AMSER Case of the Month: November 2018

52 year old female with an abnormal screening mammogram

Areeg Rehman, MS 4
Nova Southeastern University

Rebecca T. Sivarajah, MD
Penn State University College of Medicine
Patient Presentation

• 52 year old asymptomatic female with abnormality noted in the left breast on screening mammography.

• Medical History: GERD, Grave’s disease, HTN, IBS

• Surgical History: None

• Family History: Diabetes, HTN. No history of breast cancer or other cancer

• Social History: Married, physician, denies ETOH use, 3 children (breast fed each)
ACR Appropriateness Criteria for Screening Mammography in an average risk women

This imaging modality was ordered.

### Breast Cancer Screening

**Variant 1:** Breast Cancer screening. Average-risk women: women with $<15\%$ lifetime risk of breast cancer.

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Appropriateness Category</th>
<th>Relative Radiation Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mammography screening</td>
<td>Usually Appropriate</td>
<td></td>
</tr>
<tr>
<td>Digital breast tomosynthesis screening</td>
<td>Usually Appropriate</td>
<td></td>
</tr>
<tr>
<td>US breast</td>
<td>May Be Appropriate</td>
<td></td>
</tr>
<tr>
<td>MRI breast without and with IV contrast</td>
<td>Usually Not Appropriate</td>
<td></td>
</tr>
<tr>
<td>MRI breast without IV contrast</td>
<td>Usually Not Appropriate</td>
<td></td>
</tr>
<tr>
<td>FDG-PEM</td>
<td>Usually Not Appropriate</td>
<td></td>
</tr>
<tr>
<td>Te-99m sestamibi MBI</td>
<td>Usually Not Appropriate</td>
<td></td>
</tr>
</tbody>
</table>
II. INDICATIONS

A. Screening Mammography [3,10-12]

1. Women undergoing screening mammography should be asymptomatic. If a woman has symptoms or clinical signs of breast disease, diagnostic mammography should be performed instead (see section II.B.).

2. For women at average risk for breast cancer, annual screening mammography starting at age 40 is recommended [1-6,13,14].
Screening Mammography
The screening mammogram demonstrates segmentally distributed microcalcifications in the left breast from 12-1 o’clock. Incidentally noted is a clip in the lateral breast from a prior benign biopsy for a fibroadenoma.
What additional imaging if any should we order next?
## ACR Appropriateness Criteria

### Breast Microcalcifications — Initial Diagnostic Workup

#### Pleomorphic, fine, linear, branching in any distribution.

<table>
<thead>
<tr>
<th>Clinical Condition</th>
<th>Radiologic Procedure</th>
<th>Rating</th>
<th>Comments</th>
<th>RRL*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variant 1:</td>
<td>Mammography diagnostic</td>
<td>9</td>
<td>Only after diagnostic mammographic workup demonstrates suspicious microcalcifications with an associated mass/focal asymmetry or having an extensive distribution, and an underlying invasive component is suspected.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>US breast</td>
<td>4</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Mammography short interval follow-up</td>
<td>1</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>MRI breast without and with contrast</td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>FDG-PEM</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tc-99m sestamibi BSGI</td>
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<td></td>
<td></td>
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<tr>
<td></td>
<td>Core biopsy breast</td>
<td>1</td>
<td></td>
<td>Varies</td>
</tr>
<tr>
<td></td>
<td>Fine needle aspiration breast</td>
<td>1</td>
<td></td>
<td>Varies</td>
</tr>
<tr>
<td></td>
<td>Imaging localization for surgical excision 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*
The diagnostic spot magnification mammographic views confirm segmentally distributed fine linear branching calcifications from 12-1 o’clock.
Next Step?
Core Biopsy was performed

Multiple Core biopsy samples demonstrate calcifications
Final Dx:

Ductal Carcinoma In Situ (DCIS)
Grade 3 with possible microinvasion
Ductal Carcinoma In Situ (DCIS)

- Ductal Carcinoma in Situ (DCIS) is the clonal proliferation of malignant epithelial cells originating in the terminal ducts with no extension beyond the basement membrane.

- Invasive carcinoma: cancer cells grow through the basement membrane.
  - Microinvasion: cancer cells extend beyond the basement membrane with no focus > 0.1 cm.
Ductal Carcinoma In Situ (DCIS)

• Clinical Presentation
  • Usually asymptomatic
  • Most discovered by screening mammography

• Imaging Findings:
  • Mammography
    • Microcalcifications - most common (80%)
    • Mass with calcifications (10%); Mass alone (10%)
  • MRI - linear or segmental clumped enhancement
  • Ultrasound (least sensitive)
    • Dilated ducts, +/- calcifications; Mass

• Treatment:
  • Lumpectomy with negative margins or mastectomy (for more extensive disease)
  • Radiation therapy following lumpectomy
  • Tamoxifen for estrogen receptor positive cancers
ACR BI-RADS Classification of Breast Calcifications

• The BI-RADS® atlas provides standardized breast imaging terminology for mammography
  • The morphology and distribution of mammographic calcifications should be described using BIRADS terms.

• Fine Linear Branching Morphology (our case)
  • Thin, linear, irregular calcifications, which may be discontinuous with branching forms, and <0.5 mm in caliber
  • Suggests filling of the lumen of a duct or ducts involved irregularly by breast cancer, with a PPV of 70%

• Segmental distribution (our case)
  • Calcifications in segmental distribution are of concern because they suggest deposits in a duct or ducts and their branches which raises the possibility of extensive or multifocal breast cancer in a lobe or segment of the breast, with a PPV of 62%
References:

1. ACR Appropriateness Criteria: Breast Cancer Screening.
5. Radiopedia.
6. Stat DX.