

# RADY401 Case Presentation: Breast Cyst Aspiration

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22 August 2019

# History

- Patient is a 40-year-old female with no significant past medical history who presented to clinic with a self-detected, tender left breast lump.
  - No prior breast mass or other symptoms
  - G2P2 with first child at age 24. Menarche at 13 and currently premenopausal.
  - Prior genetic tests for BRCA1 and BRCA2 were negative
  - Notable family history:
    - Mother: uterine cancer (62)
    - Maternal grandmother: breast and ovarian cancer

# Focused physical exam

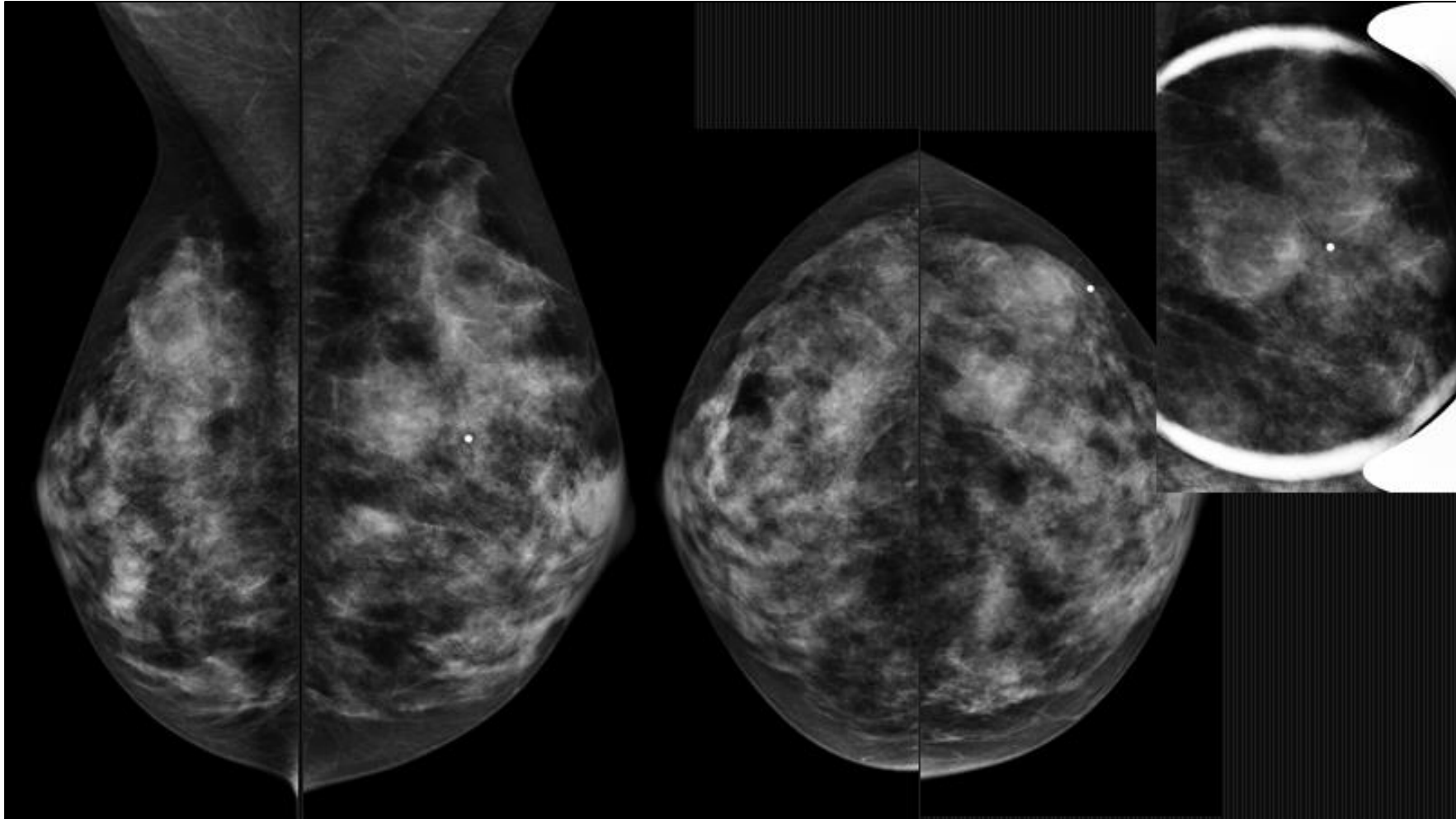
**General:** Well-appearing, well-nourished

**Breast:** Grossly symmetric with everted nipples. On the right, no mass, no skin dimpling or changes, no nipple discharge. Left breast has a palpable, tender, mobile, 2cm x 2cm mass at the 3 o'clock position. Left breast with no skin changes or dimpling, no nipple discharge.

