

# Screening for breast cancer in women with breast augmentation

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## Abstract

Breast cancer represents the most common cancer worldwide, being the second deadliest cancer in women. There is no doubt regarding the importance of breast cancer screening. Mammography represents the primary imaging technique used to detect suspicious lesion for breast cancer. This imagistic method has been found to decrease the mortality related to breast cancer. Mammography may detect evidence of cancer one and a half to four years before cancer becomes clinically obvious. Patients with breast tissue augmentation need a routine screening mammography in order to evaluate the native breast tissue. The indications for breast cancer screening are the same as in women without implants, the only difference being that women with breast implants should be approached differently from a clinical point of view. Standard imaging technique for this type of patients involves four sections in alternative of the usual two sections per breast. In conclusion, women with breast augmentation should not be neglected and should undergo breast cancer screening alongside the targeted population, even though the required technique is more laborious and requires a more experienced eye.

**Keywords:** breast cancer, breast augmentation, screening

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## Screeningul cancerului de sân pentru femeile cu implant mamar

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## Rezumat

Cancerul de sân este cel mai comun tip de cancer din lume, ocupând locul al doilea în topul mortalității în cazul femeilor. Nu există niciun dubiu în ceea ce privește importanța screeningului pentru cancerul mamar. Mamografia reprezintă imagistica de primă intenție utilizată pentru detectarea leziunilor suspecte pentru cancerul mamar. Această metodă imagistică a demonstrat o scădere a mortalității asociate cancerului de sân. Mamografia poate detecta dovezi ale existenței leziunilor canceroase cu un an și jumătate până la patru ani înainte ca leziunile să devină evidente clinic. Pacientele cu implant mamar necesită o mamografie de screening pentru a evalua țesutul mamar nativ. Indicațiile screeningului pentru cancer de sân sunt aceleași ca pentru femeile fără implant mamar, chiar dacă femeile cu implant mamar ar trebui să fie abordate diferit din punct de vedere clinic. Imagistica standard pentru aceste femei include patru secțiuni ca alternativă pentru cele două secțiuni per sân. În concluzie, femeile cu implant mamar nu ar trebui neglijate și ar trebui să efectueze împreună cu populația vizată screening pentru cancerul de sân, chiar dacă tehnica utilizată este mai laborioasă și necesită un ochi mai experimentat.

**Cuvinte-cheie:** cancer de sân, implant mamar, screening

## Introduction

Breast cancer represents the most common cancer worldwide, being the second deadliest cancer in women. About 2.3 million women were diagnosed with breast cancer worldwide in 2020 and there were approximately 685,000 deaths due to breast cancer. There is no doubt about the importance of breast cancer screening. Several modalities of screening for breast cancer in women will be approached in this article.

Breast self-examination – there is no beneficial effect of regular breast self-examination, according to multiple studies, in relation to the rates of breast cancer diagnosis and breast cancer related death. On top of this, breast self-examination is associated with higher rates of breast biopsy for benign lesions<sup>(1)</sup>.

Clinical breast examination – it is difficult to determine the effectiveness of the clinical breast examination, as it is considerably dependent on the clinician skills and has not been standardized. Clinical breast

examination modestly improves the early detection of breast cancer as an adjunct to mammography<sup>(11)</sup>. Several randomized trials that included both mammography and clinical breast examination showed that mammography detected approximately 90% of screen-detected cancers and clinical breast examination detected approximately 50%. The Canadian National Breast Screening Study compared the efficiency of careful clinical breast examination alone with clinical breast examination combined with mammography on breast cancer mortality in women in their 50s<sup>(12,13)</sup>. After 13 and 25 years of follow-up, breast cancer mortality was the same in both groups, even though mammography found more breast cancers<sup>(13,14)</sup>.

As medical science has evolved, breast tissue can be evaluated using imaging methods such as mammography, ultrasonography and magnetic resonance imaging (MRI).

Mammography represents the primary imaging technique used to detect suspicious lesions for breast cancer.

This imaging method has been found to decrease the breast cancer related mortality<sup>(4)</sup>. Mammography may detect evidence of cancer one and a half to four years before cancer becomes clinically obvious<sup>(4)</sup>. The routine evaluation requires two sections: craniocaudal and mediolateral of each breast. The technique for the craniocaudal view consists of lifting and placing the breast on the plate and compressing the breast from above<sup>(5)</sup>. In the mediolateral view, the breast is compressed from the side and the image created is from one side. Breast positioning has an extreme importance, as it can lead to a deficient image of interest area of the breast that causes the omission of the abnormal areas<sup>(5)</sup>.

Tomosynthesis – digital breast tomosynthesis represents an adjustment of digital mammography, using a moving X-ray source and a digital detector that provides 3D images. It has been approved in the United States of America for breast cancer screening<sup>(10)</sup>.

