

AMSER Case of the Month

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Initial Breast Cancer Screening in a Transgender Woman

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Patient Presentation

HPI: 40 year old transgender woman (male-to-female, she/her/hers). Treated with exogenous estrogen for the past 16 years, presents for preliminary breast cancer screening exam, no current breast complaints

PMH: asthma, essential hypertension, HIV, major depressive disorder (recurrent), anal LSIL

Meds: albuterol, amlodipine, biktarvy (bictegravir, emtricitabine, tenofovir alafenamide), cetirizine, D3, **Delestrogen** (estradiol valerate injection), losartan, omeprazole, ondansetron, Prezcofix (darunavir, cobicistat), quetiapine. Sertraline, **spironolactone**

Family history: Breast cancer in maternal aunt (around age 45)

Substance use: non-smoker, no injection drug use

Variant 1: Breast cancer screening. Average-risk women: women with <15% lifetime risk of breast cancer.

Procedure	Appropriateness Category	Relative Radiation Level
Mammography screening	Usually Appropriate	☼☼
Digital breast tomosynthesis screening	Usually Appropriate	☼☼
US breast	May Be Appropriate	○
MRI breast without and with IV contrast	Usually Not Appropriate	○
MRI breast without IV contrast	Usually Not Appropriate	○
FDG-PEM	Usually Not Appropriate	☼☼☼☼
Sestamibi MBI	Usually Not Appropriate	☼☼☼

Variant 2: Breast cancer screening. Intermediate-risk women: women with personal history of breast cancer, lobular neoplasia, atypical ductal hyperplasia, or 15% to 20% lifetime risk of breast cancer.

Procedure	Appropriateness Category	Relative Radiation Level
Mammography screening	Usually Appropriate	☼☼
Digital breast tomosynthesis screening	Usually Appropriate	☼☼
MRI breast without and with IV contrast	May Be Appropriate	○
US breast	May Be Appropriate	○
FDG-PEM	Usually Not Appropriate	☼☼☼☼
Sestamibi MBI	Usually Not Appropriate	☼☼☼
MRI breast without IV contrast	Usually Not Appropriate	○

Variant 3: Breast cancer screening. High-risk women: women with a BRCA gene mutation and their untested first-degree relatives, women with a history of chest irradiation between 10 to 30 years of age, women with 20% or greater lifetime risk of breast cancer.

Procedure	Appropriateness Category	Relative Radiation Level
Mammography screening	Usually Appropriate	☼☼
Digital breast tomosynthesis screening	Usually Appropriate	☼☼
MRI breast without and with IV contrast	Usually Appropriate	○
US breast	May Be Appropriate	○
FDG-PEM	Usually Not Appropriate	☼☼☼☼
Sestamibi MBI	Usually Not Appropriate	☼☼☼
MRI breast without IV contrast	Usually Not Appropriate	○

What Imaging Should We Order?

- ACR Appropriateness Criteria for Breast Cancer screening in cisgender women
- ACR does not comment on screening recommendations for transgender individuals.

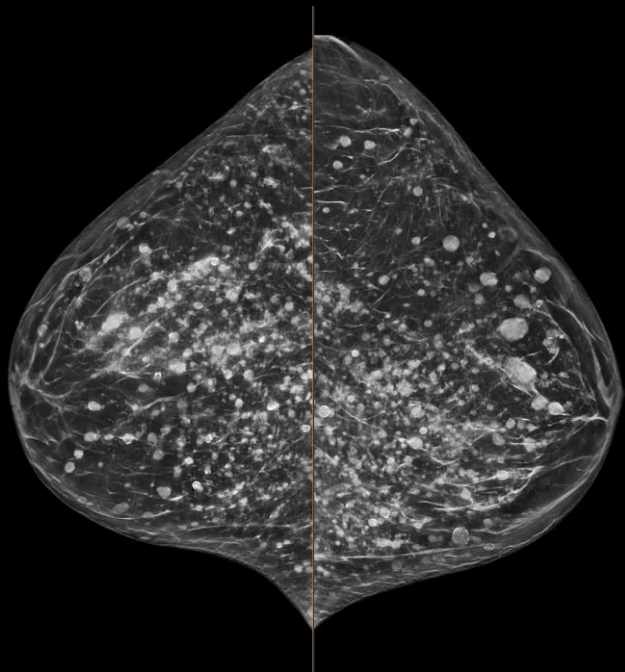
What Imaging Should We Order?

