

A comparison of the accuracy of film-screen mammography, full-field digital mammography, and digital breast tomosynthesis

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OBJECTIVE

To compare the accuracy of conventional film-screen mammography and full-field digital mammography (FFDM) with the addition of digital breast tomosynthesis (DBT) in a diagnostic setting in women recalled for further work-up after a screening mammogram.

MATERIALS AND METHODS

738 women with 759 lesions were recalled for further work-up after a routine screening with film screen mammography. Bilateral two-view FFDM and two-view DBT were performed on these women. Each lesion on these exams was scored separately by the readers for the probability of malignancy, and scores were compared to histopathology findings.

FINDINGS

Of the 759 lesions included in the study:

- 204 lesions were malignant (147 invasive and 57 *in-situ*), 286 benign and 269 normal.
- Receiving operating characteristic (ROC) and measurement of area under the curve (AUC) were used to evaluate the diagnostic accuracy.
- AUC showed improvements with each additional modality included:
 - DBT + FFDM + film-screen mammography = 0.9671
 - FFDM + film-screen mammography = 0.8949
 - film-screen mammography = 0.7882
- AUC values for soft-tissue lesions were greater compared to calcifications:
 - DBT + FFDM + film-screen mammography
 - » Soft-tissue lesions = 0.9905 and microcalcifications = 0.7920
 - FFDM + film-screen mammography
 - » Soft-tissue lesions = 0.9201 and microcalcifications = 0.7843

CONCLUSION

The study concludes that the diagnostic accuracy of the assessment of soft-tissue mammographic abnormalities increases with the addition of DBT, compared to combined FFDM and film-screen mammography and film-screen mammography alone.

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