

AMSER Case of the Month

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76-year-old female with abnormal screening mammogram

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Patient Presentation

- **HPI:** 74yo female presented for annual screening mammography, found to have architectural distortion of the right breast requiring additional evaluation.
- **Family History:** Breast and colon cancer in mother.
- **OB/GYN History:** G2P2, menarche started at age 12, with her first live birth at age 31. Underwent menopause at age 51 and was on hormone replacement for 10 years.
- **Medical History:** Colon cancer s/p colostomy, hyperlipidemia.
- **Surgical History:** Colon resection and cholecystectomy.
- **Medications:** Atorvastatin.
- **Physical Exam:** Bilateral breasts without dominant mass, nodularity, or skin dimpling.
- **No Pertinent Labs**

What Imaging Should We Order?

ACR Appropriateness Criteria for Screening Mammography in an average risk women

This imaging modality was ordered



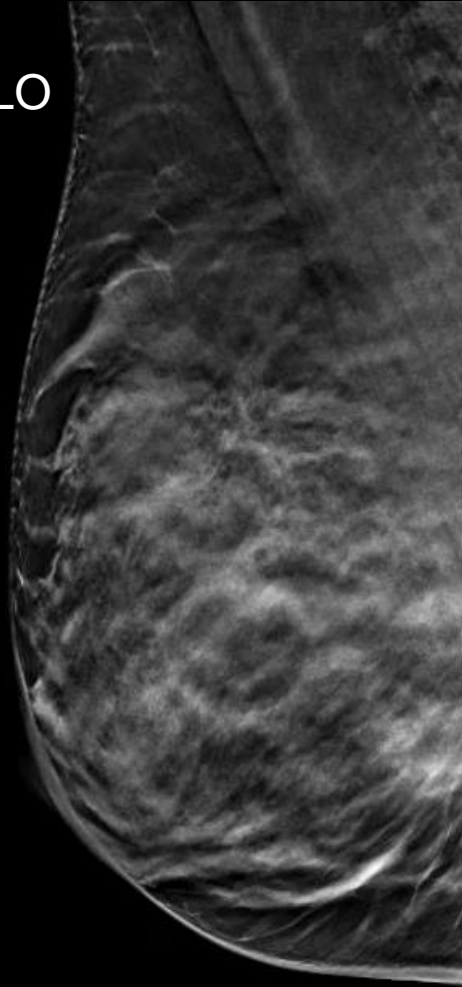
**American College of Radiology
ACR Appropriateness Criteria®
Breast Cancer Screening**

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

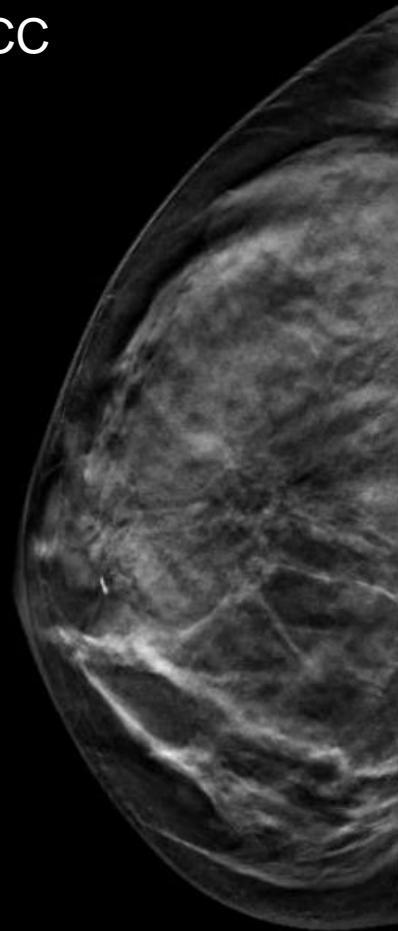
Procedure	Appropriateness Category	Relative Radiation Level
Mammography screening	Usually Appropriate	☼☼
Digital breast tomosynthesis screening	Usually Appropriate	☼☼
US breast	May Be Appropriate	○
MRI breast without and with IV contrast	Usually Not Appropriate	○
MRI breast without IV contrast	Usually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