Society of Breast Imaging Newsletter 2016
Current Radiology Reports 2019

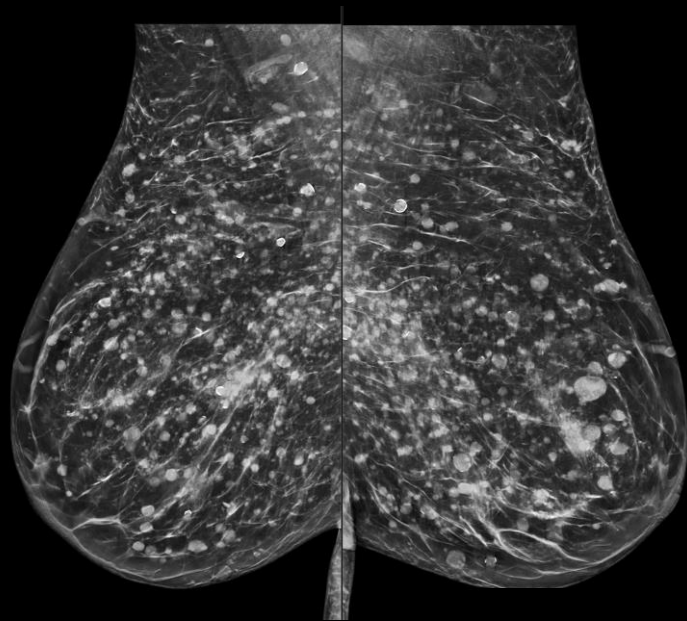
Table 1. Screening recommendations for transgender women	
Transgender women with:	Recommendation(s):
Past or current hormone use in patients \geq 50 years old	Annual mammography if the patient has additional risk factors:
	• Estrogen AND progestin use for $>$ 5 years
	• BMI $>$ 35
	• Family history
No hormone use	Routine screening is not indicated unless the patient has other known risk factors, e.g. Klinefelter syndrome, BRCA mutation
Breast augmentation by direct injection of particles	Contrast enhanced MRI is preferred for detection of breast cancer

Findings: Bilateral Diagnostic Mammogram with Tomosynthesis

CC

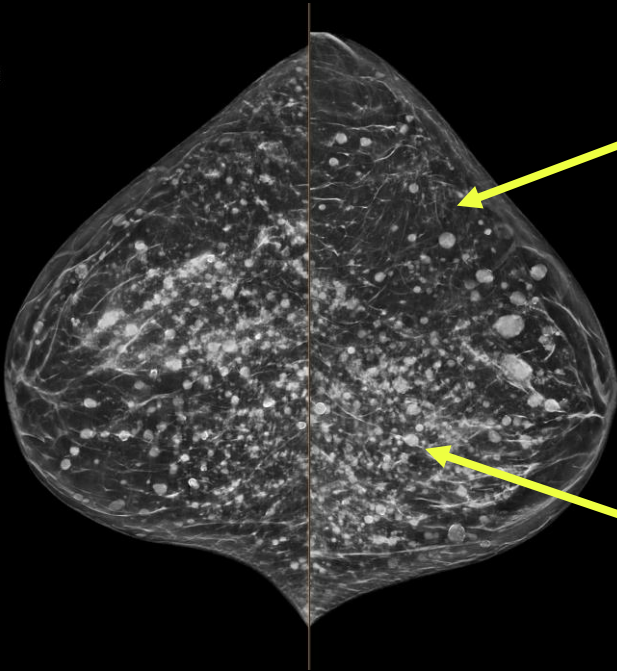


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Findings: Diagnostic Mammography with Tomosynthesis

