AMSER Case of the Month September 2025

39-year-old female with a palpable left breast lump and pain for 3 weeks

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Patient Presentation

- **History of Present Illness:** Patient is a 39-year-old female who presents to the breast imaging center due to a palpable lump in her left breast for 3 weeks. She initially had associated pain which resolved, but the mass remained. She denies trauma, infectious symptoms, or skin changes.
- **Past Medical History:** Normal spontaneous vaginal delivery in 2023. Otherwise, unremarkable.
- **Surgical History:** No prior surgeries.
- **Family History:** No family history of breast cancer.
- **Labs:** CBC and CMP within normal limits.
- **Physical Exam:** Breasts are symmetrical with no skin changes. Notable for a 4 x 6 cm area of increased density in the left breast at the 12 o'clock position. No nipple discharge expressed. Right breast was normal.

What Imaging Should We Order?

ACR Appropriateness Criteria
Palpable Breast Masses

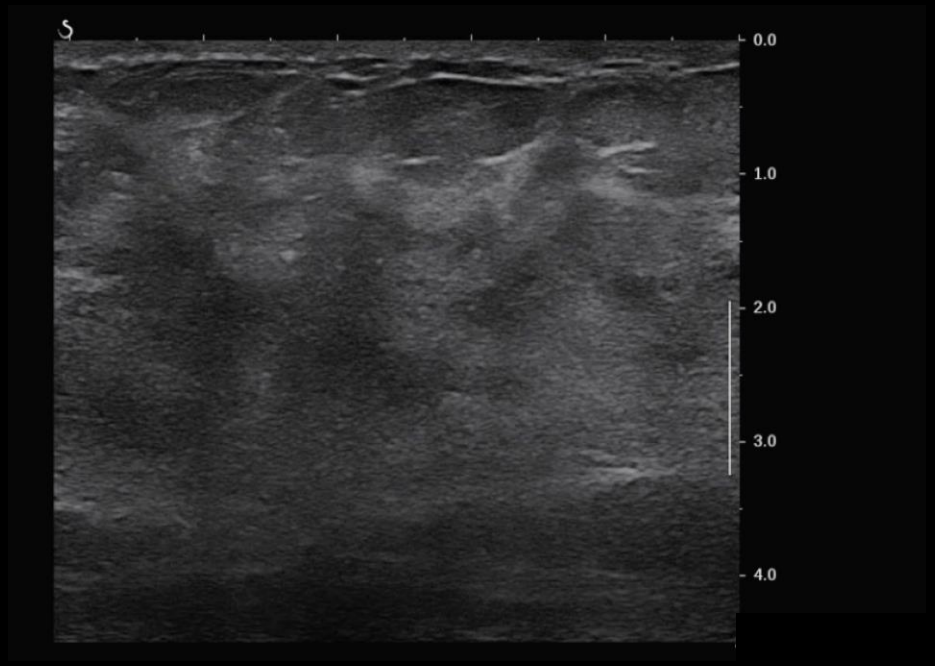
Variant 11: **Adult female, 30 to 39 years of age. Palpable breast mass. Initial imaging.**

Procedure	Appropriateness Category	Relative Radiation Level
US breast	Usually Appropriate	O
Digital breast tomosynthesis diagnostic	Usually Appropriate	☢☢
Mammography diagnostic	Usually Appropriate	☢☢
Digital breast tomosynthesis screening	Usually Not Appropriate	☢☢
Mammography screening	Usually Not Appropriate	☢☢
Image-guided core biopsy breast	Usually Not Appropriate	Varies
Image-guided fine needle aspiration breast	Usually Not Appropriate	Varies
MRI breast without and with IV contrast	Usually Not Appropriate	O
MRI breast without IV contrast	Usually Not Appropriate	O
Sestamibi MBI	Usually Not Appropriate	☢☢☢
FDG-PET breast dedicated	Usually Not Appropriate	☢☢☢

