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.)

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<th>Radiologic Procedure</th>
<th>Rating</th>
<th>Comments</th>
<th>RRL*</th>
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<td>Mammography diagnostic</td>
<td>9</td>
<td>See references [13-15].</td>
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**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)
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?
ACR Appropriateness Criteria: Palpable Breast Masses

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These imaging modalities were ordered.
Ultrasound of left breast mass

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:
- 14g needle from ultrasound guided biopsy device

Post biopsy:
- Post clip placement

CC view
- Post clip placement

MLO view
- Post clip placement
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**.
Approximately 1 month following initial diagnosis, a PET CT was performed.

Hypermetabolic 5.3 x 4.0 cm left breast mass, SUV max of 9.3
Restaging CT CAP was ordered 2 months following initial diagnosis.

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


• 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
