

# Architectural Distortion with the Use of Tomosynthesis

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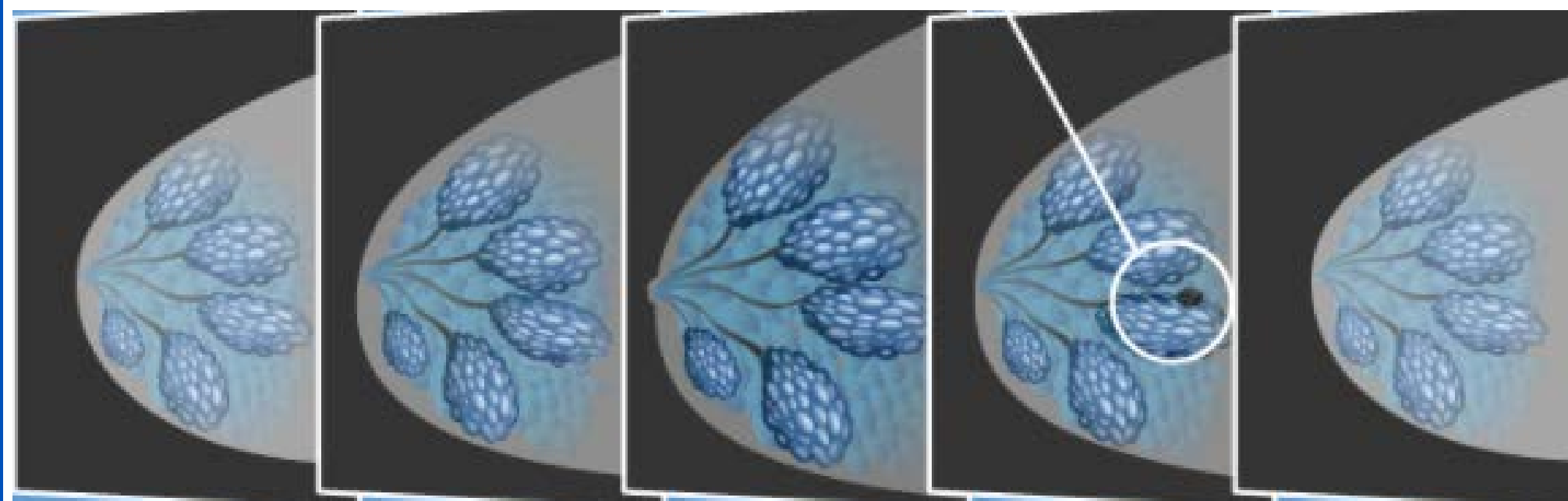
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## Introduction

**Digital breast tomosynthesis (DBT)** is an advanced mammographic technique incorporating multiple angular projections of the breast to enable three-dimensional (3D) reconstruction while requiring only a single breast compression event.

Pacifici, S. (n.d.). *Digital breast tomosynthesis: Radiology Reference Article*. Radiopaedia. <https://radiopaedia.org/articles/digital-breast-tomosynthesis?lang=us>.



Koktysh, L. (2020, October 21). *3D mammography evolves with computer-assisted diagnosis*. ScienceSoft footer icon. <https://www.scnsoft.com/blog/3d-mammography-evolution>.

**Diagnostic mammography** is administered to detect breast cancer in women who have an obvious symptom or symptoms indicating an area of concern. The physician or the patient can notify the technologist of a problem. Diagnostic mammography often utilizes specialized projections and should be performed in the presence of the radiologist.

Pearl, O. (2008). *Lange Q&A: Mammography examination* (4th ed.). McGraw Hill Publisher Professional.

