AMSER Case of the Month February 2025

75-year-old male with a palpable left breast mass and new nipple retraction

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Patient Presentation

- HPI: Patient is a 75-year-old male presenting to the breast imaging center due to feeling a new palpable lump in his left breast for 3 weeks with new onset nipple inversion. Denies breast pain and nipple discharge.
- PMHx: CHF, CAD, status post CABG and stents, HTN, hyperlipidemia, aortic stenosis, past substance use disorders (cocaine, benzodiazepines, and alcohol), history of tobacco use.
- Medications: Amlodipine, Aspirin
- Family Hx: Daughter with pancreatic cancer (30 years old at diagnosis)
- PE: Palpable nontender retroareolar left breast lump associated with nipple retraction and mild skin thickening. Right breast unremarkable.

What Imaging Should We Order?

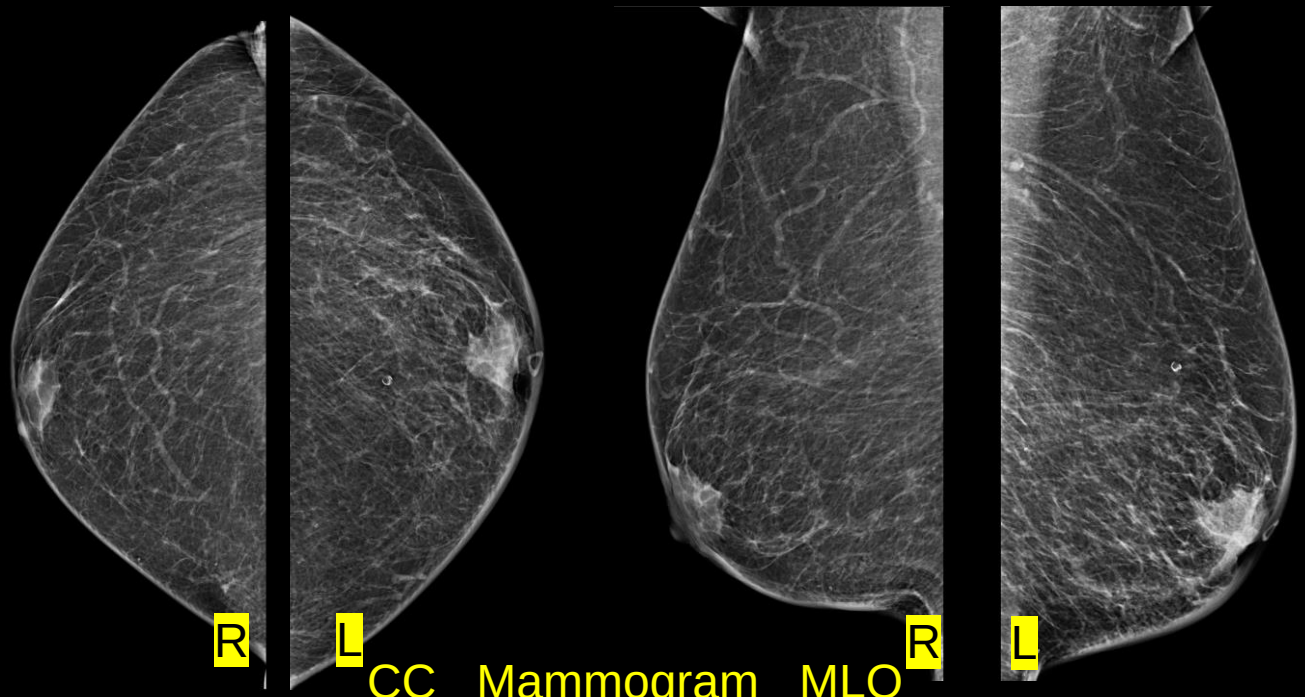
Select the applicable ACR Appropriateness Criteria

Variant 5: **Male of any age with physical examination suspicious for breast cancer (suspicious palpable breast mass, axillary adenopathy, nipple discharge, or nipple retraction). Initial imaging.**

