

# Breast Lymphoma

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October 2023

First, let's dive into a case....

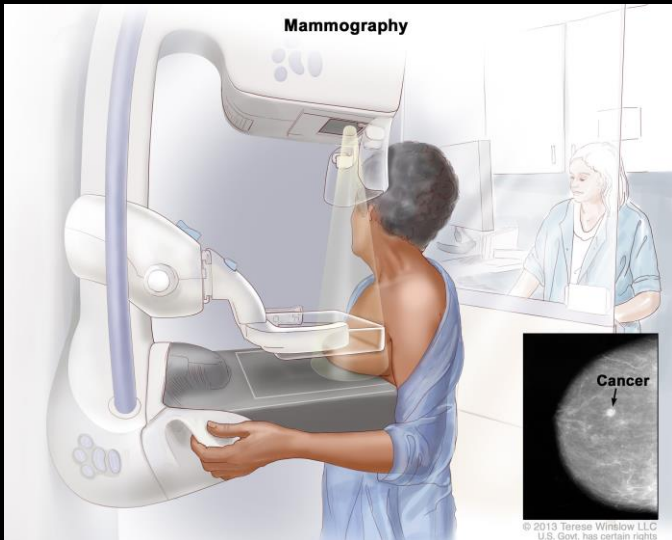
- 73 yo F with hx of MDS with transformation to AML in 2000 s/p 7+3 chemo regimen with no subsequent e/o relapse, as well as hx of follicular lymphoma of left breast/axillary node initially diagnosed in 2010 s/p tx with rituximab with one subsequent episode of relapse of lymphoma in 2017 which required additional tx with rituximab, currently in remission at the time of presentation to UNC Mammography Clinic.
- However, patient is now endorsing new-onset pain in her left breast...

Q: What is the next step in workup of this patient presenting with new breast pain?



# A: Diagnostic Mammo and Targeted Ultrasound

- Note, diagnostic mammography is different than screening mammography!
- Diagnostic mammography is used when a patient is symptomatic or after an abnormality is found on screening mammography



Some Indications for Diagnostic Mammo:

-Focal breast pain\*

*\*(this is different than physiologic diffuse bilateral breast pain that is normal with fluctuations in hormones during menstrual cycles)*