# List of imaging studies

- Bilateral diagnostic mammogram
- Ultrasound

# Pre-Aspiration Mammography



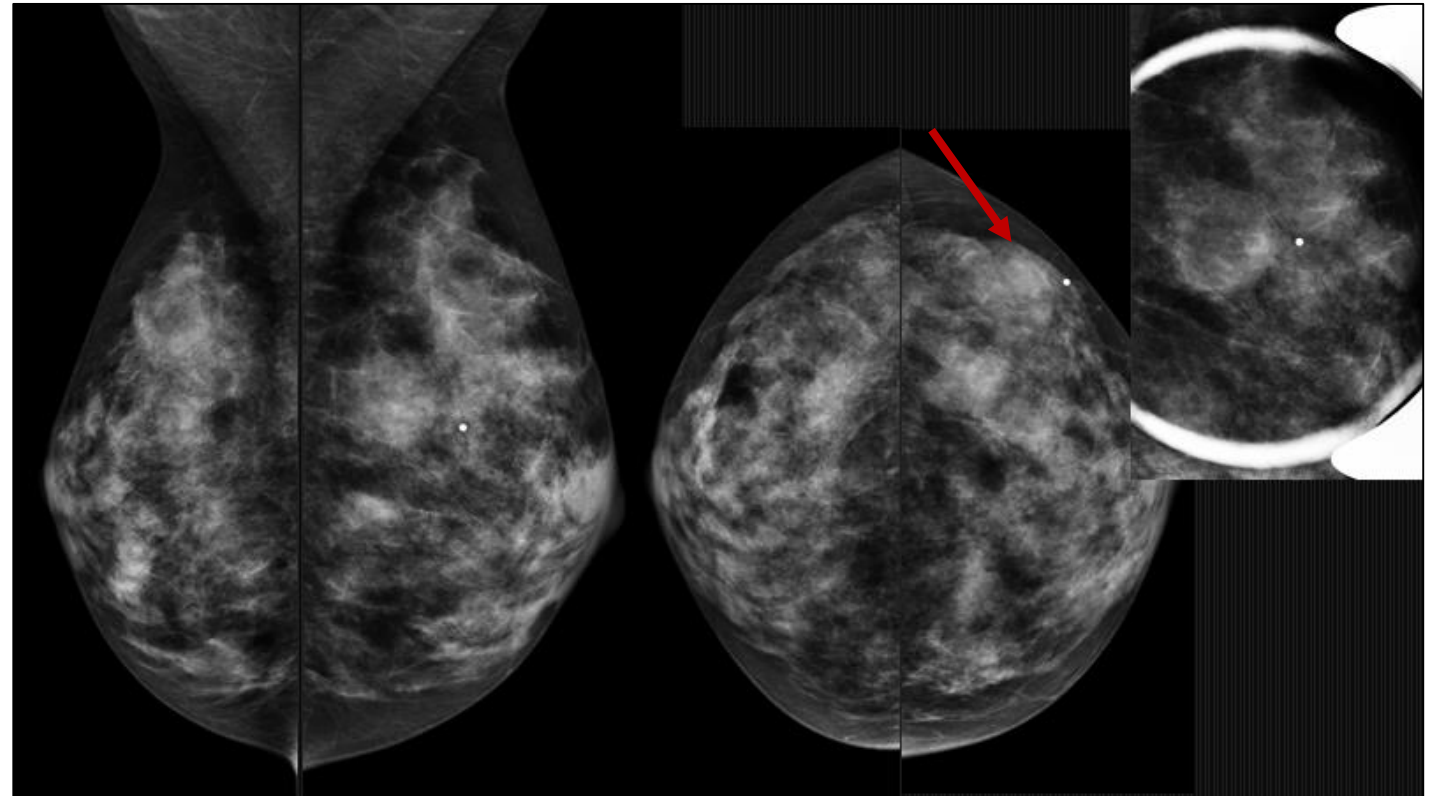
# Findings and Assessment

**Breast density:** D – the breasts are extremely dense which lowers the sensitivity of mammography

**Findings:** Site of concern is marked (arrow). In the upper outer quadrant of the left breast at the junction of the middle and posterior depths, there is a 2.1 x 2.1 cm oval, obscured mass.