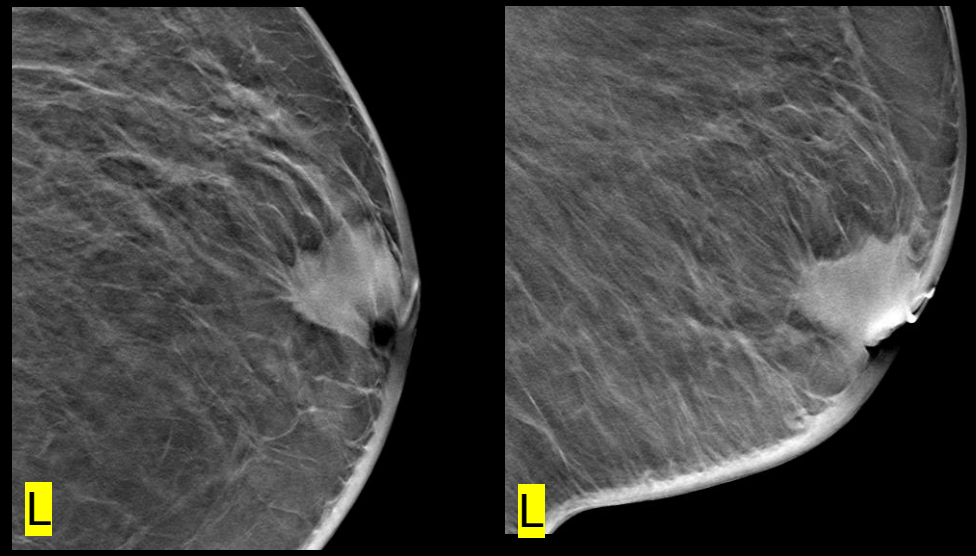
Procedure	Appropriateness Category	Relative Radiation Level
Mammography diagnostic	Usually Appropriate	☢☢
Digital breast tomosynthesis diagnostic	Usually Appropriate	☢☢
US breast	Usually Appropriate	O
MRI breast without and with IV contrast	Usually Not Appropriate	O
MRI breast without IV contrast	Usually Not Appropriate	O

These imaging modalities were initially ordered.

Findings (unlabeled)

