

# AMSER Case of the Month

## March 2021

46-year-old female with left breast mass



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# Patient Presentation

- **HPI:** 46-year-old female presents for an annual gynecological exam, offering complaints. No history of recent weight loss, fever or fatigue. Denies lumps in her breast, nipple discharge, or breast tenderness; no swollen lymph nodes in the groin or axilla.
- **PSH:** Supracervical hysterectomy, retaining both ovaries
- **OB/GYN:** No history of abnormal mammogram. As per patient, prior mammogram 1 year ago at OSH was normal (images unavailable for review).
- **PE:** Overall symmetric breasts. Large, firm golf ball size lump palpated in the left breast at the 12 o'clock. No associated skin changes.

What imaging should we order?

# ACR Appropriateness Criteria: Palpable Breast Masses

**Variant 1:** Palpable breast mass. Female, 40 years of age or older, initial evaluation. (See [Appendices 1A-1B](#) for additional steps in the workup of these patients.)

Radiologic Procedure	Rating	Comments	RRL*
Mammography diagnostic	9	See references [13-15].	☼☼
Digital breast tomosynthesis diagnostic	9	See references [16-18,20,85].	☼☼
US breast	4	If she had recent mammogram (ie, past 6 months), US may be appropriate.	○
MRI breast without and with IV contrast	2	See references [4,49].	○
MRI breast without IV contrast	1		○
FDG-PEM	1		☼☼☼☼
Sestamibi MBI	1		☼☼☼
Image-guided core biopsy breast	1		Varies
Image-guided fine-needle aspiration breast	1		Varies

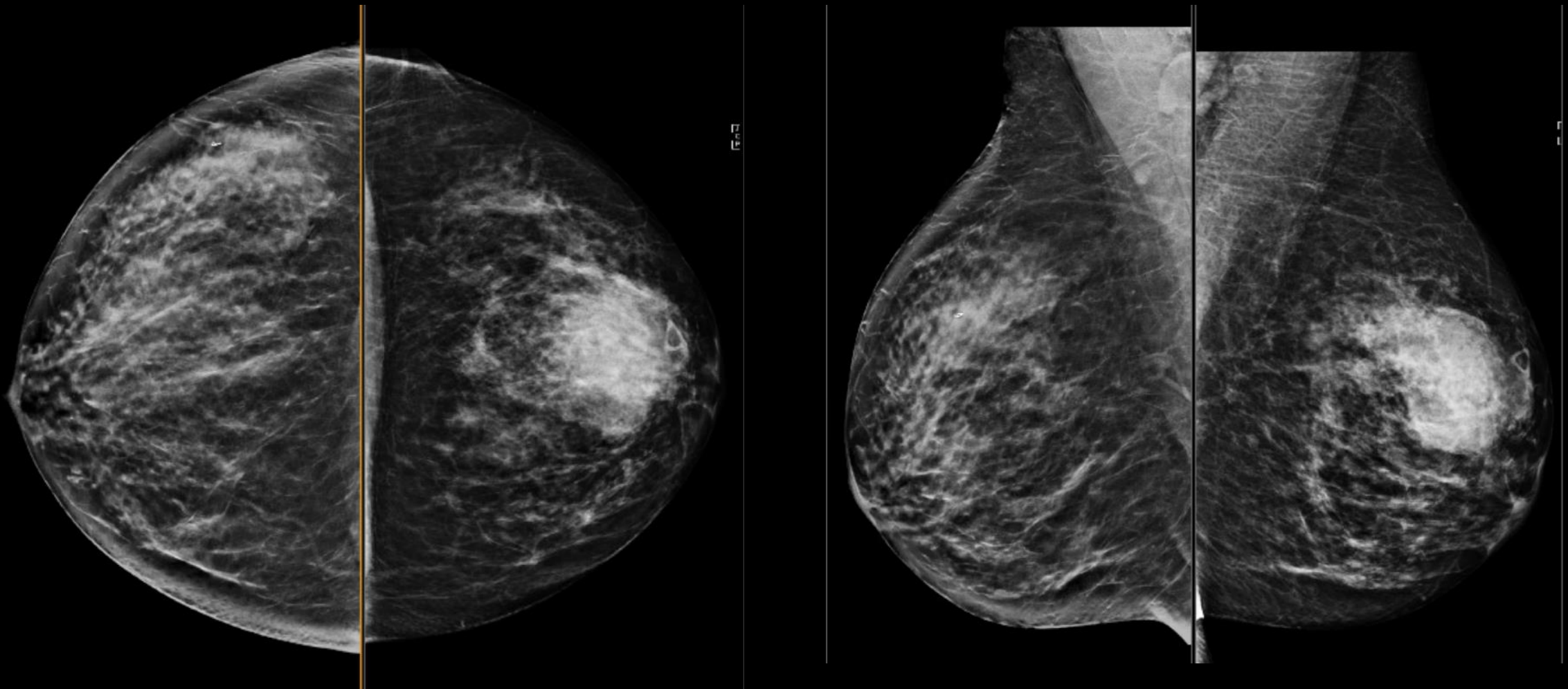
This imaging modality was ordered.