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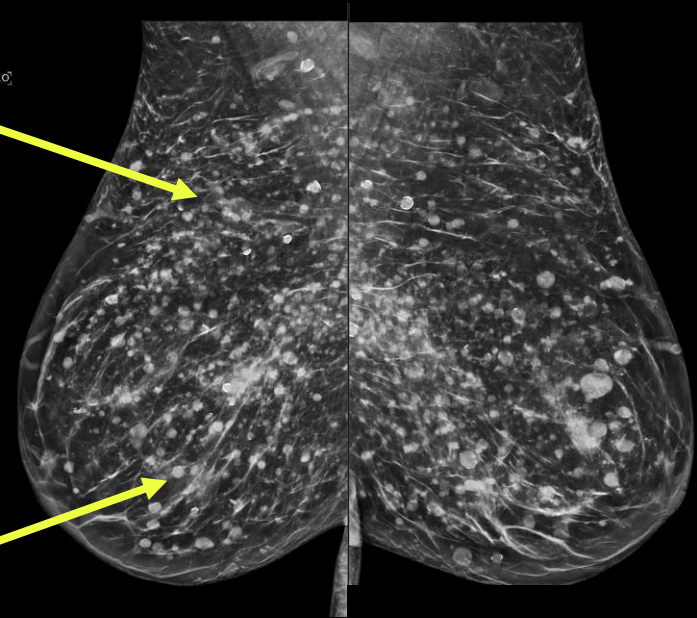
FINDINGS:

Breast density:
Almost entirely fatty

No suspicious masses,
areas of architectural
distortion or calcifications

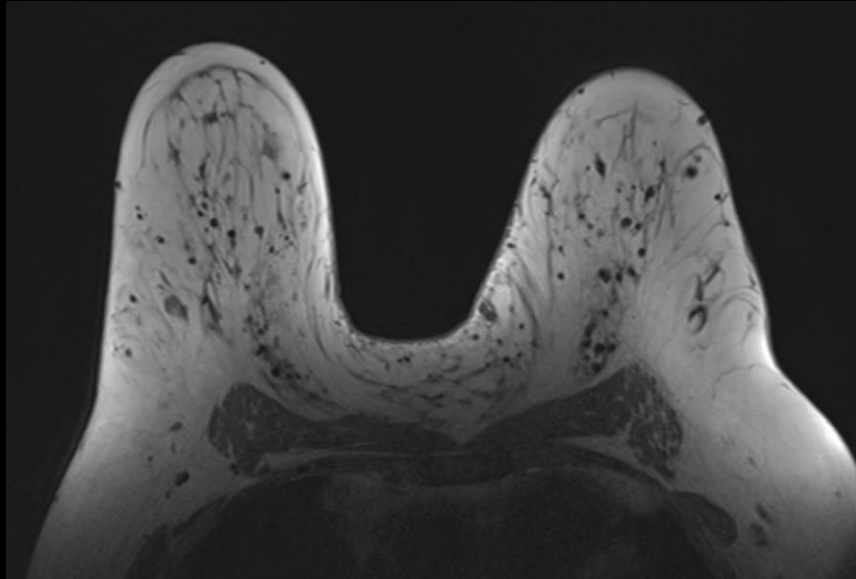
Innumerable circumscribed
dense masses throughout
both breast, compatible
with silicone injection sites