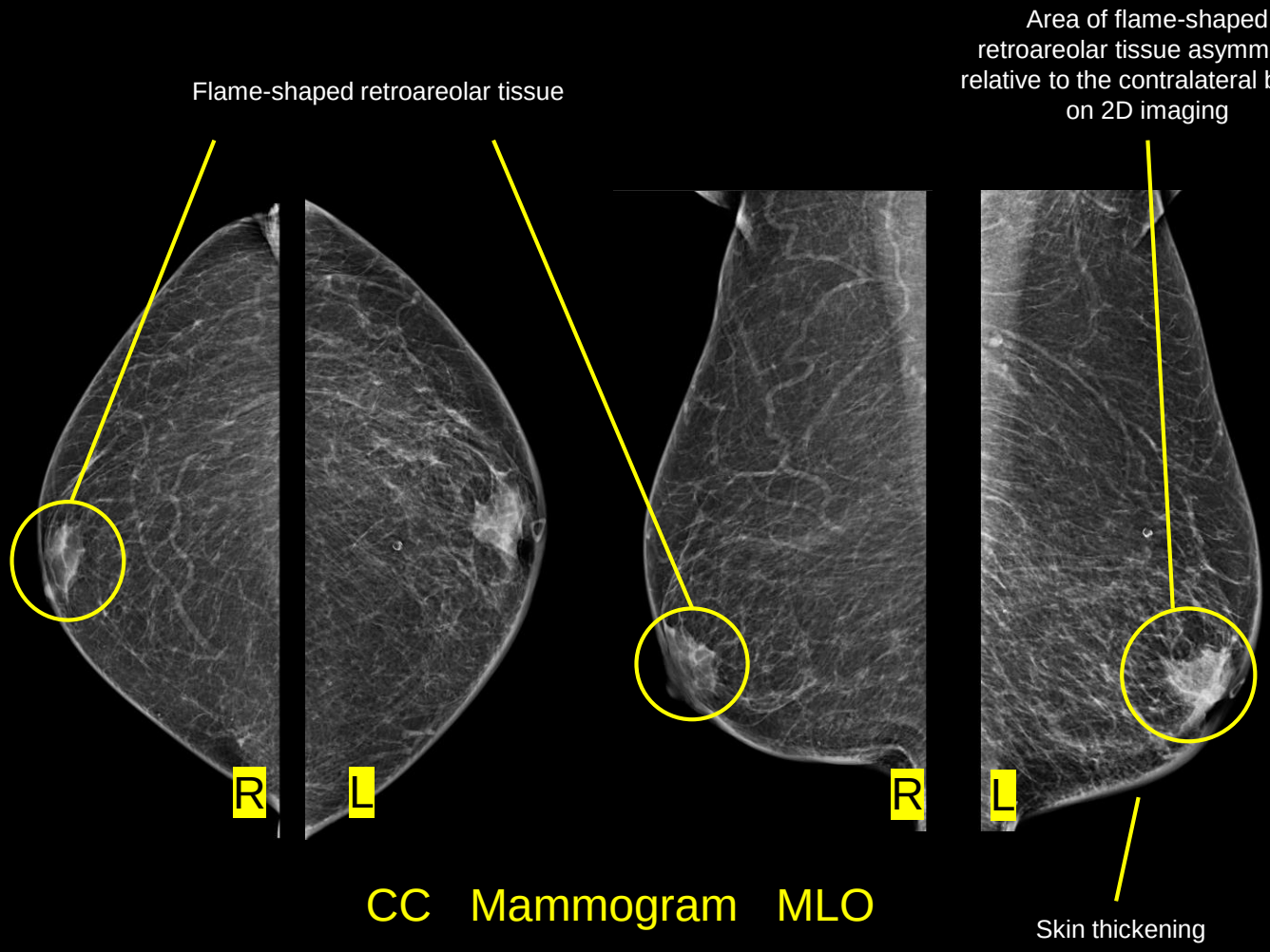


CC Mammogram MLO

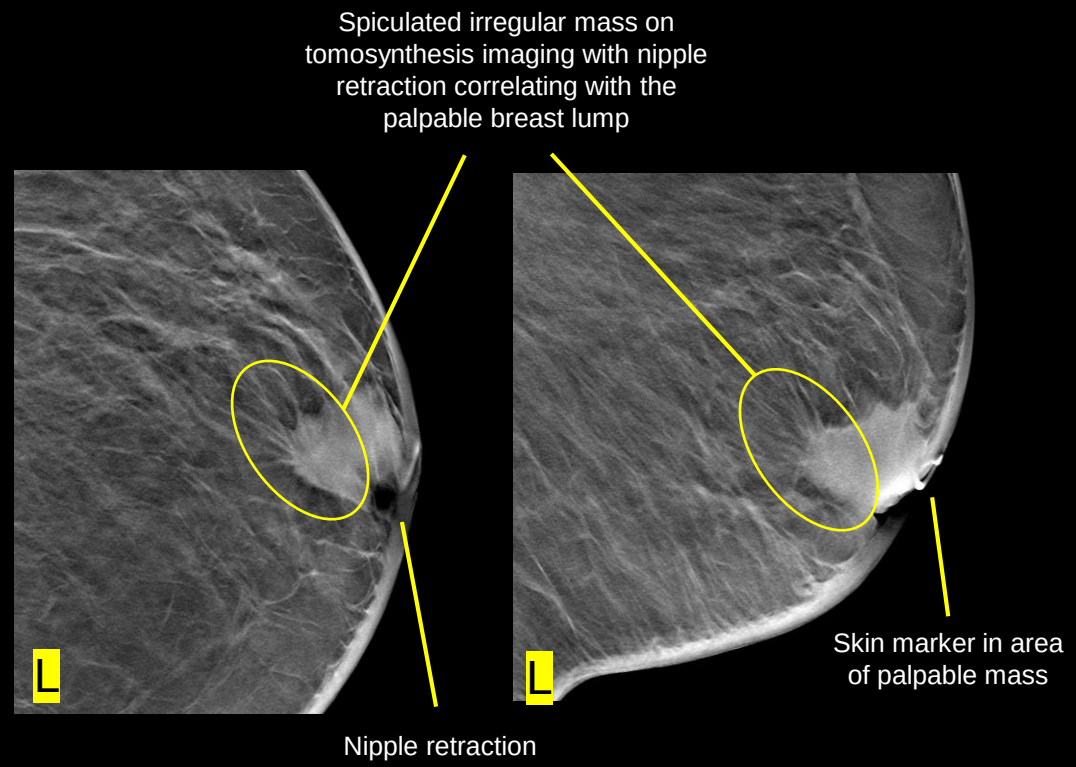


CC Tomosynthesis MLO

Findings (labeled)