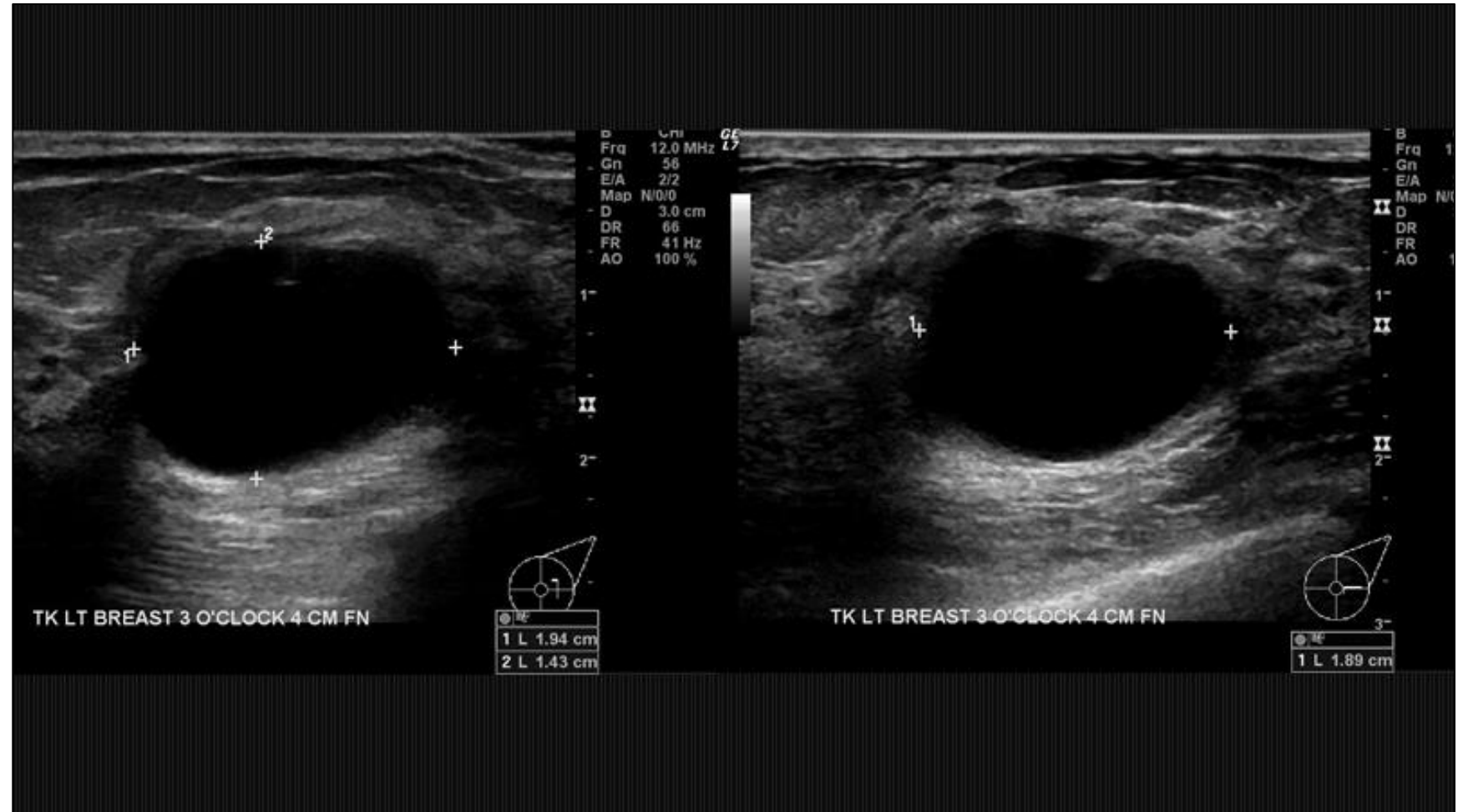
No suspicious masses, malignant type calcifications, architectural distortion or concerning asymmetries in the right breast.

**Assessment:** BI-RADS Category 2



# Ultrasound

**Findings:** Anechoic oval mass at the site of palpable abnormality 3 o'clock left breast 4 cm from the nipple, measuring 1.9 x 1.4 x 1.9 cm. Findings are consistent with a simple cyst.