MLO

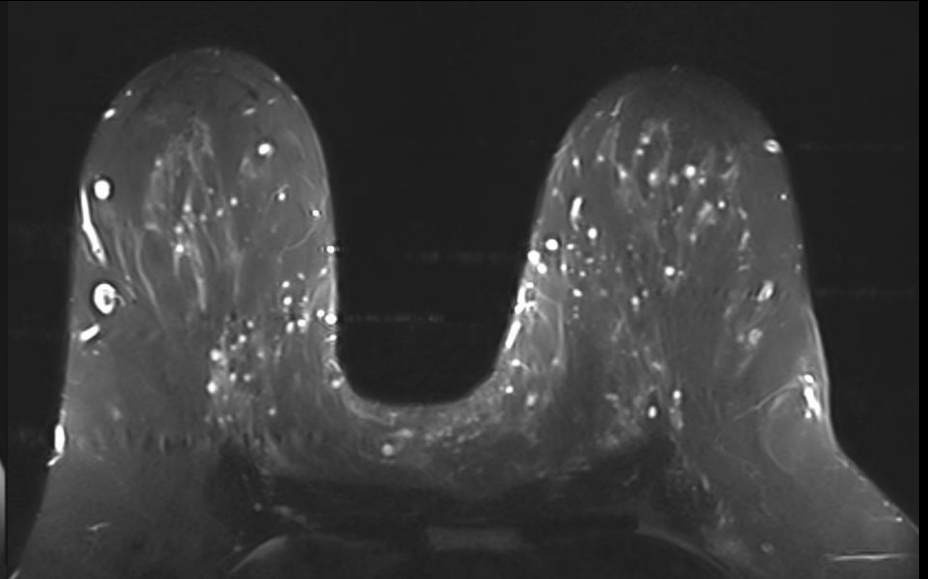


Findings: Bilateral Breast MRI with Dynacad

T1

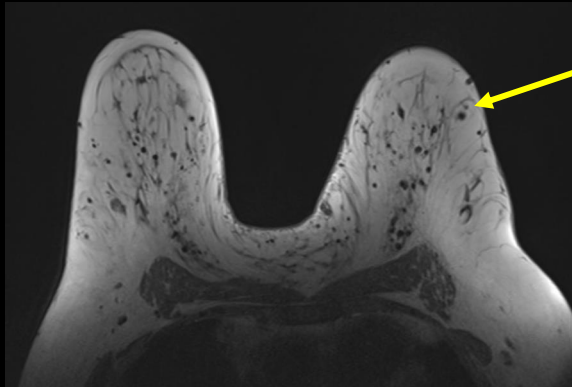


T2 STIR



Findings: Bilateral Breast MRI with Dynacad

T1



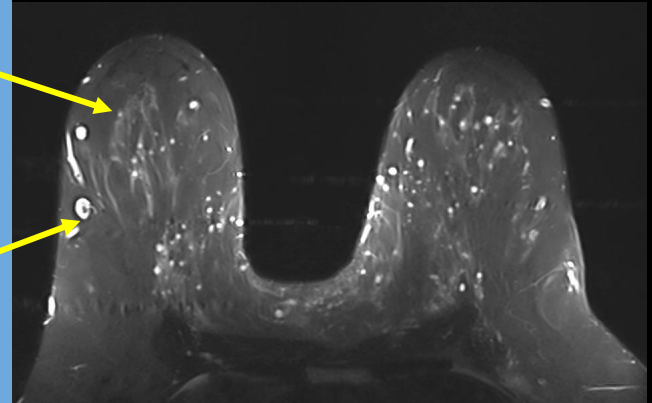
FINDINGS:

Innumerable small bilateral diffusely scattered T1 hypointense and T2 hyperintense masses, compatible with injected silicone

Prominent bilateral axillary and intramammary lymph nodes consistent with known lymphoproliferative disorder