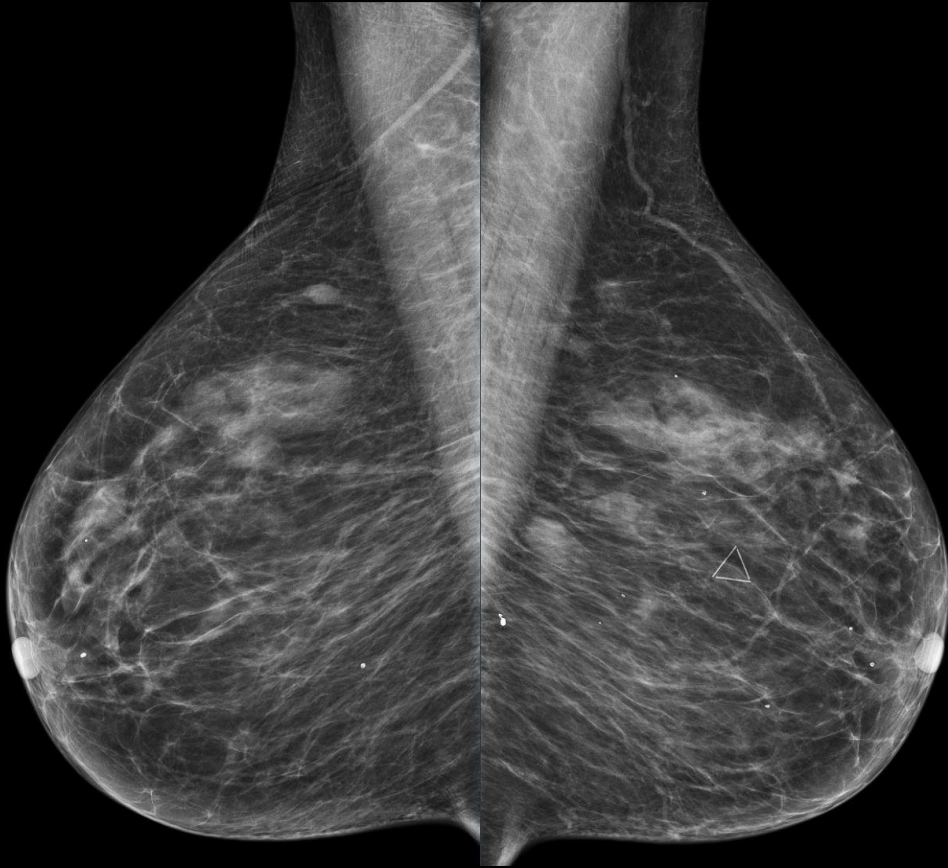
-New, palpable breast lump

-Nipple Discharge

-Nipple Inversion

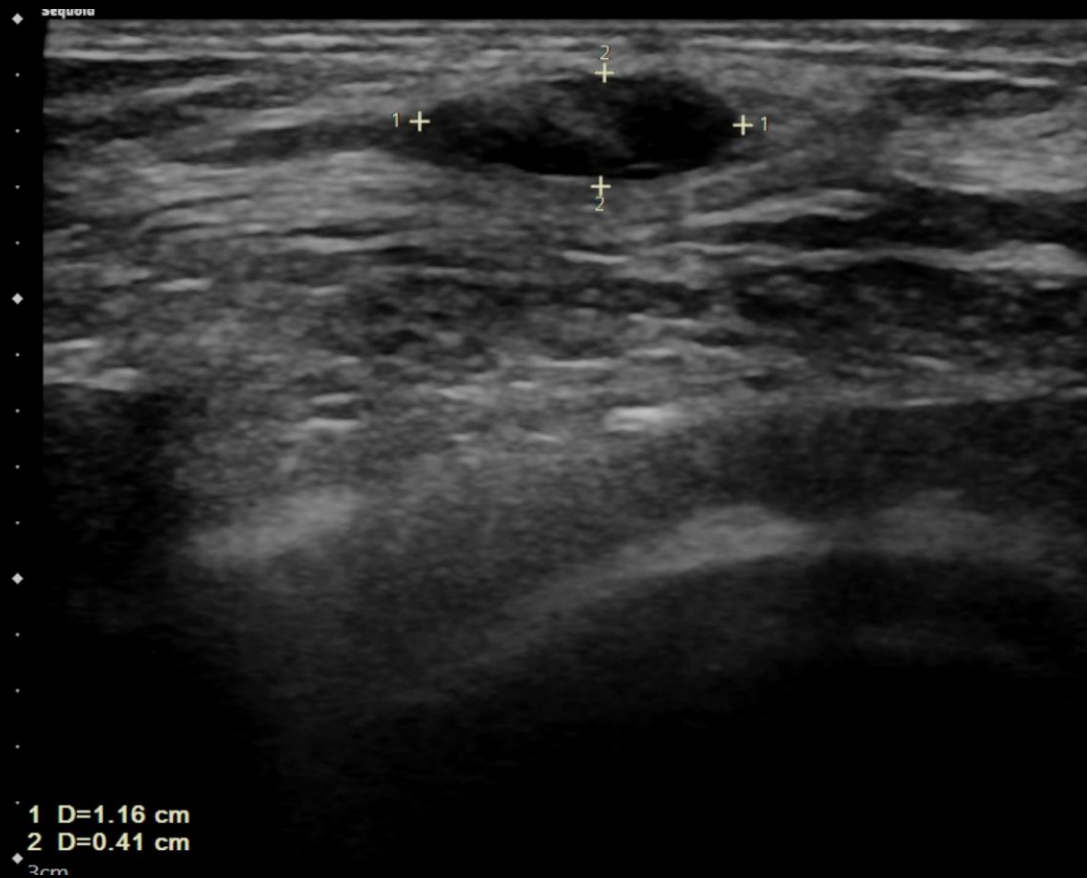
-Abnormality such as new mass or suspicious calcifications found on screening mammography