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

\*Relative Radiation Level

# Diagnostic Mammogram (unlabeled)



Right CC

Left CC

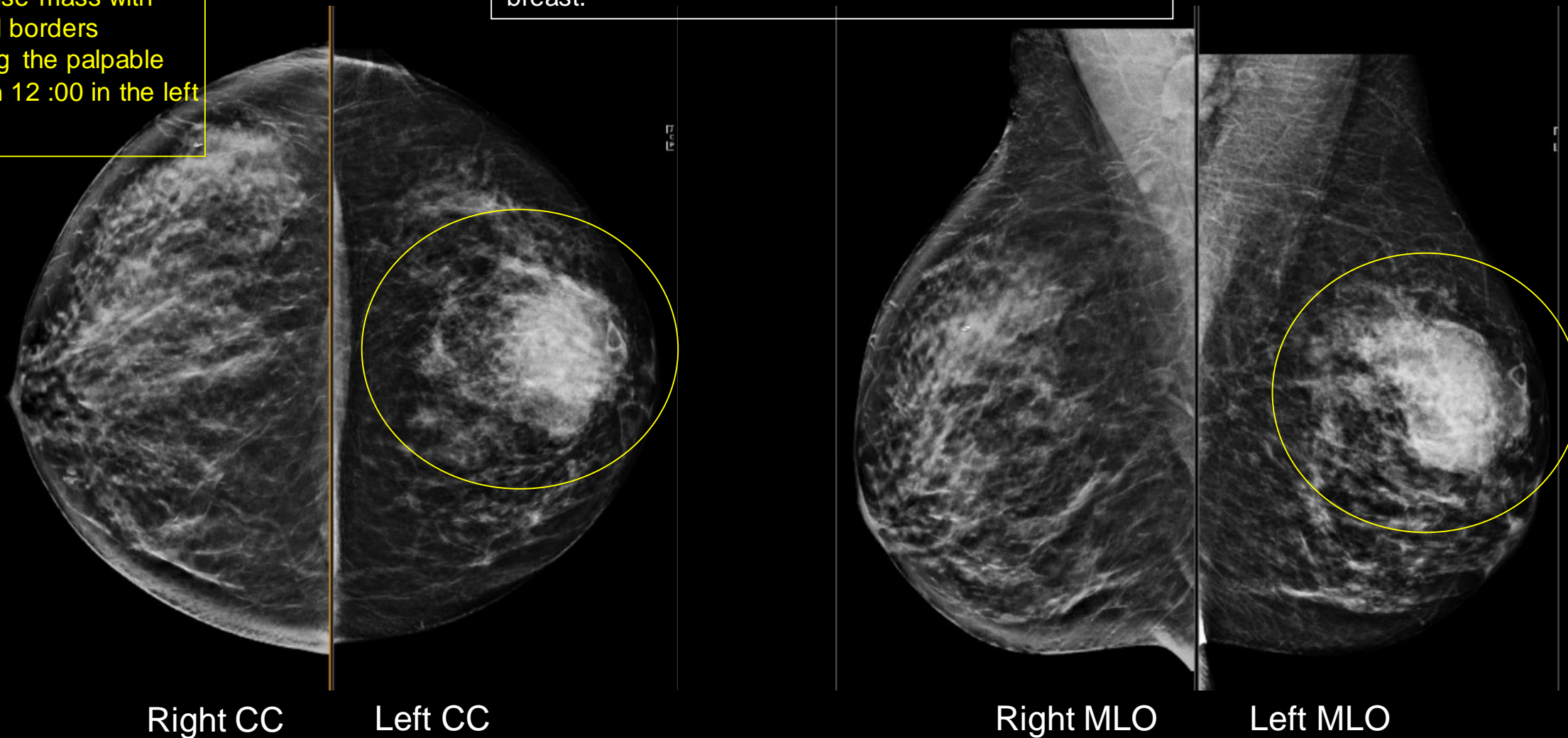
Right MLO

Left MLO

# Diagnostic Mammogram Findings (labeled)

Heterogeneously dense breast tissue with a hyperdense mass with obscured borders underlying the palpable marker in 12 :00 in the left breast.