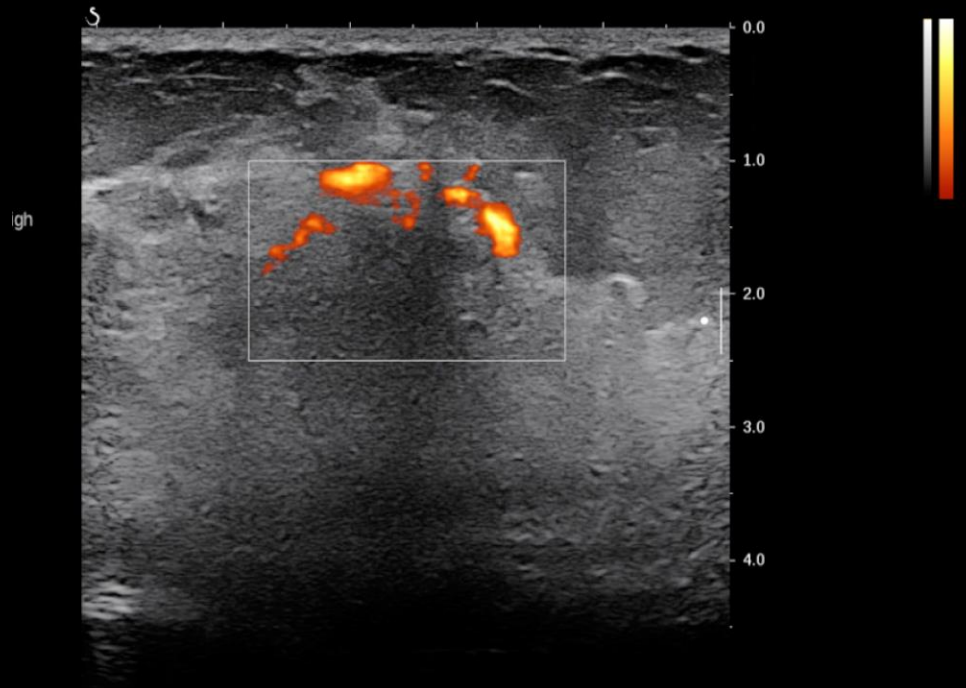
This imaging modality was initially ordered by the **OBGYN midwife**

Ultrasound Findings (unlabeled)

Left breast, 11:00 position, 2 cm from nipple



Left breast, 11:00 position, 4 cm from nipple (Color Doppler)



Ultrasound Findings (labeled)

