AMSER Case of the Month September 2026

Invasive Lobular Carcinoma Identified Via High-Risk MRI Screening

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RCSI

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Patient Presentation

- Patient is a 67-year-old woman
- History of atypical ductal hyperplasia and intraductal papilloma
- With a high lifetime risk of breast cancer >20% on the Tyrer-Cuzick model

What Imaging Should We Order?

Select the applicable ACR Appropriateness Criteria

Adult female 30 years of age or older. Breast cancer screening. High risk.

Scenario	Scenario ID	Procedure	Adult RRL	Peds RRL	Appropriateness Category
Breast cancer screening, >=20-25% estimated lifetime risk	3199408	MRI breast without and with IV contrast	0 mSv O	0 mSv [ped] O	Usually appropriate
		MRI breast without and with IV contrast abbreviated	0 mSv O	0 mSv [ped] O	Usually appropriate
		US breast	0 mSv O	0 mSv [ped] O	May be appropriate
		Digital breast tomosynthesis screening	0.1-1mSv ☢☢		May be appropriate
		Mammography screening	0.1-1mSv ☢☢		May be appropriate
		Mammography with IV contrast	0.1-1mSv ☢☢		Usually not appropriate
		MRI breast without IV contrast	0 mSv O	0 mSv [ped] O	Usually not appropriate
		MRI breast without IV contrast abbreviated	0 mSv O	0 mSv [ped] O	Usually not appropriate
		Sestamibi MBI	1-10 mSv ☢☢☢		Usually not appropriate

This imaging modality was recommended by the attending radiologist

MR Findings (unlabeled)