There were no suspicious calcifications associated with the mass or any additional concerning findings in either breast.



What additional imaging should we order next?

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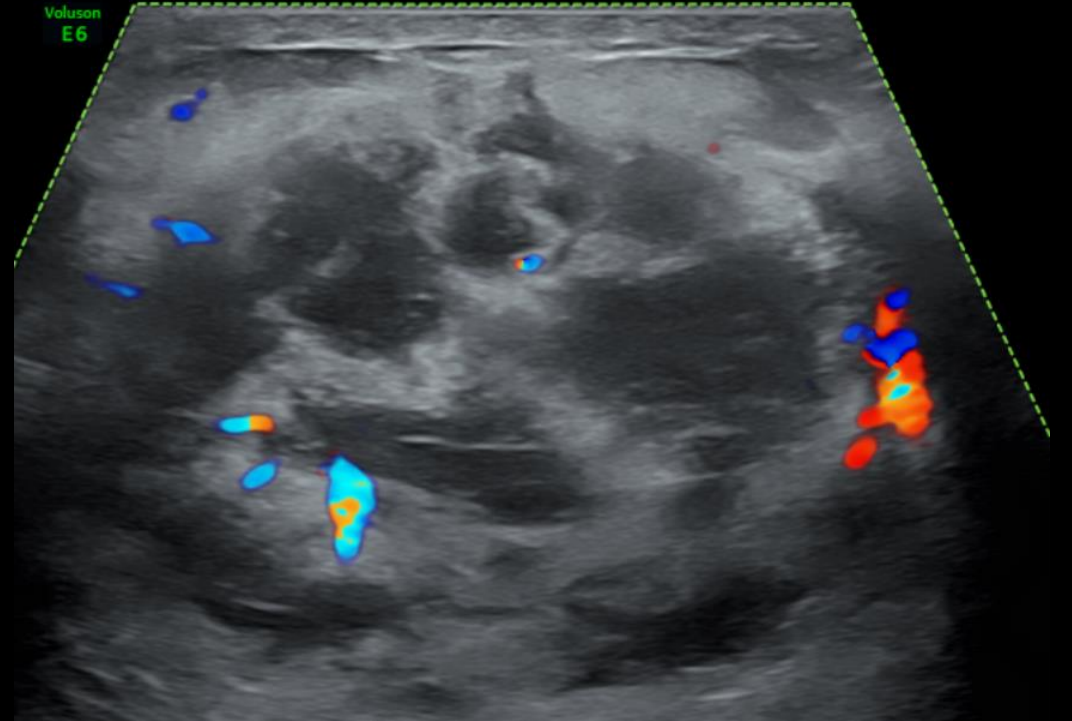