No abnormal mass or non mass enhancement, or skin thickening

T2 STIR



Final Diagnosis

BI-RADS 2 - Benign

IMPRESSION

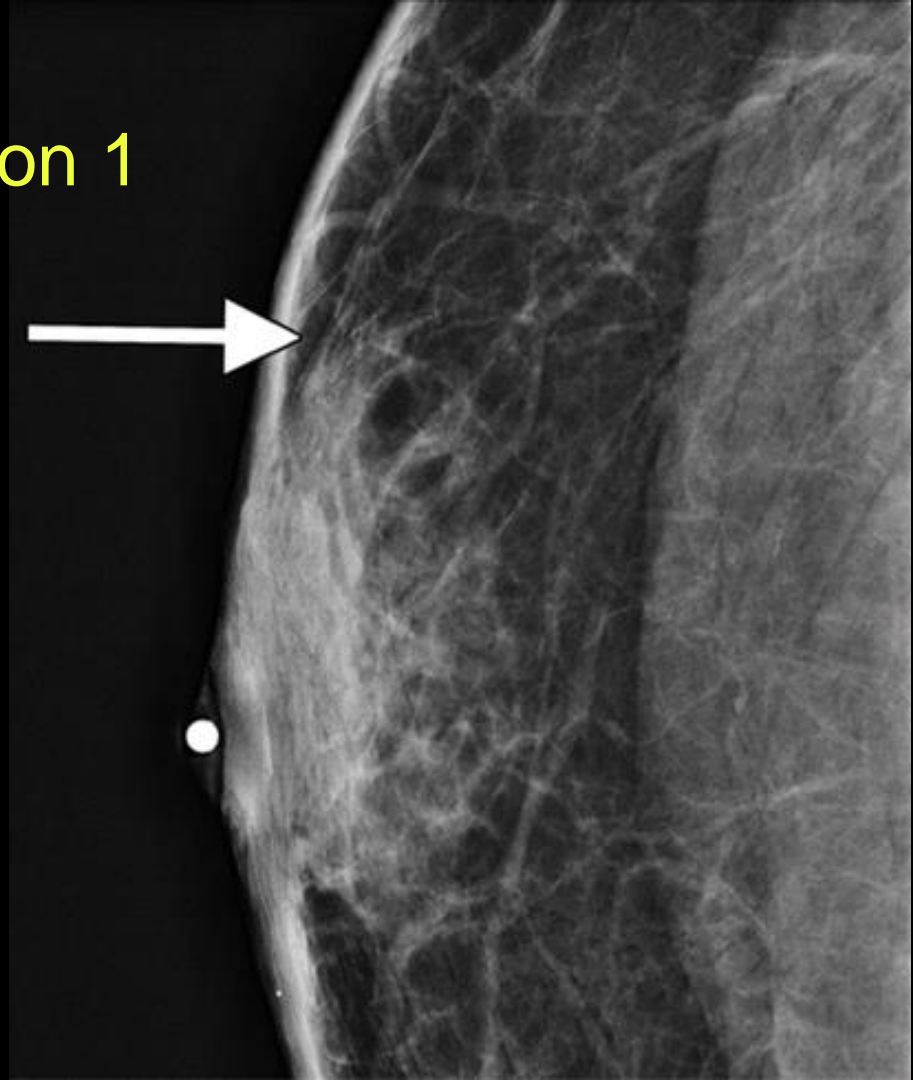
Bilateral diffusely scattered non-enhancing small masses consistent with injected silicone material.

No findings suggestive of malignancy in either breast.