# Simple Cyst

- For a benign simple cyst found incidentally on imaging, no further intervention is warranted.
- Fine needle aspiration may be performed for signs of infection or inflammation (tenderness, erythema, warmth).
  - Must be performed under ultrasound guidance to ensure complete collapse of the cyst.
- No further follow-up is necessary and patient may resume routine screening.

This patient has a simple cyst (BI-RADS 2, benign) and because she is experiencing tenderness, fine needle aspiration will be performed to alleviate her symptoms.



# Cyst Aspiration: Pre-procedure

- Risks and benefits of cyst aspiration were discussed with the patient with the most common side effect of the procedure being bruising at the site. Other risks include bleeding and infection, both of which are highly unlikely. Written and oral consent were obtained.
- Patient was positioned slightly tilted to her right side with her left arm raised above her head. The site was sterilely prepped with chlorhexidine solution (ChlorPrep) and the ultrasound probe was covered with sterile technique.
- A time-out was performed to verify the correct patient, procedure, and location.

# Cyst Aspiration: Procedure

- Area around the cyst was locally anesthetized with 10 ml of 1% lidocaine
- Using ultrasound guidance, a 20 gauge needle was inserted completely into the mass
- Fluid from the mass was aspirated, also under ultrasound guidance
- The needle was withdrawn after approximately 3ml of fluid was obtained

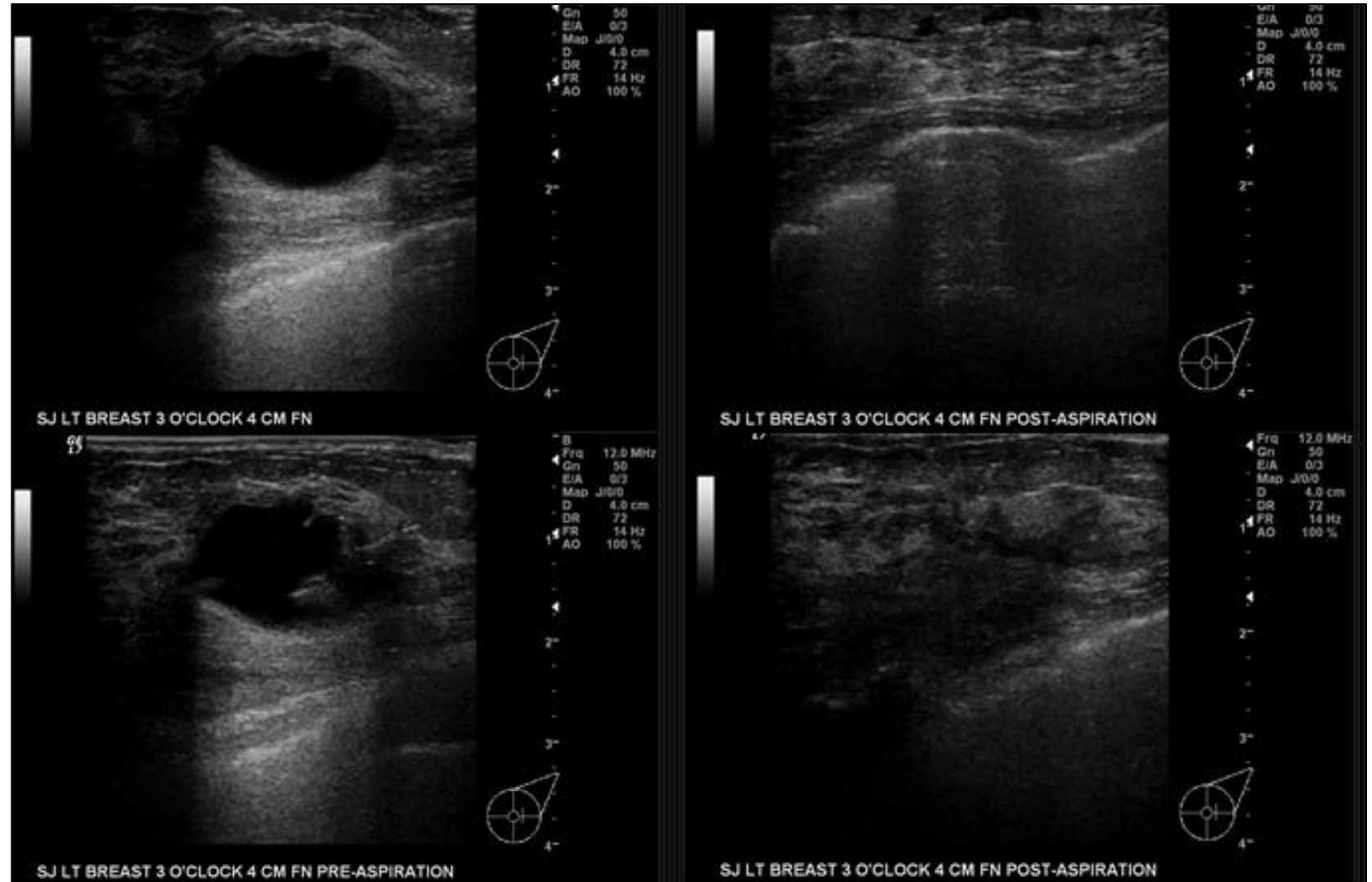
# Intra-procedure and Post-aspiration Images