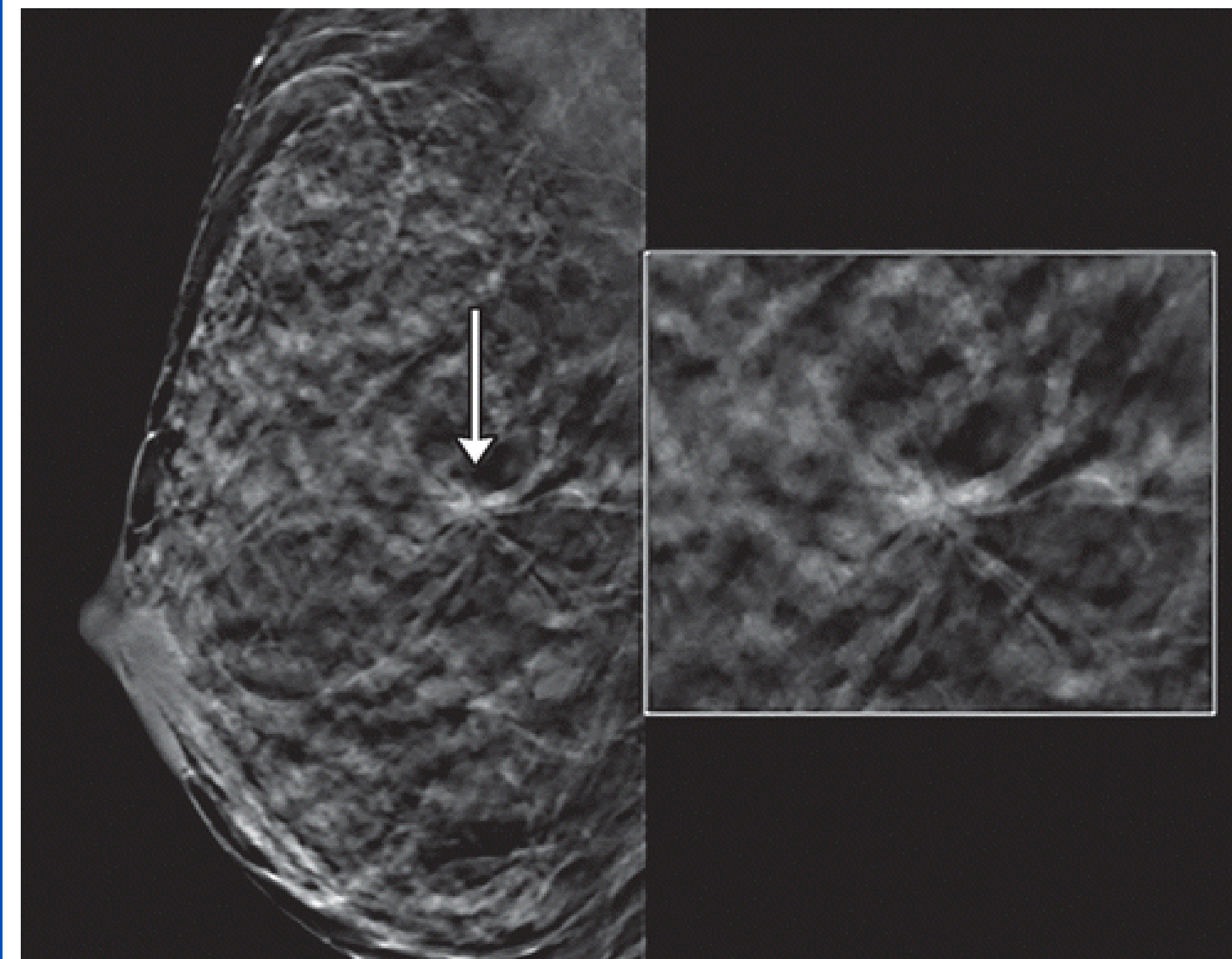


<https://www.hologic.com/hologic-products/breast-health-solutions/selenia-dimensions-mammography-system>

DBT exams are positioned and compressed the same way for a mammogram however, for the DBT exam, the x-ray tube moves in an arc over the breast while taking multiple images. When the x-ray tube stops moving the images will be put together to create one image.

Pearl, O. (2008). *Lange Q&A: Mammography examination* (4th ed.). McGraw Hill Publisher Professional.

