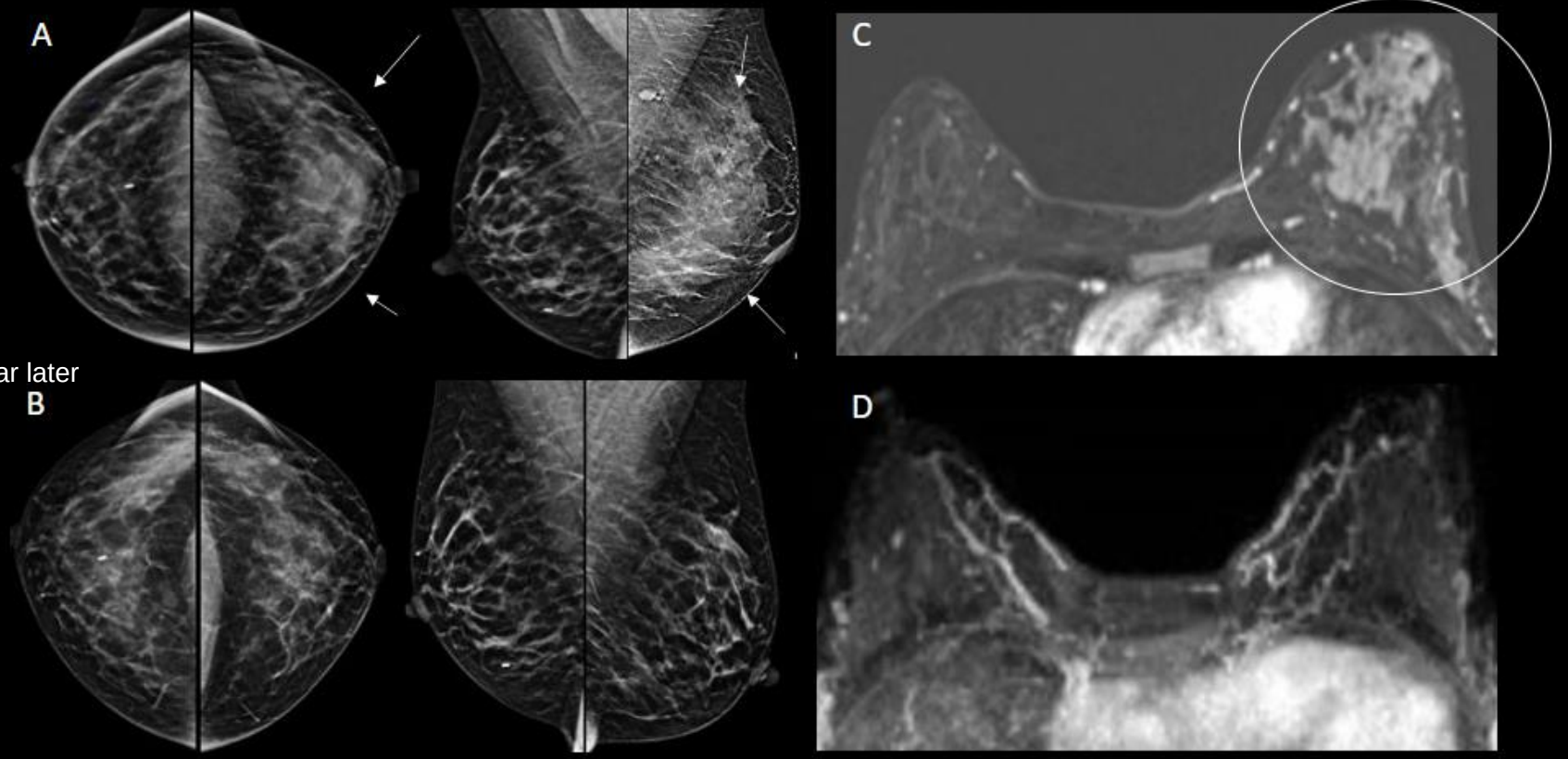




Findings: (labeled)

Original exams

One year later



(A) Bilateral 2D and MLO mammogram images demonstrate asymmetric diffuse enlargement and density in the left breast (arrows) which resolved on a mammogram one year later (B). (C) Axial contrast-enhanced, T1 weighted, fat-saturated, subtracted breast MRI demonstrates diffuse asymmetric extensive background enhancement of the left breast (circle) compared to the right. On a follow-up breast MRI one-year later (D), this asymmetric enhancement resolved.