CC Mammogram MLO



CC Tomosynthesis MLO

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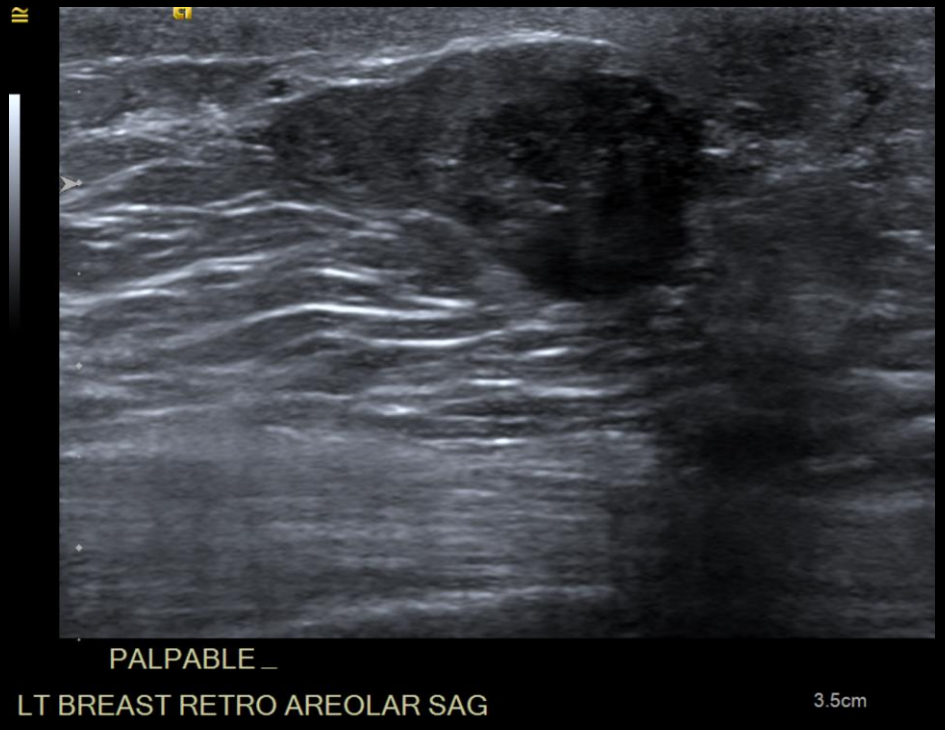
Follow Up Imaging

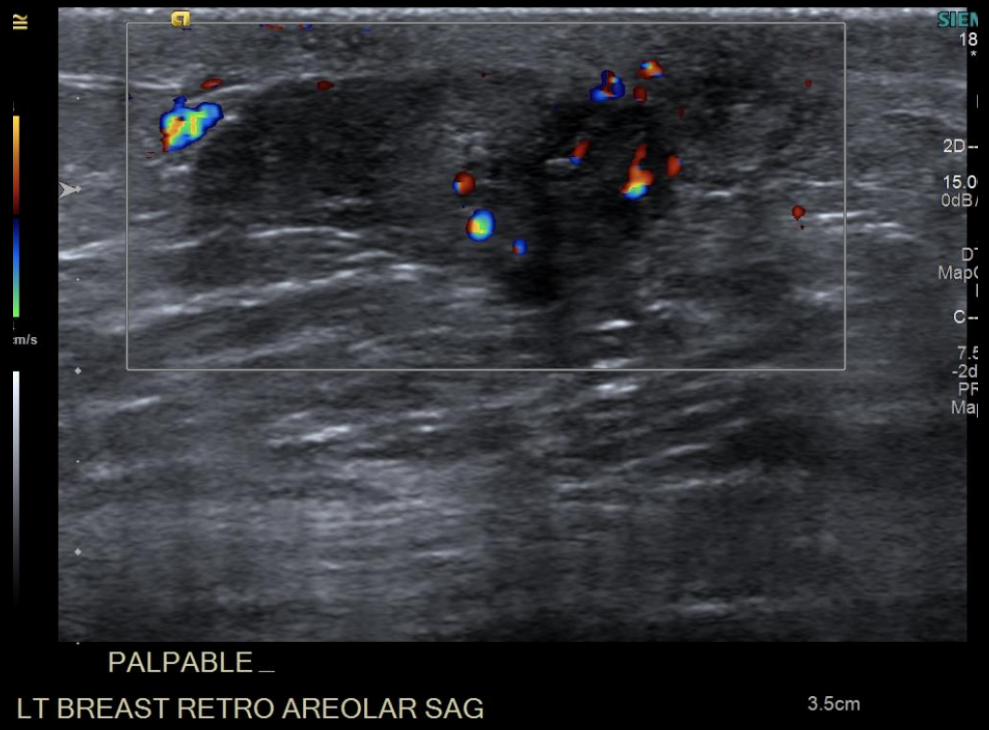
Variant 5: **Male of any age with physical examination suspicious for breast cancer (suspicious palpable breast mass, axillary adenopathy, nipple discharge, or nipple retraction). Initial imaging.**