## Architectural Distortion



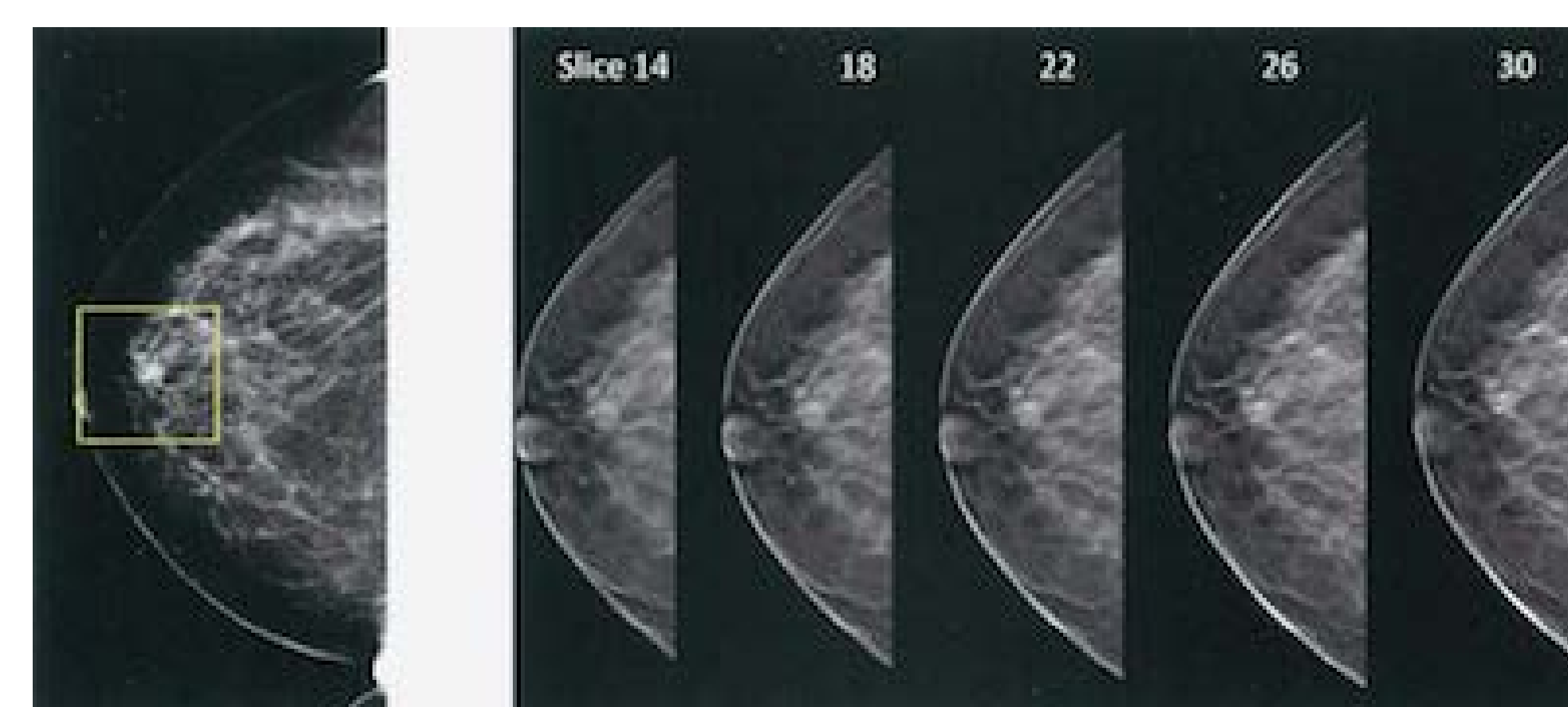
<https://pubmed.ncbi.nlm.nih.gov/30240306/>

- Asymmetrical breast tissue, also called focal architectural distortion (FAD), is usually identified when comparing one breast with the other. The breasts usually present a mirror image, although 3%-5% of normal breast can show asymmetrical densities in the outer quadrant or axillary tail.
- Areas of architectural distortion can represent a malignancy or a benign process, such as surgical scar, sclerosing lesions or posttraumatic fat necrosis.
- Often due to desmoplastic reaction in which there is a focal disruption of the normal breast tissue pattern.

