International Journal of Radiology Research
www.radiologyjournal.in
E-ISSN: 2663-4562
Received: 23-08-2026, Accepted: 24-09-2026, Published: 09-10-2026
Volume 8, Issue 4, 2026, Page No. 4-7

Radiological evaluation of the post operative breast at King Hussein Medical Center

Rawan Nahed Al Hiyari[1*], Ala Abdel Kareem Ahmad Al Durgham[2], Renad Abdelkarim Ahmad Al Durgham[1], Hebah Ahmad Al Omoush[1], Maies Nayel Mohammad Al Jbour[1]
[1] Department of Radiology, Royal Medical Services, Amman, Jordan
[2] Department of Surgical, Royal Medical Services, Amman, Jordan
Corresponding Author: Rawan Nahed Al Hiyari
DOI: https://doi.org/10.66856/ijrr.2026.8.3.8040

Abstract
Background: The number of the breast surgical operations were increased in the last two decades, Breast conservation surgery is commonly used for treatment of breast cancer, it can be segmental mastectomy or localized lumpectomy.
The radiological features of the normal breast showed changes in the post-surgical status.
Aim: To evaluate the normal radiological changes of the post-operative breast and to differentiate it from tumor recurrence.

Keywords: Breast cancer, breast conservation surgery, segmental mastectomy, lumpectomy, post-operative breast, radiological changes, tumor recurrence

Introduction
The breast conservation surgery is considered the most common operation used for treatment of breast cancer, it is also known as Lumpectomy, in some cases the surgery could be partial mastectomy or even wide local excision. During the operation the tumor is surgically removed in addition to rim of the surrounding breast healthy tissue to make a safety margin while conserving the patient's breast form and appearance.

Methods
This retrospective study included the mammography images, ultrasound images and MRI images of 87 female patients, aged between 24 to 79 years, with history of breast operation at King Hussein Medical Center of the Royal Medical Services from the period of July 2025 to July 2026.

The inclusion criteria are
1. History of breast operation either unilateral or bilateral.
2. Hisotry of confirmed breast cancer.
3. Presence of pre-operative images.

Exclusion criteria includes
1. Absent history of breast cancer.
2. Non-availability of pre-operative images.
3. Patients with age less than 24 years.

Results
All of the 87 female patients showed post operative breast changes. The mammography post operative findings include breast skin thickening, fluid collection also known as Seromas, parenchymal edema, surgical site architectural distortion at site of the operation, surgical scar, fat necrosis and dystrophic calcification (benign). The ultrasound posts operative findings include fluid collection, post-surgical scar and fat necrosis. The Magnetic Resonance Imaging (MRI) showed surgical site enhancement which showed regression in the follow up images.

Only 10 (11%) female patients develop recurrence of the tumor in their imaging modalities, the mammography findings include new enlarging mass lesion, increase in the breast density with increase in the architectural distortion, new pleomorphic microcalcification. The ultrasound showed irregular hypoechoic mass lesion which is taller than wider in addition to angular margins. The MRI showed rapid enhancement with early post contrast washout.

Discussion
Patients underwent breast conserving surgery will be combined with radiation therapy, this will lead to change in the radiological appearance of the breast specially in the mammogram studies. Some of the post operation benign findings can simulate radiological findings in tumor recurrence. Both entities can be differentiated by serial studies and comparing the interval changes.
Nowadays there is no international guidelines for the postsurgical mammogram surveillance, at our radiology department, mammograms are routinely obtained before the start of the radiation therapy, another mammogram of both breasts obtained 6 months after completion of the radiation therapy, at that time standard mediolateral oblique and craniocaudal views are taken in addition to magnification view at the site of lumpectomy bed. After that annual mammogram is performed.
Expected post operative findings include mass like lesion at the site of lumpectomy representing fluid collection also known as seromas or hematomas, this occurs because breast tissue is surgically removed which allows fluids to fill the empty space. In mammogram it appears as well defined rounded or oval shape mass, the ultrasound of this lesion will show complex cyst with thick wall and septation, these lesions are resorbed gradually and replaced by scarring and fibrosis. If the fluid collection showed increase in size within the serial images this should increase the possibility of tumor recurrence.



Fig 1: Mammogram showed large well-defined oval shape Seroma at the site of previous operation.

Breast skin thickening and edema develop locally at the area of incision, radiation therapy causes damage to the small vessels which leads to diffuse edema within the breast, it also causes skin thickening which can reach 2 cm. The maximum breast edema and skin thickening seen within the first six months of radiation therapy then diminished during 2-3 years. Any increase of the breast edema or skin thickening after stabilization should increase the possibility of recurrence, lymphatic spread of the cancer or obstructed venous drainage.

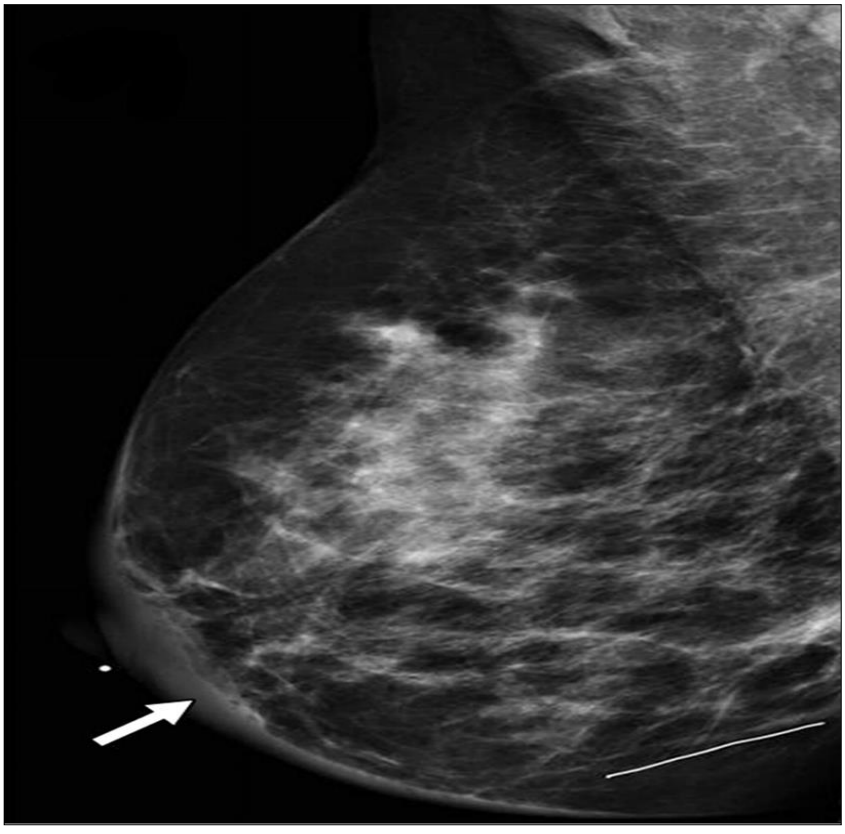


Fig 2: Breast Skin thickening and edema after surgery and radiation therapy.

Architetural distortion occurs due to post surgical scar and fat necosis, in mammogram it appears as central lucencies with changing appearance within different projections with thick and curved spiculations.

After 2 years from surgery architectural distortion usually disappeared. In cases of tumor recurrence, the architectural distortion will show increase in size and density and become more mass like.

