



Full-Field Digital Mammography (FFDM) and Tomosynthesis (FFDM-Tomo)

-Dr. Bijal Jankharia



Fig 1

Fig 1: Digital mammography machine.

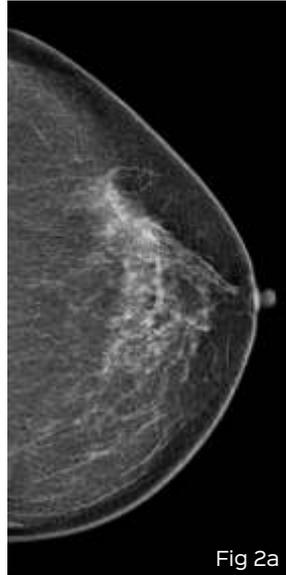


Fig 2a

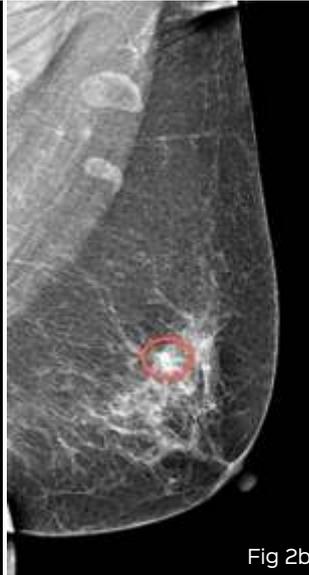


Fig 2b

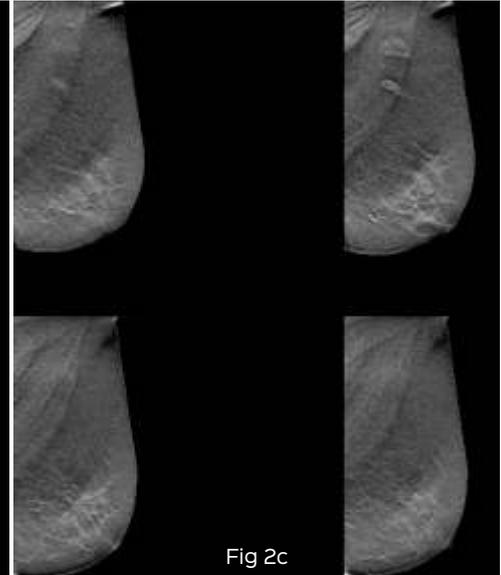


Fig 2c

Fig 2 (A-C): Overlapping of tissue giving rise to a density seen on the left MLO view. Left CC view (A) appears normal, but a density is seen in the left MLO view (B) (circled). Tomosynthesis images (C) are normal. On a standard mammogram this should have become a false positive finding.

Mammography with analogue and CR (computed radiography) systems has been the gold standard for viewing breast pathology. However, since a 3D object is viewed in 2 dimensions, there is an increased percentage of false positives (Fig. 2) and negatives.

Full-field digital mammography (FFDM) (Fig. 1) uses a high-definition, digital flat panel to detect x-rays and an image is generated in a matter of seconds. Its advantages are

- Improved diagnostic accuracy in women younger than 50 years of age and those with dense breasts.
- Less radiation exposure per image
- Fast
- Better patient compliance
- The ability to change the window of the image and to store and transmit

Along with high-resolution viewing monitors like the Uniti from Barco, the diagnostic accuracy of FFDM mammography images is far superior to regular analogue or CR based mammograms.

Full-field digital mammography tomosynthesis (FFDM-Tomo) or 3D-Mammo uses the



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At a glance

- Routine analogue mammography is a 2D representation of a 3D object
- Full-field digital mammography (FFDM) with tomosynthesis (FFDM-tomo) allows 3D

representation of the breast

- 3D-mammo improves lesion detection and characterization and reduces false positives and negatives



Fig 3 (A,B): Left breast spiculated lesion seen only on tomosynthesis view. Left MLO digital mammogram (A) in a 52-years old woman appears normal. Left MLO tomosynthesis view (B) shows spiculated lesion in the left breast superiorly (circled). This lesion would have been missed on standard analogue mammography.

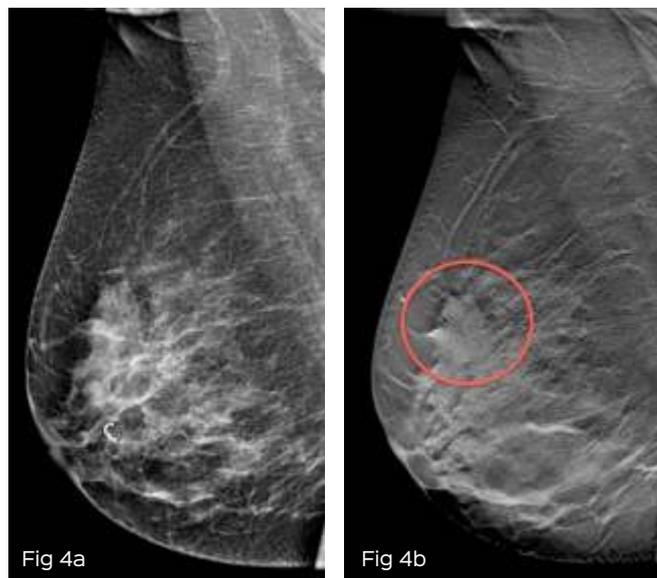


Fig. 4 (A,B): 52-years old lady with a left mastectomy and a new lump in the right breast. Right MLO view (A) shows no obvious mass. A spiculated mass is seen in the right upper outer quadrant on the tomosynthesis view (B).

movement of the tube to take multiple low-dose X-Rays of the breast from a fixed number of angle in a 14-50 degree arc, which are then used to reconstruct 3-D cross sectional images or “slices” which are 1mm thick. This

- improves the cancer detection rate, especially for small cancers that can be hidden with routine mammography (Fig. 3, 4)
- clarifies areas of overlapping breast tissue (Fig. 2)
- improves accuracy in pinpointing size, shape and location of abnormalities.

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