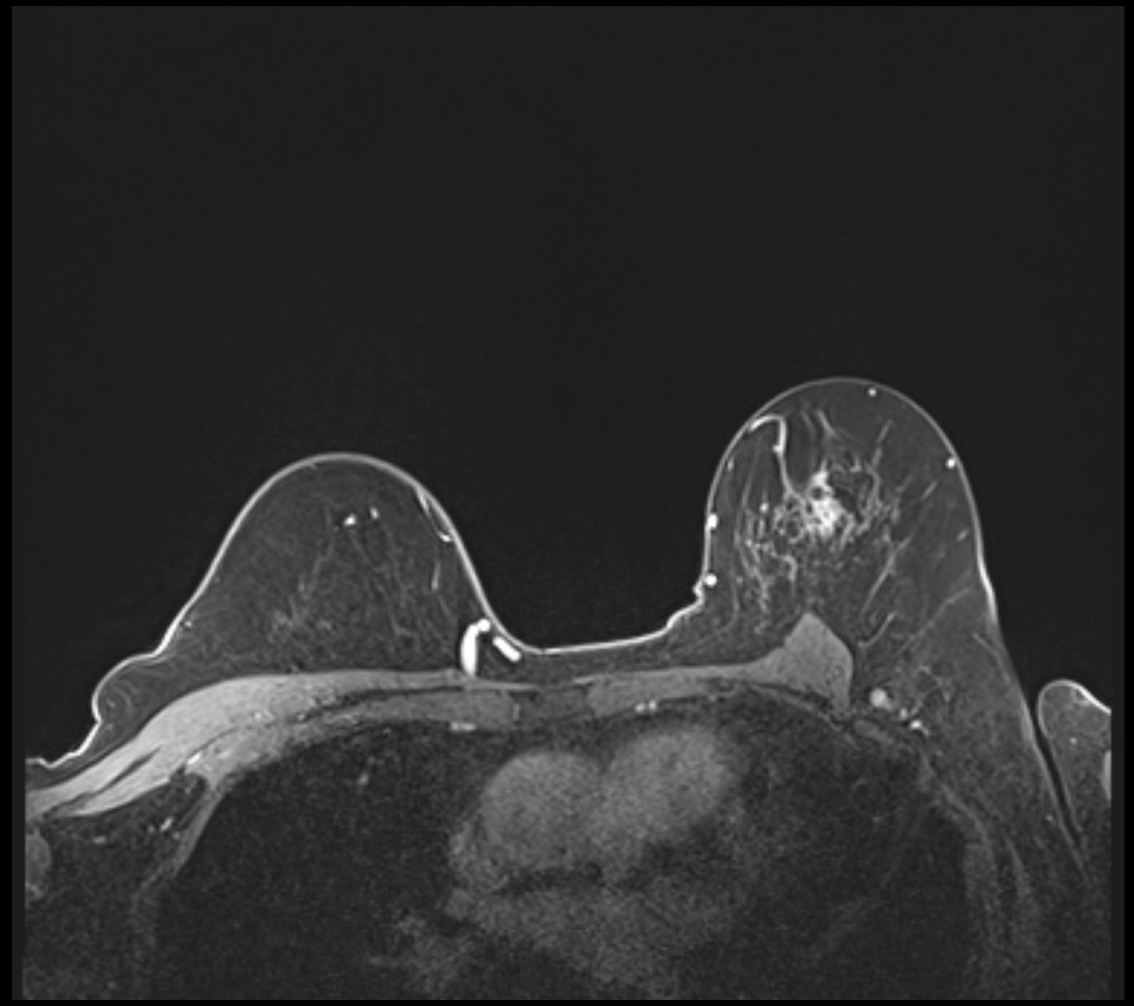

Image A

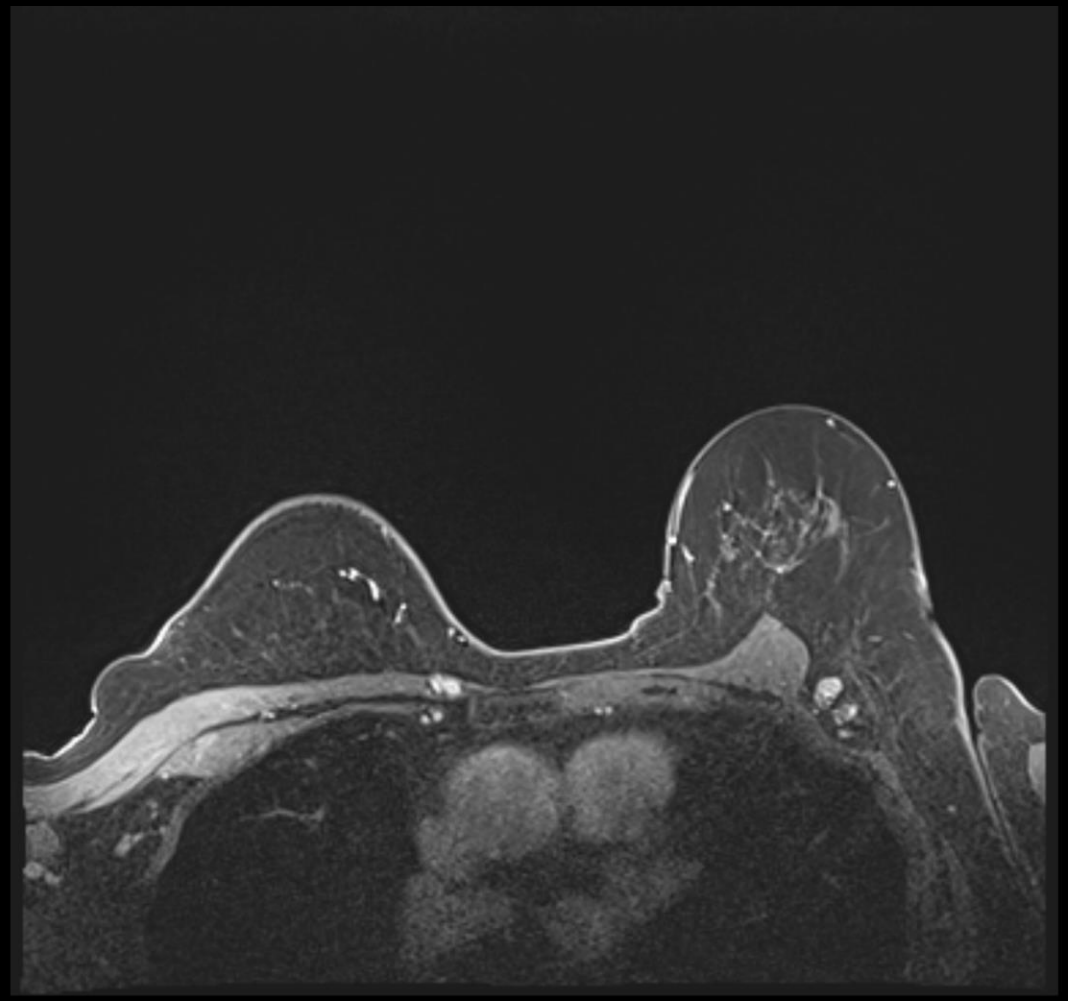

Image B

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MR Findings: (labeled)

Non-mass enhancement

- Segmental distribution
- Heterogenous internal enhancement
- BI-RADS 4C

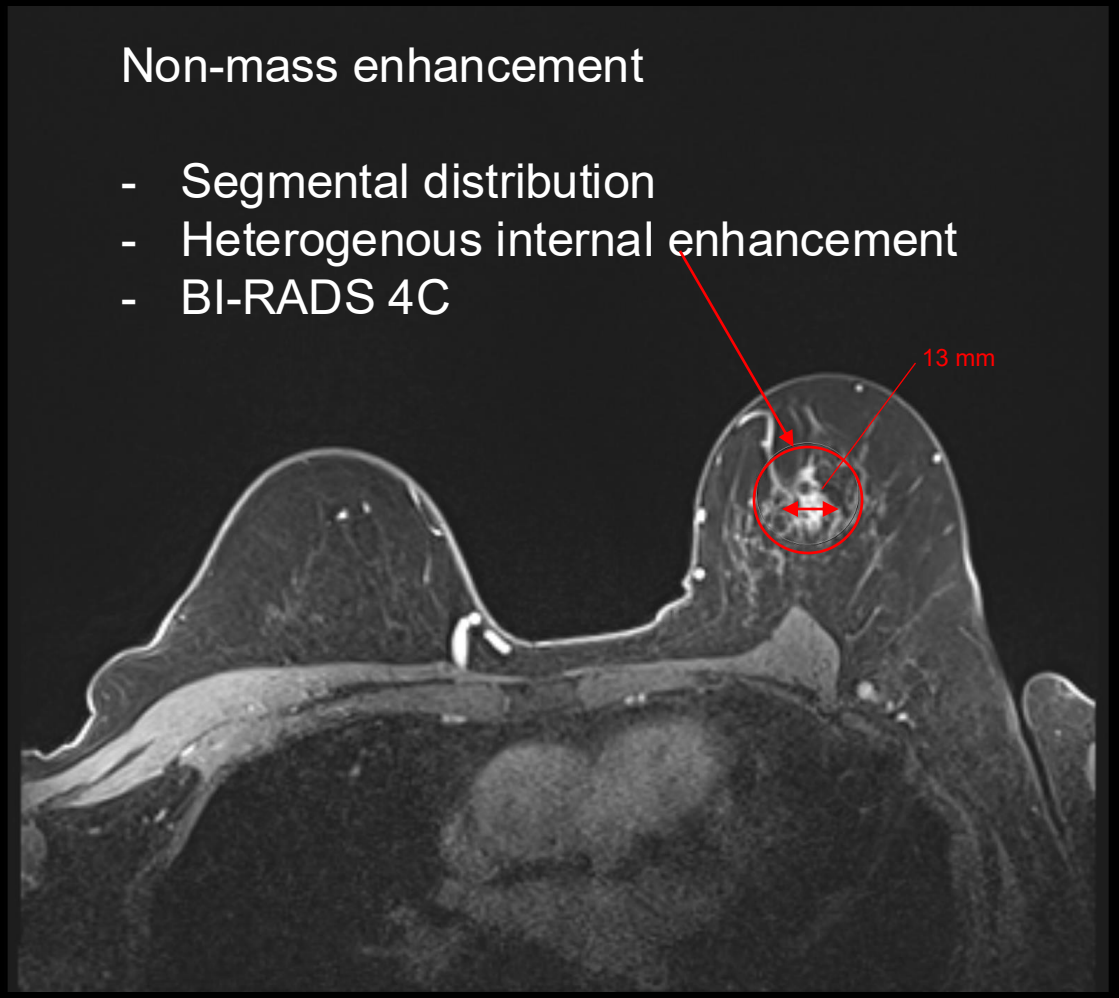

Image A

Abnormal lymph node

- Enlarged compared with other lymph nodes
- Round rather than normal reniform shape
- Loss or effacement of the central fatty hilum