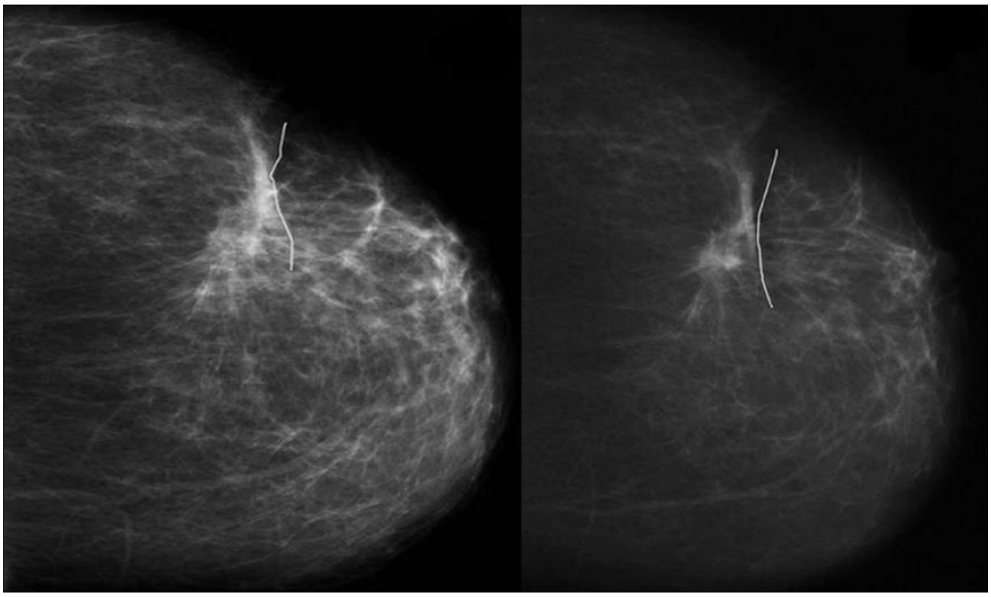


Fig 3: Architectural distortion seen at surgical bed and showed decrease in size and density in the follow up mammogram.

Benign calcifications occur at the postsurgical site due to radiation therapy within the first year. Typical mammogram appearance of benign calcification is large and rounded with lucent center and smooth border. Magnification view is the best view

to recognized benign calcification. The most common type of benign calcification observed in post-surgical breast is called Oil cyst. Features of pleomorphic and or microcalcification are highly suggestive of recurrence.

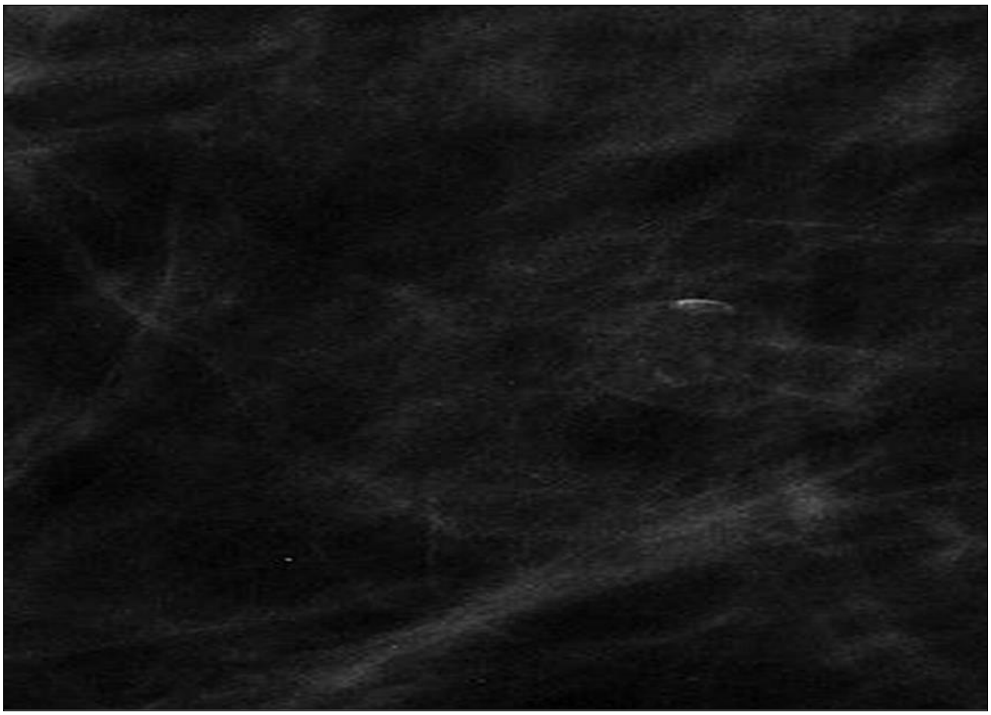


Fig 4: Magnified mammogram view showed lesion with calcified rim and lucent center at the lumpectomy site representing oil benign calcification.

