70-year-old male presents with palpable lumps in bilateral axillae radiating into the breasts

Puneet Modgil MS3
Penn State College of Medicine

Angela I Choe MD
Penn State Health Milton S Hershey Medical Center, Department of Radiology

Bing Han MD, Yong Zhang MD
Penn State Health Milton S Hershey Medical Center, Department of Pathology
Patient Presentation

Clinical History
- 70 year old male with history of hypertension, obesity, congestive heart failure, poorly controlled diabetes (type 2), arthritis, and depression presents to clinic with complaints of bilateral lumps in the axillae radiating into the breasts.

Family History:
- Leukemia in maternal grandfather
- Breast cancer in second cousin diagnosed at age 57

Social History
- Non-smoker, no drug or alcohol usage, no exercise

Physical Exam
- Bilateral axillary examination revealed multiple mobile lumps felt to be lipomas
Laboratory Data - normal

- CBC
- BMP
- LFTs
- PT-INR

What study should be ordered?
### Variant 3:
Male 25 years of age or older with indeterminate palpable breast mass. Initial imaging.

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Appropriateness Category</th>
<th>Relative Radiation Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mammography diagnostic</td>
<td>Usually Appropriate</td>
<td>🌟🌟</td>
</tr>
<tr>
<td>Digital breast tomosynthesis diagnostic</td>
<td>Usually Appropriate</td>
<td>🌟🌟</td>
</tr>
<tr>
<td>US breast</td>
<td>May Be Appropriate</td>
<td>O</td>
</tr>
<tr>
<td>MRI breast without and with IV contrast</td>
<td>Usually Not Appropriate</td>
<td>O</td>
</tr>
<tr>
<td>MRI breast without IV contrast</td>
<td>Usually Not Appropriate</td>
<td>O</td>
</tr>
</tbody>
</table>

### Variant 4:
Male 25 years of age or older with indeterminate palpable breast mass. Mammography or digital breast tomosynthesis indeterminate or suspicious.

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Appropriateness Category</th>
<th>Relative Radiation Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>US breast</td>
<td>Usually Appropriate</td>
<td>O</td>
</tr>
<tr>
<td>MRI breast without and with IV contrast</td>
<td>Usually Not Appropriate</td>
<td>O</td>
</tr>
<tr>
<td>MRI breast without IV contrast</td>
<td>Usually Not Appropriate</td>
<td>O</td>
</tr>
</tbody>
</table>
Bilateral diagnostic mammogram:
Right breast mass and left calcifications

Palpable lump
Right breast mass- tomosynthesis slices

Right MLO

Right CC
Magnification compression views of the left breast calcifications
No sonographic correlate to the mammographic mass in the right breast
Bilateral diagnostic work up summary

- Irregular equal density 13 mm mass in the right breast at 8 to 9 o’clock.
- Fine pleomorphic calcifications in a linear distribution in the UOQ of the left breast at 2 to 3 o’clock.
- Palpable masses in both axillae and breasts showed no mammographic or sonographic abnormalities. Lobules of fat were seen.
- Bilateral stereotactic biopsy recommended.
- BI-RADS 4: suspicious
Post stereotactic biopsy mammogram
Pathologic Diagnosis

• Left breast: Ductal carcinoma in situ, intermediate grade
  • Microcalcifications associated with DCIS
  • Cribriform, micropapillary, with small focus of necrosis, ER/PR positive (100%)

• Right breast: Mucinous carcinoma, moderately differentiated
  • ER/PR positive (100%), Her2 negative
Bilateral breast MRI: pre-surgical evaluation

T1 post contrast dynamic image first time point

T2WI shows mucinous cancer is bright (right)
Hematoma is bright (left)
Pathology, left breast: Ductal Carcinoma in Situ

Cribriform appearance of DCIS showing cancer cells broken up with irregularly sized spaces

Power: 100x  Stain: H&E
Pathology, left breast: Ductal Carcinoma in Situ

Micropapillary appearance of DCIS showing dilated ducts linked by cancerous cells

Power: 100x
Stain: H&E
Pathology, left breast: Ductal Carcinoma in Situ

Comedonecrosis appearance of DCIS showing cancerous cells surrounding central area of necrosis