▪ What can be considered as architectural distortion:

- Contour abnormality
- Trabecular thickening
- Trabecular disorganization

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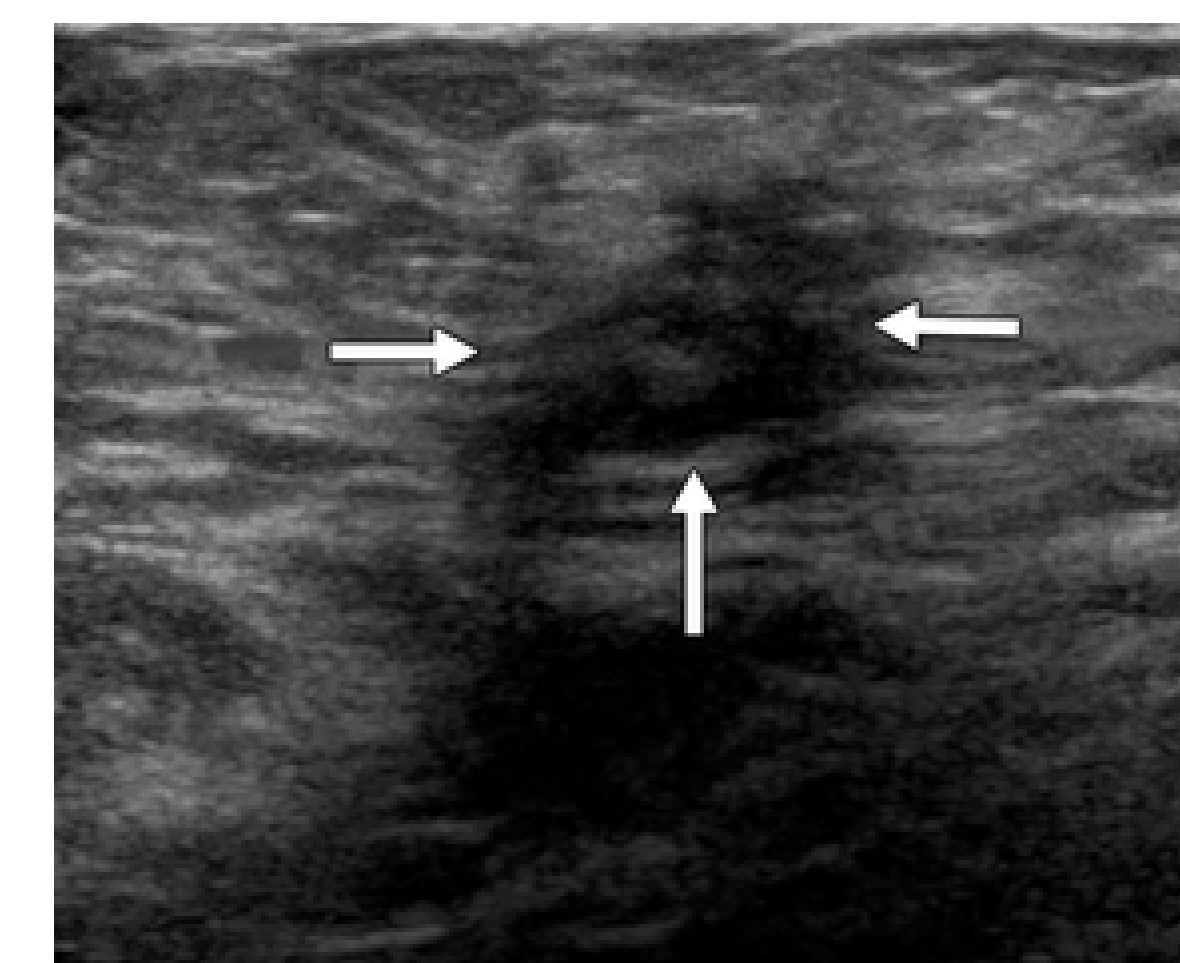
*Women's Imaging: 3D Mammography*. University Radiology. (n.d.). [https://www.universityradiology.com/womens\\_imaging/3d\\_mammography](https://www.universityradiology.com/womens_imaging/3d_mammography).

Radial scars and complex sclerosing lesions result from idiopathic processes unrelated to trauma or postsurgical change.