PMH withheld

- The patient was exclusively breast feeding only from the left breast

Diffuse Asymmetric Unilateral Enhancement on MRI due to Unilateral Breast Feeding

Case Discussion

•There are many entities that can present with diffuse asymmetric unilateral MRI findings.

• It is important for radiologists to be familiar with the differential of this presentation to ensure the correct diagnosis is considered.

• A thorough history and biopsy is often needed to make a diagnosis.

• This slide will be followed with differentials to consider when asymmetric enhancement is seen on imaging.

Case Discussion Cont.

Possible Differentials

Diffuse asymmetric masses/non-mass enhancement

Malignant

- Diffuse Invasive ductal carcinoma (IDC) or ductal carcinoma in situ (DCIS)
- Diffuse invasive lobular carcinoma
- Paget's Disease with extensive underlying breast cancer

Benign

- Pseudoangiomatous Stromal Hyperplasia (PASH)
- Giant Fibroadenoma/phyllodes

Case Discussion Cont.

Asymmetric diffuse MRI findings associated with skin and trabecular thickening

Malignant

- Inflammatory Breast Cancer (IBC)
- Non-IBC locally advanced breast cancer

Benign

- Idiopathic Granulomatous Mastitis
- Lupus Mastitis
- Infectious mastitis
- Early radiation changes
- Unilateral Central Vein Obstruction

Case Discussion Cont.

Asymmetric relative background parenchymal enhancement (BPE)

- Late Radiation Changes
- Unilateral Lactation

Unilateral Lactation

The breast undergoes physiologic changes during lactation. This is due to changes in hormones such as estrogen, progesterone, and prolactin. These hormone changes result in ductal proliferation and milk production.

Imaging Findings:

Mammography: Increase in parenchymal density which can decrease sensitivity

Ultrasound: Echotexture of the breast becomes diffusely echogenic with prominent ducts and increased vascularity

MRI: Lactating breast demonstrates increased background parenchymal enhancement, increased vascularity, increased T2 signal intensity, and increased fibroglandular volume.

There are some instances when a women breastfeeds solely from one breast. In this case, there will be asymmetric unilateral enhancement of the breastfeeding breast. On the follow up MRI with breastfeeding cessation, there was resolution of enhancement in this patient.

References:

Peterson MS, Gegios AR, Elezaby MA, Salkowski LR, Woods RW, Narayan AK, Strigel RM, Roy M, Fowler AM. Breast Imaging and Intervention during Pregnancy and Lactation. Radiographics. 2023 Oct; 43(10):230014. doi: 10.1148/rg.230014. PMID: 37708073; PMCID: PMC10560982.

Alex A, Bhandary E, McGuire KP. Anatomy and Physiology of the Breast during Pregnancy and Lactation. Adv Exp Med Biol. 2020;1252:3-7. doi: 10.1007/978-3-030-41596-9_1. PMID: 32816256.

Robbins J, Jeffries D, Roubidoux M, Helvie M. Accuracy of diagnostic mammography and breast ultrasound during pregnancy and lactation. AJR Am J Roentgenol. 2011 Mar; 196(3):716-22. doi: 10.2214/AJR.09.3662. Erratum in: AJR Am J Roentgenol. 2011 May;196(5):1237. PMID: 21343518.

Nissan N, Bauer E, Moss Massasa EE, Sklair-Levy M. Breast MRI during pregnancy and lactation: clinical challenges and technical advances. Insights Imaging. 2022 Apr 9;13(1):71. doi: 10.1186/513244-022-01214-7. PMID: 35397082; PMCID: PMC8994812.

Nissan N, Furman-Haran E, Shapiro-Feinberg M, Grobgeld D, Degani H. Diffusion-tensor MR imaging of the breast: hormonal regulation. Radiology. 2014 Jun;271(3):672-80. doi: 10.1148/radiol.14132084. Epub 2014 Feb 12. PMID: 24533873.