AMSER Case of the Month
February 2020

41 Year Old Female with Bilateral Palpable Breast Masses

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Allegheny Health Network
Patient Presentation

• HPI: Patient presents with one week history of palpable, tender, right sided breast mass
• OB/GYN Hx:
  • G2P2002
  • FDLNMP 2 weeks prior to presentation
• Past Medical Hx: None
• Past Surgical Hx: None
• Medications: None
• Physical Examination: Bilateral palpable breast masses

• No pertinent labs
What Imaging Should We Order?
Select the applicable ACR Appropriateness Criteria

American College of Radiology
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.)

<table>
<thead>
<tr>
<th>Radiologic Procedure</th>
<th>Rating</th>
<th>Comments</th>
<th>RRL*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mammography diagnostic</td>
<td>9</td>
<td>See references [13-15].</td>
<td>🌒</td>
</tr>
<tr>
<td>Digital breast tomosynthesis diagnostic</td>
<td>9</td>
<td>See references [16-18,20,85].</td>
<td>🌒</td>
</tr>
<tr>
<td>US breast</td>
<td>4</td>
<td>If she had recent mammogram (ie, past 6 months), US may be appropriate.</td>
<td>O</td>
</tr>
<tr>
<td>MRI breast without and with IV contrast</td>
<td>2</td>
<td>See references [4,49].</td>
<td>O</td>
</tr>
<tr>
<td>MRI breast without IV contrast</td>
<td>1</td>
<td></td>
<td>O</td>
</tr>
<tr>
<td>FDG-PEM</td>
<td>1</td>
<td></td>
<td>🌒</td>
</tr>
<tr>
<td>Tc-99m sestamibi MBI</td>
<td>1</td>
<td></td>
<td>🌒</td>
</tr>
<tr>
<td>Image-guided core biopsy breast</td>
<td>1</td>
<td></td>
<td>Varies</td>
</tr>
<tr>
<td>Image-guided fine-needle aspiration breast</td>
<td>1</td>
<td></td>
<td>Varies</td>
</tr>
</tbody>
</table>

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

This imaging modality was ordered by the ordering physician.
Findings

Bilateral round, well-circumscribed breast masses
**Variant 3:**

Palpable breast mass. Female, 40 years of age or older, mammography findings probably benign. Next examination to perform. (See Appendix IIA for additional steps in the workup of these patients.)

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<td>US breast</td>
<td>8</td>
<td>US is frequently performed to confirm correlation of imaging and clinical findings, as well as lesion characterization. See reference [62].</td>
<td>O</td>
</tr>
<tr>
<td>Mammography short-interval follow-up</td>
<td>8</td>
<td>See references [40,43,45].</td>
<td>☒ ✔</td>
</tr>
<tr>
<td>Digital breast tomosynthesis short-interval follow-up</td>
<td>8</td>
<td>See references [74,75].</td>
<td>☒ ✔</td>
</tr>
<tr>
<td>MRI breast without and with IV contrast</td>
<td>2</td>
<td>See references [4,49].</td>
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<tr>
<td>Image-guided core biopsy breast</td>
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<td>MRI breast without IV contrast</td>
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<td>O</td>
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<td>FDG-PEM</td>
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<td>☒ ☒ ☒</td>
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<td>Image-guided fine-needle aspiration breast</td>
<td>1</td>
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*Relative Radiation Level

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

Right Breast 9:00 4cm n
Left Breast 3:00 4cm n
Right Breast 10:00 4cm n
Right Breast 9:00 4cm n

FR 36Hz
RS
2D
65%
C 50
P Med
Res
TAC1

FR 49Hz
RS
2D
47%
C 50
P Med
Res
TAC1

Dist 1.59 cm
Dist 4.04 cm
Dist 6.18 cm
Dist 3.30 cm
Dist 1.26 cm
*round, anechoic, well-circumscribed lesions with posterior enhancement (arrow) = simple breast cysts [1,2]
Ultrasound-Guided Aspiration of a Simple Cyst for Symptomatic Relief[^2]  
(Right Breast)

Complete aspiration of the cyst yielded 32 ccs of cloudy yellow fluid
Final Dx:

Bilateral simple breast cysts
BI-RADS 2-Benign
Breast Cysts\textsuperscript{[1,2]}

- **Simple**: anechoic, well circumscribed, posterior acoustic enhancement
  - Not associated with increased risk of breast cancer detection
  - BIRADS 2
- **Complicated**: low level echoes, homogenous with possible thin septa. No solid components, thick walls, septa, or vascularity
  - BIRADS 2 or 3
- **Complex masses**: contain both solid (echogenic) and cystic components
  - BIRADS 4 or 5
Features of Benign vs. Malignant Breast Masses on Ultrasound\cite{2,3,4}

Benign
- Smooth, well-circumscribed
- Hyperechoic/isoechoic
  - Some can be mildly hypoechoic
- Thin capsule
- Ellipse shape
  - Shorter than wide
- Smooth large lobulations

Malignant
- Spiculation
- Hypoechoic
- Taller than wide
- Angular margins
- Microlobulations
- Shadowing
- Branching pattern
- Calcifications
- Duct extension
Features of Breast Cysts on Mammography\[^2\]

- Circumscribed or partially obscured mass
- Oval or Round
- Low density or equal density to breast parenchyma
- Can be multiple
  - When there are at least 3 (with at least 1 in each breast), each circumscribed or at worst partially obscured can be dismissed as benign findings
- Can be unilateral or bilateral
# BiRADS Categories[^4,^5]

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>Likelihood of malignancy</th>
<th>Examples</th>
<th>Next step in evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Incomplete; need additional imaging evaluation, or comparison with previous examinations</td>
<td>Unknown</td>
<td>Asymmetry, mass, calcifications on screening mammography</td>
<td>Special mammographic views, ultrasonography, magnetic resonance imaging; obtain previous examinations</td>
</tr>
<tr>
<td>1</td>
<td>Negative</td>
<td>No mammographic evidence of malignancy</td>
<td>Normal mammography</td>
<td>Routine screening</td>
</tr>
<tr>
<td>2</td>
<td>Benign finding</td>
<td>No mammographic evidence of malignancy</td>
<td>Intramammary lymph node, oil cyst, vascular calcifications, calcifying fibroadenoma</td>
<td>Routine screening</td>
</tr>
<tr>
<td>3</td>
<td>Probably benign finding</td>
<td>Less than 2 percent[^1]</td>
<td>Benign-appearing solid mass or clustered calcifications</td>
<td>Follow-up imaging (mammography or ultrasonography) at six and 12 months</td>
</tr>
<tr>
<td>4</td>
<td>Suspicious abnormality</td>
<td>12 to 25 percent[^2]</td>
<td>Complex or solid mass, indeterminate clustered calcifications</td>
<td>Fine-needle aspiration, percutaneous or surgical biopsy</td>
</tr>
<tr>
<td>5</td>
<td>Highly suggestive of malignancy</td>
<td>Greater than 95 percent[^1]</td>
<td>Spiculated mass</td>
<td>Percutaneous or surgical biopsy</td>
</tr>
<tr>
<td>6</td>
<td>Known malignancy</td>
<td>100 percent[^1]</td>
<td>Biopsy-proven</td>
<td>Definitive surgery, chemotherapy, radiation therapy</td>
</tr>
</tbody>
</table>

[^4]: [Source 4]
[^5]: [Source 5]
References:


