Postsurgical Breast

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Jennifer Choi, Lucy Chow, Bill Zhou, and Bo Li

J. Choi (✉)
Department of Radiology, LAC+USC (GH), Los Angeles, CA, USA

L. Chow · B. Zhou · B. Li
Department of Radiology, David Geffen School of Medicine at UCLA, Los Angeles, CA, USA

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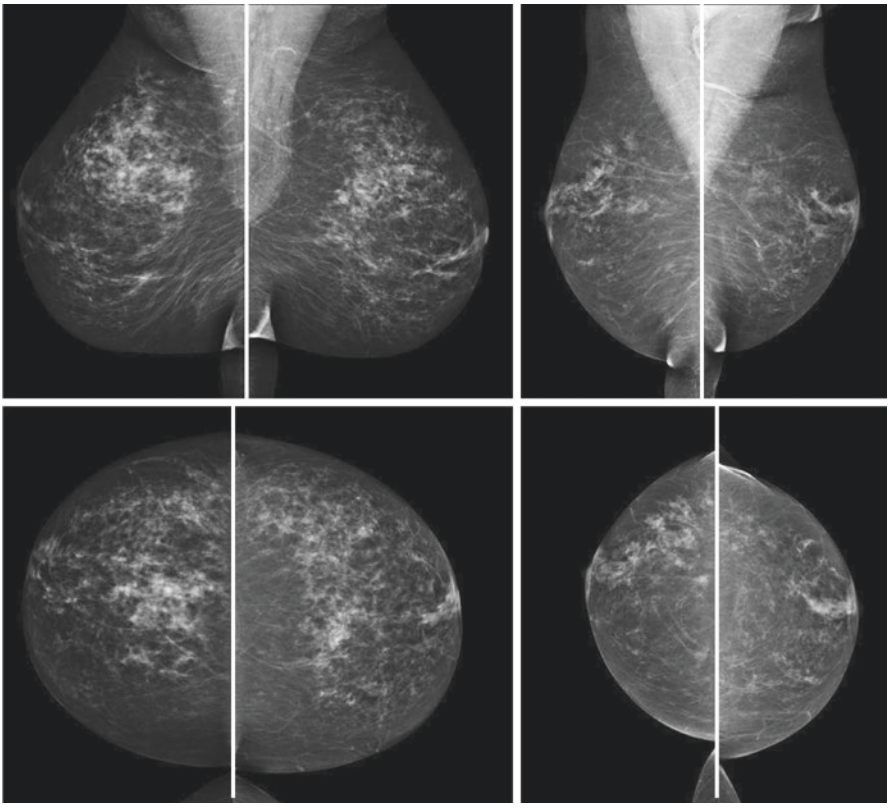
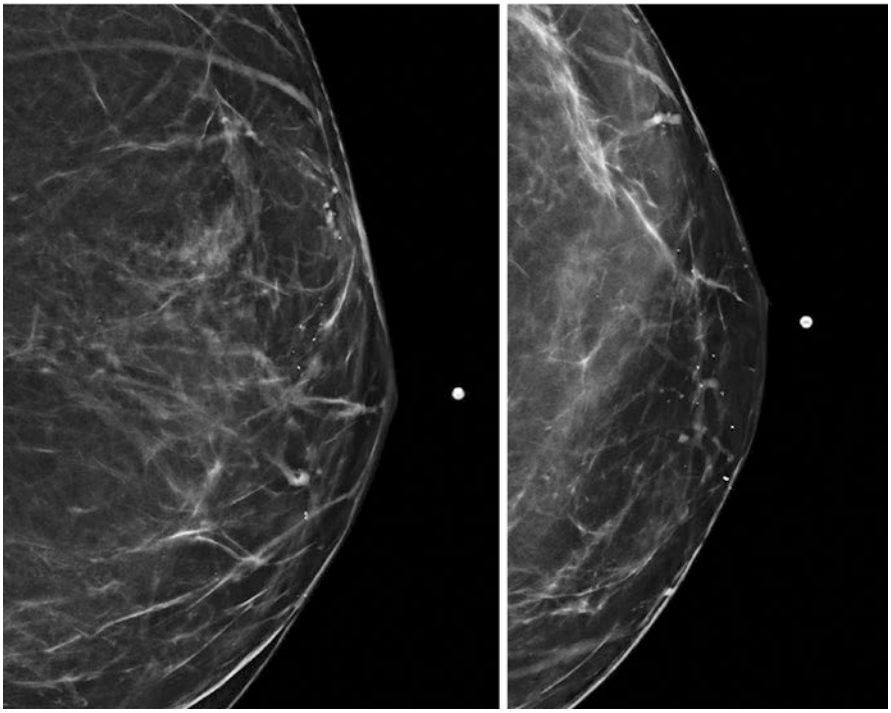
1. A 47-year-old woman presents for her annual screening mammogram. What is the most likely clinical history to explain the interval changes seen on the current screening mammogram?



Screening mammogram from 1 year | Current screening mammogram

(a) Weight loss.
(b) Discontinued use of hormone replacement therapy.
(c) Shrinking breast due to invasive lobular carcinoma.
(d) Reduction mammoplasty.

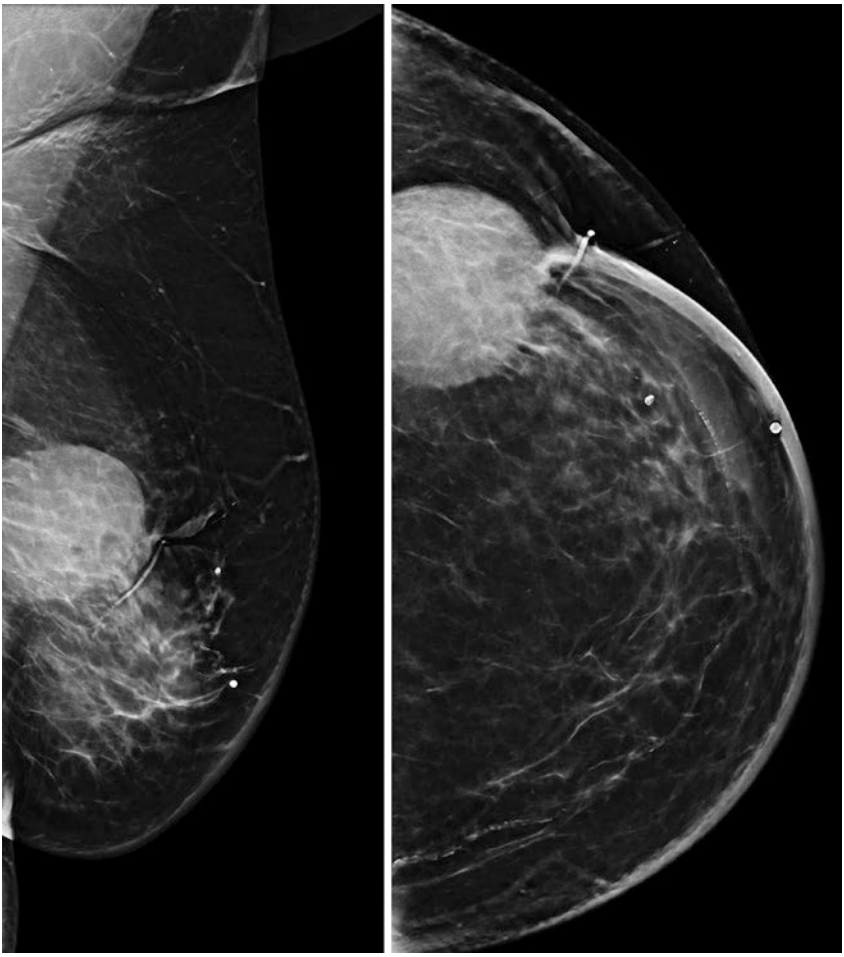
2a. What type of calcifications are seen on this mammogram?



(a) Secretory.
(b) Dystrophic.
(c) Dermal.
(d) Vascular.
(e) Milk of calcium.

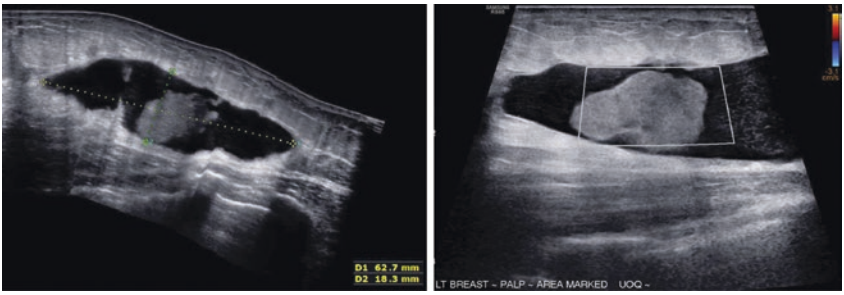
2b. What is the appropriate BI-RADS category assessment for the mammogram? Patient reports history of breast reduction.
(a) BI-RADS Category 0: Incomplete—Need additional imaging evaluation.
(b) BI-RADS Category 2: Benign.
(c) BI-RADS Category 3: Probably Benign.
(d) BI-RADS Category 4: Suspicious.

3a. A 65-year-old woman with history of left lumpectomy followed by radiation therapy 7 months ago for a small invasive ductal carcinoma presents for her first mammogram following treatment. She has a palpable lump in the area of her lumpectomy scar. A radiopaque BB marker has been placed in the area of lump. What is the most appropriate next step?



(a) Biopsy.
(b) Ultrasound.
(c) Return to annual screening mammogram.
(d) Short-term follow-up.

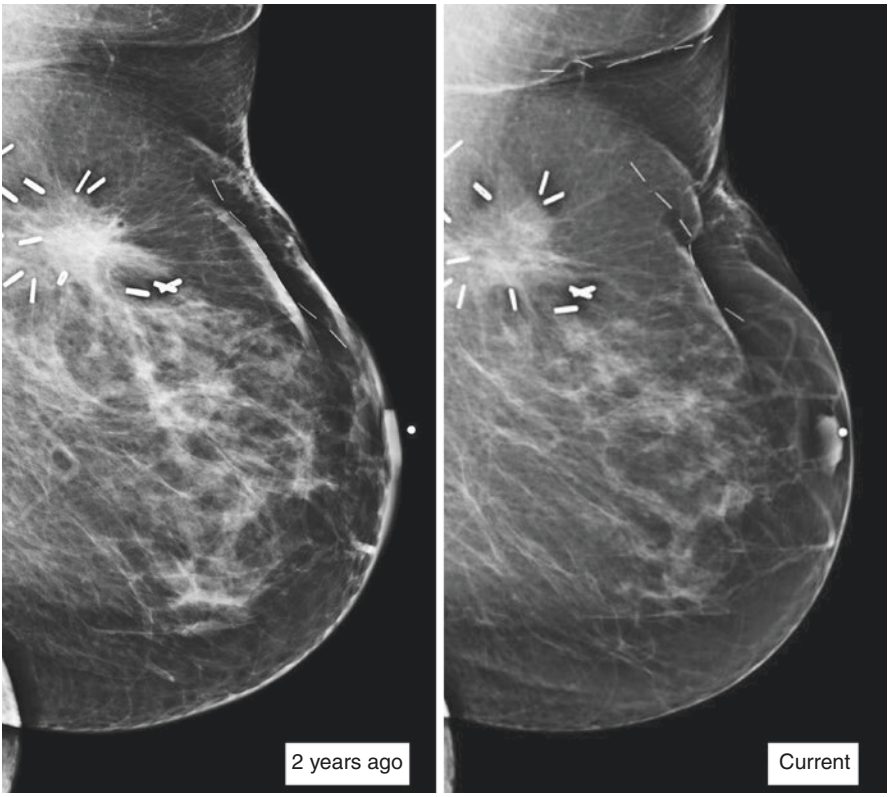
3b. What is the most likely etiology for the palpable finding seen on mammogram and ultrasound in the setting of negative surgical margins and compliance with treatment?



(a) Seroma.
(b) Abscess.
(c) Metachronous cancer.
(d) Recurrence.

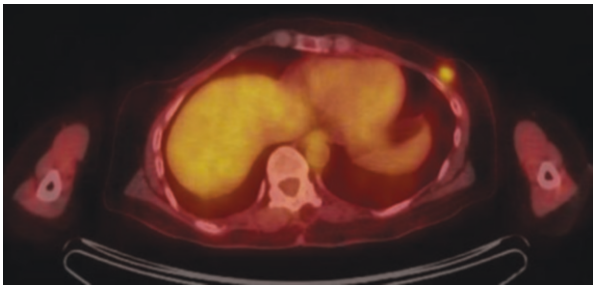
4. What are the expected signal and enhancing characteristics of a seroma on a breast MRI?
(a) T1 hypointense, STIR hyperintense, smooth, thin rim enhancement.
(b) T1 hyperintense, STIR hyperintense, smooth, thin rim enhancement.
(c) T1 hypointense, STIR hypointense, smooth, thin rim enhancement.
(d) T1 hyperintense, STIR hypointense, smooth, thin rim enhancement.

5. A 58-year-old woman who had breast conservation therapy for left breast cancer presents for a routine annual mammogram. The left MLO views from current exam and an exam from 2 years ago are shown. What is the appropriate BI-RADS category assessment for the current mammogram exam?



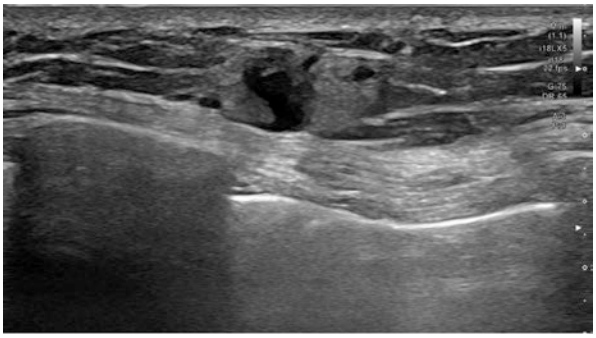
(a) BI-RADS Category 6: Known biopsy-proven malignancy.
(b) BI-RADS Category 2: Benign.
(c) BI-RADS Category 3: Probably benign.
(d) BI-RADS Category 4: Suspicious.

6a. A PET/CT of a 49-year-old woman with history of bilateral mastectomies for left breast cancer is shown. What is the most appropriate next step?



(a) Biopsy.
(b) Ultrasound.
(c) Mammogram.
(d) Surgical excision.
(e) Breast MRI.

6b. The patient subsequently had a targeted left breast ultrasound. What is the most appropriate BI-RADS category assessment for the ultrasound finding?



(a) BI-RADS Category 2: Benign.
(b) BI-RADS Category 3: Probably benign.
(c) BI-RADS Category 6: Known biopsy-proven malignancy.
(d) BI-RADS Category 4: Suspicious.

7. What is the best description of a modified radical mastectomy?
   (a) Modified radical mastectomy removes breast tissue, skin envelope, nipple areolar complex.
   (b) Modified radical mastectomy removes breast tissue, skin envelope, level I-II axillary lymph nodes.
   (c) Modified radical mastectomy removes breast tissue, skin envelope, nipple areolar complex, level I-II axillary lymph nodes.
   (d) Modified radical mastectomy removes breast tissue, skin envelope, nipple areolar complex, pectoralis muscles.

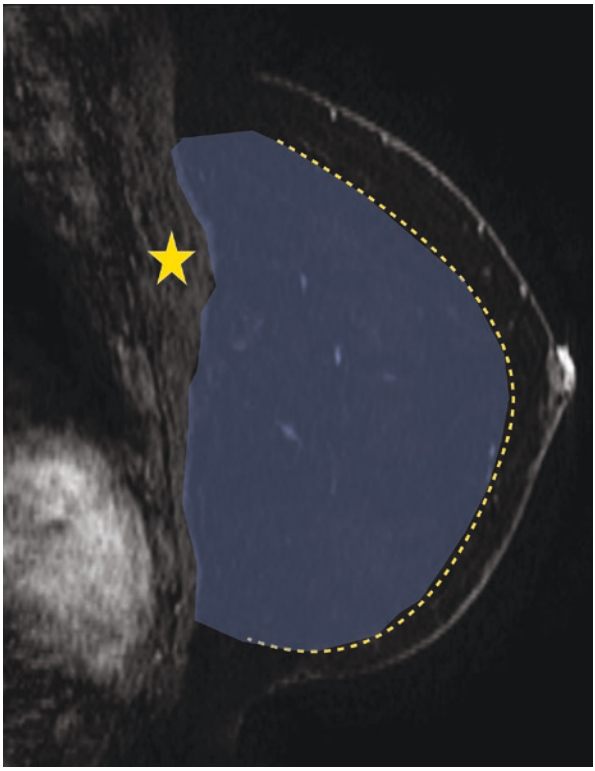
8. What components are surgically removed in a nipple-sparing mastectomy (also known as a total-skin-sparing mastectomy or subcutaneous mastectomy)?
   i. Skin envelope.
   ii. Nipple areolar complex.
   iii. Breast tissue.
   iv. Axillary lymph nodes.
   v. Pectoralis muscles.

   (a) iii.
   (b) ii, iii.
   (c) i, ii, iii.
   (d) i, ii, iii, v.
   (e) ii, iii, iv.

9. What is the most likely explanation for the appearance of this woman's mammogram?

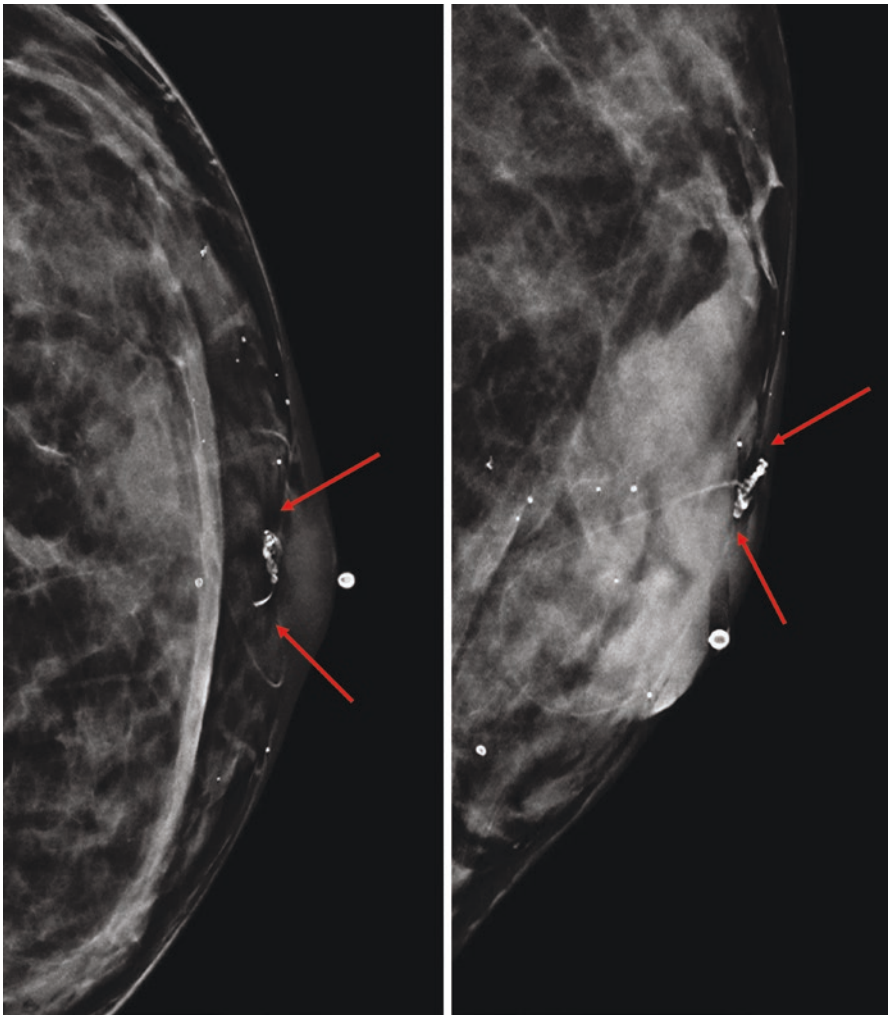
(a) Poland syndrome.
(b) Left mastectomy and autologous reconstruction.
(c) Mastectomy.
(d) Asymmetric breast tissue composition.

10. A sagittal contrast enhanced fat-suppressed T1-weighted MR subtraction image of a 43-year-old woman with history of bilateral skin-sparing mastectomies with TRAM flap reconstruction for left breast cancer is shown. Where is the most likely location of a possible recurrence of her breast cancer?



(a) Chest wall—Star.
(b) TRAM flap—Blue area.
(c) Contact zone—Dashed line.

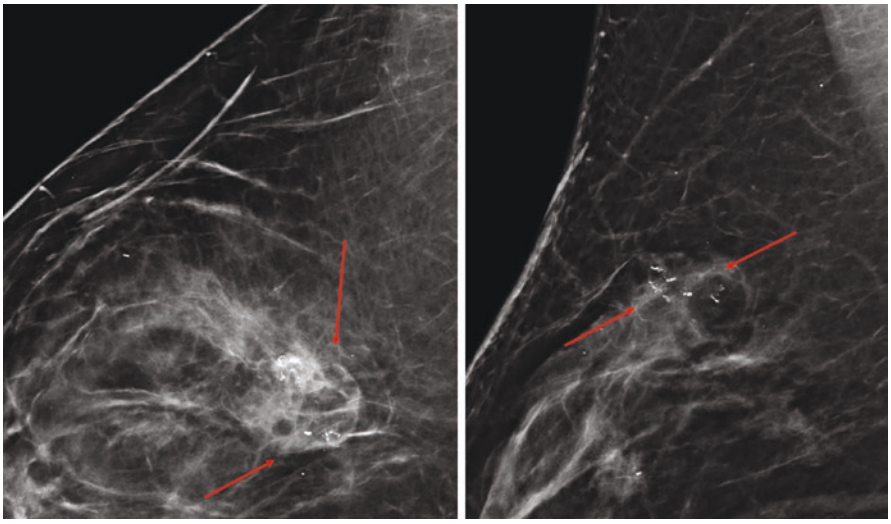
11a. What is the best description for the calcifications located between the arrows on this patient's mamm©ogram?



(a) Fine pleomorphic.
(b) Fine linear branching.
(c) Vascular.
(d) Suture.

11b. What is the most appropriate next step?
(a) Recall from screening mammogram.
(b) Annual screening mammogram.
(c) Biopsy.
(d) Six-month follow-up.

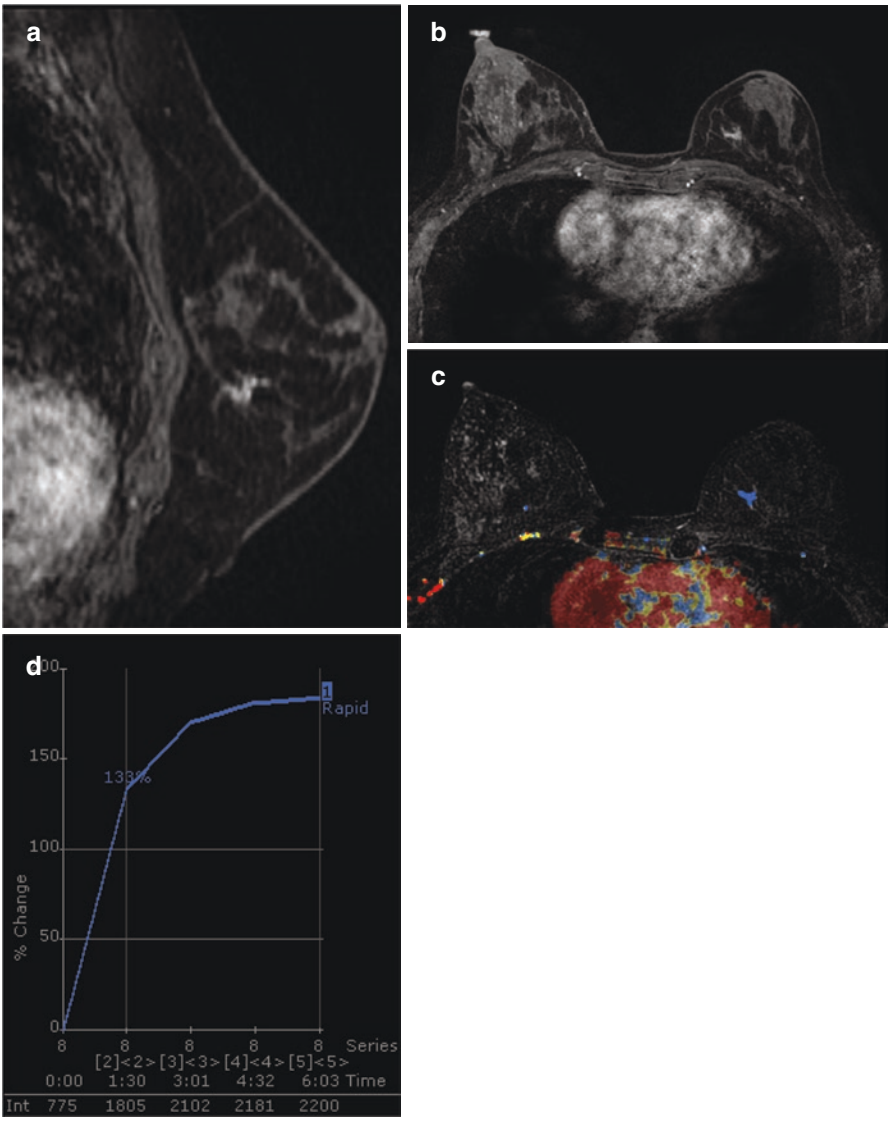
12a. A 52-year-old woman with history of right excisional biopsy for atypical ductal hyperplasia presents for routine screening mammogram. Final surgical pathology on excision showed atypical ductal hyperplasia, no evidence of carcinoma. The excisional biopsy occurred a few years ago. What is the most likely etiology of the finding indicated by the arrows?



(a) Hamartoma.
(b) Lipoma.
(c) Fat necrosis.
(d) Seroma.
(e) DCIS.

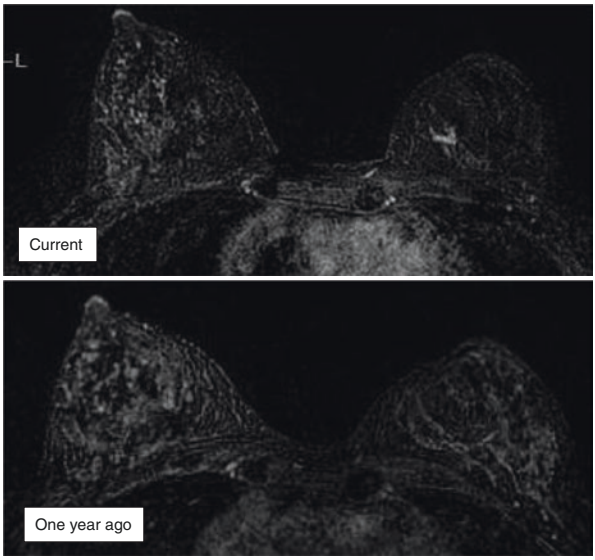
12b. If the same patient presented with a palpable lump at the area indicated by the arrows, what would be the most appropriate next step?
(a) Ultrasound.
(b) Biopsy.
(c) Six-month follow-up.
(d) Reassurance and return to screening mammogram.

13a. A 44-year-old woman with history of breast conservation therapy for a medial left breast cancer 3 years ago presents for annual high risk screening MRI. Axial (B) and sagittal (A) T1-weighted postcontrast images with (C) subtraction are shown. Kinetic enhancement curve (D) is also shown. What is the most appropriate description of the pertinent finding?



(a) Enhancing focus with persistent kinetics.
(b) Focal non-mass enhancement with washout kinetics.
(c) Enhancing focus with plateau kinetics.
(d) Focal non-mass enhancement with persistent kinetics.

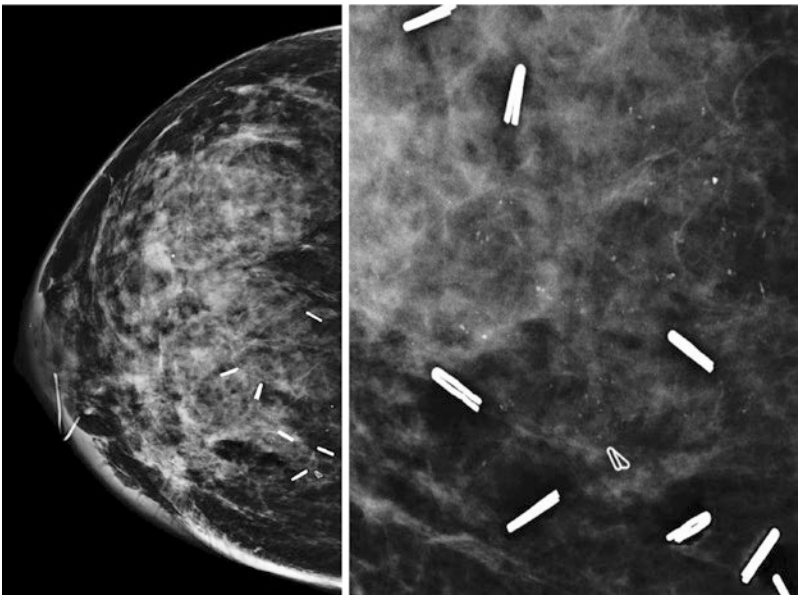
13b. Prior images have been retrieved for this patient. Axial T1-weighted fat-suppressed subtraction images from this year's MRI are shown along with her MRI from last year. What is the most concerning feature of the pertinent finding?



(a) Kinetics.
(b) Size.
(c) Location at the lumpectomy site.
(d) New/increasing enhancement.

14. A 50-year-old female status post right sided mastectomy without reconstruction presents with a palpable lump. What is the best initial imaging exam?
(a) Ultrasound.
(b) Mammogram.
(c) MRI.
(d) Defer to surgical consultation.

15a. 43-year-old female with history of biopsy-proven right breast cancer status post recent lumpectomy. Recent surgery reported positive margins and surgical specimen did not show the biopsy microclip. What is the best descriptor for the microcalcifications seen in the right inner breast?



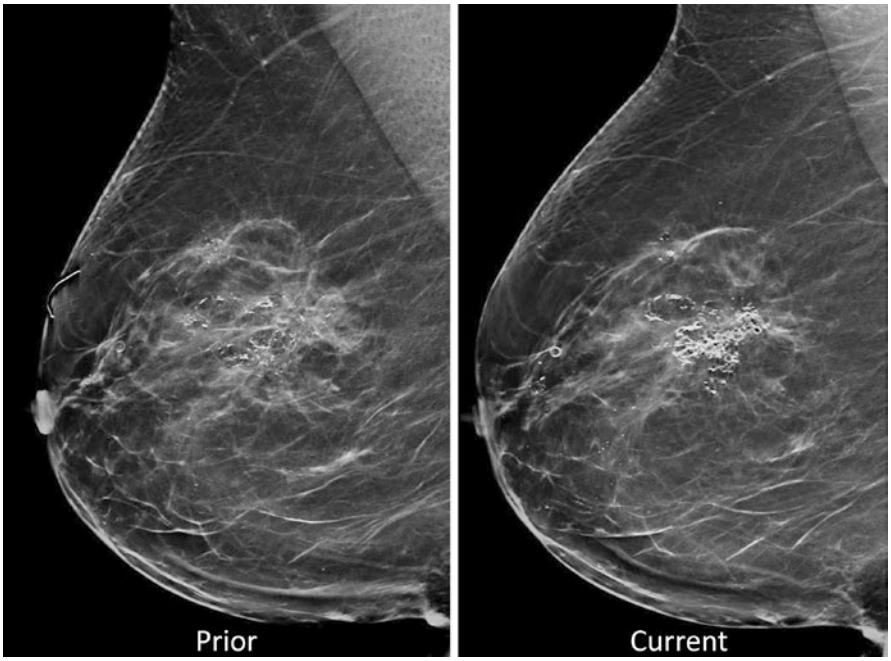
(a) Round.
(b) Coarse heterogenous.
(c) Fine pleomorphic.
(d) Layering.

15b. What is the appropriate next step for the patient?
(a) Ultrasound.
(b) Close surveillance.
(c) Surgical excision.
(d) Radiation therapy.

16. Which of the following statement about microcalcifications following breast-conserving therapy with radiation therapy is FALSE?
(a) Majority of recurrent tumors appear mammographically similar to primary tumor.
(b) Majority of recurrent tumors recur in the same quadrant as the primary tumor.
(c) Majority of recurrent tumors have similar histopathology as primary tumor.
(d) New calcifications that arise in the lumpectomy bed 6–18 months after therapy are usually malignant.
(e) New microcalcifications that arise in the lumpectomy bed with benign appearing morphology are frequently benign.

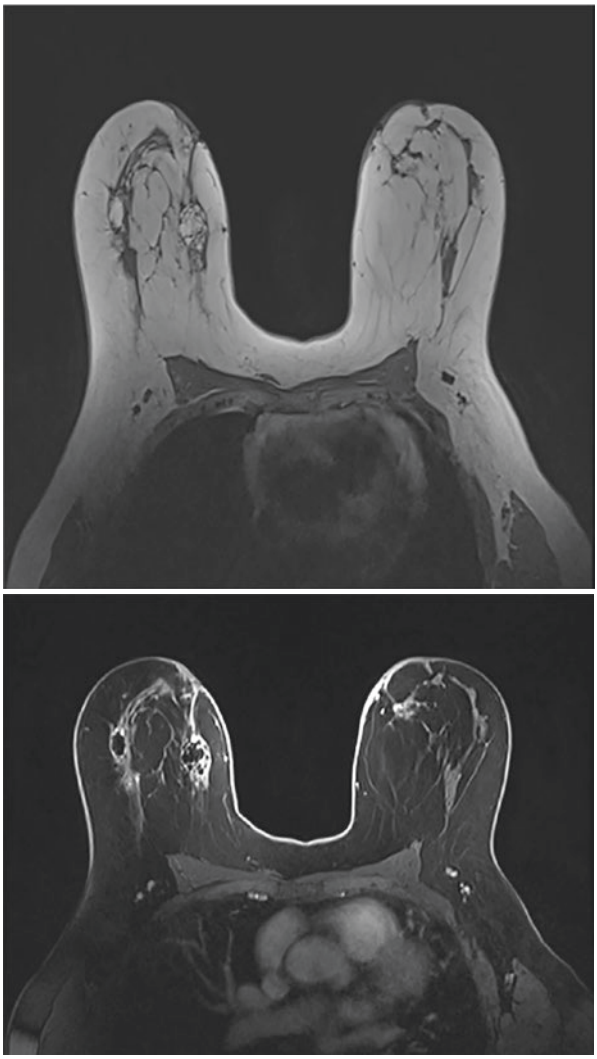
17. Which of the following about dermal calcifications is FALSE?
    (a) They can be artifactual from deodorant.
    (b) Their spatial relationship may change on different projections.
    (c) Tangential views can be obtained to confirm position.
    (d) They have lucent centers.
    (e) They are round or oval.

18a. A 70-year-old female with history of multifocal left breast invasive ductal carcinoma status post lumpectomy presents for screening. What is the appropriate next step for the increasing calcifications in her breast?



    (a) Ultrasound.
    (b) Biopsy.
    (c) Close surveillance.
    (d) Return to screening.

18b. Patient incidentally had a recent MR breast. What is the most appropriate BI-RADS assessment?



(a) BI-RADS Category 1: Negative.
(b) BI-RADS Category 2: Benign.
(c) BI-RADS Category 3: Probably Benign.
(d) BI-RADS Category 4: Suspicious.

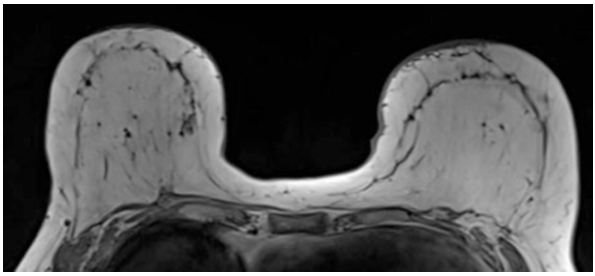
18c. Given the MRI findings, what is the appropriate next step for the right breast?
(a) Second-look ultrasound.
(b) Biopsy.
(c) Follow-up MRI in 6 months.
(d) Return to screening.

19. Which of the following statement about fat necrosis is FALSE?
    (a) Fat necrosis can be differentiated from malignancy with PET-FDG.
    (b) Fat necrosis can have rapid enhancement with washout kinetics.
    (c) Fat necrosis can have internal septations with heterogenous enhancement.
    (d) Fat necrosis is commonly seen in inferior, central breast after reduction mammoplasty.
    (e) Fat necrosis is commonly seen in periphery of flap after breast reconstruction.

20. Which of the following is NOT usually associated with breast fat necrosis?
    (a) Recent breast surgery.
    (b) Trauma.
    (c) Radiation therapy.
    (d) Scleroderma.

21. What is the most common appearance of fat necrosis on mammogram?
    (a) Smooth-bordered lucent mass.
    (b) Pleomorphic calcifications.
    (c) Irregular hyperdense mass.
    (d) Architectural distortion.

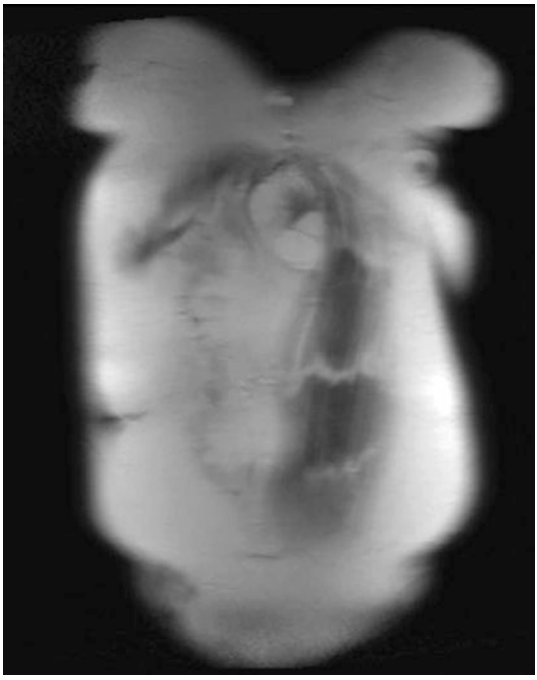
22. 75-year-old female with history of multicentric right breast cancer presenting for imaging. Which of the following complication is most commonly associated with the patient's bilateral surgery?



    (a) Implant rupture.
    (b) Capsular contracture of the implant after radiation therapy.
    (c) Anaplastic large cell lymphoma.
    (d) Fat necrosis.

23. Following mastectomy, post-reconstruction seromas are expected to resolve by what time?
    (a) 2 months.
    (b) 6 months.
    (c) 1 year.
    (d) 3 years.

24. Patient had a left mastectomy and flap reconstruction. A coronal T2 HASTE image was obtained. What type of reconstruction has the patient received?



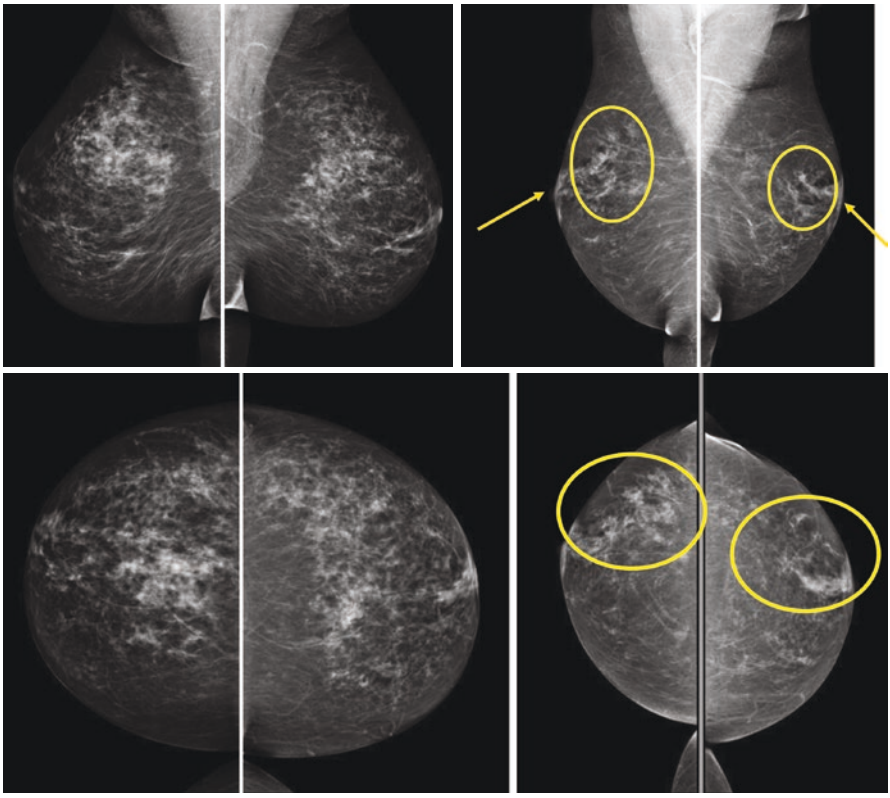
(a) Latissimus dorsi flap.
(b) TRAM (transverse rectus abdominis myocutaneous) flap.
(c) DIEP (deep inferior epigastric perforator) flap.
(d) SIEA (superficial inferior epigastric artery) flap.

Answers

1. d. Reduction Mammoplasty.

   The patient had a reduction mammoplasty since her prior mammogram. Reduction mammoplasty or breast reduction is typically performed for cosmetic reasons or to relieve shoulder/back pain symptoms related to large breast size. With reduction mammoplasty, excess breast tissue and skin are surgically removed and the nipples are surgically relocated superiorly to achieve the patient's desired breast size and appearance. The current screening mammogram demonstrates characteristic mammographic changes that can be seen after a

reduction mammoplasty, most notably the reduction in the size of the breasts, redistribution of the remaining fibroglandular tissue (circles), and elevation of the nipples (arrows). Additional imaging findings which can be seen after reduction mammoplasty include dermal calcifications, postsurgical architectural distortion, islands of fibroglandular tissue, fat necrosis, and skin thickening [1, 2].



Screening mammogram from 1 year ago Current screening mammogram

2a. c. Dermal calcifications.

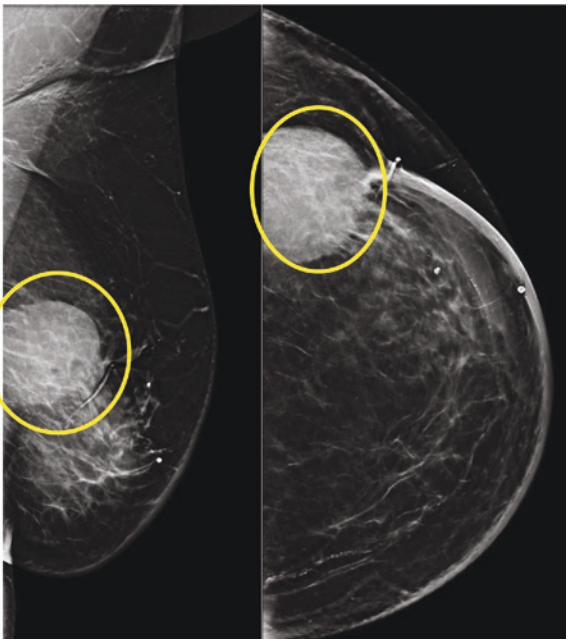
The mammogram demonstrates dermal calcifications along the nipple areolar region in a circumferential pattern. In patients who have undergone reduction mammoplasty or breast augmentation, dermal calcifications are commonly seen along the scars and skin incision sites, typically around the areolas and the inferior breasts [1, 2].

2b. b. BI-RADS Category 2: Benign Findings.

With the appropriate clinical history, characteristic post-reduction mammoplasty changes are benign findings and, in most cases, can be distinguished from screening mammography and do not require additional workup. It is not appropriate to assign BI-RADS 3 and 4 category assessments on screening mammogram.

3a. b. Ultrasound.

Ultrasound is the most appropriate next step in the evaluation of a palpable lump unless a clearly benign etiology is identified on mammogram, such as a lipoma, hamartoma, or calcified involuting fibroadenoma. Mammogram demonstrates a partially obscured, iso- to hyperdense round mass at the lumpectomy site.

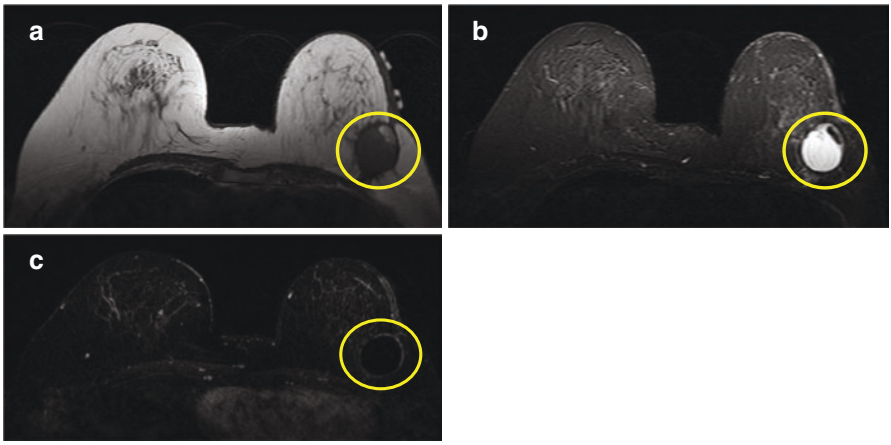


3b. a. Seroma.

Seromas are common postsurgical fluid collections. Seromas typically decrease in size over time and can even resolve (see below example). Mammography findings can show an oval or round, iso- or hyperdense mass with circumscribed or obscured margins [3, 4]. There can be adjacent postsurgical architectural distortion. Ultrasound findings show a fluid collection with varying degrees of complexity due to debris, wall thickening, or septations, which should demonstrate no vascularity on color Doppler interrogation.

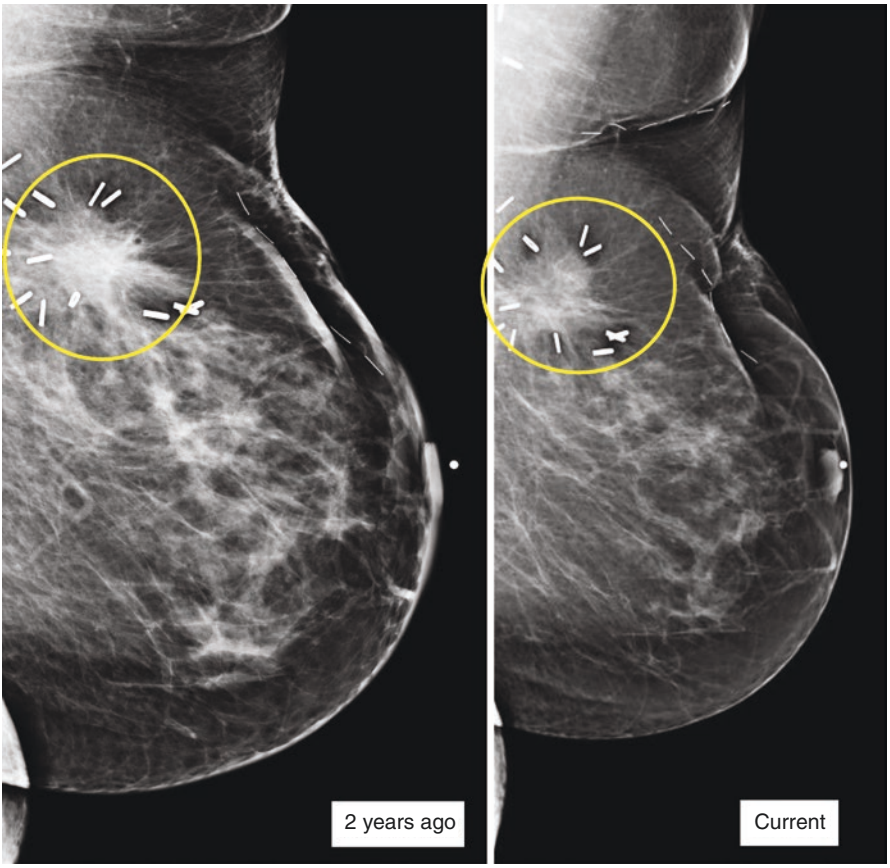
4. a. T1 hypointense, STIR hyperintense, smooth, thin rim enhancement,

Axial T1-weighted (A), STIR (B) and postcontrast subtraction images (C) show a benign T1-hypointense, STIR hyperintense mass within the surgical bed. There is thin peripheral rim enhancement. These findings are consistent with seroma [5, 6].



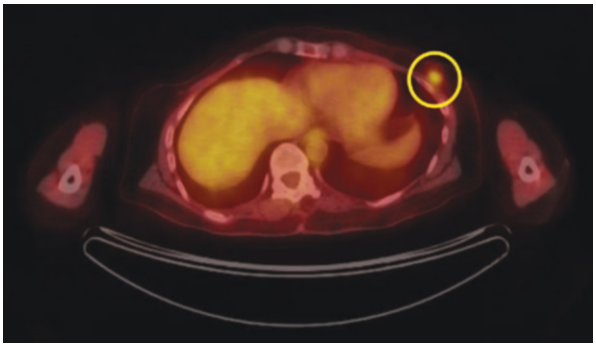
5. b. BI-RADS Category 2—Benign Findings.

   The current MLO view demonstrates the lumpectomy changes in the posterior superior left breast. Compared to the MLO view from 2 years ago, the scar is decreased in density, which is expected for a healing scar. Lumpectomy changes that increase in size and density over time are suspicious and should be further evaluated with ultrasound and biopsied as indicated. If present, postsurgical distortion should also decrease in prominence over time [2].



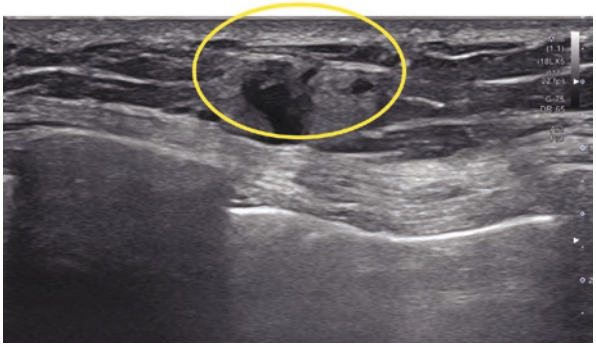
6a. b. Ultrasound.