Tumor recurrence rate after breast conservation operation is 3%, recurrence occurs two years after the breast surgery at the site of the original tumor which indicates failure of eradication of the tumor, if recurrence seen after more than ten years of the surgery It will be outside the area of the original tumor and represent new malignancy. The treatment of choice in case of breast tumor recurrence is salvage mastectomy.

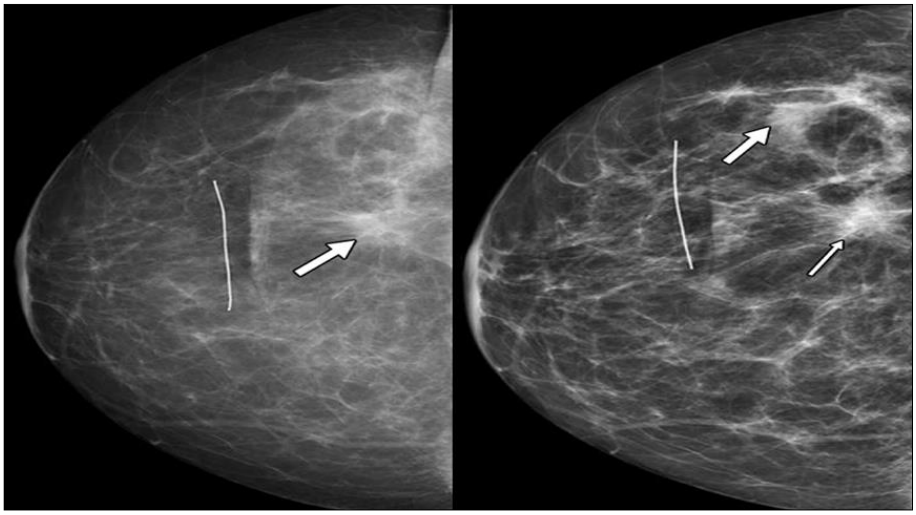


Fig 5: Increase in number, size and density of breast asymmetry within the surgical bed on the follow up mammogram indicating tumor recurrence.

Conclusion

Breast conservation surgery and radiation therapy used to treat breast cancer, both of them changes the normal appearance of the breast mammogram. Post operative findings include benign findings such as fluid collection (seroma) at the surgical bed, breast edema and skin thickening, architectural distortion and benign calcification, these changes tend to diminish within the follow up images. Any increase of these findings after stabilization or development of pleomorphic microcalcification rises the possibility of tumor recurrence.

References

1. Mendelson EB. Evaluation of the postoperative breast. Radiol Clin North Am,1992:30:107-138.
2. Dershaw DD. Breast imaging and the conservative treatment of breast cancer. Radiol Clin North Am,2002:40:501-516.
3. Krishnamurthy R, Whitman GJ, Stelling CB, Kushwaha AC. Mammographic findings after breast conservation therapy. RadioGraphics,1999:19:53-S62.
4. Leung JW, Sickles EA. Developing asymmetry identified on mammography: correlation with imaging outcome and pathologic findings. AJR Am J Roentgenol,2007:188:667–675.
5. Yi A, Kim HH, Shin HJ, Huh MO, Ahn SD, Seo BK. Radiation-induced complications after breast cancer radiation therapy: a pictorial review of multimodality imaging findings. Korean J Radiol,2009:10:496–507.
6. Clemons M, Danson S, Hamilton T, Goss P. Locoregionally recurrent breast cancer: incidence, risk factors and survival. Cancer Treat Rev,2001:27:67–82.
7. Curran J. How effective is mammography in detecting breast cancer recurrence in women after Breast Conservation Therapy (BCT) - A systematic literature review. Radiography,2016:22:252-256.
8. Kurtz JM, Amalric R, Brandone H, *et al*. Local recurrence after breast-conserving surgery and radiotherapy: frequency, time course, and prognosis. Cancer,1989:63:1912-1917.