<https://www.ajronline.org/doi/10.2214/AJR.12.10153>

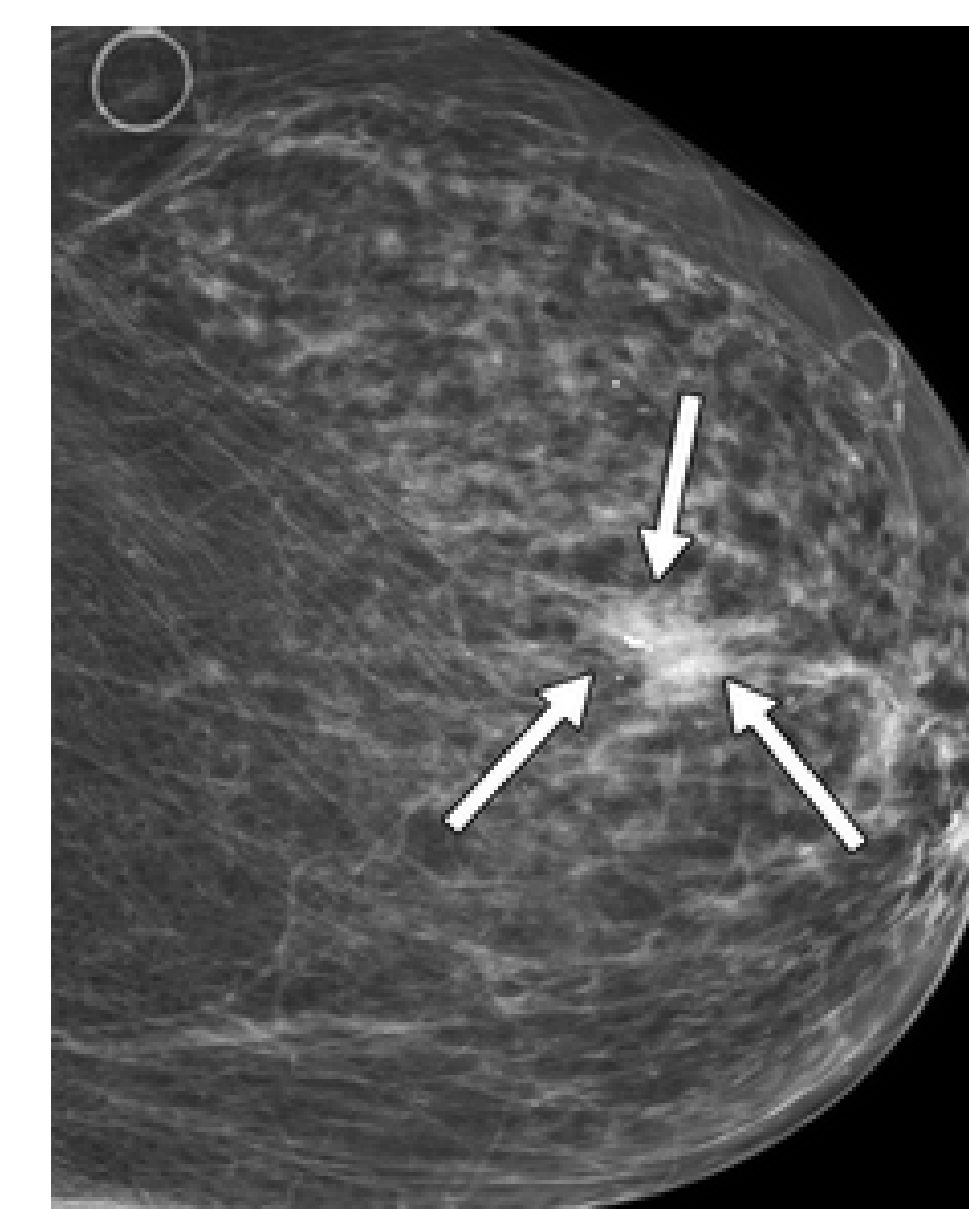
## Ultrasound:

On ultrasound, radial scars commonly present as a hypoechoic mass or parenchymal distortion that mimics malignancy.