# Ultrasound of left breast mass

without Doppler



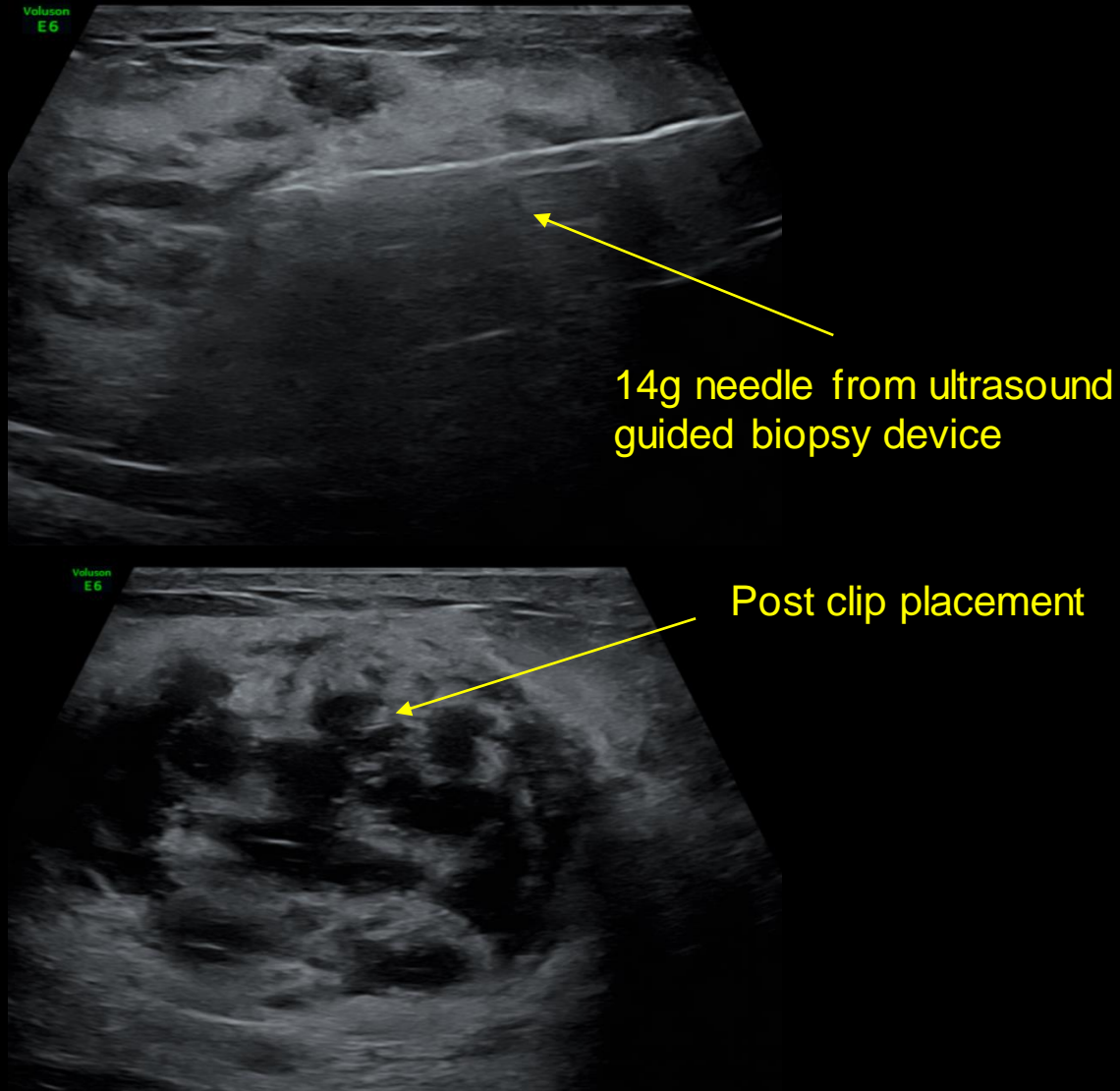
with Doppler



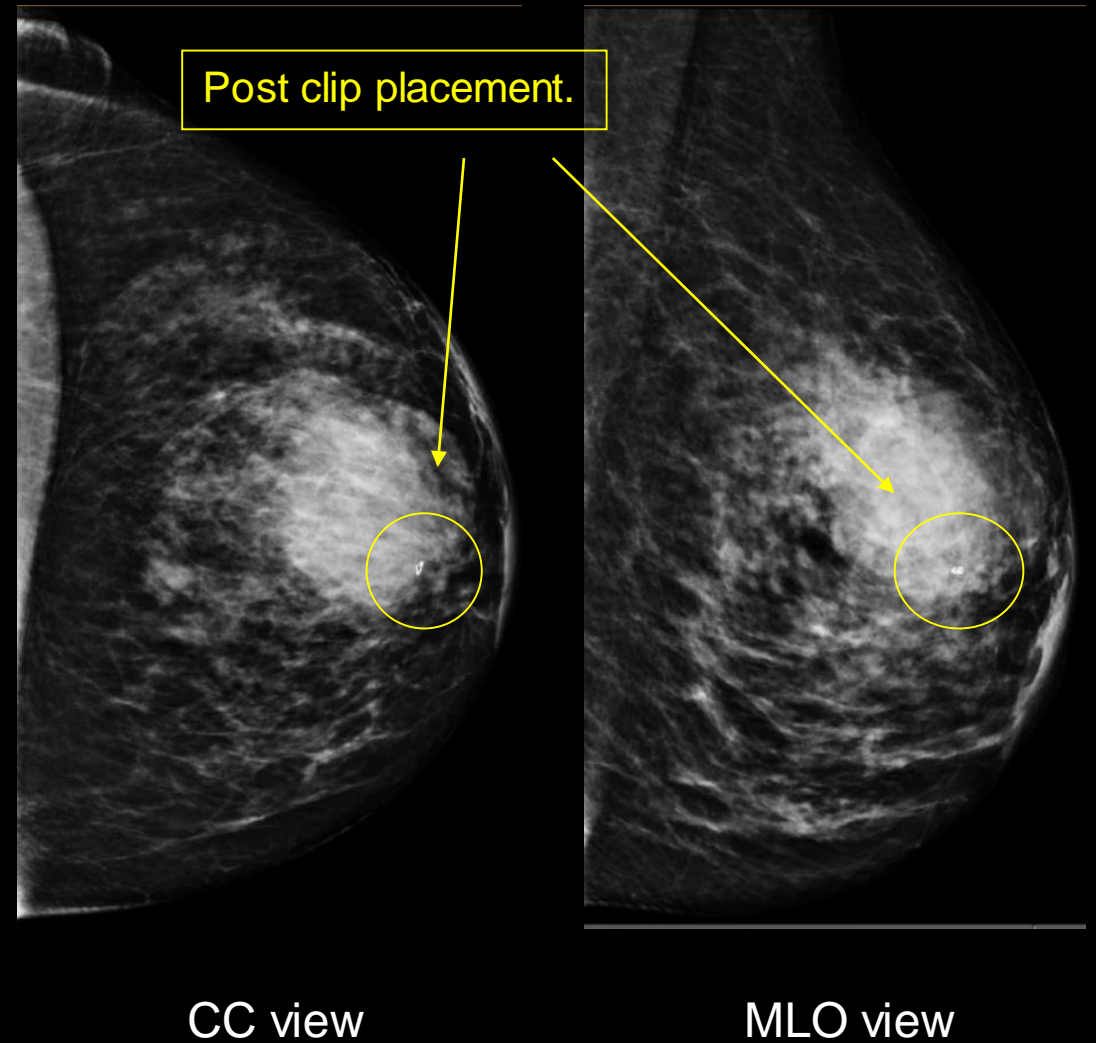
Sonographic evaluation of the left breast revealed a heterogeneous, solid and cystic 5.1 x 3.5 x 4.7 cm mass with indistinct margins and internal vascularity at 12:00, corresponding to mammogram finding. BIRADS 4. There was no left axillary adenopathy. Subsequent ultrasound guided core biopsy was performed.