# No significant findings on tomosynthesis (“3D mammography”)



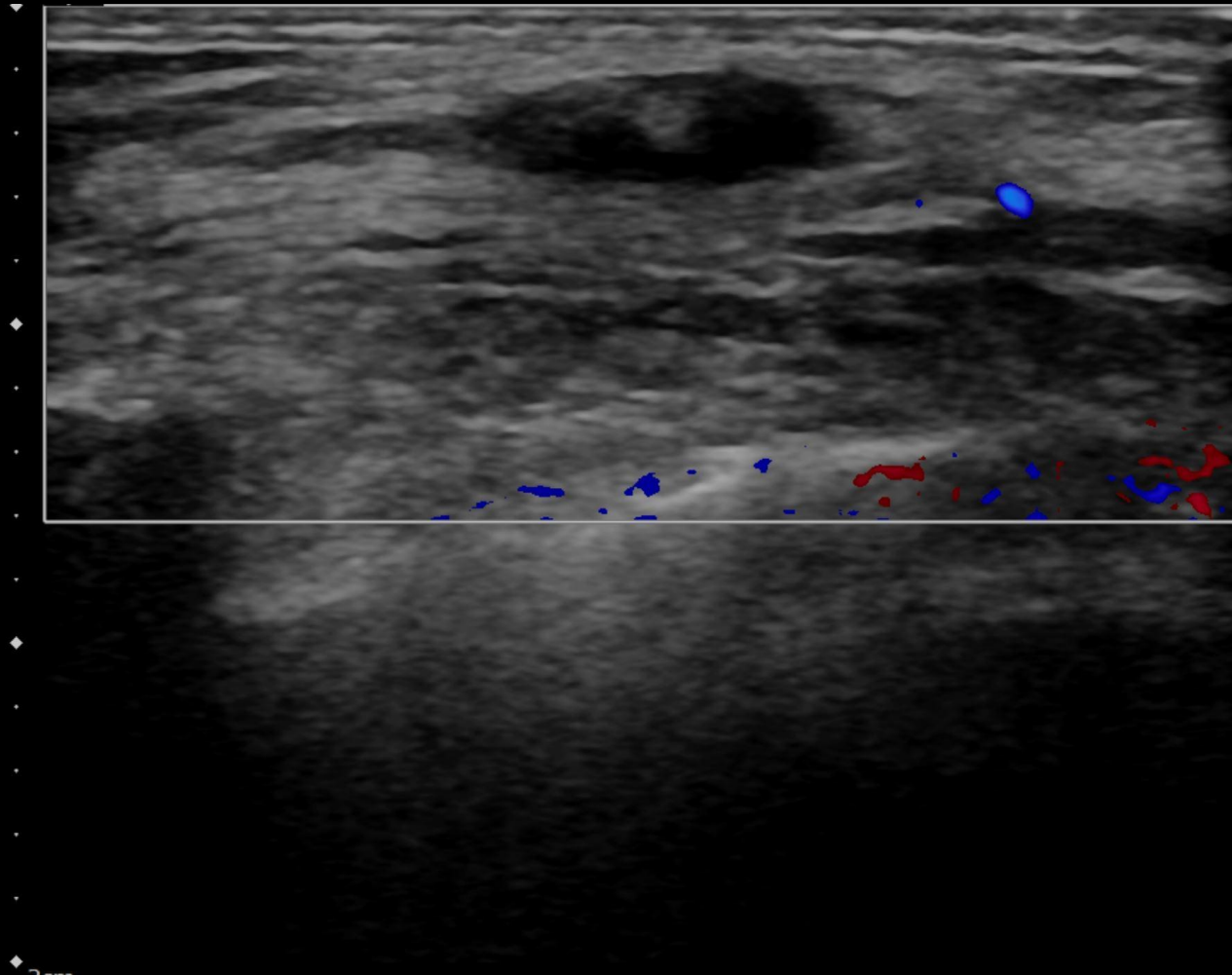
- MLO view\*
- Breast density: b (scattered areas of fibroglandular density)
- No suspicious masses, malignant-type calcifications, architectural distortion, or concerning asymmetry noted on tomo
- Patient does have bilateral benign-appearing calcifications
- \*CC view performed, not shown on this slide