<https://www.ajronline.org/doi/10.2214/AJR.12.10153>

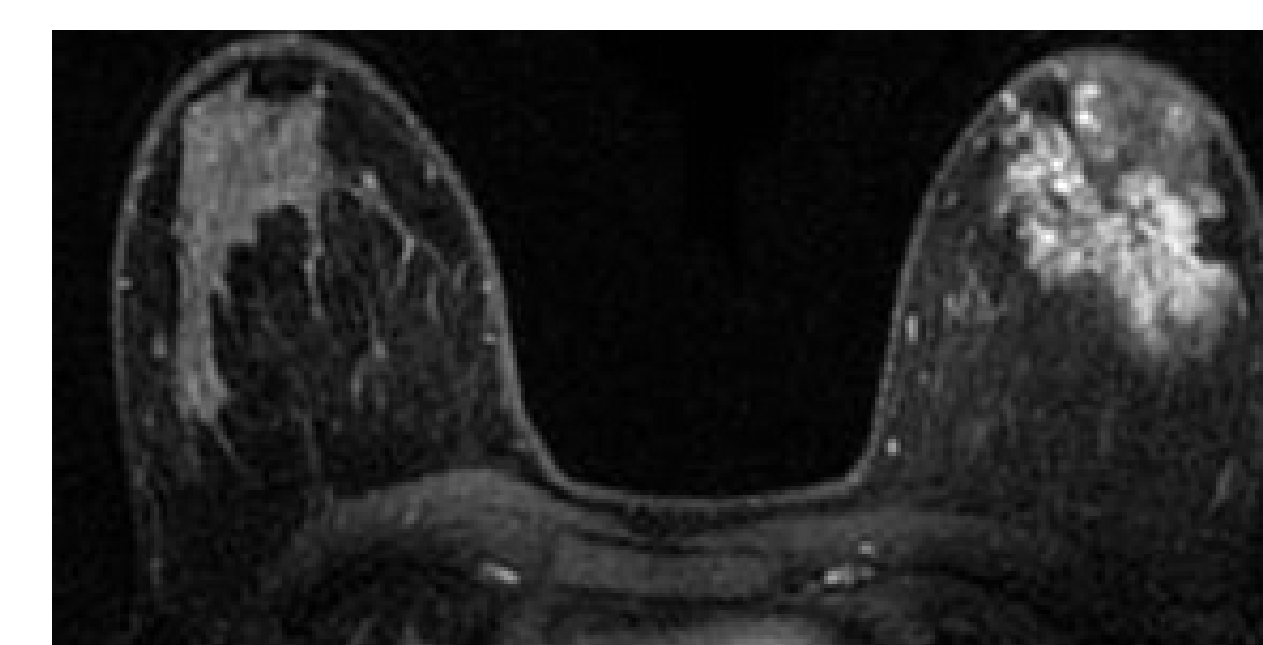
## Tomosynthesis: Craniocaudal view:



<https://www.ajronline.org/doi/10.2214/AJR.12.10153>

## MRI: Contrast-enhanced MRI:

On MRI, the morphologic features and contrast enhancement patterns cannot reliably differentiate a benign from malignant mass.



<https://www.ajronline.org/doi/10.2214/AJR.12.10153>

## Advantages

- Better results and screening for dense breasts
- Less discomfort
- Earlier detection of breast cancer with symptoms
- Detection of breast cancer in women with no symptoms
- Fewer calls backs for additional imaging
- Improved imaging for large, dense breast tissue
- Simple detection that shows inner breast structure