# Ultrasound Guided Core Biopsy & Post Biopsy Clip Placement

During biopsy



Post biopsy

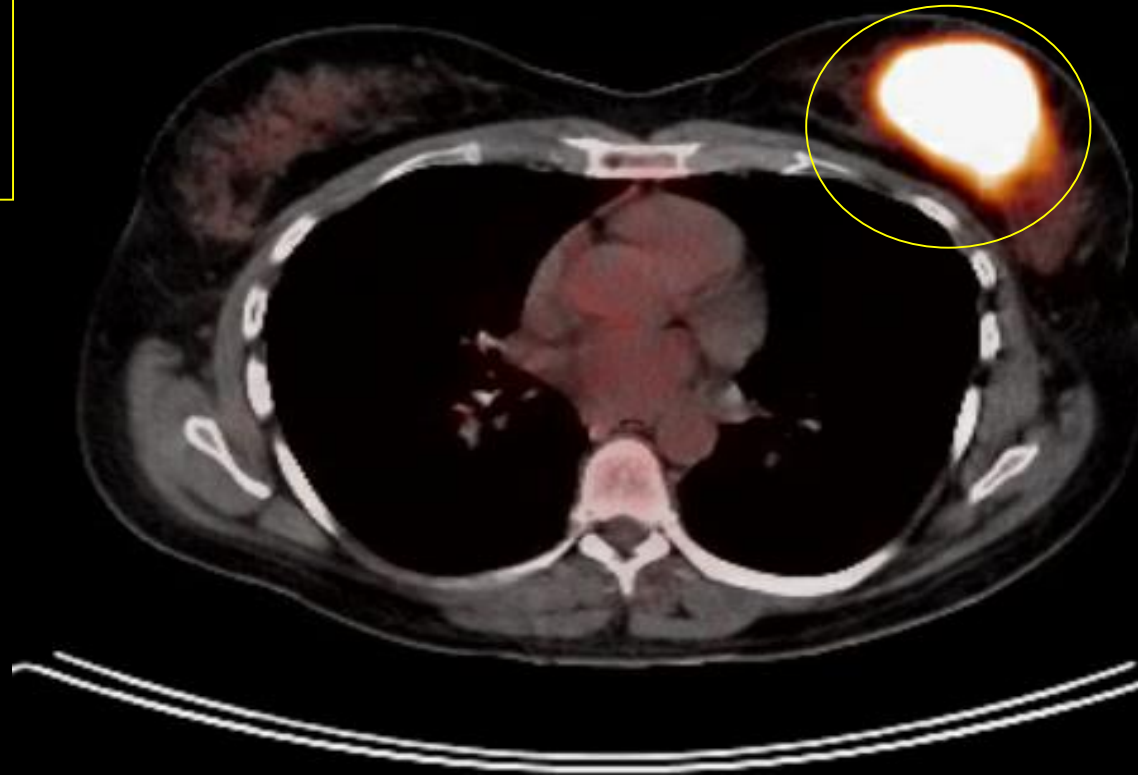


## Findings and Final Dx:

- Pathology revealed a starry sky morphology and a phenotype of CD20+, CD79a+, CD10+, bcl6+, myc+, bcl2 and bcl1 negative, and TdT negative. Ki-67 was 99%. Fluorescence in situ hybridization revealed a bcl6 and c-myc rearrangement.
- The final pathology review classified the specimen as a **double-hit high grade B cell lymphoma**.

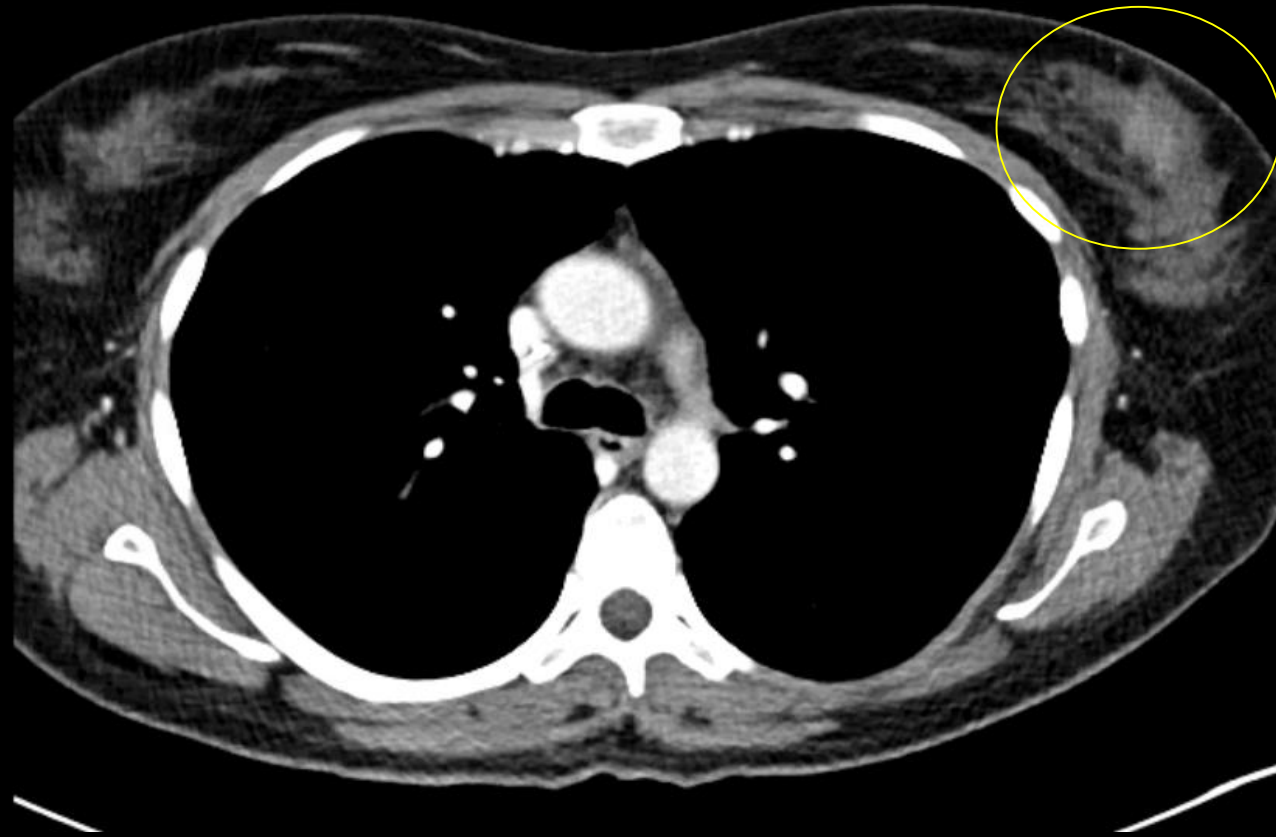
# PET CT

Hypermetabolic  
5.3 x 4.0 cm left  
breast mass, SUV  
max of 9.3



Approximately 1 month following initial diagnosis, a PET CT was performed.