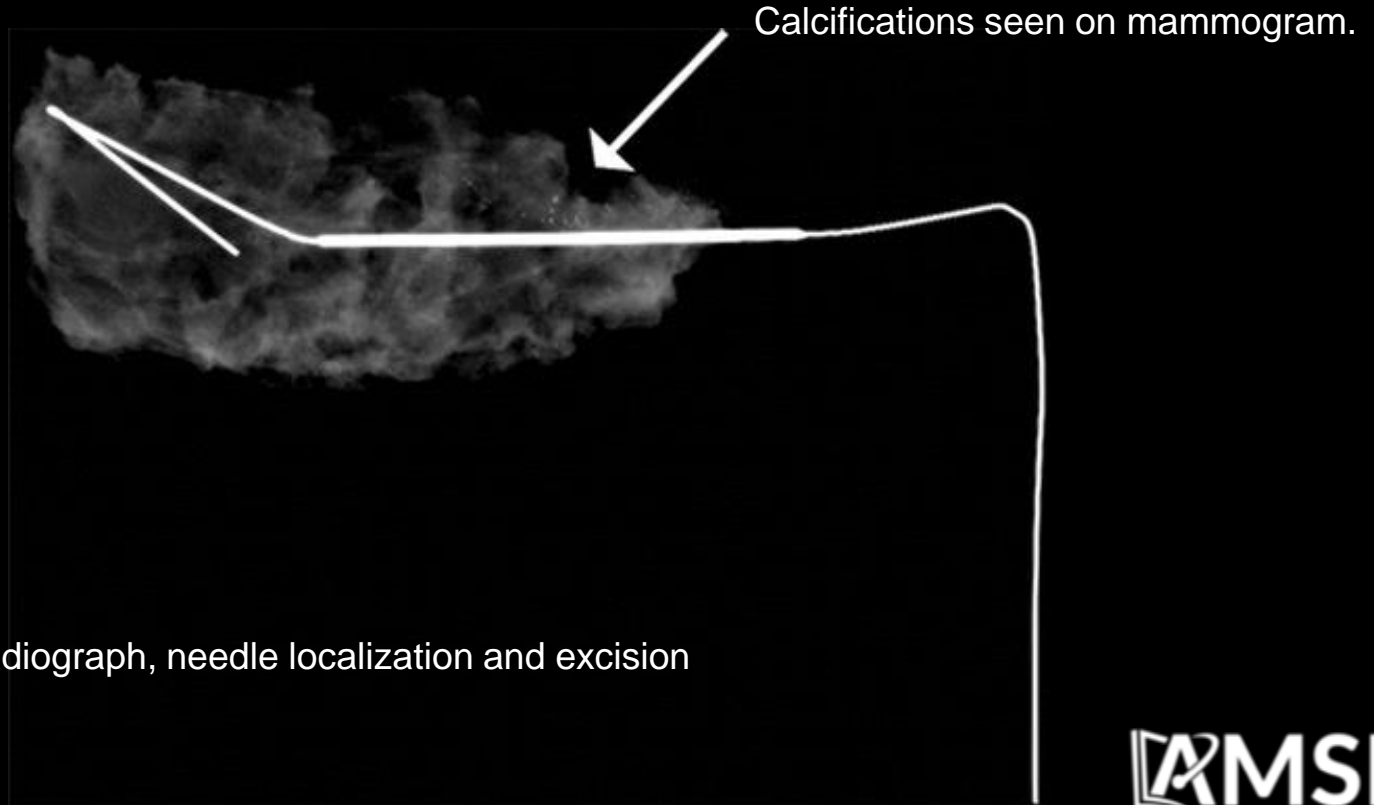
Companion Case Comparison 1

Diagnostic magnification view mammogram

- 60 year old transgender woman
- Benign calcifications (arrow) after silicone injections and gender-affirming hormone therapy
- Segmental, coarse, heterogenous and amorphous
- Retroareolar, in 12 o'clock position

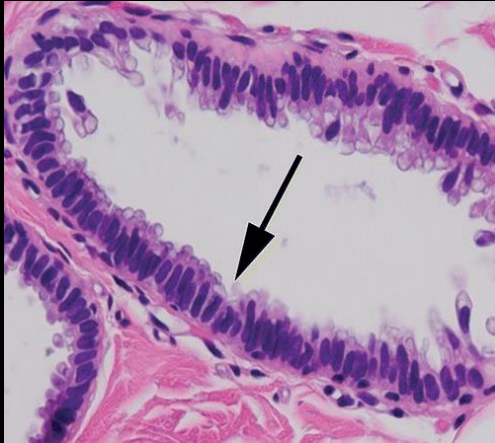


Companion Case Comparison 1



Companion Case Comparison 1

Hematoxylin-eosin stain; original magnification, x20.