Screening Mammography

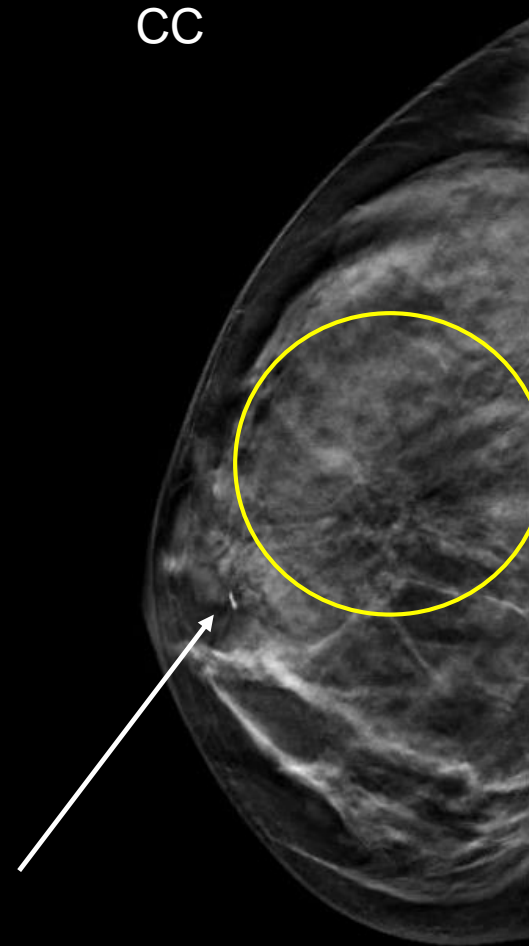
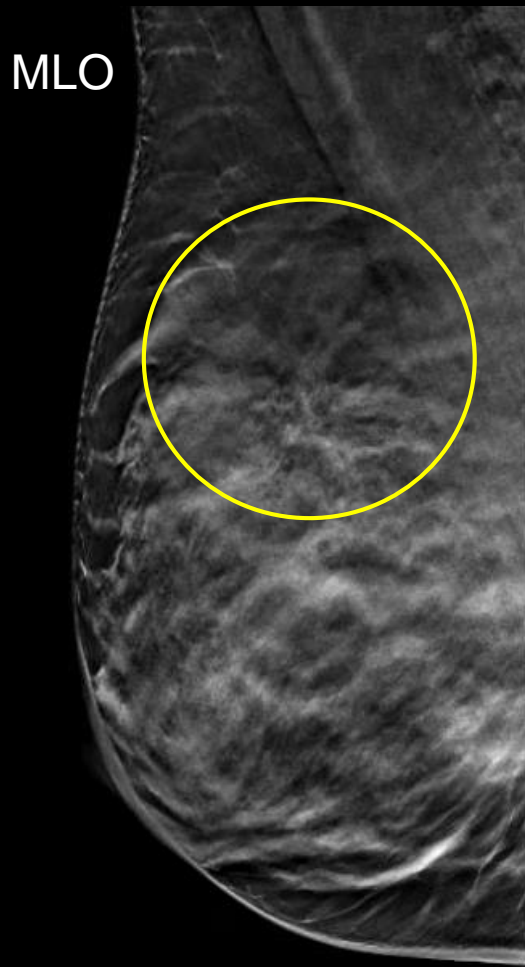
MLO



CC



Screening Mammography



Select tomosynthesis images from a screening mammogram of the right breast demonstrate subtle architectural distortion at 12 o'clock posterior depth (yellow circle). A clip from a remote prior benign biopsy is noted more anteriorly (arrow).

What additional imaging if any should we order next?

ACR Appropriateness Criteria

Date of origin: 1996
Last review date: 2012

American College of Radiology ACR Appropriateness Criteria®

Clinical Condition:

Nonpalpable Mammographic Findings (Excluding Calcifications)

Variant 1:

Architectural distortion seen on screening mammogram. No history of prior surgery or trauma. Next examination to perform. (See [Appendix 1](#) for additional steps in the workup of these patients.)

Radiologic Procedure	Rating	Comments	RRL*
Mammography diagnostic	9		☼☼
Mammography short-interval follow-up	1		☼☼
US breast	1		○
MRI breast without and with contrast	1		○
MRI breast without contrast	1		○
Image-guided core biopsy breast	1		Varies

Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate

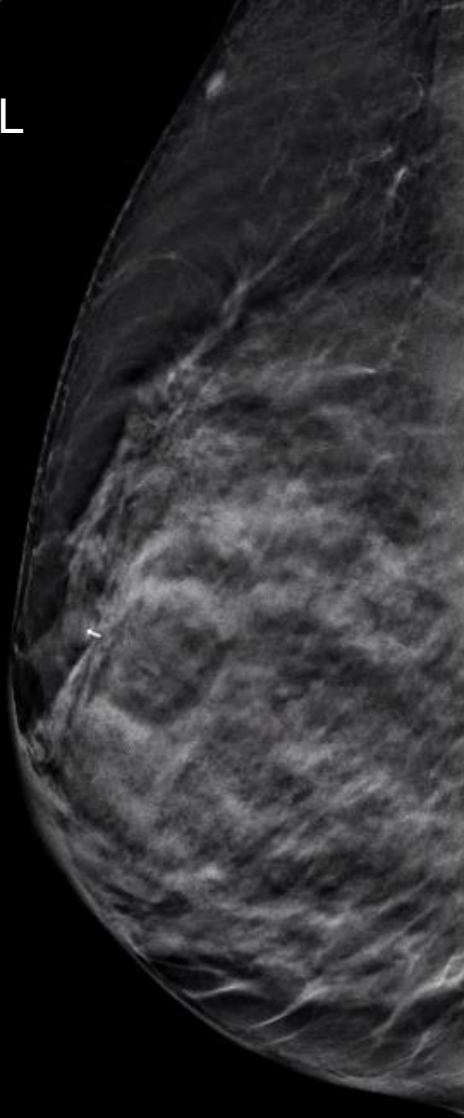
*Relative Radiation Level

This imaging modality was performed

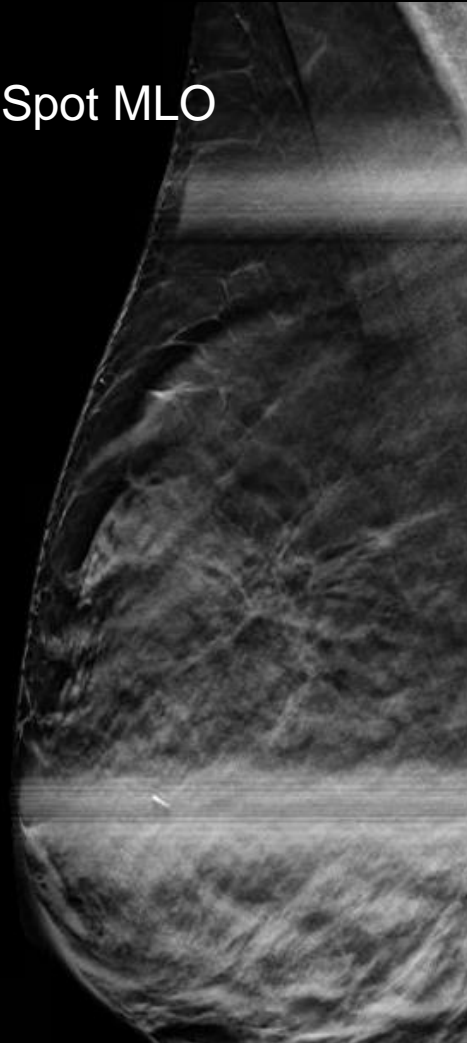


Diagnostic Mammography

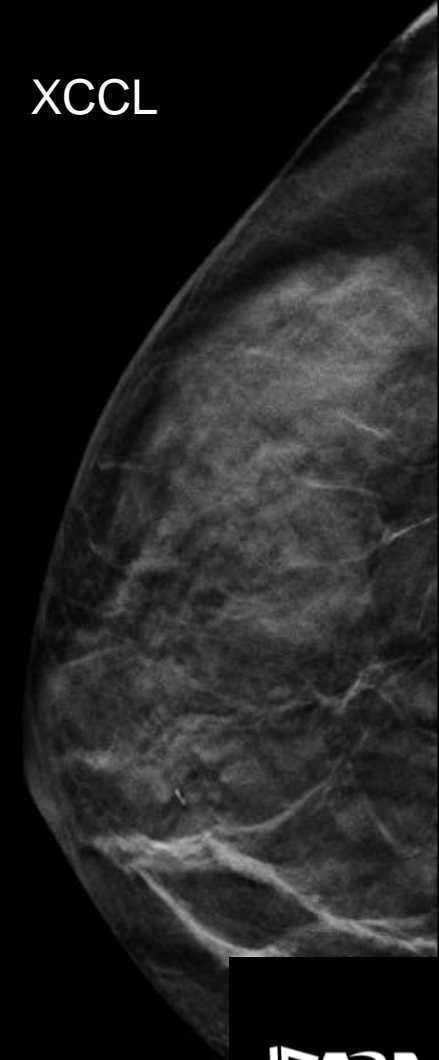
ML



Spot MLO

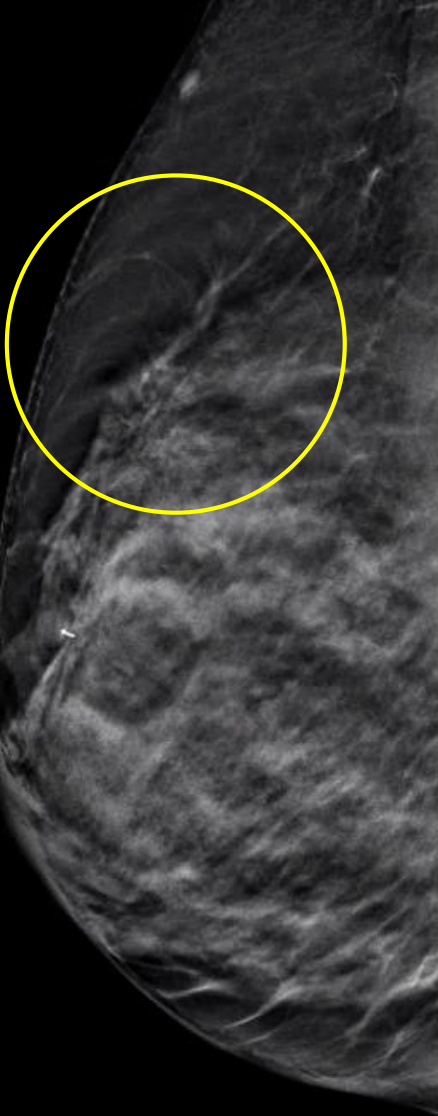


XCCL