# Targeted Ultrasound Findings



- Parallel hypoechoic mass with smooth margins found at 3 o'clock position 5 cm from the nipple on the left breast
- Mass dimensions:  
1.1 X 1.2 X 0.4 cm
- Mass position concordant with patient's identified site of pain
- Assigned BI-RADS Category 4A

# Ultrasound with Doppler



# Differential for Hypoechoic Breast Mass on Ultrasound

- Fibroadenoma
- Phyllodes tumor
- Breast cancer (epithelial origin/carcinoma)
- Breast lymphoma
- Breast abscess
- Granulomatous mastitis



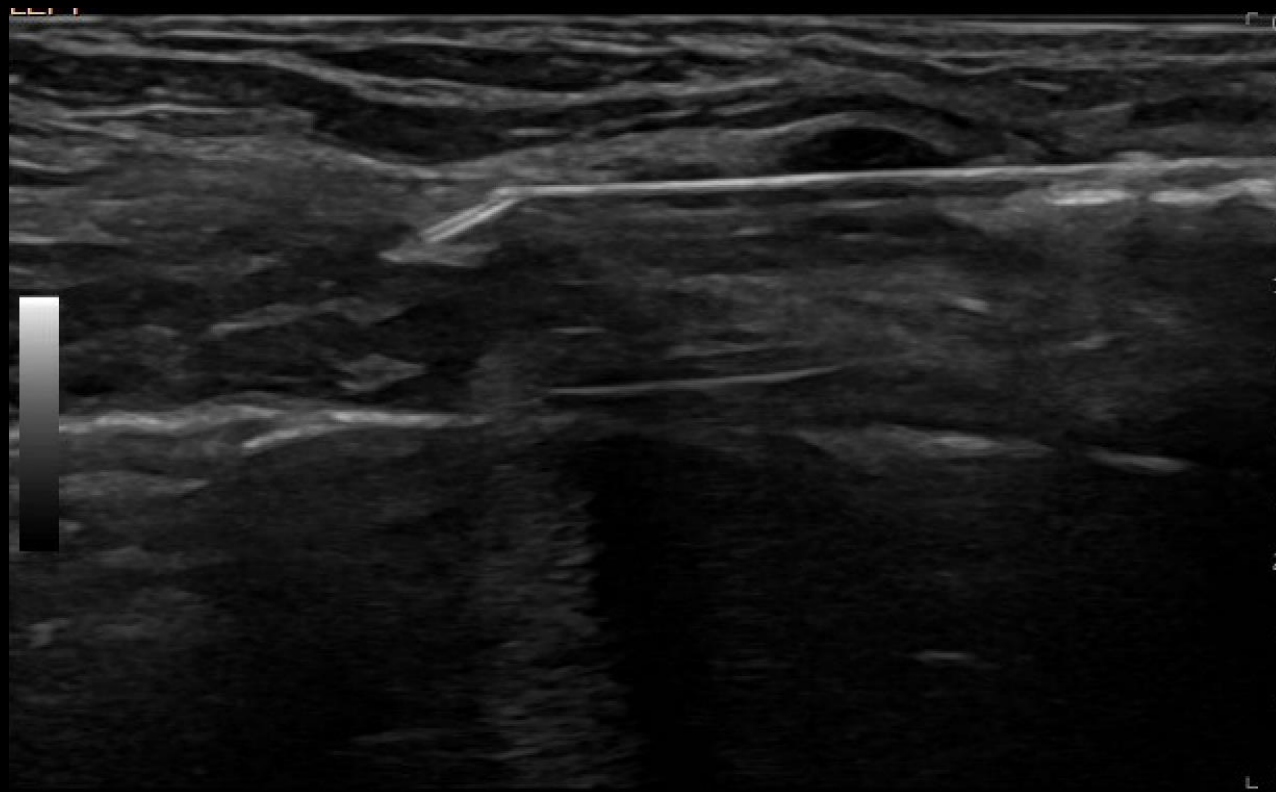


Q: Given that the abnormality found on U/S was assigned BI-RADS 4A, what is our next step in diagnosis?



# A: Ultrasound guided core needle biopsy

- Post-biopsy ultrasound image



# Biopsy Results and Next Step

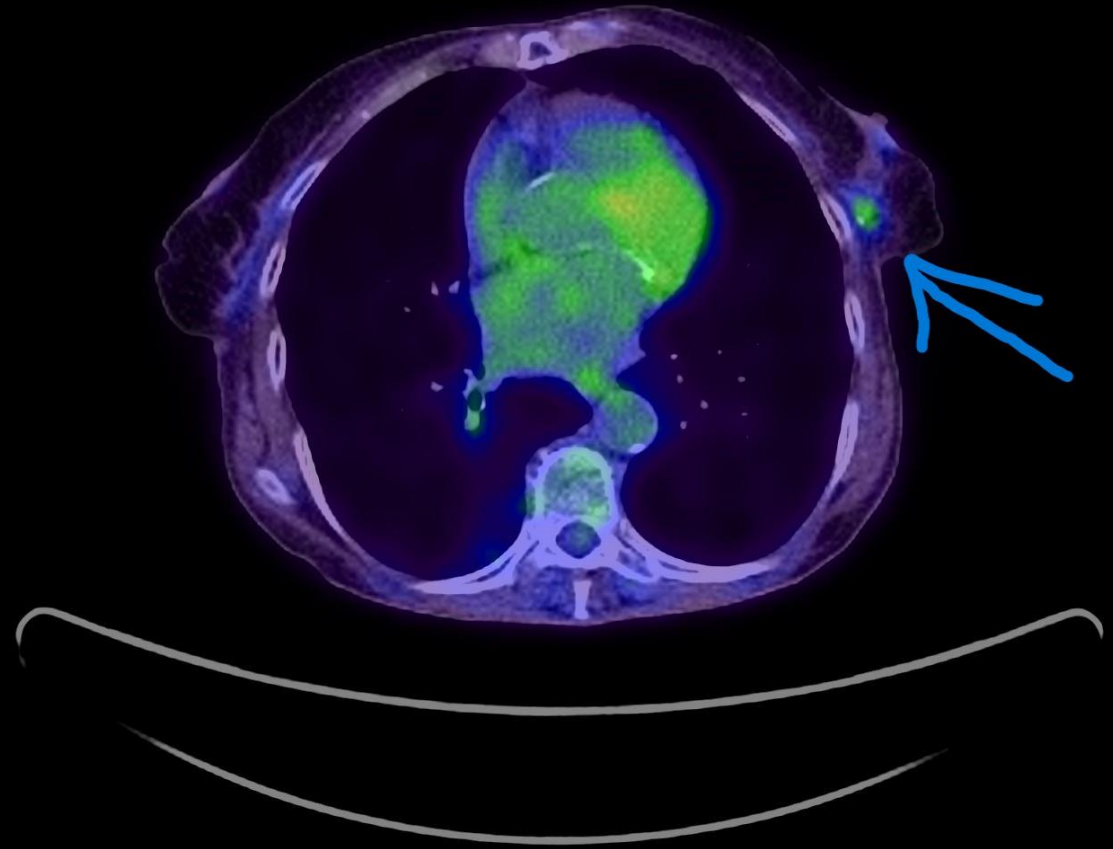
- Core biopsy of left breast: **Follicular lymphoma**, WHO grade 1-2
- PET/CT was recommended for further evaluation