**Top left:** cyst immediately prior to needle insertion

**Bottom left:** image of cyst with tip of needle inserted

**Top right:** site immediately following cyst drainage (completely collapsed)

**Bottom right:** post-aspiration site



# Aspirated Fluid

Turbulent, yellow-tan fluid was aspirated from the patient (right).

- For simple cysts, only frankly bloody fluid should be sent for culture and cytology
- Turbid or purulent fluid may be sent for culture if infection is suspected. It should not be sent for cytology (cyst fluid frequently contains atypical cells)
- Fluid color varies normally from light yellow to dark green or black



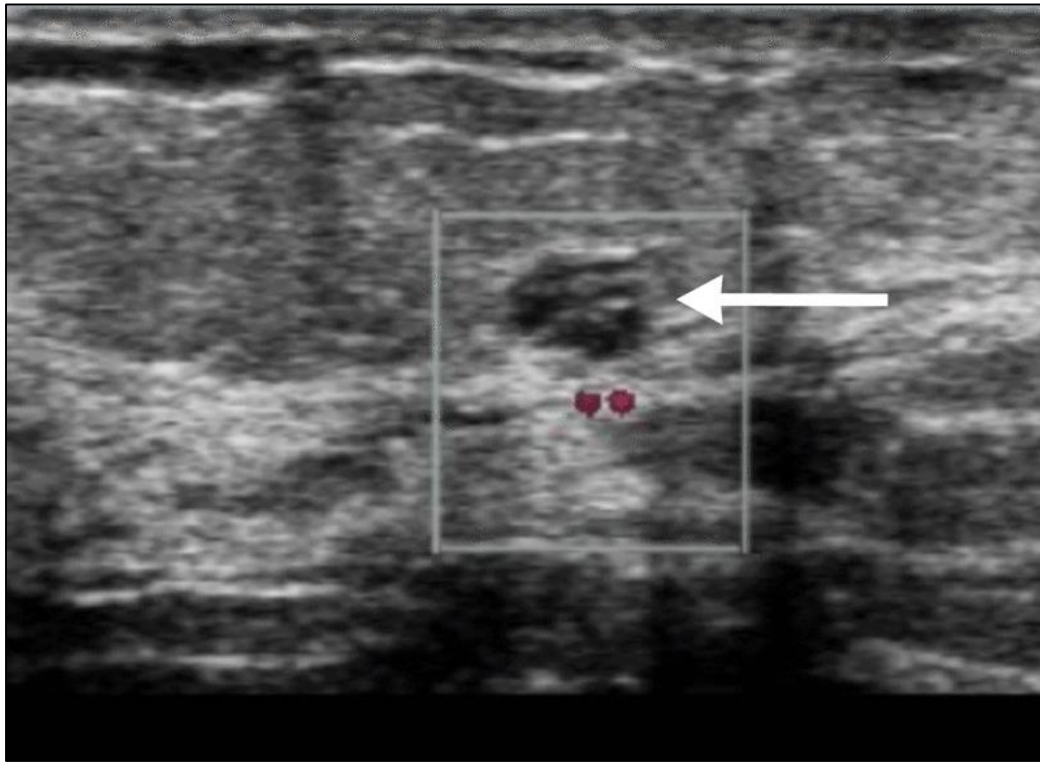
# Post-procedure

- Direct pressure with 4x4 gauze was applied to the site of aspiration until hemostasis was achieved. A bandage was applied at the conclusion of the procedure and the patient was given instructions on wound care and provided with return precautions.
- Aspirated fluid was discarded as it was a simple cyst with no suspicion for infection.
- Patient returned home and will follow up as needed in clinic. She may begin routine screening mammography as recommended by the USPSTF at age 50 (vs age 40 as recommended by the ACR).