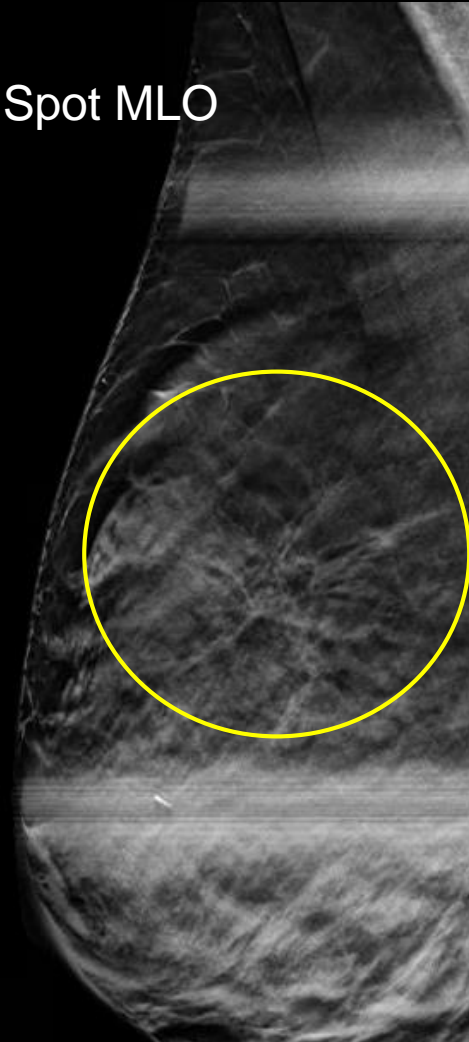


Diagnostic Mammography

ML



Spot MLO

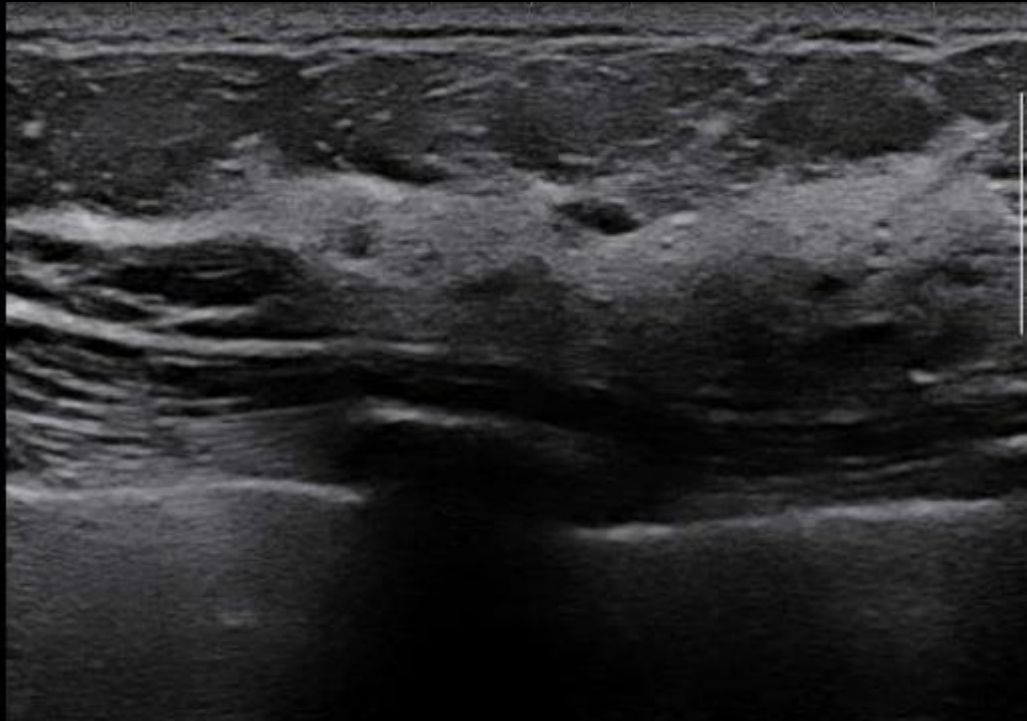


XCCL



Diagnostic right ML, spot MLO, and XCCL tomosynthesis images confirm the presence of architectural distortion (yellow circle) at 12 o'clock posteriorly. However, no central mass is seen.

Diagnostic Ultrasound