Left breast, 11:00 position,
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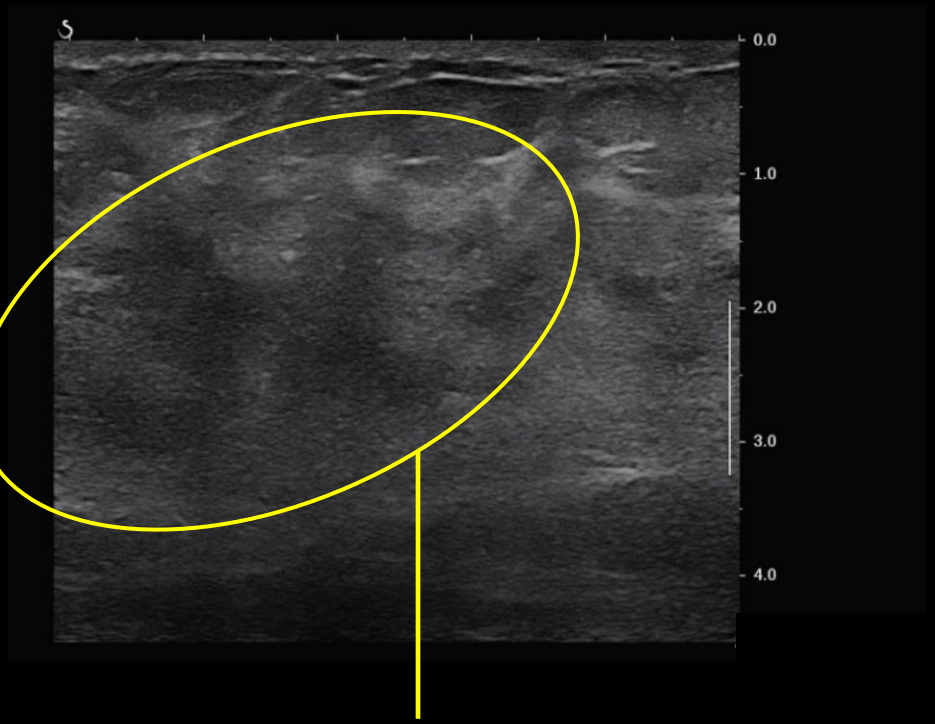
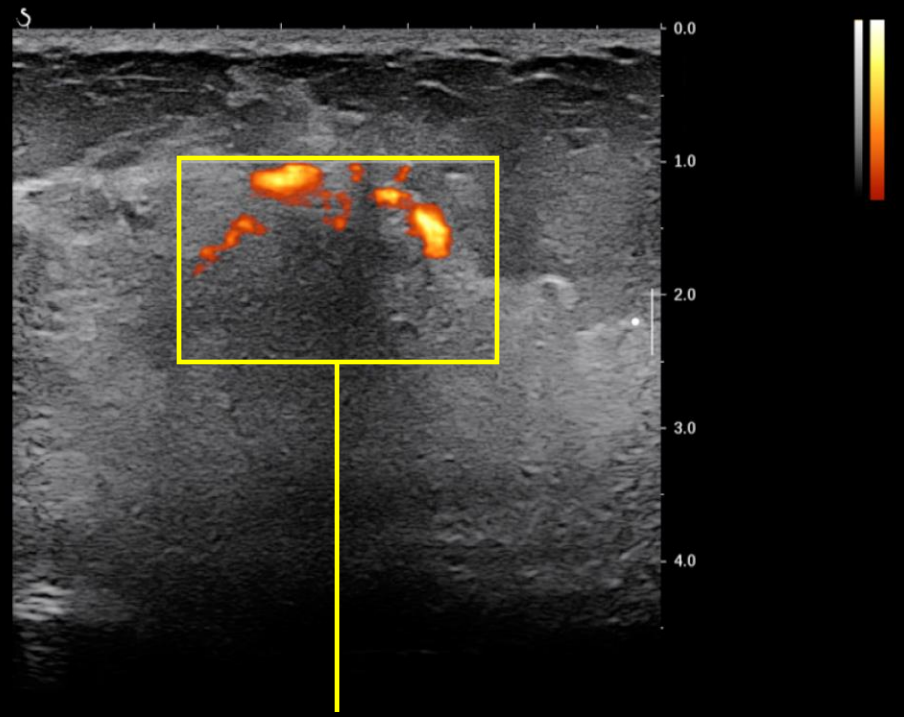


Non-mass lesion with indistinct margins and heterogeneous internal echogenicity, measuring at least 5.0 cm.

Left breast, 11:00 position, 4
cm from nipple (Color Doppler)



The non-mass lesion demonstrates internal vascularity on color Doppler imaging.

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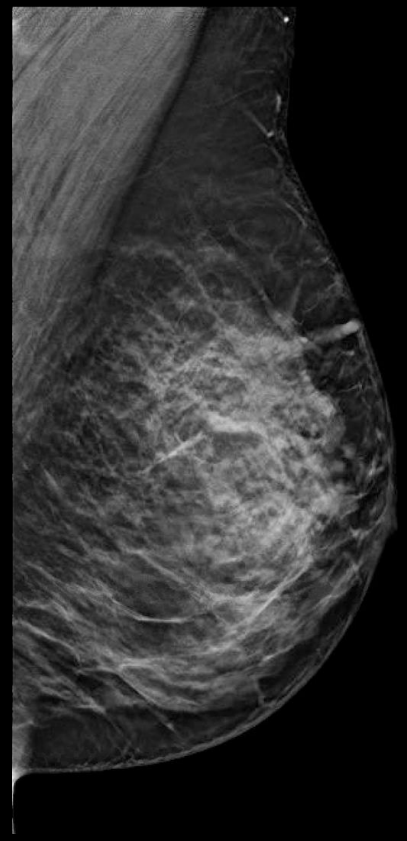
FDG-PET breast dedicated	Usually Not Appropriate	☢☢☢