Power: 100x

Stain: H&E
Pathology, right breast: Mucinous Carcinoma

Floating cancer cells suspended in pools of mucinous material
Immunohistochemistry Staining revealed DCIS was 100% Estrogen Receptor and Progesterone Receptor positive.
ER and PR staining, right breast: Mucinous Carcinoma

Immunohistochemistry Staining revealed Mucinous Carcinoma was 100% Estrogen Receptor and Progesterone Receptor positive
Male Breast Cancer

• Male breast cancer is rare and accounts for < 1% of all breast cancer diagnoses in the U.S.
• Average age of presentation is greater than that of women which is likely related to lack of awareness and no screening.
• Overall worse prognosis compared to women due to most cancers being found at a later stage.
• Common presentations: palpable painless mass, skin ulceration, nipple retraction or discharge
• Ipsilateral lymphadenopathy is common.
Molecular subtypes of invasive male breast cancer

- Ductal carcinoma (not otherwise specified) - 87%
- Carcinoma with mixed ductal and lobular features – 5.9%
- Papillary carcinoma – 3%
- Invasive lobular carcinoma – 1.4%
- Mucinous carcinoma – 1%
- Cribriform, tubular, metaplastic, adenoid cystic, and others - <1% each
Risk factors for male breast cancer

• Increasing age
• Testicular malfunction and increased estrogen
• Family History
• Radiation exposure
• Genetic mutations (BRCA2 > BRCA1)
• Cowden and Klinefelter syndromes
• Alcohol consumption
• Liver disease
• Jewish or central African population
Ductal Carcinoma in Situ (DCIS) of the Male Breast

- A rare lesion representing 0.1% of all breast cancers and <0.1% of all cancers in men
  - Malignant proliferation of endothelial cells confined to breast ducts
  - Approximately 90% are Estrogen Receptor + or Progesterone Receptor +
  - Approximately 10% are HER2neu positive
  - Usually low to intermediate grade
Mucinous Carcinoma in men

- Mucinous Carcinoma is extremely rare and accounts for 1% of all breast cancers in men
- Gross pathology reveals a soft, gelatinous appearing mass
- Histopathology demonstrates low grade proliferation of cells dispersed in between pools of mucus

- Radiographic Findings
  - Low density masses with well circumscribed margins on mammography
  - Iso/hypoechoic lesions than can be both homogenous/heterogenous, and can have solid/cystic components on ultrasound
  - Circumscribed mass with high signal intensity on fat saturated T2 weighting on MRI
    - Can often be confused with benign lesions

- It has been suggested that mucinous carcinoma has a better prognosis than most other forms of breast cancer, however given the rarity of cases, hard to make definitive conclusions
Treatment

• Standard treatment for male breast cancer is surgery followed by adjuvant treatment (endocrine, chemotherapy, and radiation)

• Radical mastectomy used to be the standard surgical intervention

• Current guidelines prefer simple mastectomy or local tumor excision and adjuvant therapy

• Radiotherapy is mandatory following breast conserving surgeries
  ➢ Indicated if positive lymph node and tumor larger than 5 cm with margin positivity

• Radiotherapy decreases local recurrence and improves long survival in women

• Data for men suggests local tumor control, but no overall survival benefit
Treatment (continued)

• Chemotherapy used in patients not responsive to hormone therapy (ER, PR, and Her2 negative) which significantly increases survival rates for 5-10 years

• Adjuvant endocrine therapy recommended since majority of male breast cancer are hormone receptor positive
  ➢ Most patients undergo 5 year trial of tamoxifen with same prognostic indications as women
  ➢ Studies evaluating the benefits for aromatase inhibitors such as anastrazole and letrozole have not been fully evaluated in men
Prognosis and Survival

• The mortality rate for male breast cancer remains unchanged since 1975

• Overall 5-year survival rate- 40-65%
  • Stage 1 (5-yr SR)- 75-100%
  • Stage 2 (5-yr SR)- 50-80%
  • Stage 3 (5-yr SR)- 30-65%

• Median survival for patients with metastatic disease (bone, lung, liver or brain) is 26.5 months
Our Patient

• Mastectomies were recommended as the left breast calcifications (DCIS) extended to the subareolar region and required excision of the nipple areolar complex.
• He has pulmonary hypertension and mastectomy provided the best chance of avoiding radiation.
• He was most comfortable electing bilateral mastectomies.
References