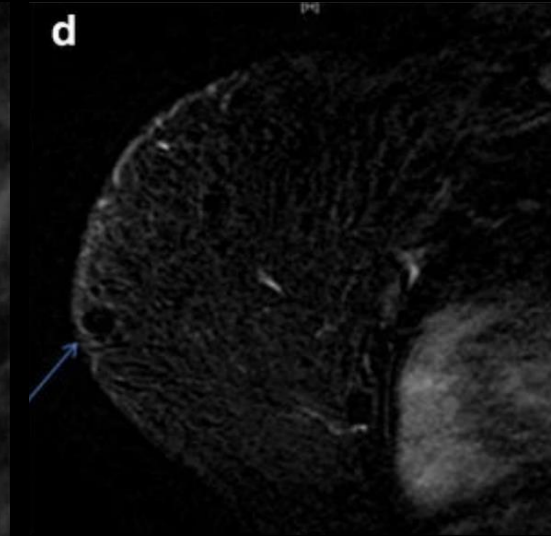
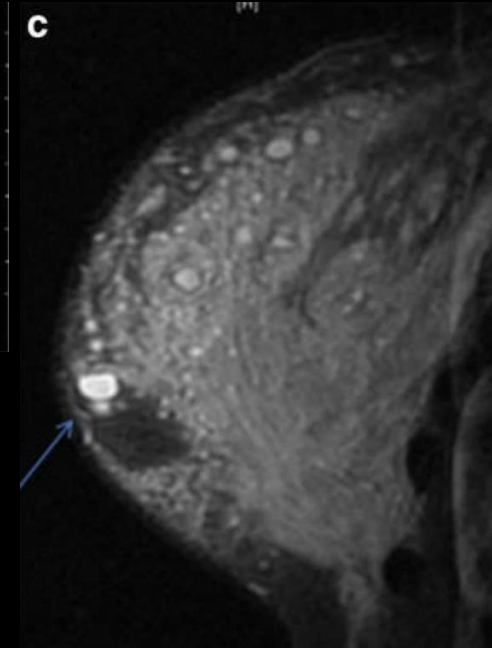
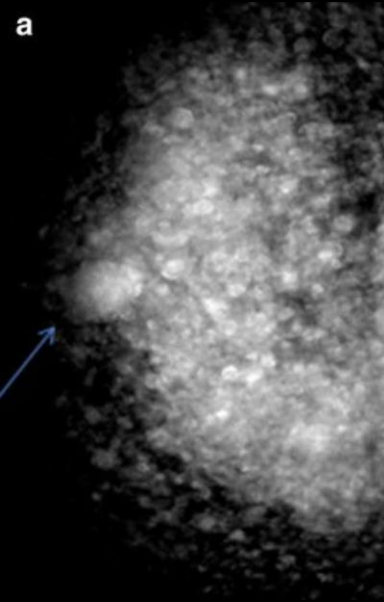
Columnar changes and benign ductules