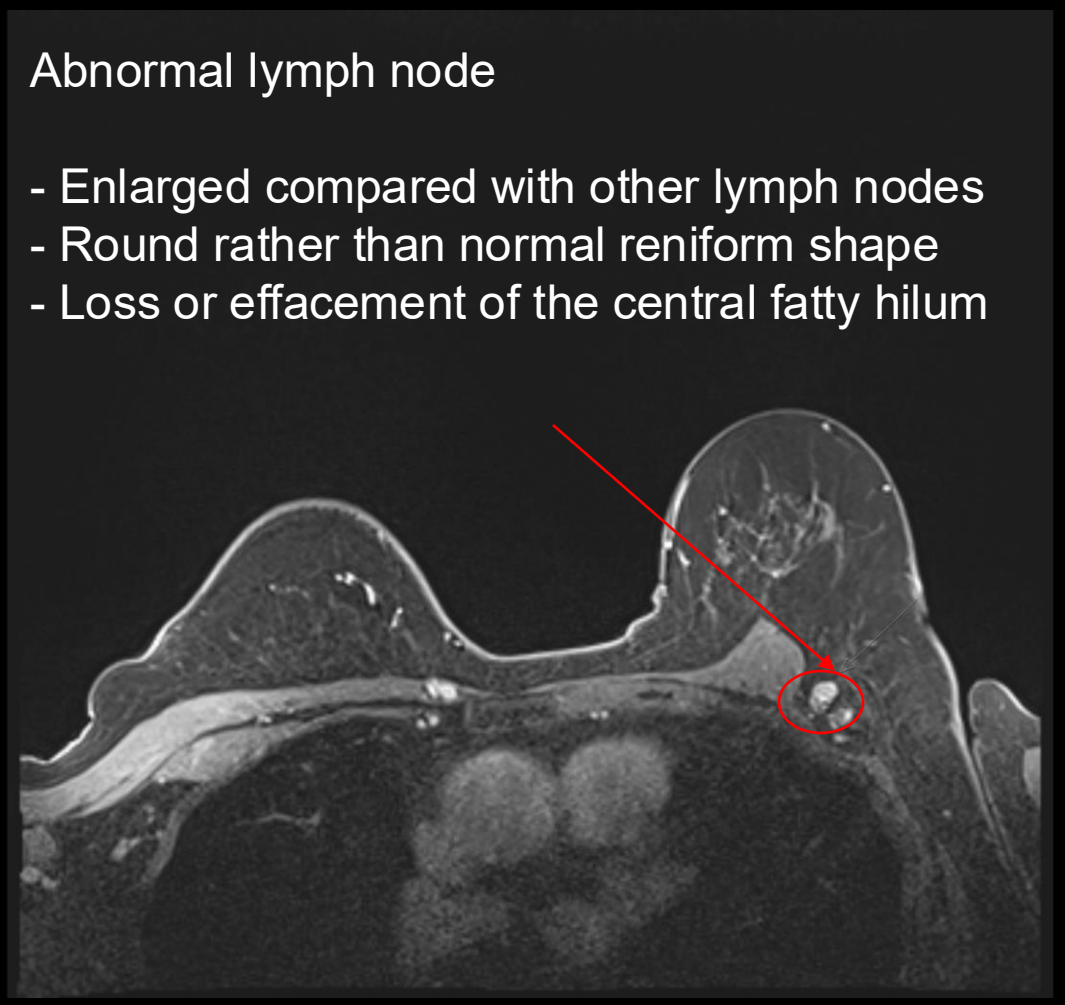

Image B

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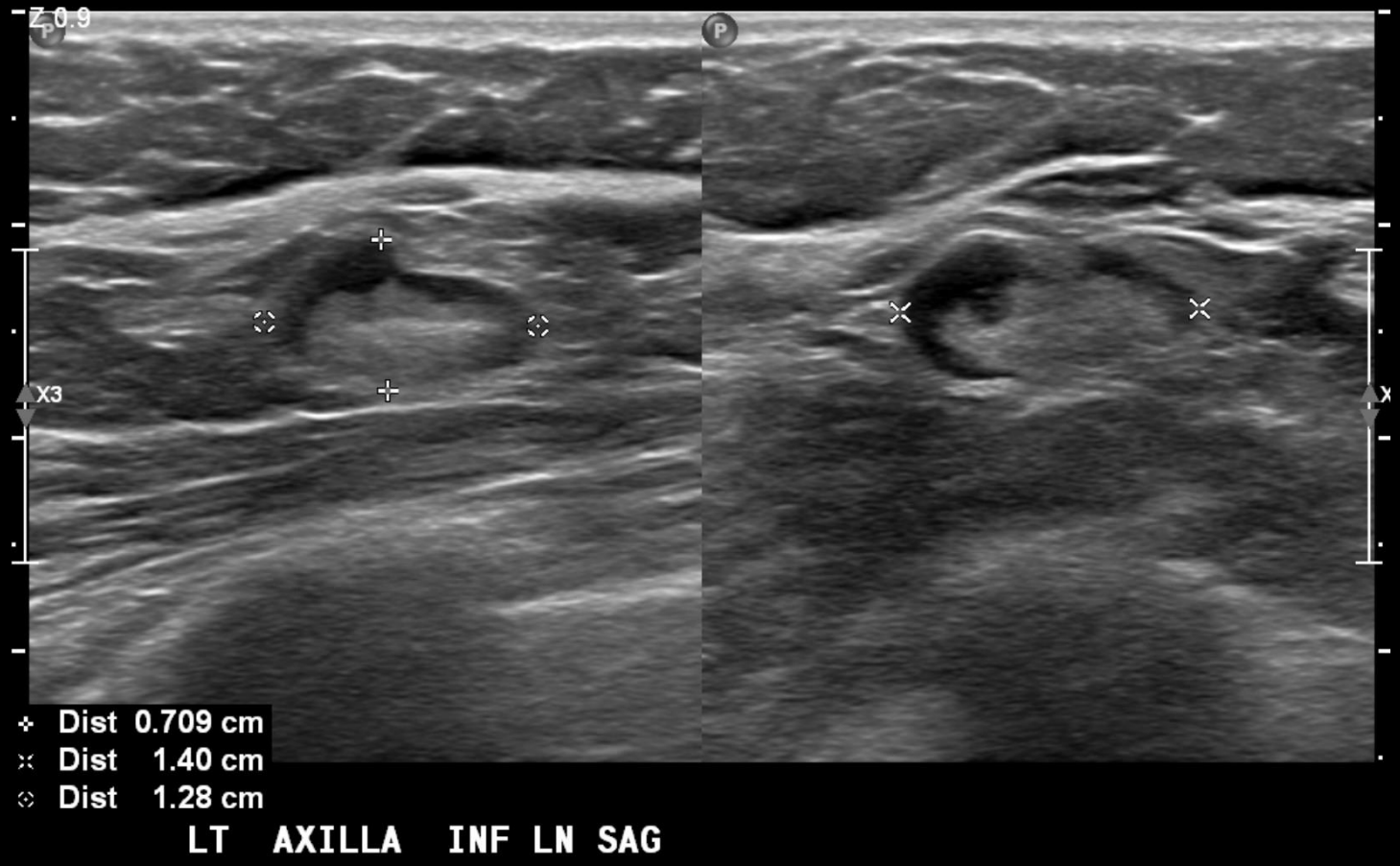
Select the applicable ACR Appropriateness Criteria