Procedure	Appropriateness Category	Relative Radiation Level
Mammography diagnostic	Usually Appropriate	☢☢
Digital breast tomosynthesis diagnostic	Usually Appropriate	☢☢
US breast	Usually Appropriate	O
MRI breast without and with IV contrast	Usually Not Appropriate	O
MRI breast without IV contrast	Usually Not Appropriate	O

Additional imaging was ordered due to suspicious palpable breast mass and nipple retraction.

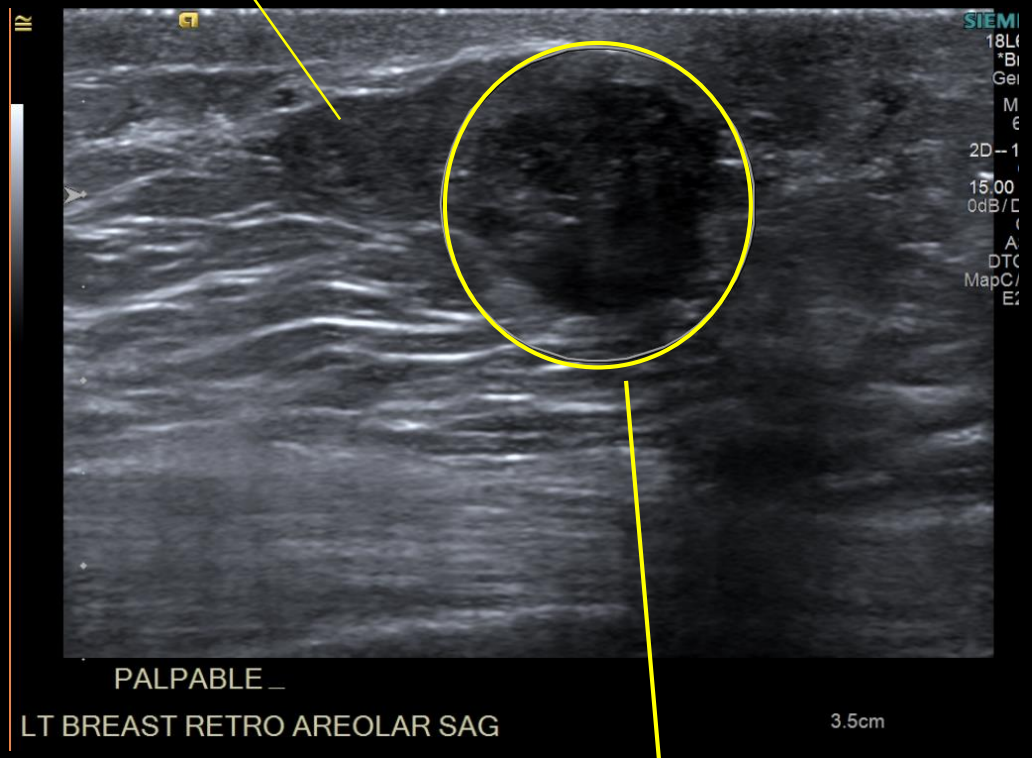
Ultrasound Findings: (unlabeled)