# CT CAP

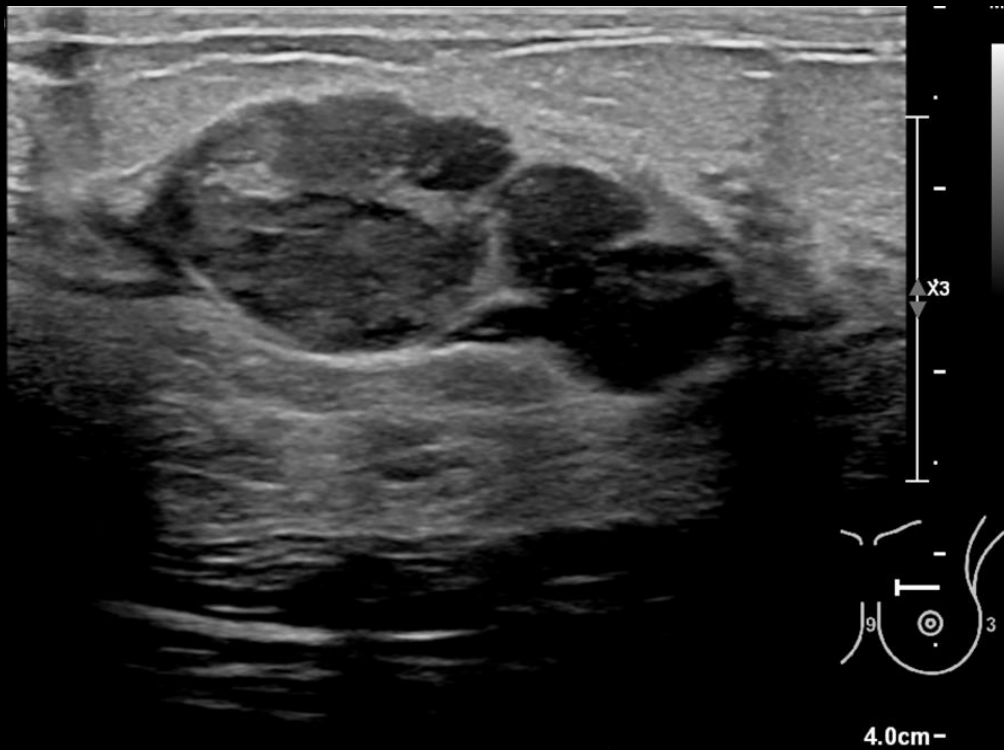


Ill-defined enhancing soft tissue in the left breast, decreased in size since original presentation; no distant metastases.

Restaging CT CAP was ordered 2 months following initial diagnosis.