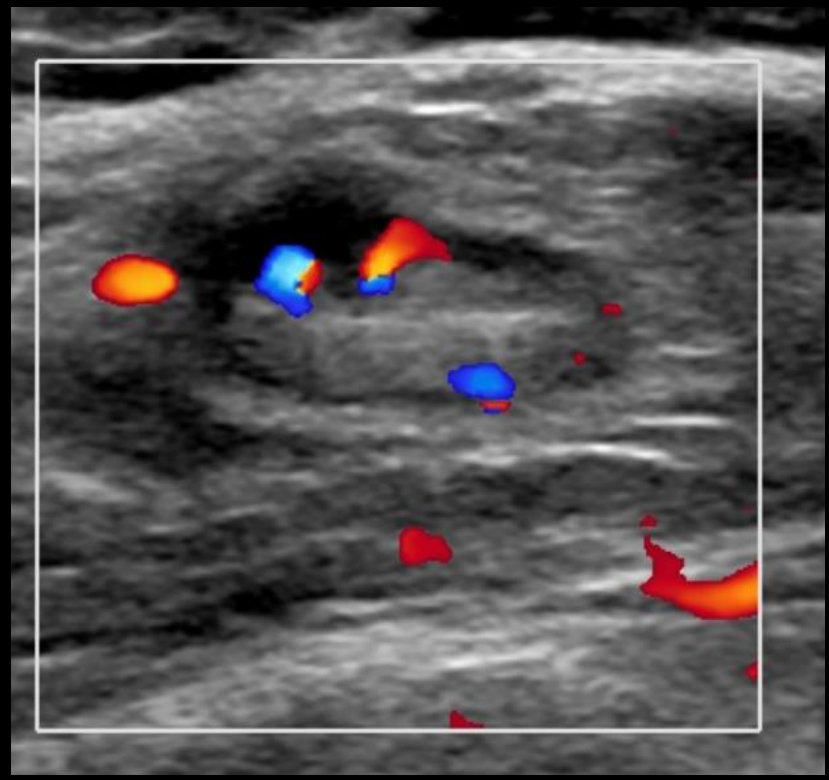
. Suspicious axillary node on any other imaging modality (excluding mammography and ultrasound). Next imaging study.

Scenario	Scenario ID	Procedure	Adult RRL	Peds RRL	Appropriateness Category
Axillary node, suspicious on imaging, not mammo or US, next imaging study	3194837	US axilla	0 mSv O	0 mSv [ped] O	Usually appropriate
		Digital breast tomosynthesis diagnostic	0.1-1mSv ☢☢		Usually appropriate
		Mammography diagnostic	0.1-1mSv ☢☢		Usually appropriate
		US-guided core biopsy axillary node	0 mSv O	0 mSv [ped] O	May be appropriate (Disagreement)
		US-guided fine needle aspiration biopsy axillary node	0 mSv O	0 mSv [ped] O	May be appropriate

This imaging modality was recommended by the attending radiologist

Left Axilla Ultrasound Findings (Unlabeled)





Left Axilla Ultrasound Findings (labeled)