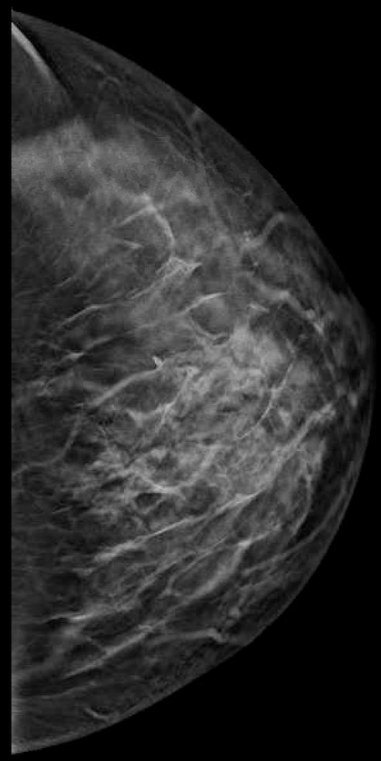
This imaging modality was performed on the same day by the **breast radiologist**

Mammogram Findings (unlabeled)

Left MLO with tomosynthesis



Left CC with tomosynthesis



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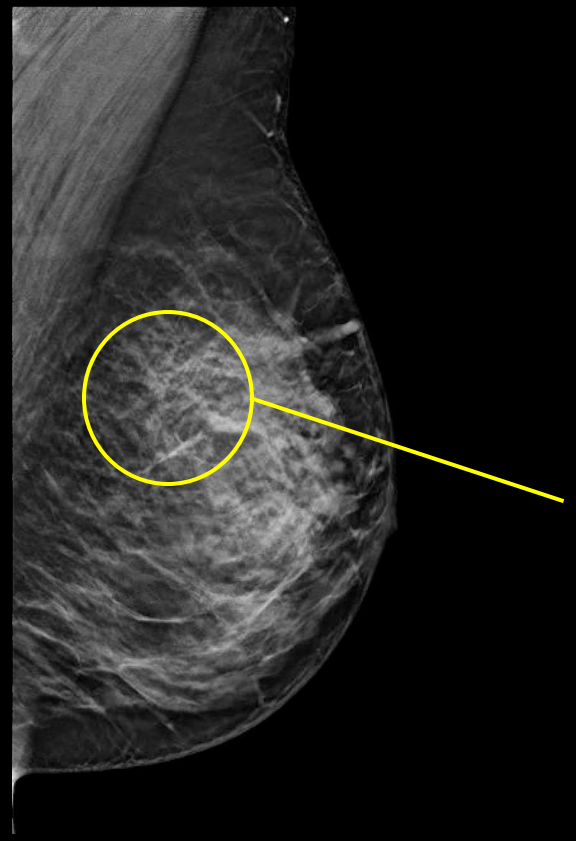
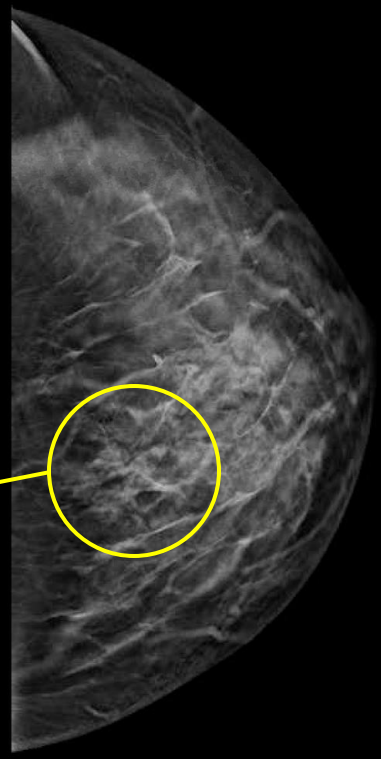
Mammogram Findings (labeled)

