Breast cancer screening using tomosynthesis in combination with digital mammography

Friedewald S M, Rafferty E A, Rose S L, Durand M A, Plecha D M, Greenberg J S, Hayes M K, Copit D S, Carlson K L, Cink T M, Barke L D, Greer L N, Miller D P, Conant E F

Objective

To study how 3D mammography (breast tomosynthesis) in combination with 2D mammography when used in breast cancer screening has impacted patient care at 13 academic and community based sites in the U.S.

Materials and Methods

A total of 454,850 examinations (n = 281,187 digital mammography; n = 173,663 digital mammography + tomosynthesis) for 13 centers interpreted by 139 radiologists over two time periods were retrospectively analyzed to determine if 2D mammography combined with 3D mammography improved performance of breast screening programs. Period 1 included 1 full year of screening with 2D mammography alone, ending on the date of 3D mammography introduction at each institution. Period 2 included screening with 2D mammography + 3D mammography until December 31, 2012. The 13 participating centers all used the only FDA-approved 3D Mammography device (Selenia® Dimensions®, Hologic) during these screening periods.

The primary measured outcomes were recall rate (proportion of patients requiring additional imaging based on a screening examination result), cancer detection rate, positive predictive value for recall (PPV1 – proportion of patients recalled after screening who were diagnosed as having breast cancer) and positive predictive value for biopsy (PPV3 – proportion of patients undergoing biopsies who were diagnosed as having breast cancer).
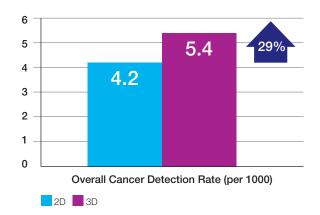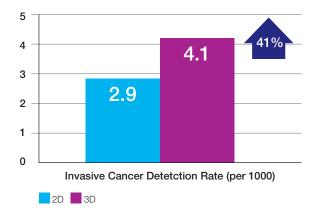
Results

This is the largest study reported to date on the effectiveness of 3D mammography. An analysis of the data (summarized below) indicated that 3D mammography outperformed conventional 2D mammography. Eleven (11) of the 13 sites showed simultaneous improvement for the key metrics of cancer detection and recall rates; the two sites that did not see these combined benefits had used 3D mammography for a short time or imaged very few women.
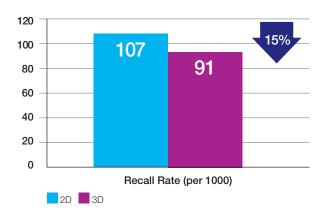
	2D	2D+3D Mammography	Relative Change	P-Value
PPV for Recall	4.3%	6.4%	+49%	P<.001
PPV for Biopsy	24.2%	29.2%	+21%	P<.001

Conclusion

The authors conclude that the addition of 3D mammography to 2D mammography demonstrated an increase in cancer detection rate and a decrease in the recall rate. For complete findings and full-text, please click here.

Overall Cancer Detection Rate (per 1000)
■ 2D ■ 3D

Invasive Cancer Detetction Rate (per 1000)
■ 2D ■ 3D

Recall Rate (per 1000)
■ 2D ■ 3D

Presented by Hologic Medical Education

hologic.com | info@hologic.com | +1.781.999.7300