Breast ultrasonography is not recommended as screening for average-risk women. Breast ultrasonography was not proven to be a screening strategy that reduces breast cancer mortality in the average-risk population<sup>(6)</sup>. It can be recommended as an additional imaging investigation to mammography in women with increased breast density. Ultrasonography is frequently used for patients with visible abnormalities detected on a screening mammography to clarify the presence of a potential lesion<sup>(6)</sup>.

Screening magnetic resonance imaging is not recommended for average-risk women, according to supplemental screening MRI guidelines from the American Cancer Society<sup>(7)</sup>. MRI is an important tool when it comes to diagnosis and evaluation of breast cancer<sup>(1)</sup>. It represents an imaging technology that can detect the location and the local chemical conditions of protons. MRI can be used in association with contrast agents that improve the contrast between the normal and the pathological tissue<sup>(2,3)</sup>.

## Effectiveness of imaging for patients with breast augmentation

Complications of reconstructive or esthetic breast surgery are important considerations for women seeking these options. They must follow a proper approach for breast cancer screening and for other complications that can occur regarding the post-augmentation status.

An important concern correlated to implants used for breast augmentation is the possible interference with breast cancer detection, and the potential risk of breast cancer development. Augmented patients are not at a significant risk than the non-augmented patients for breast cancer development. It is possible to early detect occult cancer in breast augmented patients. The recommendations for screening are no different for breast augmented patients, and the importance of screening is incommensurable<sup>(24)</sup>.

Taking into consideration the advice of the European guidelines on breast cancer screening and diagnosis, screening for breast cancer is recommended for women

aged between 45 and 74 years old, after the age limit has been lowered. The use of mammography or tomosynthesis is advised. When required, MRI can be also used<sup>(25)</sup>.

Implant-associated malignancy – there is a possibility of rare implant-associated malignancies such as breast implant-associated anaplastic large cell lymphoma, breast implant-associated squamous cell cancer and other lymphomas, and it needs to be considered when counseling the patients<sup>(16,17)</sup>. The American Society of Plastic Surgeons noted the occurrence of 400 cases of suspected or confirmed cases of squamous cell carcinoma in the United States. FDA issued reports on the association between textured breast implants and a rare cancer, anaplastic large cell lymphoma<sup>(21)</sup>. Squamous cell carcinoma has been reported in the capsule surrounding the breast implant (textured or smooth, saline or silicone)<sup>(17,22,23)</sup>. That is why we need to know which are the proper imaging technologies we can count on, when involving people with breast augmentation in a discussion about breast cancer.

Information about an increased risk of sarcoma or multiple myeloma among breast implant recipients couldn't be provided by any epidemiologic studies. Some epidemiologic studies have confirmed an increased risks of vulvar, cervical and lung cancers among patients with breast implant, but it is more likely that they are related to the lifestyle characteristics, such as cigarette smoking and sexual behavior, than to the effects of the implants. At the moment, there is no convincing evidence that breast implants can increase the risk of these specific non-breast malignancies<sup>(20)</sup>.

Patients with breast tissue augmentation require a routine screening mammography in order to evaluate the native breast tissue; the indications for screening are the same as in women without implants<sup>(8)</sup>. The content of the implant is radiopaque and, as a consequence, it can intricate the visualization of small lesions. Also, the presence of the implant itself makes it challenging to evaluate all parts of the breast<sup>(8)</sup>.

Women with breast implants should be approached differently. Standard imaging technique for this type of patients involves four views in alternative of the usual two views per breast. It is important to position the breast in such a manner to include as much breast tissue as possible by pushing the implant out of view<sup>(15)</sup>. The craniocaudal and mediolateral views of each breast are obtained with the implant included. These views will evaluate the implant and the deep breast tissues adjacent to the implant<sup>(15)</sup>. The two views are repeated after the implant is displaced back against the chest wall a maneuver that allows the breast tissue to be pulled forward<sup>(9)</sup>. Another important detail is the type of implant, as well as its location (prepectoral or retrogladular versus retropectoral or subpectoral). This aspect plays an important role in the ease of imaging; breasts with implants placed behind the pectoralis muscle (retropectoral or subpectoral) are easier to position<sup>(15)</sup>.

Opposite to female patients with native mammary tissue, mammography is not performed as a routine

screening for patients with mastectomy. If there is no native breast tissue left behind, mammography won't provide any substantial supplementary benefit to the clinical examination for the process of detecting cancer recurrence<sup>(18,19)</sup>.