Left MLO with tomosynthesis

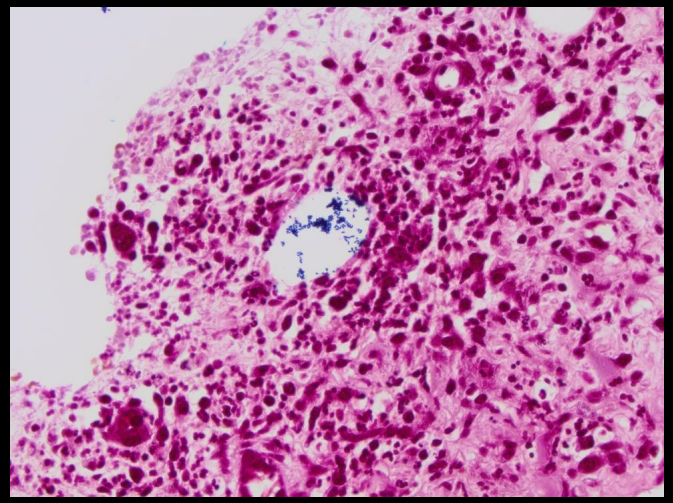


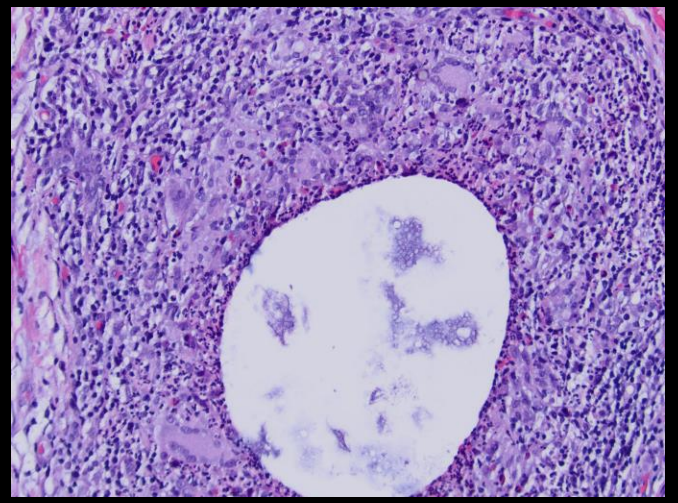
Area of architectural distortion in the left breast at 11:00 position, 2 cm from the nipple.