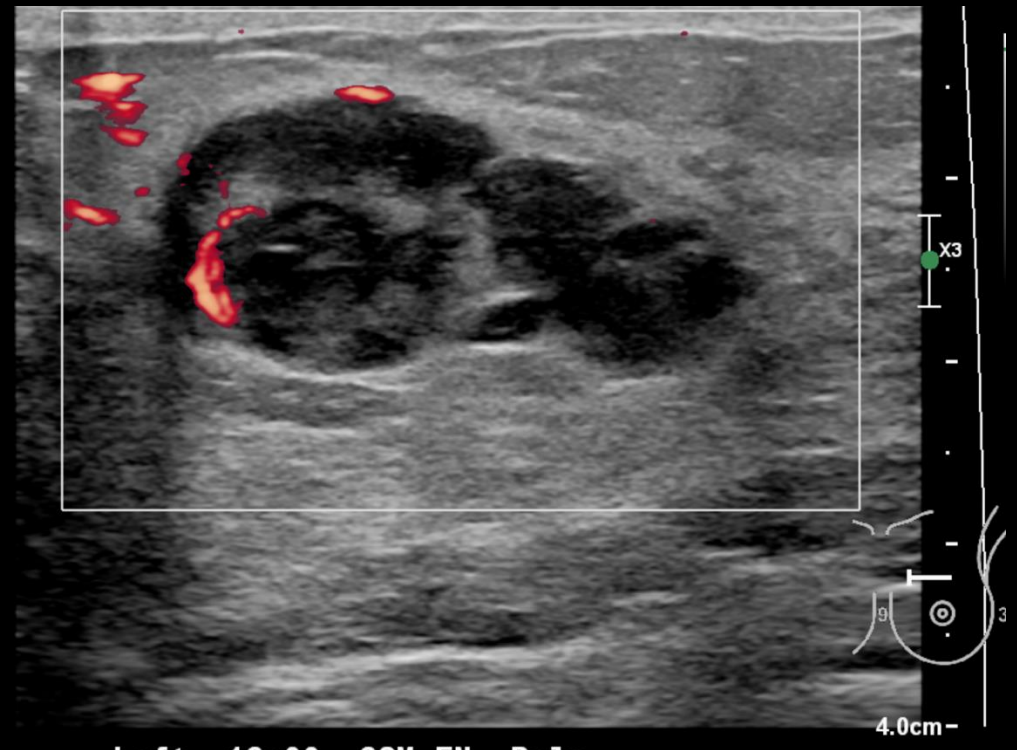
# 3 month follow-up ultrasound

Without Doppler



Left 12:00 2CM FN Palp |

With Doppler



Left 12:00 2CM FN Palp

Follow up ultrasound evaluation demonstrated a 3.3 x 1.6 x 2.1 cm hypoechoic mass at 12:00, 2 cm from nipple, a decrease in size from the original ultrasound imaging, with decreased vascularity and increasingly circumscribed margins; birads 6.

## Final Imaging:

- Unfortunately, a repeat ultrasound performed 2 months after initial follow-up imaging (5 months since the original presentation) demonstrated an increase in tumor size, to 6.6 cm, initially 5.1 cm on presentation.
- Repeat ultrasound-guided biopsy revealed the same tumor as on initial biopsy, high-grade B-cell lymphoma.

# Discussion: Primary Breast Lymphoma Presentation and Pathology

- Primary breast lymphoma is a form of extranodal lymphoma, representing 0.5% of all breast malignancies.
- Histologically, diffuse large B-cell lymphoma is the most common.
- PBL makes up 1% of all non-Hodgkin lymphoma and <3% of extranodal lymphomas.
- Most commonly presents solely as a painless breast mass, making it difficult to differentiate from breast carcinoma.
- Constitutional symptoms, cutaneous changes, and nipple retraction and discharge are not often associated.
- Right breast involvement is often reported over left breast.



# Discussion: Imaging and Diagnosing

- While there are no distinguishing pathognomonic features on imaging, multiple studies denote features which could point to breast lymphoma over other pathologies.
- On mammography, circumscribed margins, absent calcifications, and normal breast architecture with axillary lymphadenopathy should propose lymphoma.
- On ultrasound, a hypoechoic mass either round or oval in nature is observed most commonly.
- PET/CT scans are beneficial in terms of staging and management.

# Discussion: Treatment

- Treatment involves a combination of chemotherapy and radiotherapy. Additionally, CNS prophylaxis is also highly recommended.
- Suggested chemotherapy is R-CHOP (rituximab, cyclophosphamide, doxorubicin, vincristine, and prednisone).
- However, it has been proposed in cases of high Ki-67 expression and more aggressive lymphomas such as double- and triple-hit, R-EPOCH (etoposide, prednisone, vincristine, cyclophosphamide, and doxorubicin) is first-line.
  - This was the therapy chosen for the patient presented here with a Ki-67 of 99% diagnosed with double-hit high grade B cell lymphoma, in addition to intrathecal methotrexate and alternating cytarabine for CNS prophylaxis.

# References:

- Cheah, C. Y., Campbell, B. A., & Seymour, J. F. (2014). Primary breast lymphoma. *Cancer treatment reviews*, 40(8), 900-908.
- Jia-Jia Huang, Wenqi Jiang, Zhi-Ming Li; R-EPOCH Is Superior to R-CHOP As a First-Line Regimen in De Novo DLBCL Patients with High Ki-67 Expression. *Blood* 2015; 126 (23): 5085. doi: <https://doi.org/10.1182/blood.V126.23.5085.5085>
- Phuoc, V., Sandoval-Sus, J., & Chavez, J. C. (2019). Drug therapy for double-hit lymphoma. *Drugs in context*, 8, 2019-8-1. <https://doi.org/10.7573/dic.2019-8-1>
- Santra, A., Kumar, R., Reddy, R., Halanaik, D., Kumar, R., Bal, C. S., & Malhotra, A. (2009). FDG PET-CT in the management of primary breast lymphoma. *Clinical nuclear medicine*, 34(12), 848–853. <https://doi.org/10.1097/RLU.0b013e3181becdfc>