Benign calcifications

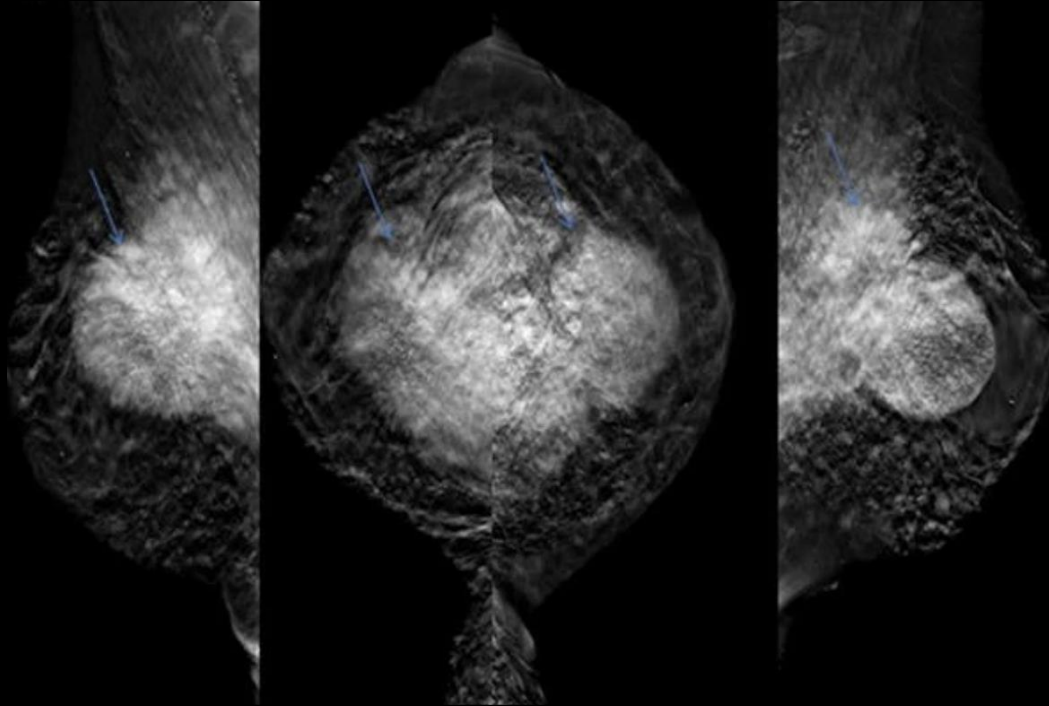
Companion Case Comparison 2

Silicone Granuloma in 60 y/o trans woman with palpable lump (different patient).



Companion Case Comparison 3

Breast tomosynthesis images showing painful masses, inseparable from pectoralis muscles (arrows), caused by silicone injections in a 54 y/o transgender woman, who later underwent nipple-sparing mastectomy.



Discussion

- Approximately 1 in 167 people in the US is transgender
 - 8 to 25 million people worldwide
- Male-to-female gender-affirming hormone therapies
 - Estrogens, progestins, anti-androgens (spironolactone)
 - Exogenous and endogenous estrogens are implicated in breast cancer pathogenesis in cisgender women:
 - Direct stimulation of neoplastic breast tissue proliferation
 - Genotoxic metabolites
- Breast development in transgender women undergoing hormone therapy
 - Muted version of Tanner development stages; Stage V is rarely reached.
 - Breast tissue in transgender women varies but is more similar to that of cisgender women than to gynecomastia, in both radiologic appearance and physiologic function
 - Some hypothesize that breast tissue remains immature in these patients and may therefore be more susceptible to adverse effects of radiation exposure. More research is needed.

Discussion

- Breast cancer in transgender women
 - Population-level evidence is lacking; more research is needed to develop a risk score calculator
 - Breast cancer in transgender women is less prevalent than in cisgender women
 - Case studies exist and are used to guide clinical decision making
- Considerations for screening (joint decision-making)
 - Surgical history and hormone therapy
 - Family history
 - BMI
 - Augmentation by free particle injections (silicone, mineral oil, petroleum jelly)
 - Precursor to breast implants
 - previously offered by health professionals; sometimes done at home by patients themselves
 - Illegal in the US since 1990s; can cause granulomas and painful masses
- Recommendations for *diagnostic* exams in transgender women are the same as those for cisgender women.

References

- Brown, A.L. Delivering better care to transgender patients in breast imaging. Member Newsletter. 2016; Society of Breast Imaging: <https://www.sbi-online.org/Portals/0/SBI%2016-03%20SBI%202016%20Issue%201%20DigiNews%20Final.pdf>. Accessed July 22, 2020.
- Deutsch MB, Radix A, Wesp L. Breast Cancer Screening, Management, and a Review of Case Study Literature in Transgender Populations. Seminars in reproductive medicine. <https://www.ncbi.nlm.nih.gov/pubmed/29073682>. Published September 2017. Accessed July 22, 2020.
- Parikh U, Mausner E, Chhor CM, Gao Y, Karrington I, Heller SL. Breast Imaging in Transgender Patients: What the Radiologist Should Know. RadioGraphics. 2020;40(1):13-27. doi:10.1148/rg.2020190044
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