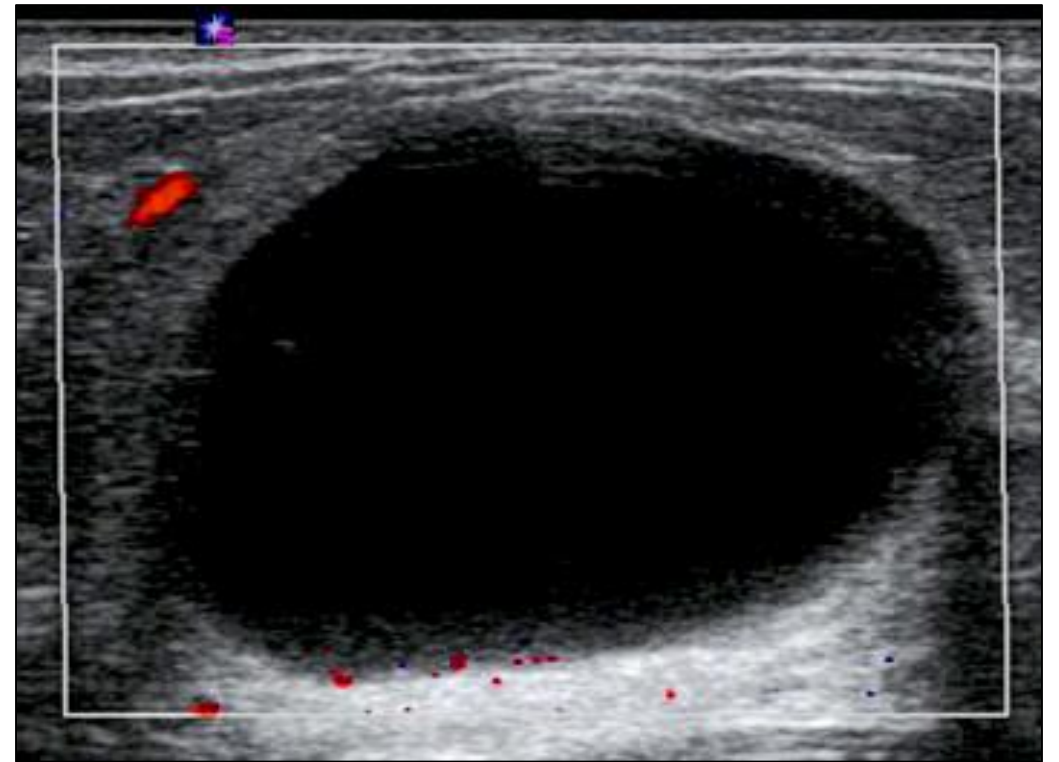
# Cyst Types: Simple

- Simple
  - Well-circumscribed
  - Posterior acoustic enhancement on ultrasound
  - Anechoic with no solid components or Doppler signal
  - Clustered microcysts and cysts that have septa less than 0.5 mm in thickness are also within this category
- Complicated
- Complex

## Cyst Types: Simple



**Left:** Ultrasound of small cluster of anechoic masses with no vascularity and thin internal septations, consistent with microcysts [4].



**Right:** Well-circumscribed, anechoic mass with no internal vascularity or solid structures, consistent with a simple cyst [6].

# Cyst Types: Complicated

- Simple
- **Complicated**
  - Masses with homogenous low-level internal echoes
  - No solid components, thick walls or thick septa
  - No vascular flow
- Complex



# Cyst Types: Complicated Cyst

- Low-level internal echoes
- Well-circumscribed, does not contain any solid components or septations
- Posterior acoustic enhancement