## Immunohistochemical Results:

- **CD3**: CD3 stains small T-cells in between and scattered within the atypical nodules
- **CD10**: CD10 is positive in the neoplastic cells
- **CD20**: CD20 is positive in the neoplastic cells
- **CD21**: CD21 highlights follicular dendritic cell meshworks associated with the atypical nodules
- **CD23**: CD23 highlights follicular dendritic cell meshworks associated with the atypical nodules and also highlights a subset of the neoplastic cells
- **Bcl-2**: Bcl-2 is strongly positive in the neoplastic cells
- **Bcl-6**: Bcl-6 is positive in the neoplastic cells
- **Ki-67**: The Ki-67 proliferation index is <10% overall in the neoplastic cells, though there are foci with a slightly elevated proliferation index
- **PAX5**: PAX5 is positive in the neoplastic cells

# PET/CT

- Note focal increase in FDG uptake in left breast



# Breast Lymphoma

- Rare hematologic malignancy that arises from neoplastic B or T cells in breast lymphoid tissue
- Important to distinguish between primary breast lymphoma and secondary breast lymphoma
  1. Primary Breast Lymphoma
    - primary location of lymphoma should be the breast
    - no hx or e/o of widespread disease within 6 months of diagnosis
    - ipsilateral lymph nodes may be involved
  2. Secondary Breast Lymphoma
    - originating from a different location other than breast
    - presents in breast as part of secondary involvement

# Primary Breast Lymphoma

- Very rare: makes up just 1% of malignant breast neoplasms; less than 1% of non-Hodgkin lymphomas
- Most cases of primary breast lymphoma are of B cell origin
  - most common type: diffuse large B cell lymphoma
  - others: follicular lymphoma, marginal zone lymphoma, Burkitt
- T cell origin
  - anaplastic large cell lymphoma including breast implant-associated

# Imaging Findings Associated with Primary Breast Lymphoma

- Findings are mostly nonspecific and can vary widely but the following characteristics may be seen on different modalities:
  - mammo: isodense or hyperdense oval-shaped mass  
*note, calcifications and spiculations are normally absent!*
  - ultrasound: hypoechoic/heterogenous echotexture; hypervascular
  - MRI: enhancing mass with type II kinetics
  - PET: FDG uptake on PET
- *Given these are nonspecific findings, obtaining sample for biopsy is very important!*