RT BREAST RADIAL

12:00 6 cm fn



Diagnostic ultrasound was performed but no definitive ultrasound correlate was identified for the architectural distortion.

Next Step?

Tomosynthesis Guided Biopsy was performed

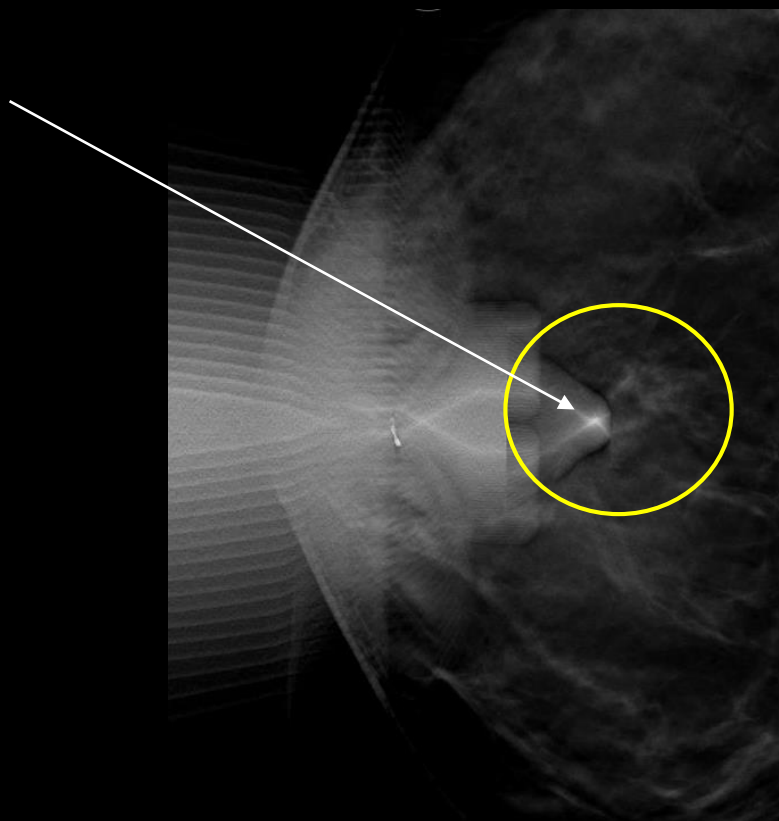
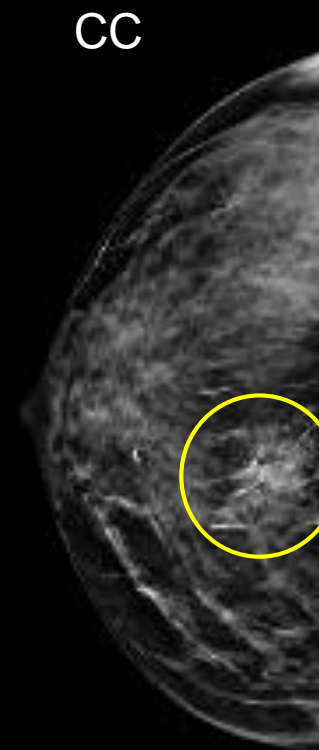
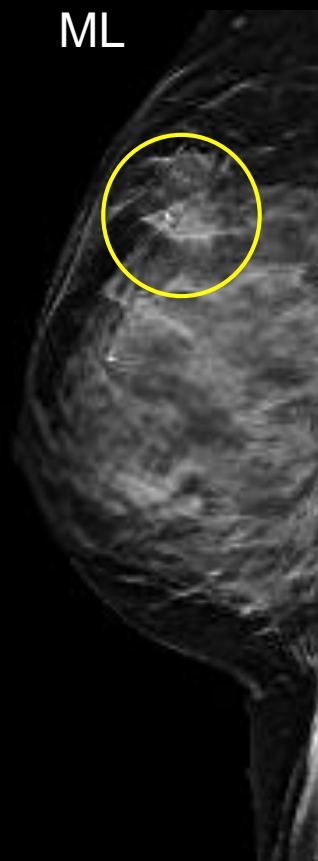