Image A

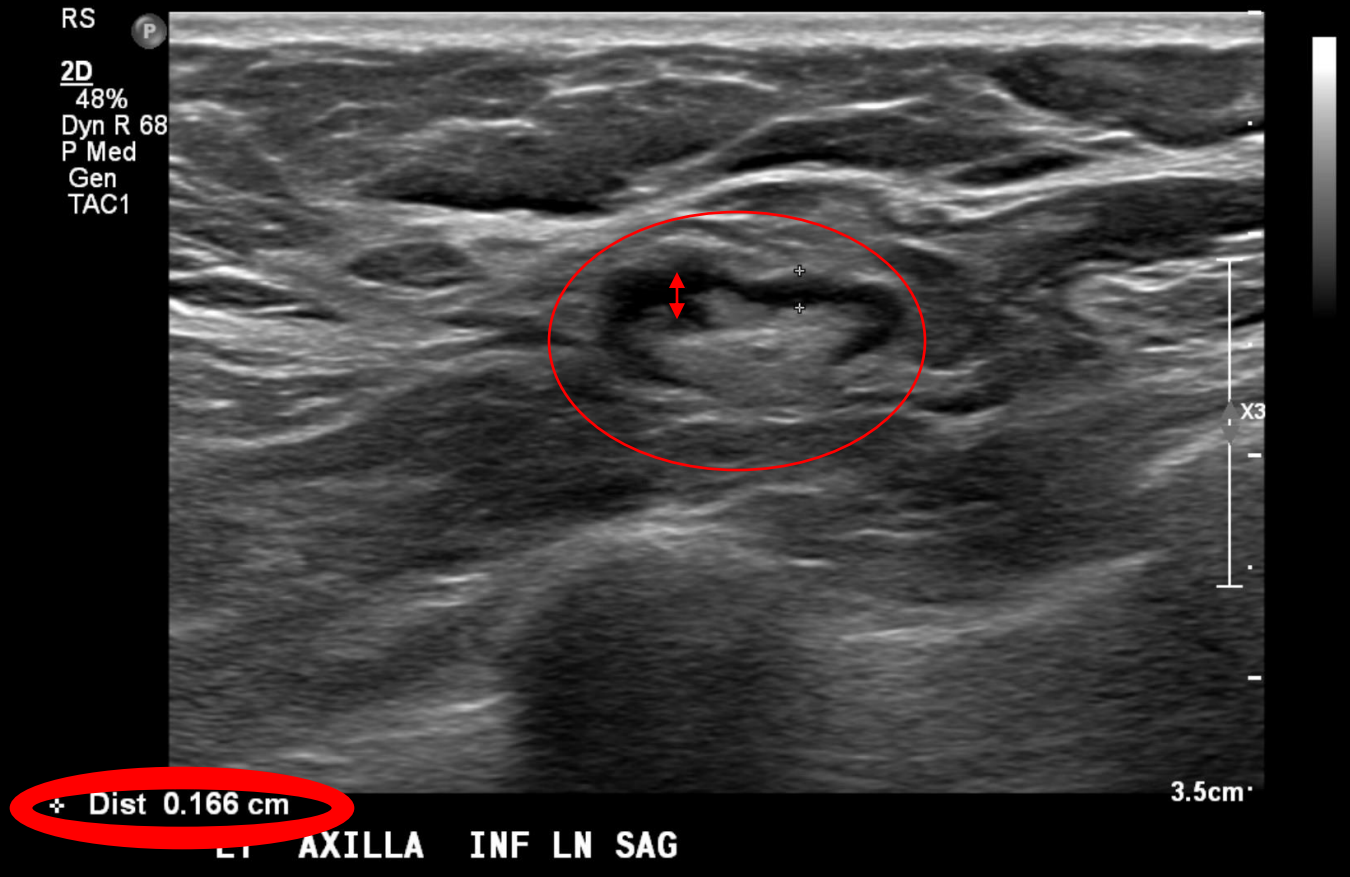
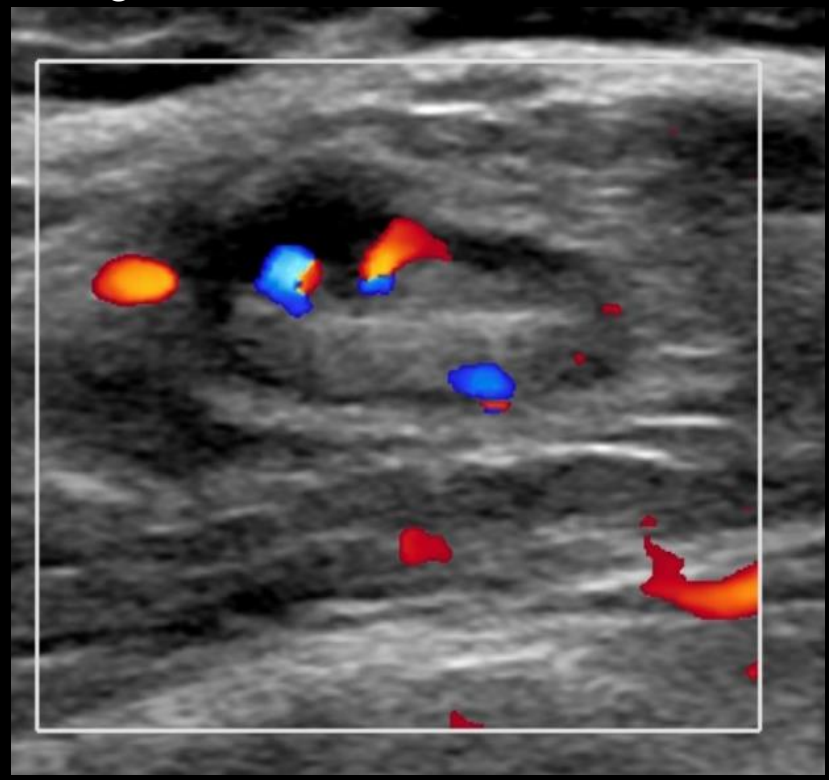


Image B



An oval left axillary lymph node with smooth margins and a preserved fatty hilum is demonstrated (circle) with a cortex measuring 1.6 mm. Central vascular flow is present In image B

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MR-Guided Biopsy Findings

1. Invasive lobular carcinoma of classic, pleomorphic and signet ring cell types.

2. Scarf Bloom Richardson score of 7 (Grade 2) [architecture =3, nuclear = 2, mitotic count= 2]

3. Er +, Pr +, Her2 –

Updated BI-RADS: 6 (biopsy proven malignancy)