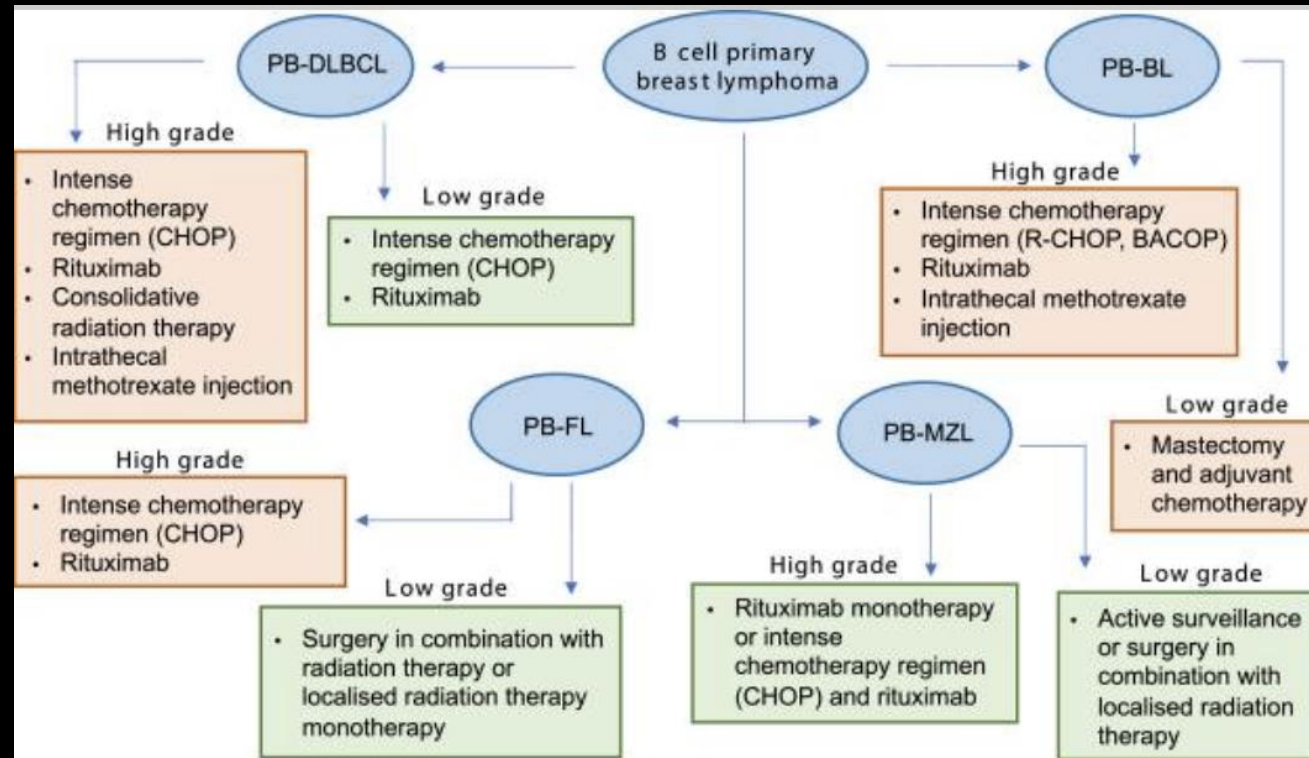
# Prognosis and Treatment

- Prognosis: dependent on lymphoma type, as well as grade and stage
- Treatment: Still no consensus on best treatment plan per literature review from Sakhri et al. (2023) due to limited amount of studies given this is a rare disease manifestation
- Different combinations of chemo, immunotherapy, radiation, and surgery



# Prognosis and Treatment

- Example of proposed treatment modalities for B cell breast lymphomas from James et al. 2022