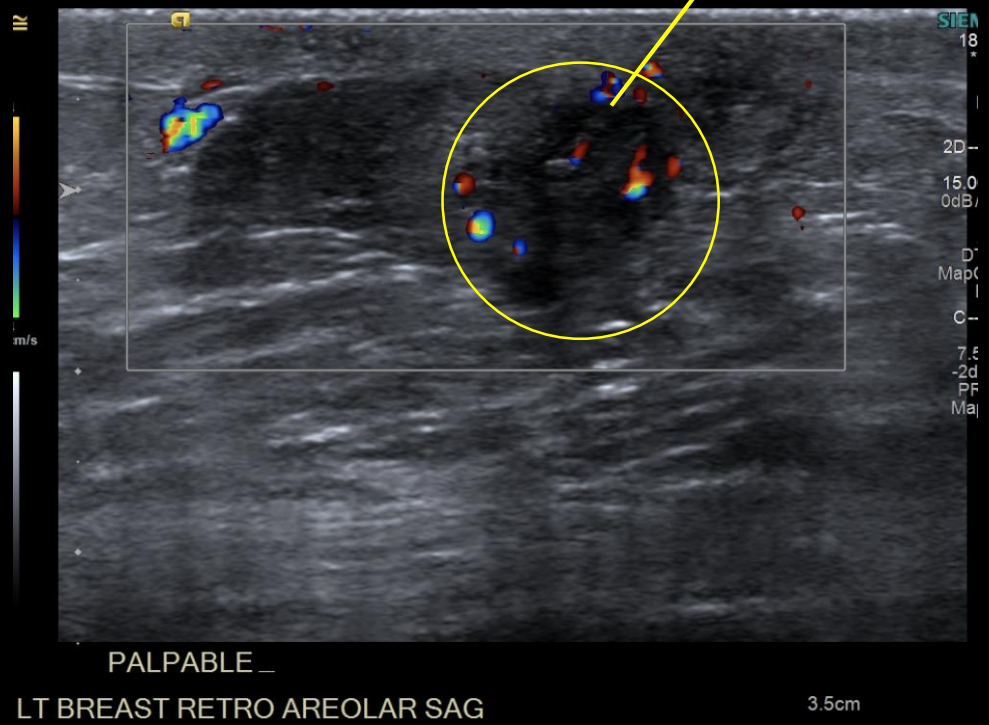
Ultrasound Findings: (labeled)

Distinctly separate retroareolar tissue in a parallel orientation with circumscribed margins (that is not involved by the irregular mass) in keeping with gynecomastia.



32 mm x 14 mm x 34 mm palpable irregular, anti-parallel hypoechoic mass with angular and indistinct margins

Mass demonstrates internal vascularity on color Doppler imaging distinct from adjacent gynecomastia



Final Dx:

ER/PR+ Her2- Invasive Ductal Carcinoma of Left Breast

Bilateral Gynecomastia

Case Discussion – Male Breast Cancer

- Etiology
  - Most common form is ER/PR+ Her2- Invasive Ductal Carcinoma
    - Male breast tissue does not contain lobules
- Epidemiology
  - 1% of breast cancers
    - 0.5% of all cancers
  - Incidence rate is 1.32/100,000 men (2017)
    - Increase from 0.90/100,000 (1980)
  - Highest incidence rate of 1.89/100,000 in non-Hispanic black population
- Clinical Presentation
  - 75 % present with unilateral painless, palpable breast mass
  - Early nipple retraction
  - 46.7% have nodal involvement at time of diagnosis
    - Average time from first palpation of lump to diagnosis is 21 months

Case Discussion – Male Breast Cancer

- Pathophysiology Overall unclear, risk factors include:
  - Genetics
    - BRCA2 increases risk more than BRCA1
    - PALB2 mutation confers 4-6x risk
    - Klinefelter Syndrome
  - Age > 50
  - Family History
    - First degree relative with breast cancer confers 2-3x risk
    - Cowden and Lynch Syndromes
  - Exposures
    - Ionizing radiation
    - Combustion hydrocarbons
  - Hormonal imbalance leading to increases in estrogen
    - Heavy alcohol use
    - Liver cirrhosis
    - Obesity
    - Testicular dysfunction

*There is no evidence to support gynecomastia as a precursor lesion

Case Discussion – Male Breast Cancer

- Differential of palpable breast lump in males
  - Abscess
  - Cancer
  - Gynecomastia
  - Cyst
  - Lipoma
  - Reactive changes to recent trauma or fat necrosis
  - Fibromatosis or Desmoid tumors
  - Pseudoangiomatous stromal hyperplasia
  - Metastatic disease