There is a hypermetabolic mass in the left mastectomy site (circle). Ultrasound is the most appropriate next step in the evaluation of this mass.



6b. d. BI-RADS Category 4: Suspicious.

Ultrasound demonstrates a complex cystic and solid oval mass with indistinct margins that correlates with the hypermetabolic mass seen on the PET/CT. This suspicious mass is worrisome for recurrence given the history of left breast cancer. Biopsy is indicated and BI-RADS 4 is the appropriate assessment. Ultrasound guided core biopsy demonstrated invasive ductal carcinoma.



7. c. Modified radical mastectomy entails the complete removal of the breast parenchymal tissue, skin envelope, nipple areolar complex, and level I and II axillary lymph nodes [1]. The pectoralis muscles are not removed in a modified radical mastectomy. The muscles are removed in a radical mastectomy, which is an older surgical technique that is still sometimes utilized for advanced cases of breast cancer.

8. a. iii—Breast tissue.

   The nipple-sparing mastectomy (NSM) preserves both the skin envelope and the nipple areolar complex. NSM is also known as total-skin-sparing mastectomy or subcutaneous mastectomy. NSM technique is most often performed for women undergoing prophylactic mastectomies. A skin-sparing mastectomy (SSM) is a different mastectomy technique that preserves just the skin envelope. It involves the complete removal of the breast parenchymal tissue and the nipple areolar complex. Both NSM and SSM are considered conservative mastectomies and are associated with promising aesthetic outcomes and improved patient satisfaction [1, 7].

9. b. Left mastectomy and autologous reconstruction.

   The patient has had a left mastectomy with autologous TRAM (transverse rectus abdomens myocutaneous) reconstruction. The left mammogram demonstrates fatty tissue from the flap which originated from the abdomen. In some patients, the muscular pedicle can be seen posteriorly on mammogram [8].

10. c. Contact Zone—Dashed Lines.

    The dashed line delineates the junction or contact zone between the native residual subcutaneous fat and the TRAM flap. Most recurrences occur at this contact zone and within the skin envelope, reported to be up to 72% [1, 9, 10]. Recurrences in the chest wall are less common but can occur and tend to have a poorer prognosis [9].

11a. d. Suture.

    Sutural calcifications can have a variable imaging appearance but classically they demonstrate a curvilinear appearance following the shape of a knotted suture. Sutural calcifications can often be seen in patients with history of breast cancer following treatment; however, they can also be seen after benign breast surgery and augmentation [11, 12].

11b. b. Annual screening mammogram.

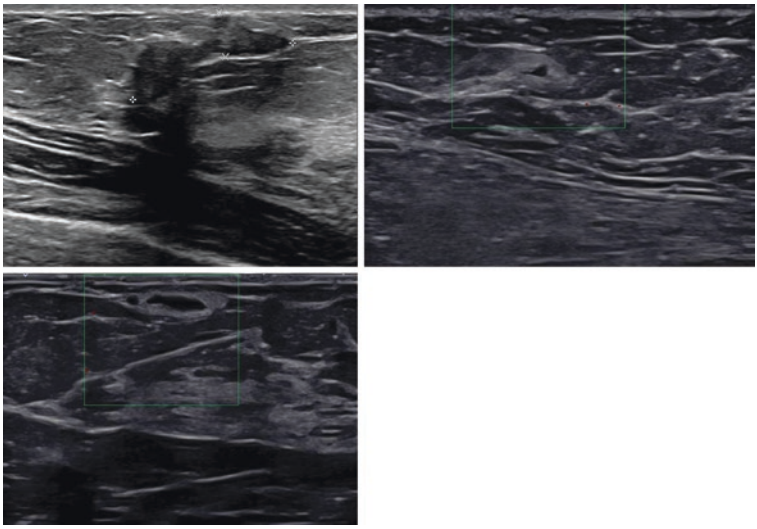
    Sutural calcifications are considered benign and do not warrant further workup.

12a. c. Fat necrosis.

    The mammogram demonstrates coarse and rim calcifications associated with fat-containing masses in the area of postsurgical scar (as denoted by the skin scar marker). This is most consistent with fat necrosis related to the excisional biopsy. Fat necrosis can have a widely variable appearance on mammogram, sometimes manifesting as asymmetries, suspicious calcifications, or spiculated masses [13, 14].

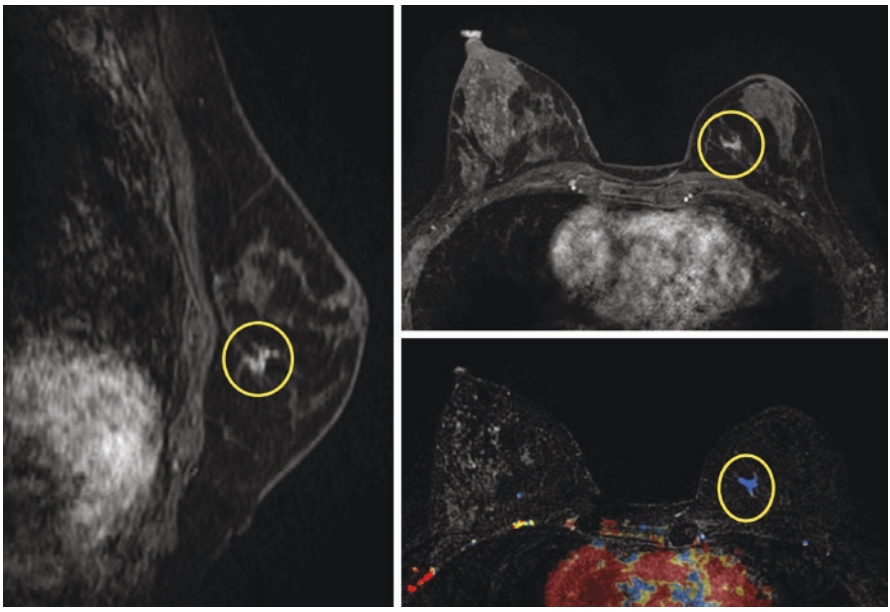
12b. d. Reassurance and return to screening mammogram.

With the typical mammographic appearance for fat necrosis and the absence of suspicious mammographic findings as in this case, the patient can be reassured of the benign etiology of her palpable lump and return to annual screening mammography. Mammogram is more specific than ultrasound when evaluating for fat necrosis. If there are no worrisome features on mammogram, then ultrasound may not be needed to make the diagnosis. For any mammogram where the findings are equivocal or worrisome, ultrasound can be helpful. The ultrasound appearance of fat necrosis varies and depends on the amount of fibrosis. While no vascularity within the sonographic finding does not exclude malignancy entirely, it is a reassuring finding that helps support the diagnosis of fat necrosis [13, 14]. The following three examples show the varying sonographic appearances of biopsy-proven fat necrosis. As shown, fat necrosis can have a cystic or solid appearance on ultrasound.



13a. d. Focal non-mass enhancement with persistent kinetics.

The pertinent finding on the breast MRI is within the medial left breast where there is a focal area of non-mass enhancement demonstrating persistent kinetics, as indicated by the kinetics curve and blue color on the color overlay map.



13b. d. New/increasing enhancement.

The most suspicious feature of the non-mass enhancement seen at the left lumpectomy site on the current breast MRI is that it is new/increasing from the prior exam. It is common to see enhancement at a lumpectomy scar during the immediate post-operative period. Radiation can also cause increased enhancement in the surgical bed, up to 3 months after radiation [15].

Lumpectomy scars can continue to demonstrate enhancement years after treatment but should demonstrate stability or decrease in prominence on subsequent exams. An increase in size or prominence of enhancement should be viewed as suspicious and warrants further evaluation to exclude recurrence. In patients with breast conservation treatment, enhancement may be present in the surgical bed up to 5 years after surgery [16]. Enhancement after 5 years was uncommon [16].