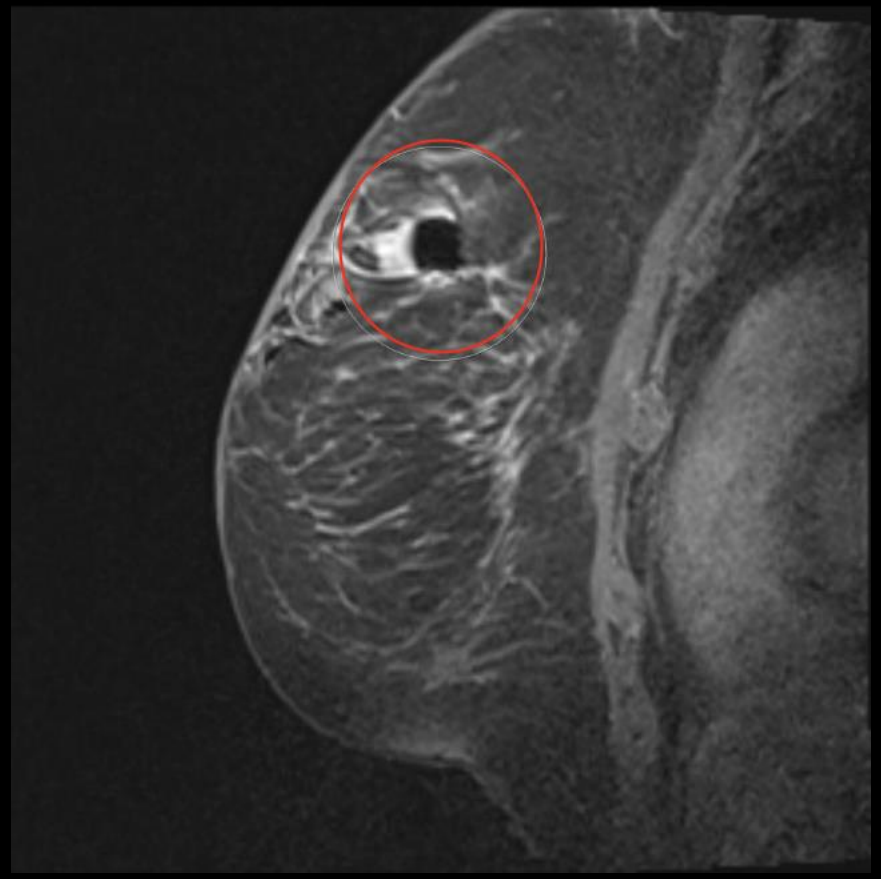
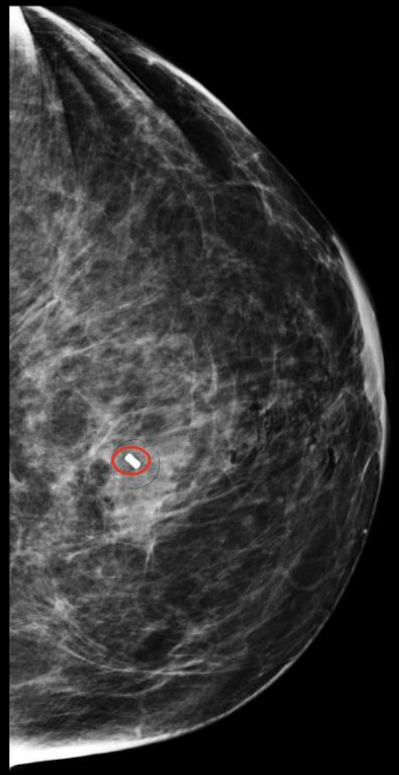


Image A: MRI Post Biopsy

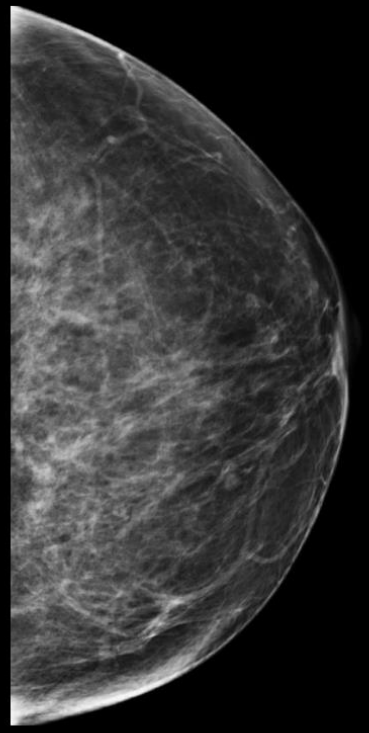
DIAGNOSTIC MAMMOGRAM TO CONFIRM BIOPSY SITE AND PIN PLACEMENT

CC VIEW



Post Biopsy

CC VIEW

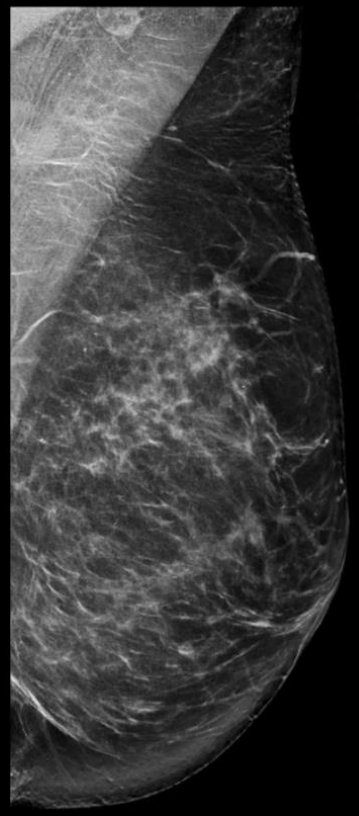


Prior

MLO VIEW

Post Biopsy

MLO VIEW



Prior

Final Diagnosis:

Invasive Lobular Carcinoma

Treatment Steps

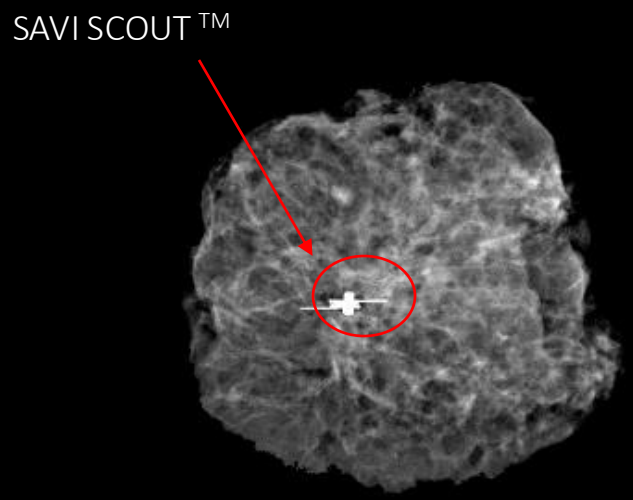
- Lumpectomy

- Done via SAVI SCOUT ™ guidance

- Sentinel Lymph Node Biopsy

- 2/2 Lymph nodes positive for metastatic cancer

Lumpectomy



Lumpectomy Pathology Results

Surgical Pathology Final Report

Final Diagnosis:

A. Breast, left, lateral margin, excision:
- Large volume of invasive lobular carcinoma involves the resection margin in multiple foci.

B. Breast, left, superior margin, excision:
- Invasive lobular carcinoma present away (>2 mm) from the resection margin.

C. Breast, left, inferior margin, excision:
- Large volume of invasive lobular carcinoma involving the resection margin in multiple foci.

D. Breast, left, lumpectomy:
- Invasive lobular carcinoma, classic, histiocytoid, and signet ring cell types with interstitial spread, spanning at least 3.0 cm microscopically, with biopsy site and in situ lobular carcinoma (LCIS) (classic type), see note and see synoptic summary.
- Invasive carcinoma involves the anterior, superior, medial, inferior, lateral, and posterior specimen edges; see parts A-C, and E-H for final margins.
- Background breast tissue with fibrocystic and columnar cell change containing calcifications, florid duct hyperplasia, duct ectasia, tiny fibroadenoma and radial scars.
  Note - Nottingham grading system utilized - SBR score 6 (architecture grade 3, nuclear grade 2, mitotic count 1).

