Breast Lymphoma

Jill Thompson, MS4
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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


Image Sources

• Actual Patient Images with PHI removed
• Stock Photos
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