



The Power of Tomosynthesis (3D-Mammography)

-by Dr. Bijal Jankharia

Tomosynthesis or 3-D Mammography in simple terms is getting 1mm slices of the breast. This is done by movement of the tube in an arc and taking multiple low dose X-rays of the breast which are then reconstructed to form slices (Fig. 1).

The greatest benefit of tomosynthesis is:

- 1 Improved cancer detection rate by 30-50% (1) (Fig. 2)
- 2 Decrease in the false positive recall rate by 15-20%

The breast is a 3-D structure, but routine mammography visualizes it as a 2-D image with a lot of overlapping tissue, especially in a dense breast. With 3-D Mammography or Tomosynthesis, using 1mm thin slices, the overlap of the breast parenchyma with the lesion is considerably reduced (Fig. 3). The margins of a lesion are better delineated and masses as well as areas of architectural distortion are much better visualized with tomosynthesis (Fig. 4).

Fig. 1: Full field digital mammography machine with tomosynthesis.





At a glance

- Tomosynthesis / 3-D Mammography picks up more cancers than seen on 2-D Mammography.

- It can also clear out superimposed glandular tissue which can look like a mass on 2-D, thereby reducing false positive recalls.

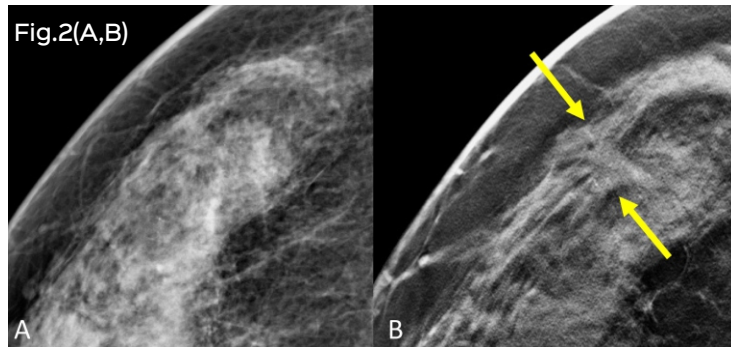


Fig. 2 (A,B): 41-years old lady for routine screening. On the 2-D cranio-caudal (CC) view (A), the lesion is not well seen. However, on the 3-D / tomosynthesis view (B), there is a spiculated lesion (arrows) with adjacent microcalcifications. On histopathology, it was a small invasive ductal carcinoma with ductal carcinoma in-situ (DCIS) detected only on tomosynthesis.

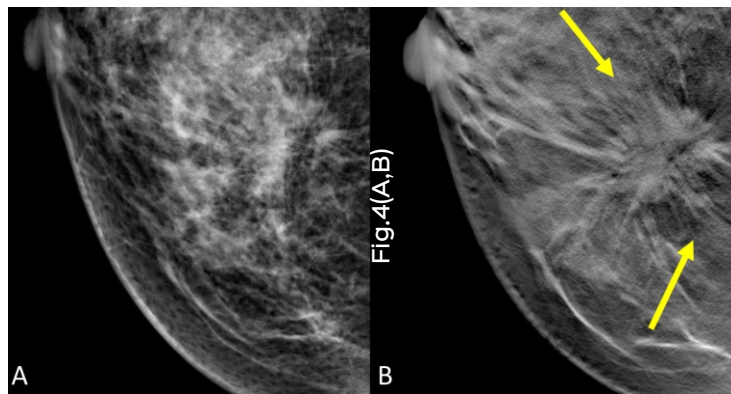


Fig. 4 (A,B): The spiculations of an invasive duct carcinoma are not seen on the 2-D CC view (A) as compared to the tomosynthesis view (B), where they are easily evident (arrows).

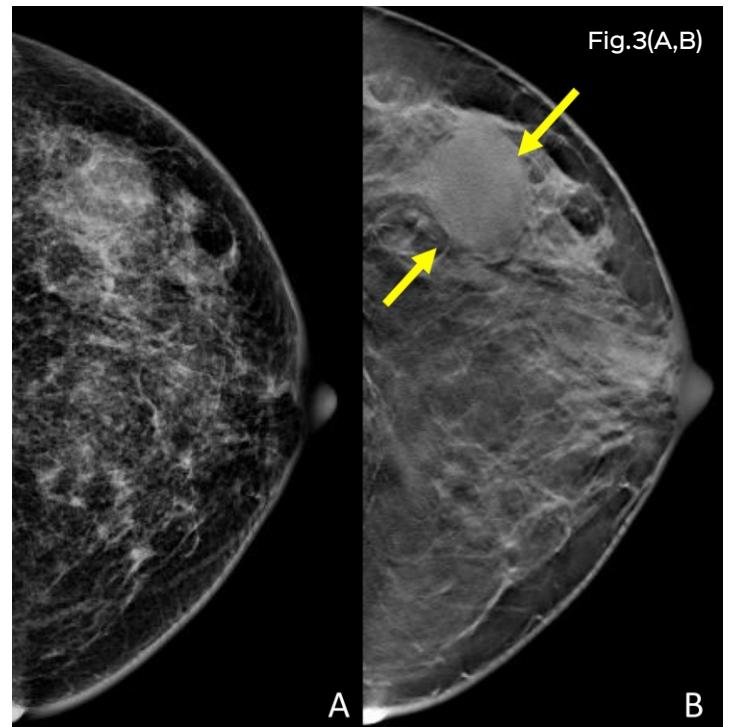


Fig. 3 (A,B): On the 2-D CC view (A), the lesion is obscured whereas on the 3-D view (B), the well-circumscribed margins of the lesion (arrows) are better appreciated.

References:

1. Poplack Steven. Breast Tomosynthesis, Clinical Evidence. Radiol Clin N Am. 2017;55: 475-492

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