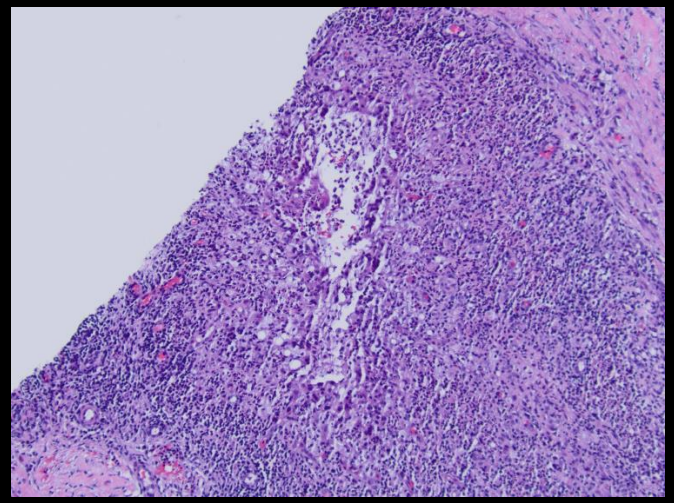
Left CC with tomosynthesis

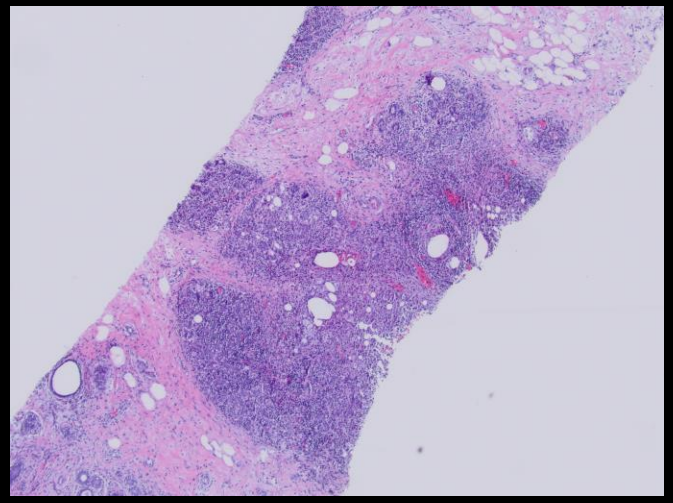


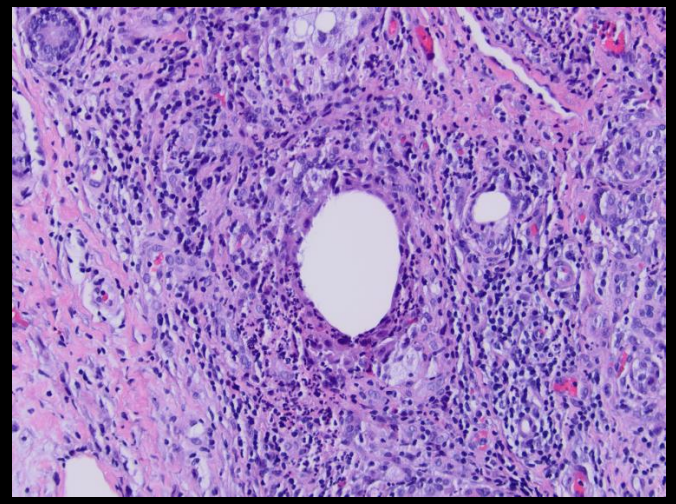
Ultrasound Core Needle Biopsy Findings (unlabeled)