BI-RADS® ASSESSMENT CATEGORIES		
Category 0:	**Mammography:** Incomplete – Need Additional Imaging Evaluation and/or Prior Mammograms for Comparison **Ultrasound & MRI:** Incomplete – Need Additional Imaging Evaluation	
Category 1:	Negative	
Category 2:	Benign	
Category 3:	Probably Benign	
Category 4:	Suspicious	Mammography & Ultrasound: Category 4A: Low suspicion for malignancy Category 4B: Moderate suspicion for malignancy Category 4C: High suspicion for malignancy
Category 5:	Highly Suggestive of Malignancy	
Category 6:	Known Biopsy-Proven Malignancy	

Figure from BI-RADS Atlas, 2013

- Imaging: 2D mammography, 3D tomosynthesis, and ultrasound are utilized to properly classify and assign a BI-RADS classification based on imaging findings. When assigned BI-RADS category 4 or 5, a biopsy is performed, typically through image guidance.
- Management
  - Surgery
    - Majority choose simple mastectomy because of small volume of breast tissue
    - Lumpectomy, sentinel lymph node biopsy, followed by radiation is also an option
  - Adjuvant anthracycline-based chemotherapy and tamoxifen
  - Radiation if:
    - Tumor > 5 cm on presentation
    - Nodal involvement
    - Chest wall invasion