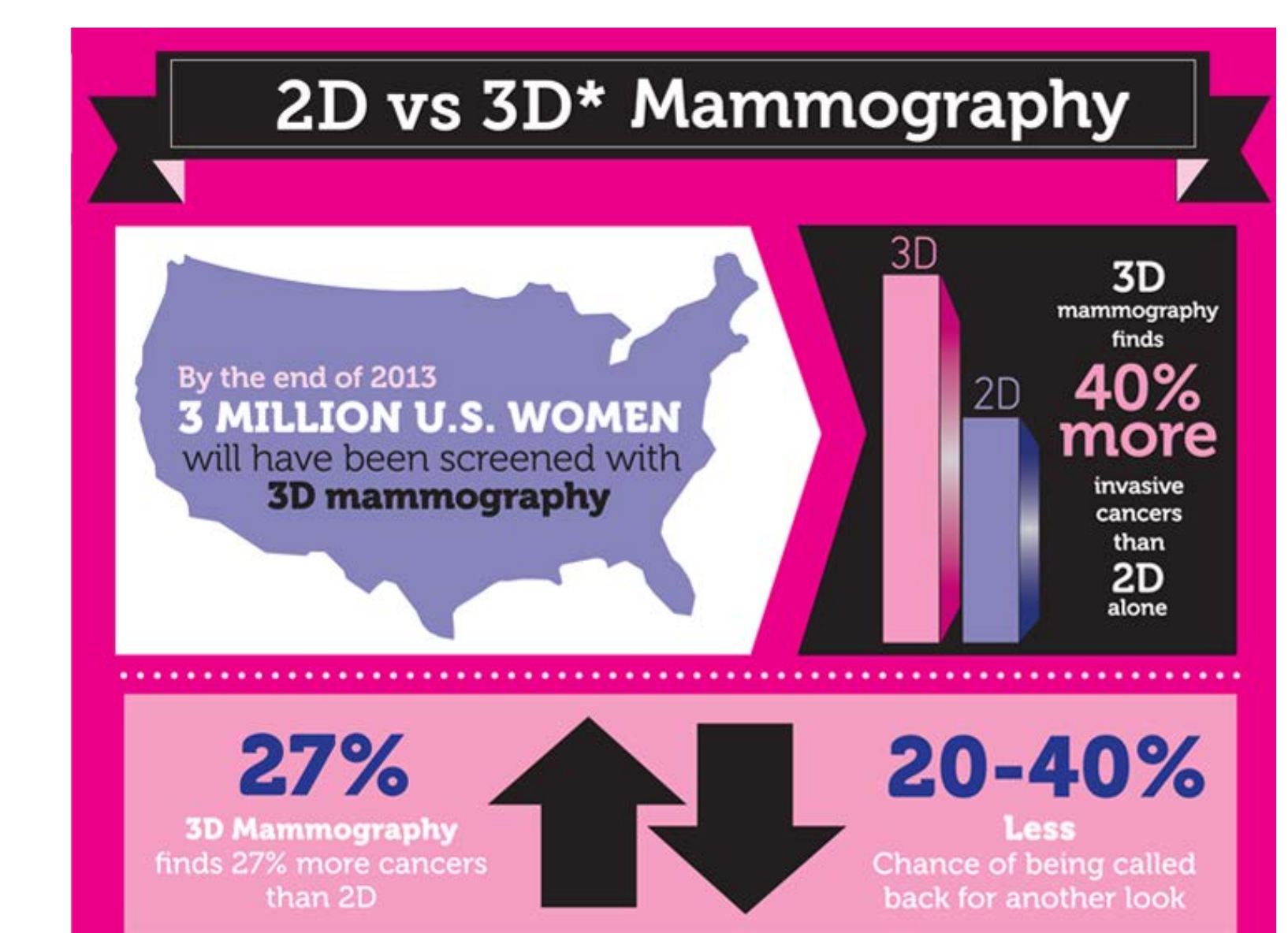
## Disadvantages

- More exposure to radiation
- More images taken
- Variation in the images
- Relatively new procedure

## Statistics

- There are about 2,300 new cases of breast cancer in men each year, and about 230,000 new cases in women each year.
- Architectural Distortion accounts for 12-45% of breast cancer cases.
- Malignant cases are noted in 6.8%-50.7% of cases presented yearly.

Costa, M. P., & Barreiro, G. C. (2016). Importance of concepts in abdominoplasty and liposuction in breast reconstructions. In A. B. Fioravanti (Ed.), *New concepts on abdominoplasty and further applications* (pp. 147-148). essay, Springer International



*3D Mammograms*. Effingham Health System. (2020, October 1). <https://www.effinghamhealth.org/our-services/mammograms/>.

## Conclusion

DBT is a fairly new technology that can assist in diagnosing of breast cancer. DBT uses a series of 2D images to build a 3D mage of the breast. DBT is the most helpful screening technique used for detection of breast cancer with women of dense breasts. Architectural distortion (AD) is detected more frequently on a tomosynthesis and if questionable on diagnostic imaging, MRI may be performed. AD is the most missed abnormality in false-negative cases.