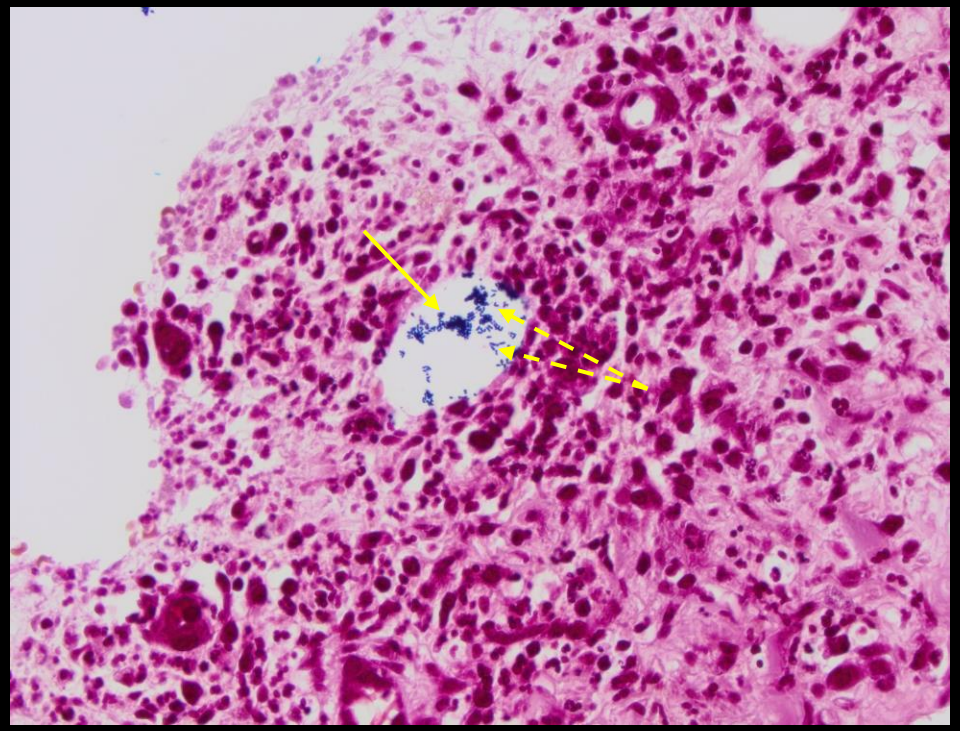




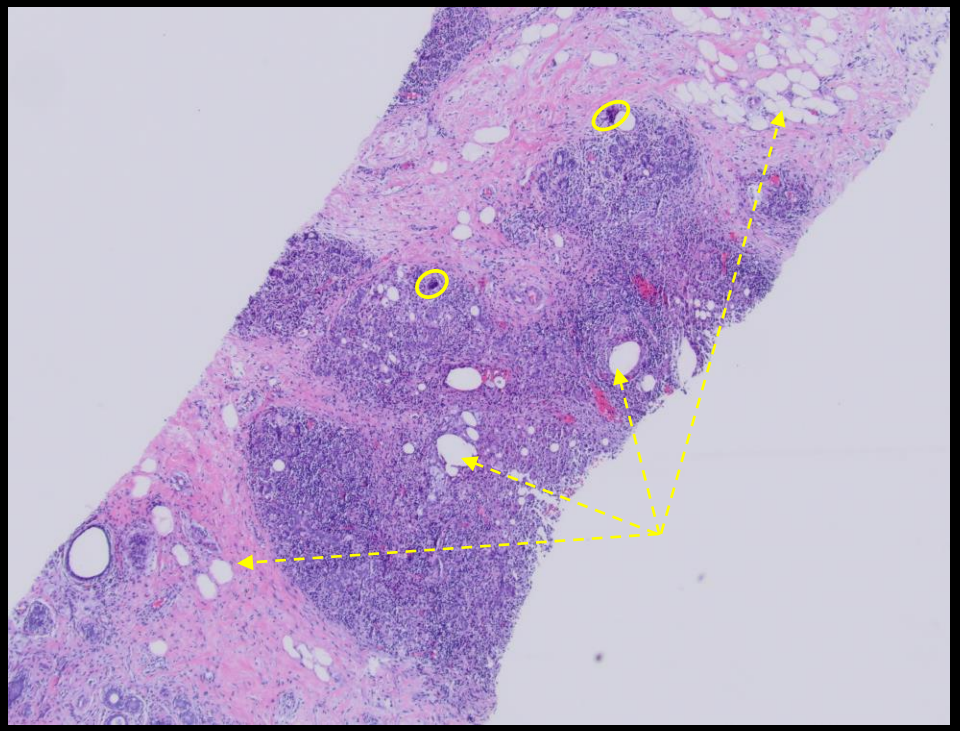




Ultrasound Core Needle Biopsy Findings (labeled)



High power view: Gram positive rods (solid arrow) within the cystic spaces, with occasional V-shaped forms (dashed arrows) suggestive of *Corynebacterium*.



Low power view: lobulo-centric inflammation consisting of neutrophils, lymphocytes, and histiocytes (outlined in solid yellow). Small round to oval cystic spaces are present (dashed yellow arrows).

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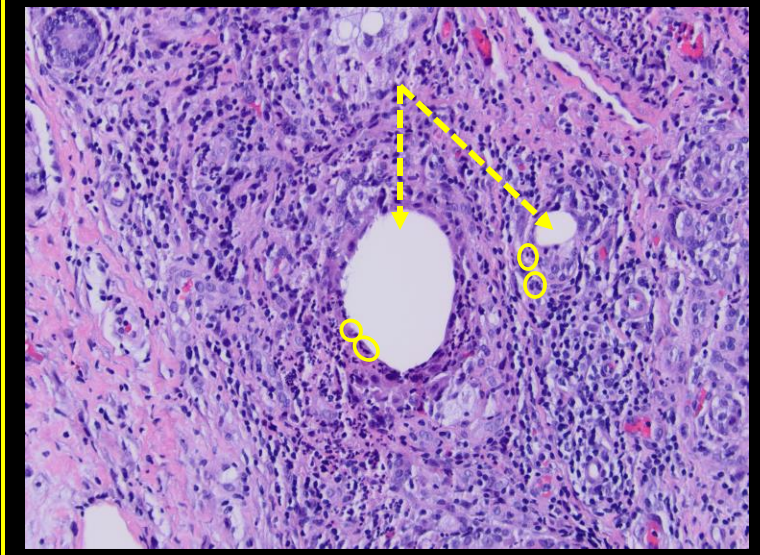
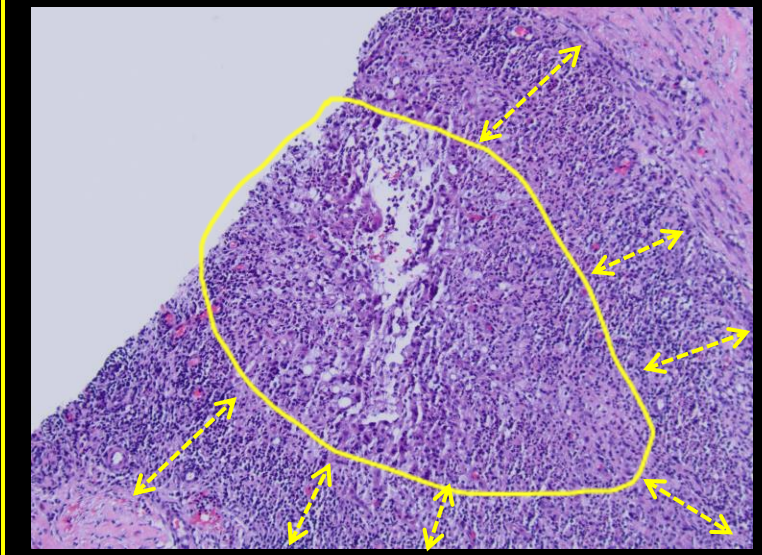
Ultrasound Core Needle Biopsy Findings (labeled)

Medium/high power view: another cystic space (dashed yellow arrow), with at least two nearby multinucleated giant cells (outlined in solid yellow)



Medium/high power view: two of the oval/round cystic spaces (dashed yellow arrows), partially rimmed by neutrophils (outlined in solid yellow).