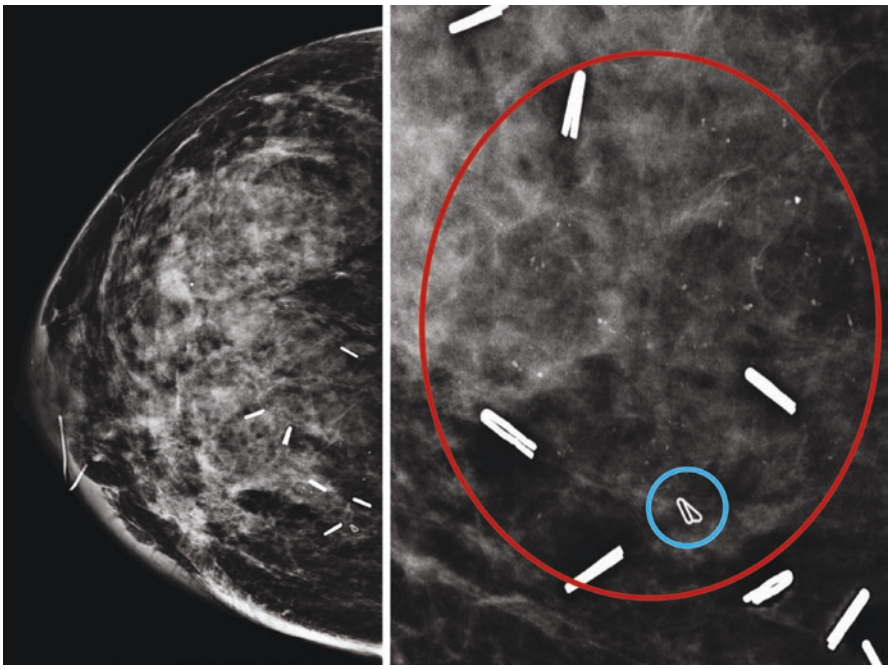
14. a. Ultrasound.

Per ACR Appropriateness criteria [17], ultrasound of the breast is given the appropriateness category of "usually appropriate". Mammogram "may be appropriate", but there is insufficient evidence for use of mammogram as the initial imaging test. Mammograms can also be technically challenging or not possible if very little tissue remains. Dashevsky et al. evaluated 118 palpable cases with a history of mastectomy and demonstrated that targeted ultrasound had a high negative predictive

value of 97% [18]. Of note, mammography did not show any additional cancers but did help to confirm benign findings such as fat necrosis [18].

15a. c. Fine pleomorphic.

CC (left) and magnified (right) views of the right breast demonstrate pleomorphic calcifications (red circle) adjacent to surgical clips. A heart-shaped biopsy microclip is seen (blue circle).



15b. c. Surgical excision.

Breast-conserving therapy includes breast-conserving surgery followed by radiation therapy to eradicate residual microscopic disease. Positive margins are associated with twofold increase of local recurrence. Given the history of positive margins, residual calcifications in the lumpectomy bed are suspicious for residual disease. In this case, patient's mammogram demonstrates fine pleomorphic calcifications within the lumpectomy bed. In addition, the previously placed biopsy microclip was not excised. Patient will need repeat surgical resection of the remaining calcifications prior to receiving radiation therapy to reduce the chance for recurrence. Breast-conserving surgery has a reoperation rate of 21.6% in the United States.

16. d. New calcifications that arise in the lumpectomy bed 6–18 months after therapy are usually malignant.

New microcalcifications that arise in the lumpectomy bed after breast-conserving therapy are common. Though microcalcifications are frequently seen with recurrent tumor (positive predictive value ranging from 33% to 100% in various

studies), most microcalcifications are benign (studies range from 50–91%) [19]. This poses a conundrum for radiologists. Higher suspicion should be given to calcifications with the same appearance and occur in the same quadrant as the primary tumor. Furthermore, microcalcifications that occur early (6–18 months) tend to be benign while those that occur later tend to be malignant (median 52 months) [19]. Nevertheless, morphology and distribution should always be the most important factors in determining the need for biopsy.

17. b. Their spatial relationship may change on different projections.

Dermal calcifications have fixed relationships to each other on different mammographic views in what is known as the tattoo sign.

18a. d. Return to screening.

Serial MLO images of the right breast demonstrate increasing regional rim and dystrophic calcifications, consistent with evolution of fat necrosis. Mammographic appearances of fat necrosis is highly varied with the most common findings being dystrophic or coarse calcifications and radiolucent oil cysts. Other findings include calcifications with indeterminate morphology, ill-defined spiculated mass, asymmetry, and deformity of skin and subcutaneous tissue, emphasizing the difficulty of distinguishing fat necrosis from malignancy.

18b. b. BI-RADS Category 2: Benign.

Axial T1 non-fat-saturation and T1 post-contrast fat saturation images demonstrate multiple oval fat-containing lesions with homogenous thin wall enhancement, consistent with benign fat necrosis. Fat necrosis involves the saponification of fat, calcification, and fibrosis. Fat necrosis is usually an asymptomatic entity but can cause skin thickening, erythema, ecchymosis, and a palpable mass. Fat necrosis has a wide spectrum of findings on MR, and it is dependent on the amount of inflammatory reaction, liquefied fat, and degree of fibrosis. Because of its varied appearance, fat necrosis can be difficult to distinguish from malignancy, especially in the setting of new calcifications in the surgical bed following resection.

18c. d. Return to screening.

Fat necrosis is a benign finding.

19. a. Fat necrosis can be differentiated from malignancy with PET-FDG.

Fat necrosis can exhibit ^{18}F-FDG avidity [20].

20. d. Scleroderma.

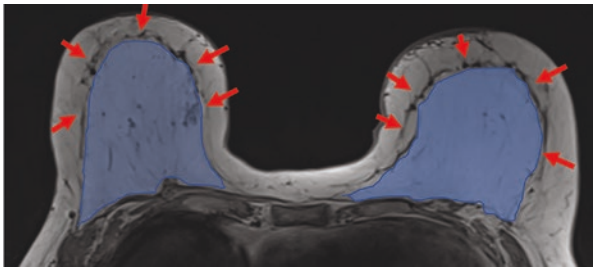
In a patient with recent breast surgery, the recent surgery is the most common etiology of fat necrosis. In patients with no history of recent breast surgery, trauma is more likely the cause of fat necrosis. Patient with flaps are more likely to have fat necrosis when irradiated. Scleroderma is associated with coarse subcutaneous calcifications but is not a cause of fat necrosis.

21. a. Smooth-bordered radiolucent mass.

Fat necrosis is a benign inflammatory entity of adipose tissue, usually secondary to trauma, surgical intervention, or radiation therapy. Appearance of fat necrosis can be highly variable. On mammography, fat necrosis typically appears as a smooth-bordered lucent mass, oil cyst, or coarse calcifications. On ultrasound, the most specific sign on ultrasound is a hyperechoic oval lesion with a mobile fluid-fluid level. On MR, fat necrosis typically demonstrates a round or oval mass with hypointense T1 signal on fat-saturated images and an enhancing rim, which represents inflammatory changes. Calcifications may present as signal voids. Enhancement kinetics is variable and not specific. Fat necrosis may also present non-classically with internal septations, thick and irregular rim, associated spiculations and architectural distortion, or irregular masses [20]. Lesions with indeterminate imaging characteristics can be indistinguishable from malignancy and may require tissue diagnosis to confirm benignity.

22. d. Fat necrosis.

    Axial T1-weighted nonfat saturated images demonstrate bilateral mastectomies with autologous tissue flap reconstruction. On MR, mastectomy with reconstruction is evidenced by linear T1 hypointensities running parallel to the skin (red arrow) which represent acellular dermal matrix of the allograft as well as replacement of normal fibroglandular tissue with fat (shaded area) and possible muscle. This surgery has a 5–35% incidence of fat necrosis due to inadequate bloody supply to the flap [8]. The other complications are associated with reconstruction with capsule implant.



23. c. 1 year.

    Post-reconstruction seromas are typically replaced by scarring and fibrosis within 1 to 1 ½ years after surgery [8].

24. b. TRAM (transverse rectus abdominis myocutaneous) flap. The image demonstrates absent right abdominus rectus muscles (arrow), which have been surgically moved to create a flap following left mastectomy. TRAM flaps may be pedicled, free, or free muscle-sparing. Latissimus dorsi flaps do not use the rectus muscles and are easier to create though less pleasing aesthetically. DIEP and SIEA flaps use only the skin and fat from the anterior abdominal wall and not the underlying muscle; they pose higher risk of ischemic complications compared to myocutaneous flaps.

    Autologous tissue flaps, along with prosthetic implants and more recently autologous fat grafting, are commonly employed for breast reconstruction following mastectomies. Tissue flap techniques are varied but most commonly utilize the muscle and fat from the anterior abdominal wall. Postsurgical imaging demonstrates predominantly fatty breasts devoid of normal fibroglandular

tissue. Breast cancer recurrence may occur following reconstruction since breast tissue in the chest wall and axilla are not completely surgically removed. Most recurrences present in subcutaneous tissue of the flap, superficial to the muscular component.

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