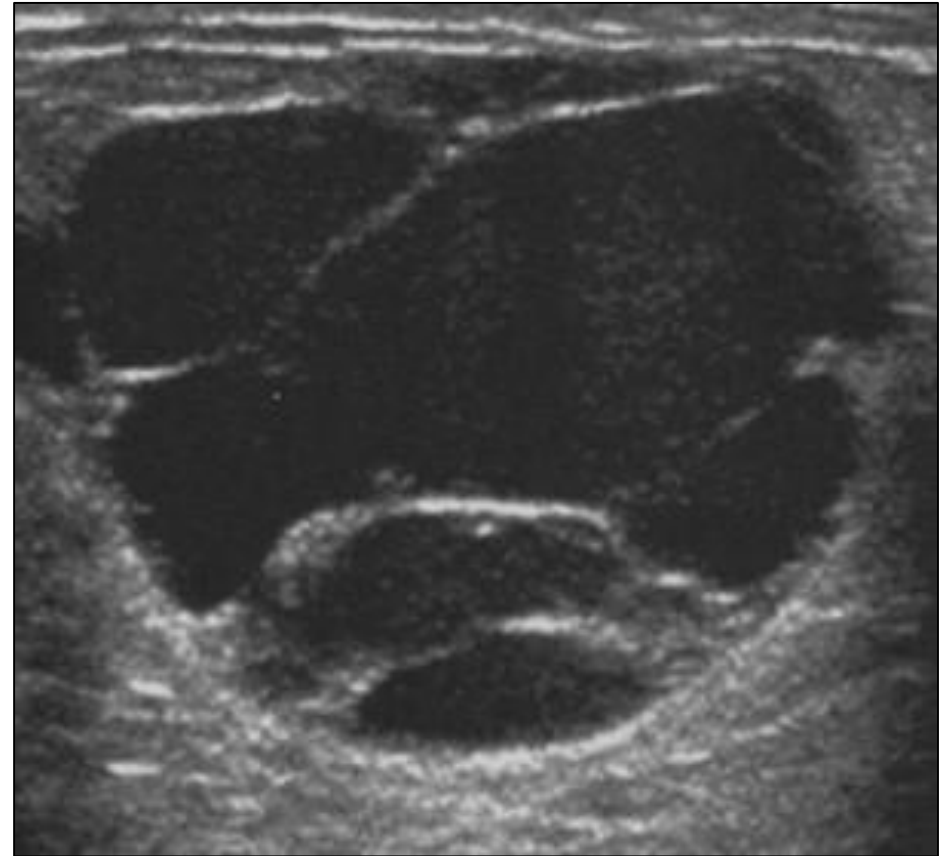


# Cyst Types: Complicated Cystic and Solid Mass

- Simple
- Complicated
- **Complicated Cystic and Solid**
  - Thick-walled or thickly-septated (>0.5mm) masses
  - Presence of cystic or solid components
  - Absence of posterior wall enhancement

# Cyst Types: Complicated Cystic and Solid Mass

- Predominantly cystic mass
- Septations are numerous and >0.5mm thick
- Hemorrhagic changes



# BI-RADS Categories

- Simple cysts, clustered microcysts, and the majority of complicated cysts are assigned BI-RADS Category 2 (benign)
  - Essentially zero percent likelihood of malignancy
  - Tissue sampling not warranted
  - Routine annual mammography
- Complicated cysts may be BI-RADS Category 3 (likely benign)
  - 0-2 percent likelihood of malignancy
  - 6-month follow-up or continued surveillance mammography
- Complex cystic and solid cysts should be BI-RADS Category 4 or 5
  - Category 4: Suspicious for malignancy (2 – 95% likelihood of malignancy)
  - Category 5: Highly suggestive of malignancy (>95% likelihood of malignancy)
  - Both require tissue biopsy

# Summary

- Cysts are common in both pre and post menopausal women and the risk of breast cancer is not increased in women who have a history of simple cysts.
- Three types of cysts with variable management strategies: simple, complicated, and complicated cystic and solid
- Ultrasound is the modality of choice for diagnosis and to guide intervention (aspiration or biopsy)
  - BI-RADS categories 4 and 5 are suspicious or likely malignancy and a tissue biopsy is warranted

# References

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6. "Simple cyst" *UpToDate*. Version 2.0, Graphic 73503. Accessed August 22, 2019, from [https://www.uptodate.com/contents/image?imageKey=SURG%2F73503&topicKey=SURG%2F799&search=breast%20cyst%20aspirate%20colors&rank=1~150&source=see\\_link](https://www.uptodate.com/contents/image?imageKey=SURG%2F73503&topicKey=SURG%2F799&search=breast%20cyst%20aspirate%20colors&rank=1~150&source=see_link)