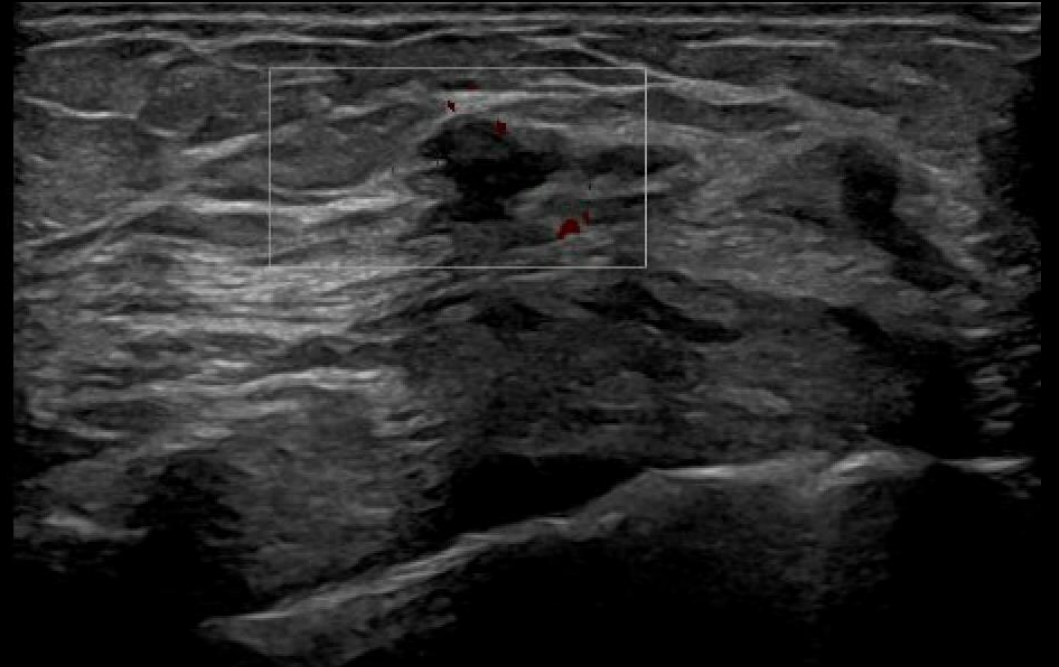
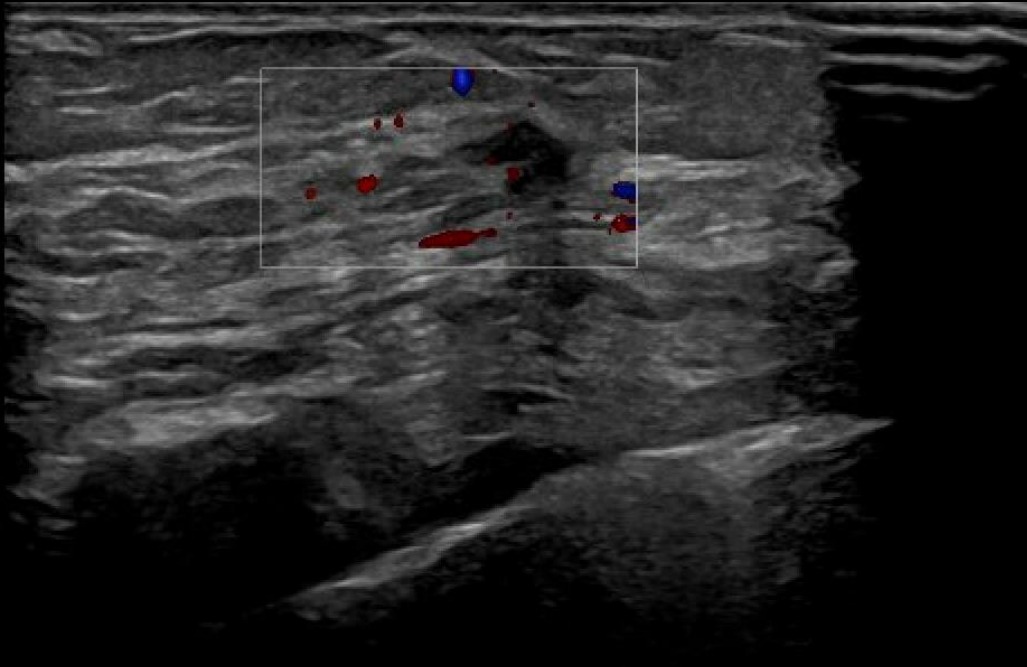


# Back to Our Patient....

- 4 Gy in 2 fractions of radiation to left breast
- Even after radiation, patient presented 6 months later with two new hypoechoic masses in the left breast at 3:00, 5 cm from the nipple:
  1. A mass that measures 10 x 7 x 5 mm without associated internal blood flow.
  2. Another mass measures 6 x 5 x 11 mm with associated internal blood flow.

*Most recent biopsy still pending...*

# New Targeted Ultrasound Findings in Left Breast



# Thank you!

- Special Thanks to the Breast Radiology Team for hosting me and teaching me so much this month!
- Special Thanks to the patients who allow us the opportunity to serve them!



# References

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# Image Sources

- Actual Patient Images with PHI removed
- Stock Photos
- <https://www.facs.org/for-patients/home-skills-for-patients/breast-cancer-surgery/preoperative-tests-and-imaging/mammography/>
- [https://link.springer.com/chapter/10.1007/978-3-030-20829-5\\_1](https://link.springer.com/chapter/10.1007/978-3-030-20829-5_1)
- <https://www.med.unc.edu/radiology/>