68-year-old male with prostate cancer presenting with abnormal radiotracer uptake along the right pectoralis muscle on Prostate-Specific Membrane Antigen (PSMA) PET/CT

Samantha Allen, MS2
Penn State College of Medicine

Kamyar Ghabili, MD, R1
Penn State Health Milton S. Hershey Medical Center

Angela I. Choe, MD
Penn State Health Milton S. Hershey Medical Center
Patient Presentation

• **HPI:** 68-year-old male with newly diagnosed Gleason grade group 5 prostate cancer presented to the Breast Clinic after abnormal radiotracer uptake was seen anterior to the right chest wall pectoralis muscle on Prostate-Specific Membrane Antigen (PSMA) PET/CT, which was performed to check for overall prostate cancer metastases.

• **PMHx:** Hypertension, hyperlipidemia, obesity, gout, diabetes mellitus, nephrolithiasis, benign prostatic hyperplasia on dutasteride (for >5 years)

• **FHx:** No family history of breast cancer
Original PSMA PET/CT Scan (not labeled)
Original PSMA PET/CT Scan (labeled)

Abnormal radiotracer uptake anterior to the right chest wall pectoralis muscle (SUV max = 7.7)
What is the next appropriate step?
ACR Appropriateness Criteria

**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>
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</thead>
<tbody>
<tr>
<td>Mammography diagnostic</td>
<td>Usually Appropriate</td>
<td>📆анс</td>
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<tr>
<td>Digital breast tomosynthesis diagnostic</td>
<td>Usually Appropriate</td>
<td>📆анс</td>
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<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>
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</tbody>
</table>
Right Diagnostic Mammogram
(not labeled)
Right Diagnostic Mammogram: No mammographic abnormality seen in the expected location of the mass on PET scan.
Right Breast Ultrasound (not labeled)
Irregular hypoechoic mass (yellow arrow) with spiculated margins and posterior shadowing (red arrow) directly involves the pectoralis musculature (blue arrow).

**BI-RADS Category 4**
Suspicious abnormality - Biopsy should be considered
Differential Diagnosis

- Primary Breast Malignancy (usually ductal carcinoma)
- Metastasis (including prostate cancer)
- Diabetic mastopathy (given PMH of Diabetes Mellitus)
- Granular Cell Tumor of Breast
- Fibromatosis of Breast
- Soft tissue sarcoma
Final Dx:
Granular Cell Tumor of the Breast
Granular Cell Tumor of the Breast

• Definition
  • Soft tissue neoplasms thought to be derived from Schwann cells

• Characteristics
  • Most commonly arise in the 4th-6th decades of life
  • 0.1% of all breast tumors
  • Typically benign, rarely malignant (only 6 cases to date)
  • Develop within interlobar stromal tissue in breast
  • Multiple lesions in 18% of granular cell tumors of breast
  • May have a predilection for upper inner quadrant (supraclavicular nerve cutaneous branches)
  • Can mimic breast carcinoma both clinically and radiologically
Granular Cell Tumor: Imaging/Radiology

Mammography
- Focal asymmetry or mass (hyper/isodense)
- Irregular shape with obscured, indistinct or spiculated margins
- Microcalcifications not typically present

Ultrasound
- Irregular mass with heterogenous echogenicity and spiculated margins
- Non-parallel orientation
- Can cause intense posterior shadowing

Breast MRI
- Mass with spiculated margins
- Iso to hyperintense on T2-weighted
- Hypointense on T1-weighted
- Avid early enhancement with washout or mild progressive enhancement
Granular Cell Tumor: Pathology

Tissue sampling with IHC studies is critical for establishing diagnosis

Microscopy:
- Cytoplasm: full of coarse granules of varying size
- Granules: accumulation of lysozyme within cytoplasm

IHC staining:
- Positive for S100, CD68, CD63, and NSE
- Negative for cytokeratin (differentiates from an invasive carcinoma)
Granular Cell Tumor: Management

• Benign
  • Wide local excision
  • Can recur if positive surgical margins

• Malignant
  • Standard surgical treatment
  • Sentinel lymph node biopsy
References


