

Diagnostic Accuracy of Tomosynthesis Mammographic Supplemental Views: Impact of Lesion Shape Perception

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OBJECTIVE

To compare perceived shape and BI-RADS classification accuracy of verified noncalcified breast lesions using supplemental mammographic views versus tomosynthesis.

MATERIALS AND METHODS

8 radiologists retrospectively reviewed 217 consecutively accrued non-calcified lesions in 182 patients who underwent diagnostic mammography with supplemental views and tomosynthesis. Truth was verified with histopathology (in 191 lesions), US showing a cyst (in 12 lesions), or normal follow-up (in 14 lesions). Probability of malignancy (POM), BI-RADS assessment and perceived lesion shape (round, oval, lobulated, or irregular) were collected using both modalities.

FINDINGS

The perceived lesion shape correlated highly with POM and BI-RADS ratings. Irregular masses had the highest average BI-RADS score, followed by lobulated, then oval and then round. With tomosynthesis, the number of irregular masses decreased, reclassifying them to lobulated (45%) or oval (23%). This reclassification was seen more for benign lesions. Of the cancerous lesions that were classified as irregular with supplemental views, 70% were described as lobulated on tomosynthesis. BI-RADS based ROC curve was consistently higher for tomosynthesis for all lesions regardless of shape reclassification. For lesions having the same perceived shape for both modalities, tomosynthesis was more accurate than supplemental views (AUC = 0.82 vs. 0.77).

CONCLUSION

Tomosynthesis enables improved diagnostic performance for non-calcified lesions in part but not entirely due to improved perception of lesion shape.

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