

Diagnostic Efficacy and Usefulness of Digital Breast Tomosynthesis (DBT) in Evaluation of Breast Microcalcifications as a Pre-Procedural Study for Stereotactic Biopsy

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Abstract : Purpose: To investigate the diagnostic power of digital breast tomosynthesis (DBT) in evaluation of breast microcalcifications and usefulness as a pre-procedural study for stereotactic biopsy in comparison with full-field digital mammogram (FFDM) and FFDM plus magnification image (FFDM+MAG). Methods and Materials: An IRB approved retrospective observer performance study on DBT, FFDM, and FFDM+MAG was done. Image quality was rated in 5-point scoring system for lesion clarity (1, very indistinct; 2, indistinct; 3, fair; 4, clear; 5, very clear) and compared by Wilcoxon test. Diagnostic power was compared by diagnostic values and AUC with 95% confidence interval. Additionally, procedural report of biopsy was analysed for patient positioning and adequacy of instruments. Results: DBT showed higher lesion clarity (median 5, interquartile range 4-5) than FFDM (3, 2-4, p-value < 0.0001), and no statistically significant difference to FFDM+MAG (4, 4-5, p-value=0.3345). Diagnostic sensitivity and specificity of DBT were 86.4% and 92.5%; FFDM 70.4% and 66.7%; FFDM+MAG 93.8% and 89.6%. The AUCs of DBT (0.88) and FFDM+MAG (0.89) were larger than FFDM (0.59, p-values < 0.0001) but there was no statistically significant difference between DBT and FFDM+MAG (p-value=0.878). In 2 cases with DBT, petit needle could be appropriately prepared; and other 3 without DBT, patient repositioning was needed. Conclusion: DBT showed better image quality and diagnostic values than FFDM and equivalent to FFDM+MAG in the evaluation of breast microcalcifications. Evaluation with DBT as a pre-procedural study for breast stereotactic biopsy can lead to more accurate localization and successful biopsy and also waive the need for additional magnification images.

Keywords : DBT, breast cancer, stereotactic biopsy, mammography

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