E. Breast, left, medial margin, excision:
- Large volume of invasive lobular carcinoma involves the resection margin in multiple foci.

F. Breast, left, posterior margin, excision:
- Invasive lobular carcinoma present away (>2 mm) from the resection margin.

Select the Applicable ACR Appropriateness Criteria

Adult female or male or transfeminine (male-to-female) or transmasculine (female-to-male). Known breast cancer with clinical suspicion of metastatic disease. Staging or assessment of response to neoadjuvant chemotherapy. Initial imaging.

Scenario	Scenario ID	Procedure	Adult RRL	Peds RRL	Appropriateness Category
Breast cancer, metastatic disease suspected, staging, initial imaging	3195960	Bone scan whole body	1-10 mSv ☢☢☢	3-10 mSv [ped] ☢☢☢☢	Usually appropriate
		CT chest abdomen pelvis with IV contrast	10-30 mSv ☢☢☢☢	3-10 mSv [ped] ☢☢☢☢	Usually appropriate
		FDG-PET/CT skull base to mid-thigh	10-30 mSv ☢☢☢☢	3-10 mSv [ped] ☢☢☢☢	Usually appropriate
		MRI chest abdomen pelvis without and with IV contrast	0 mSv O	0 mSv [ped] O	Usually not appropriate
		MRI chest abdomen pelvis without IV contrast	0 mSv O	0 mSv [ped] O	Usually not appropriate
		CT chest abdomen pelvis without and with IV contrast	10-30 mSv ☢☢☢☢	10-30 mSv [ped] ☢☢☢☢☢	Usually not appropriate
		CT chest abdomen pelvis without IV contrast	10-30 mSv ☢☢☢☢	3-10 mSv [ped] ☢☢☢☢	Usually not appropriate

This imaging modality was recommended by the attending radiologist

FES PET was chosen over the other options due to:

- *Useful in ILC: Can identify subtle bone and soft-tissue metastases that may be difficult on conventional imaging.*
- *Whole-body assessment: Shows ER expression across metastatic sites, which can help guide endocrine therapy.*
- *Available at UPenn: FES-PET is performed at the Hospital of the University of Pennsylvania, making it a practical option for us to consider.*

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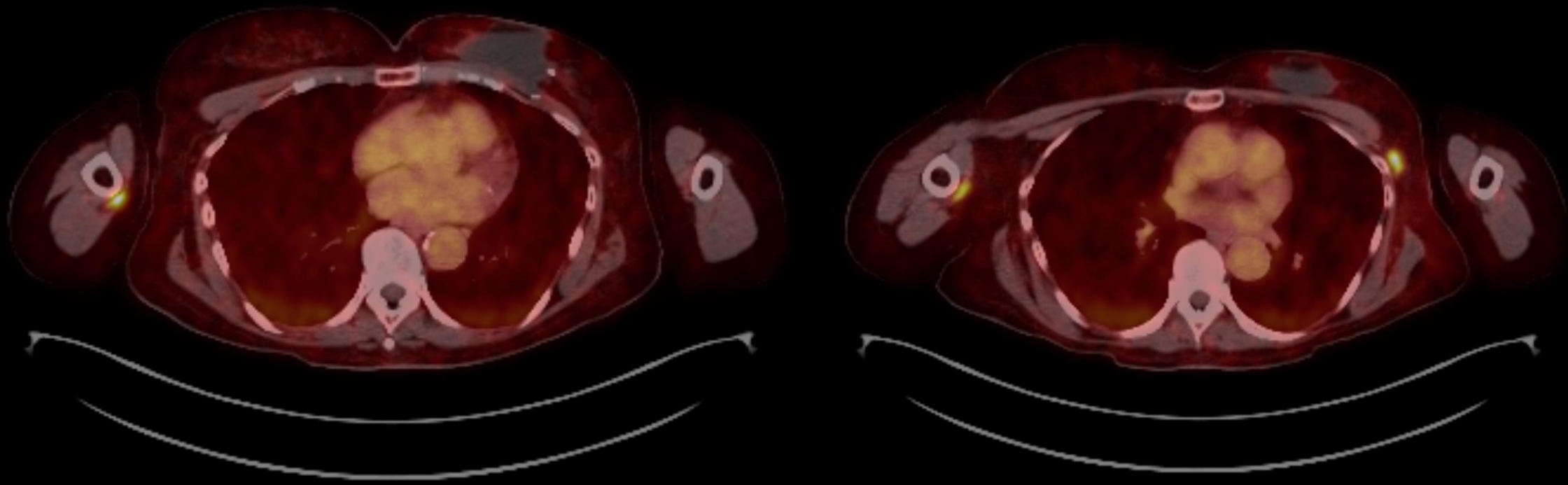
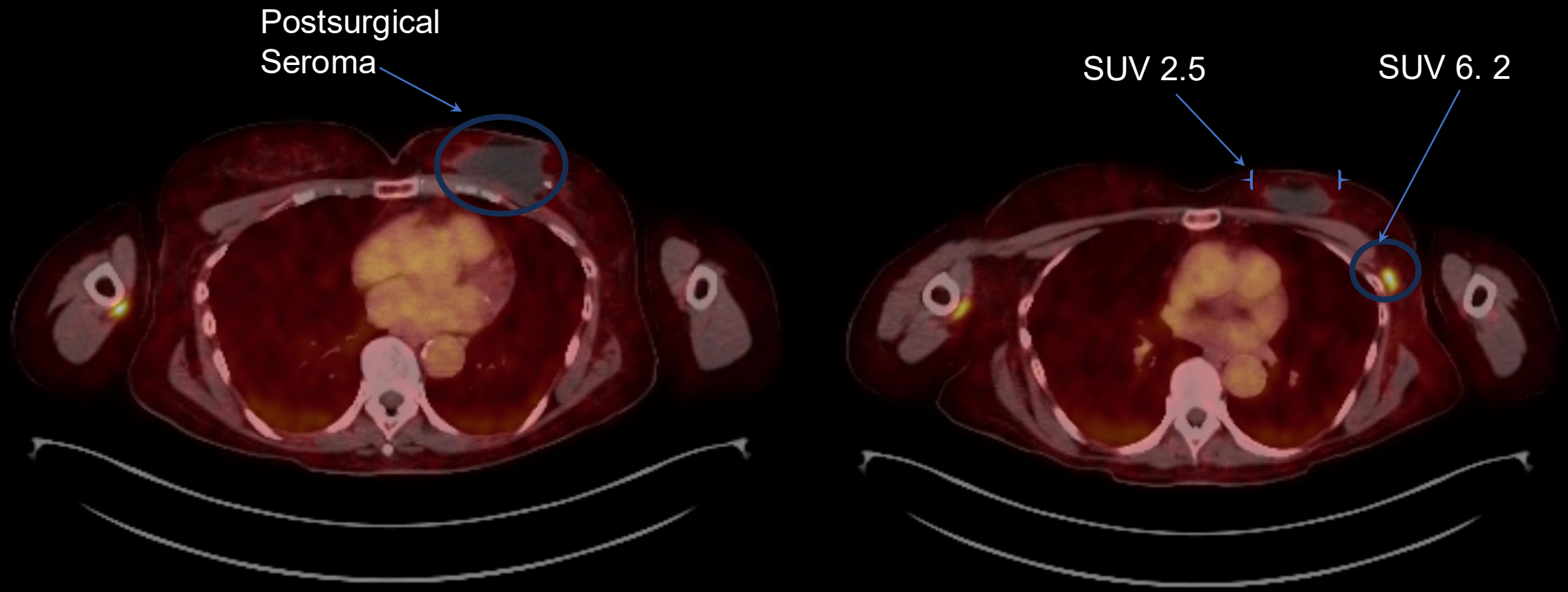
FES PET Findings (Unlabeled)