Image from a tomosynthesis biopsy demonstrating the needle (arrow) directed towards the area of architectural distortion (circle). The needle is blurry due to the tomosynthesis technique.



Post biopsy ML and CC right mammogram demonstrates the cork clip at the site of the architectural distortion (more anterior clip from prior benign biopsy)

Final Dx:

Radial Scar

Differential Diagnoses for Architectural Distortion

- Architectural distortion is often due to growth of fibrous tissue that leads to disruption of the normal breast tissue pattern.
- The differential diagnosis for architectural distortion includes:
 - Invasive breast cancer
 - Radial scar or complex sclerosing lesion
 - Fibromatosis
 - Sclerosing adenosis
 - Fat necrosis/post-op scar

Radial Scar Definitions

- Radial Scar
 - Benign breast lesions characterized by a central fibroelastic core with radiating spokes of ducts and lobules
- Complex Sclerosing Lesion
 - Radial scar larger than 1 cm

Radial Scar – Imaging appearance

- Mammogram
 - Radiating long spicules with no central density
 - Radiolucent linear structures parallel the white spicules, “black stars”
 - But – no feature reliable for differentiating from cancer
- Ultrasound
 - If present most common appearance is hypoechoic, irregular mass with indistinct margins
 - No reliable feature to differentiate scars from malignancies
- MRI
 - Variable – not visible to enhancing irregular masses

*Since no imaging feature reliably differentiates from cancer, biopsy is required.

Radial Scars and Breast Cancer

- Management of radial scars diagnosed at core biopsy remains controversial without a clear consensus.
- Radial scars coexist with other proliferative lesions, like atypia and cancer.
- Literature shows varying rates (0%-43%) of upgrade to cancer of radial scars excised after diagnosis by image-guided core biopsy.
- Imaging and clinical follow up may be sufficient for radial scars ≤ 1 cm after biopsy, if adequately sampled or if a small radial scar is incidentally found at biopsy.
- Surgical excision recommended for radial scars > 1 cm, associated with high-risk lesions, or if the finding was only seen as an enhancing lesion on MRI.
- In our case, the radial scar was larger than 1 cm and the patient underwent excisional biopsy to rule out associated malignancy. Final pathology was benign.

References:

ACR Appropriateness Criteria: Breast Cancer Screening & Diagnosis.

Bahl M. Management of High-Risk Breast Lesions. Radiol Clin North Am. 2021 Jan;59(1):29-40. doi: 10.1016/j.rcl.2020.08.005. PMID: 33222998.

Cohen MA, Newell MS. Radial Scars of the Breast Encountered at Core Biopsy: Review of Histologic, Imaging, and Management Considerations. AJR Am J Roentgenol. 2017 Nov;209(5):1168-1177. doi: 10.2214/AJR.17.18156. Epub 2017 Aug 16. PMID: 28813198.

Farshid G, Buckley E. Meta-analysis of upgrade rates in 3163 radial scars excised after needle core biopsy diagnosis. Breast Cancer Res Treat. 2019 Feb;174(1):165-177. doi: 10.1007/s10549-018-5040-3. Epub 2018 Nov 20. PMID: 30460464.

Radial scar: Radiology Reference Article. Jones. <https://radiopaedia.org/articles/radial-scar>