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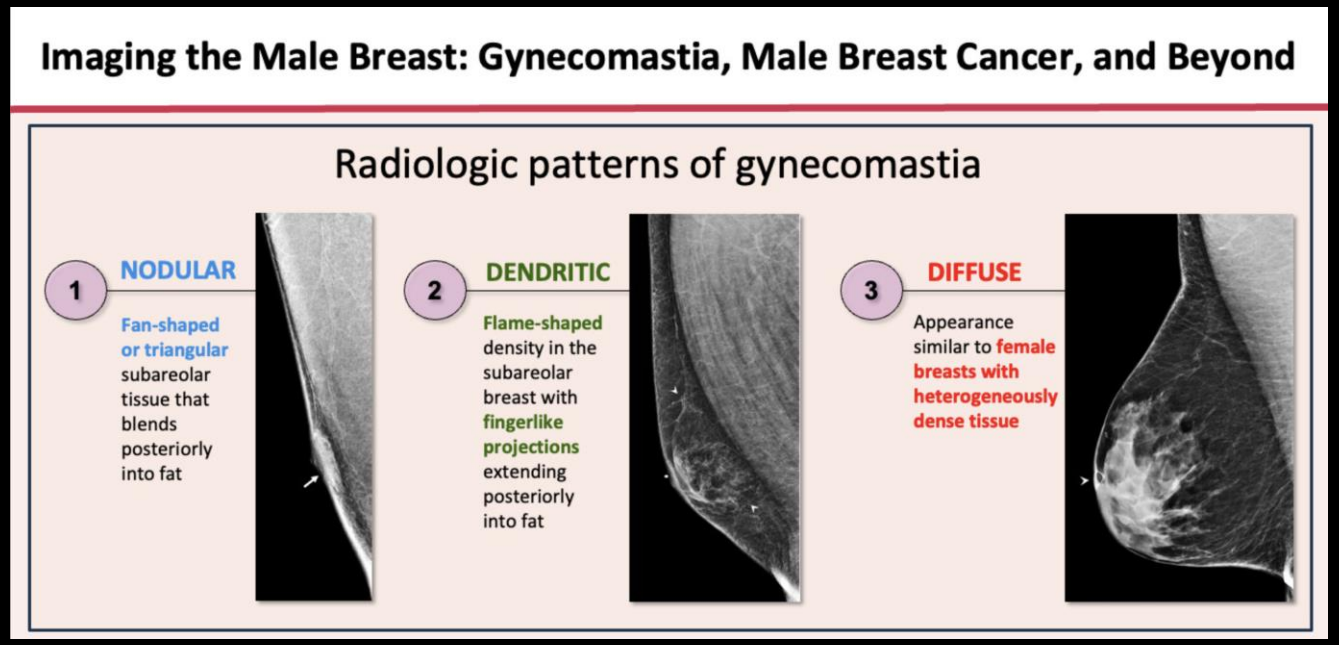
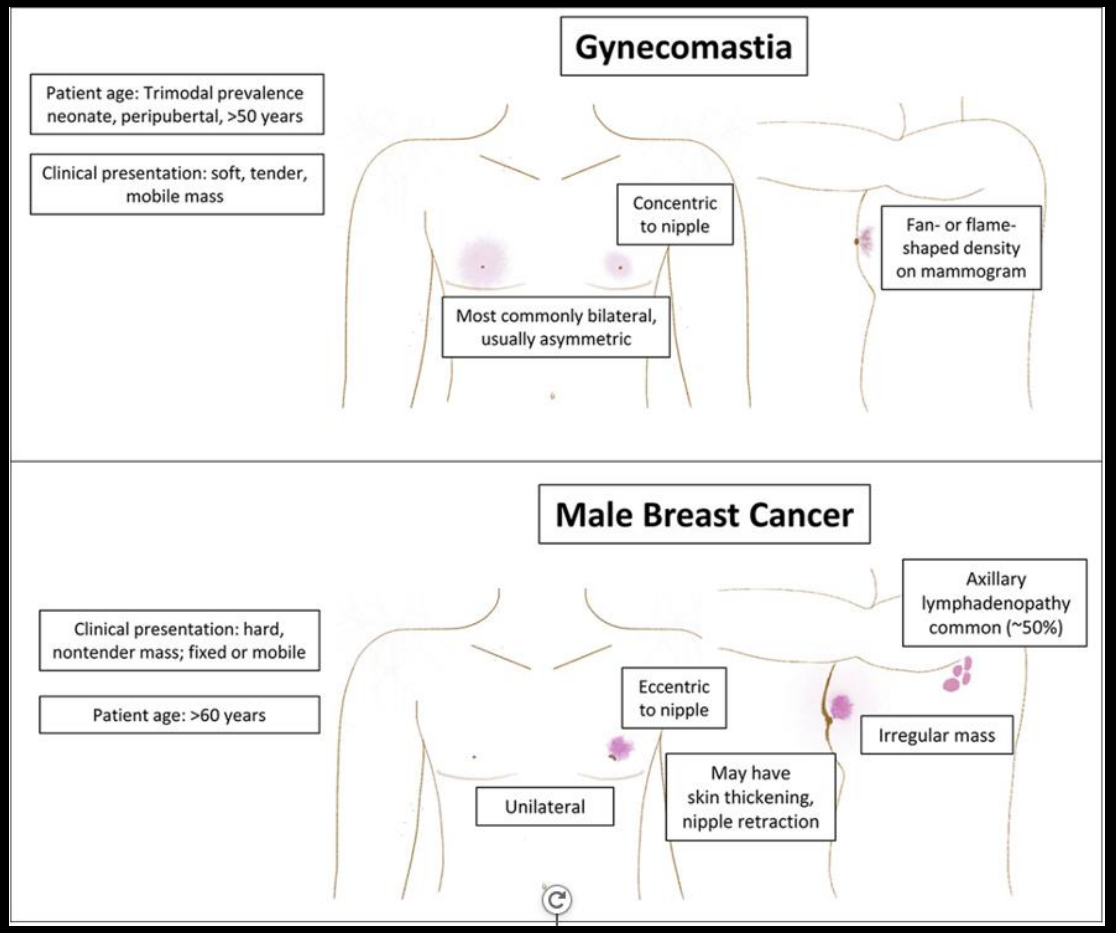
Gynecomastia vs. Male Breast Cancer



Radiologic Findings of Gynecomastia

Imaging supporting gynecomastia is benign and classified as BI-RADS 2; appropriate clinical follow-up is advised. A biopsy is recommended for an imaging finding suspicious of cancer, classified as BI-RADS 4 or 5.

Mannix J et al. Published online: May 16, 2024



Differences between Gynecomastia and Male Breast Cancer

References:

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K.J. Ruddy, E.P. Winer. Male breast cancer: risk factors, biology, diagnosis, treatment, and survivorship. Annals of Oncology. Volume 24, Issue 6. 2013. Pages 1434-1443. ISSN 0923-7534. https://doi.org/10.1093/annonc/mdt025.

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Mannix J, Duke H, Almajnooni H, and Ongkeko M. Imaging the Male Breast: Gynecomastia, Male Breast Cancer, and Beyond. RadioGraphics 2024 44:6.

Zheng, Guoliang, Leone, Jose Pablo, Male Breast Cancer: An Updated Review of Epidemiology, Clinicopathology, and Treatment, Journal of Oncology, 2022, 1734049, 11 pages, 2022. https://doi.org/10.1155/2022/1734049