

Clinical Performance of Synthesized Two-dimensional Mammography Combined with Tomosynthesis in a Large Screening Population

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Objective

The purpose of this study was to evaluate and compare the clinical performance of synthesized 2D (s2D) and DBT, FFDM and DBT to and FFDM alone, in a large community based screening population. The group analyzed outcomes performance, including recall rates, positive predictive values, cancer detection rate among others.

Modality	Screening examinations
Full-Field Digital Mammography (FFDM)	32,076
Digital Breast Tomosynthesis + FFDM (DBT + FFDM)	30,561
DBT + s2D (synthesized 2D image)	16,173
Total	78,810

Methods

This was a retrospective study evaluating 78,810 screening exams performed during October 2011 through June 2016

Results

Recall rates with DBT-s2D were statistically significantly lower when compared to DBT-FFDM and FFDM alone. DBT-s2D image format, the detection of invasive cancer and positive predictive values were significantly higher compared to DBT-FFDM.

Findings	DBT + s2D	DBT + FFDM	FFDM
Recall rate	4.3%	5.8%	8.7%
Cancer detection rate	6.1/1000	6.4/1000	5.3/1000
Invasive cancer detection rate	76.5%	61.3%	

Positive Predictive Value	DBT + s2D	DBT + FFDM	FFDM
PPV1 (number of cancers divided by number of recalls)	14.3%	10.9%	6%
PPV2 (number of cancers divided by number of biopsies)	39.3%	26.3%	20.9%
PPV3 (number of cancers divided by number of biopsies perform)	40.8%	28.5%	22.2%

Conclusion

The improvement in recall rates and positive predictive values, without a reduction in cancer detection rate, verifies screening with DBT-s2D mammography in a large community-based practice is acceptable when compared with DBT-FFDM and FFDM alone.

For the patient, DBT + s2D in screening mammography will reduce the radiation exposure compared to the use of DBT + FFDM. False-positive findings are expected to decrease and the number of invasive cancers will be comparable to those found at screening with DBT + FFDM.

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