Medium power view: somewhat ill-defined, non-necrotizing granuloma (outlined in solid yellow), surrounded by mixed inflammation (dashed yellow arrows)

Final Diagnosis:

Idiopathic Granulomatous Mastitis

Idiopathic Granulomatous Mastitis (IGM)

- **Background** [1,2]
  - A rare, benign, chronic inflammatory breast condition that can significantly impair quality of life due to its aggressive clinical course and resistance to treatment.
  - Primarily affects parous women, between ages 32 and 35, often within five years post-partum.
  - Annual prevalence is approx. 2.4 per 100,000, with an incidence rate of 0.37%, representing 1.8% of benign breast conditions and 24% of inflammatory breast diseases.
- **Pathophysiology** [2-4]
  - Exact pathogenesis remains unclear but is thought to be multifactorial, favoring an autoimmune etiology.
  - Local inflammation may be triggered by infection, hormonal changes, or chemical irritants, causing luminal secretions to contact lobular connective tissue and incite granuloma formation.
  - Hormonal imbalances, such as altered estrogen-to-progesterone ratios or hyperprolactinemia, can result in milk stasis, potentiating the inflammatory process.
  - Growing evidence links *Corynebacterium* infection in some cases, with organisms found in lesion samples.

Idiopathic Granulomatous Mastitis (IGM)

- **Clinical Presentation** [1]
  - Typically presents unilaterally with a firm, tender breast mass, sometimes accompanied by skin erythema, mastalgia, or nipple changes due to surrounding inflammation.
  - May involve abscesses, sinus tracts, or ulceration, but usually lacks systemic symptoms like fever.
  - Often mimics malignancy or infection on imaging, with no pathognomonic radiologic features.
- **Diagnosis** [1,3]
  - A diagnosis of exclusion, confirmed by histopathology and negative infectious workup.
  - Confirmed by core needle biopsy, showing non-caseating granulomas centered on lobules; special stains are essential to rule out infectious causes like TB or fungi.
  - *Corynebacterium* infection may present with a distinct pattern called cystic neutrophilic granulomatous mastitis and can be confirmed by microbiologic studies.

Idiopathic Granulomatous Mastitis (IGM)

- **Management** [3-5]
  - Medical management is preferred, including observation, antibiotics, corticosteroids, and immunomodulators such as methotrexate.
  - Goal is to avoid surgery due to risks of poor wound healing, recurrence, and cosmetic complications.
  - No standardized treatment protocol; therapy is tailored based on disease severity and patient factors.
  - Watchful waiting is appropriate for mild, non-progressive cases, while steroids (oral, topical, or intralesional) are the mainstay for more severe disease.
- **Prognosis** [4]
  - Relapse or recurrence is common after treatment, reported in 20%-50% of cases.
  - Most cases of granulomatous mastitis are self-limiting over 2-24 months, regardless of treatment modality.

References:

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2. Wang X, He X, Liu J, Zhang H, Wan H, Luo J and Yang J (2024) Immune pathogenesis of idiopathic granulomatous mastitis: from etiology toward therapeutic approaches. *Front. Immunol.* 15:1295759. doi: 10.3389/fimmu.2024.1295759
3. Yin Y, Liu X, Meng Q, Han X, Zhang H, Lv Y. Idiopathic Granulomatous Mastitis: Etiology, Clinical Manifestation, Diagnosis and Treatment. *J Invest Surg.* 2022;35(3):709-720. doi:10.1080/08941939.2021.1894516
4. Coombe RF, Hamed H. An update on granulomatous mastitis: a rare and complex condition. *Br J Hosp Med (Lond)*. 2021;82(5):1-7. doi:10.12968/hmed.2020.071
5. Bede K, Valente SA. Idiopathic granulomatous mastitis. *Ann Breast Surg* 2020;4:24. doi: 10.21037/abs-20-8

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