FES PET Findings (Labeled)



SUV = tracer uptake in region compared to reference background tissue

SUV 2.5 = high

Invasive Lobular Carcinoma

Overview

- *ILC is the second most common subtype of invasive breast cancer, accounting for approximately* **10–15%** *of all invasive carcinomas.*[1]
- *Most commonly affects* **postmenopausal women**, *with a median age at diagnosis of approximately* **60 years**.[2]
- *Characterized by* **loss of E-cadherin expression**, *resulting in single-file infiltration of malignant cells and a diffuse growth pattern that is often difficult to detect clinically and on imaging.*[3]
- *Typically presents as a* **subtle palpable thickening or asymmetry** *rather than a discrete mass and may be* **multifocal, multicentric, or bilateral** *more frequently than invasive ductal carcinoma.*[4]
- *Compared with invasive ductal carcinoma, ILC has* **lower mammographic sensitivity** *and is more likely to be underestimated on conventional imaging, making* **breast MRI valuable for assessing disease extent and identifying additional sites of malignancy.**[5]

Pathophysiology

- *Invasive lobular carcinoma arises from the* **terminal duct-lobular unit** *and is characterized by* **loss of E-cadherin function due to CDH1 gene inactivation**, *resulting in impaired cell-to-cell adhesion. This leads to* **dis-cohesive malignant cells infiltrating the breast stroma in a characteristic single-file pattern**, *often with minimal desmoplastic reaction, contributing to its subtle clinical and imaging presentation and propensity for multifocal and multicentric disease.*[1–3]

Invasive Lobular Carcinoma

Treatment

- Invasive lobular carcinoma typically involves **breast-conserving surgery (lumpectomy) with adjuvant radiotherapy** for patients with localized disease who are appropriate surgical candidates.

- However, **positive surgical margins**, extensive or multicentric disease, or **axillary lymph node involvement** may necessitate **modified radical mastectomy with axillary staging or dissection**, followed by **systemic therapy** (endocrine therapy, chemotherapy, and/or HER2-targeted therapy as indicated by tumour biology and stage).[1–5]

Case resolution and management

1. Patient underwent a left modified radical mastectomy

- **Removal of the entire left breast**, including:
  - Breast tissue
  - Nipple-areolar complex
  - Overlying skin (the amount depends on whether reconstruction is planned)
- **Level I and II axillary lymph node dissection**, which removes lymph nodes:
  - **Level I:** lateral to the pectoralis minor muscle
  - **Level II:** deep/posterior to the pectoralis minor muscle
- **Preservation of the pectoralis major (and usually pectoralis minor) muscles**, distinguishing it from the historical radical mastectomy, which removed these muscles.

2. Additional testing to determine extent of systemic treatment necessary

Post Modified Mastectomy Pathology Report

Final Diagnosis:

A. Breast, left, mastectomy:

- Mastectomy specimen - Prior lumpectomy surgical bed with abundant surrounding residual invasive lobular carcinoma, largest focus measuring up to 1.9 cm microscopically, associated with focal lobular carcinoma in situ (pleomorphic and classic subtypes).
- All specimen margins, negative (>0.2 cm) for carcinoma.
- Macrometastatic pleomorphic lobular carcinoma, entirely replacing one intramammary lymph node (1/1), largest metastatic focus measures at least 1.4 cm (gross measurement) with large volume of extranodal extension measuring at least 0.7 cm.
- Background breast tissue with fibrocystic changes containing calcifications.
- Benign skin, nipple, and skeletal muscle, uninvolved by carcinoma.

B. Axilla, left, axillary content, excision:

- Eight benign lymph nodes with surrounding prior surgical site changes, negative for carcinoma (0/8).

References

1. WHO Classification of Tumours Editorial Board. *Breast Tumours*. 5th ed. Lyon: International Agency for Research on Cancer; 2019.

2. Cserni G, et al. In: *WHO Classification of Tumours: Breast Tumours*. 5th ed. IARC; 2019.

3. Pestalozzi BC, Zahrieh D, Mallon E, et al. Distinct clinical and prognostic features of invasive lobular carcinoma of the breast. *J Clin Oncol.* 2008;26(18):3006–3014.

4. Mann RM, Cho N, Moy L. Breast MRI: State of the art. *Radiology*. 2019;292(3):520–536.

5. NCCN Clinical Practice Guidelines in Oncology. *Breast Cancer*. Version 2025; Burstein HJ, Curigliano G, Loibl S, et al. *Ann Oncol.* 2023.

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