In conclusion, women with breast augmentation should not be neglected and should undergo breast cancer screening alongside the targeted population, even though the required technique is more laborious and requires a more experienced eye. ■

## References

1. Lauterbur PC. Progress in n.m.r. zeugmatography imaging. *Philos Trans R Soc Lond B Biol Sci.* 1980;289(1037):483-7.
2. Damadian R. Field focusing n.m.r. (FONAR) and the formation of chemical images in man. *Philos Trans R Soc Lond B Biol Sci.* 1980;289(1037):489-500.
3. Lai CM, Lauterbur PC. True three-dimensional image reconstruction by nuclear magnetic resonance zeugmatography. *Phys Med Biol.* 1981;26(5):851-6.
4. Gold RH, Bassett LW, Widoff BE. Highlights from the history of mammography. *Radiographics.* 1990;10(6):1111-31.
5. Yaffe MJ. AAPM tutorial. Physics of mammography: image recording process. *Radiographics.* 1990;10(2):341-63.
6. Sprague BL, Stout NK, Schechter C, et al. Benefits, harms, and cost-effectiveness of supplemental ultrasonography screening for women with dense breasts. *Ann Intern Med.* 2015;162(3):157-66.
7. Saslow D, Boetes C, Burke W, et al. American Cancer Society guidelines for breast screening with MRI as an adjunct to mammography. *CA Cancer J Clin.* 2007;57(2):75-89.
8. Fajardo LL, Harvey JA, McAleese KA, et al. Breast cancer diagnosis in women with subglandular silicone gel-filled augmentation implants. *Radiology.* 1995;194(3):859-62.
9. Roxo AC, Nahas FX, Salin R, et al. Volumetric evaluation of the mammary gland and pectoralis major muscle following subglandular and submuscular breast augmentation. *Plast Reconstr Surg.* 2016;137(1):62-9.
10. U.S. Food and Drug Administration approved devices. <http://fda.gov/MedicalDevices/ProductsandMedicalProcedures/DeviceApprovalsandClearance/Recently-ApprovedDevices/ucm246400.htm> (Accessed on March 6, 2014).
11. Kösters JP, Götzsche PC. Regular self-examination or clinical examination for early detection of breast cancer. *Cochrane Database Syst Rev.* 2003;2003(2):CD003373.
12. Miller AB, Baines CJ, To T, Wall C. Canadian National Breast Screening Study: 2. Breast cancer detection and death rates among women aged 50 to 59 years. *CMAJ.* 1992;147(10):1477-88.
13. Miller AB, To T, Baines CJ, Wall C. Canadian National Breast Screening Study-2: 13-year results of a randomized trial in women aged 50-59 years. *J Natl Cancer Inst.* 2000;92(18):1490-9.
14. Miller AB, Wall C, Baines CJ, et al. Twenty five year follow-up for breast cancer incidence and mortality of the Canadian National Breast Screening Study: randomised screening trial. *BMJ.* 2014;348:g366.
15. Eklund GW, Busby RC, Miller SH, Job JS. Improved imaging of the augmented breast. *AJR Am J Roentgenol.* 1988;151(3):469-73.
16. US Food & Drug Administration. FDA takes action to protect patients from risk of certain textured breast implants; requests Allergan voluntarily recall certain breast implants and tissue expanders from market. <https://www.fda.gov/news-events/press-announcements/fda-takes-action-protect-patients-risk-certain-textured-breast-implants-requests-allergan> (Accessed on July 24, 2019).
17. Soni SE, Laun JC, Beard AS, Kuykendall LV. Breast implant capsule-associated squamous cell carcinoma during pregnancy: a mimicker of breast implant-associated anaplastic large-cell lymphoma. *Plast Reconstr Surg.* 2022;150(4):926e-928e.
18. Fajardo LL, Roberts CC, Hunt KR. Mammographic surveillance of breast cancer patients: should the mastectomy site be imaged? *AJR Am J Roentgenol.* 1993;161(5):953-5.
19. Propeck PA, Scanlan KA. Utility of axillary views in postmastectomy patients. *Radiology.* 1993;187(3):769-71.
20. Brinton LA. The relationship of silicone breast implants and cancer at other sites. *Plast Reconstr Surg.* 2007;120(7 Suppl 1):945-1025.
21. Breast implant associated-anaplastic large cell lymphoma (BIA-ALCL) - Letter to health care providers. <https://www.fda.gov/medical-devices/letters-health-care-providers/breast-implant-associated-anaplastic-large-cell-lymphoma-bia-alc-l-letter-health-care-providers> (Accessed on February 7, 2019).
22. Goldberg MT, Llaneras J, Willson TD, et al. Squamous cell carcinoma arising in breast implant capsules. *Ann Plast Surg.* 2021;86(3):268-72.
23. Buchanan PJ, Chopra VK, Walker KL, et al. Primary squamous cell carcinoma arising from a breast implant capsule: a case report and review of the literature. *Aesthet Surg J.* 2018;38(7):NP 97-NP 102.
24. Jakubietz MG, Janis JE, Jakubietz RG, Rohrich RJ. Breast augmentation: cancer concerns and mammography – a literature review. *Plast Reconstr Surg.* 2004;113(7):117e-22e.
25. European guidelines on breast cancer screening and diagnosis. ECIBC (europa.eu). <https://eur-lex.europa.eu/legal-content/RO/TXT/HTML/?uri=CELEX:52021DC0044&from=lv>.

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