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Clinical performance of single-view Siemens digital breast tomosynthesis versus standard supplementary mammography for the assessment of screen-detected abnormalities - a multi-reader study

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Background and purpose: In the assessment of screen-detected abnormalities, digital breast tomosynthesis (DBT) can offer equivalent or improved accuracy over standard supplementary mammography (SSM)^{1,2}. However, it is difficult to generalise study results across equipment manufacturers because of wide design variations. We aimed to establish whether Siemens DBT is at least as accurate as SSM in the assessment of screen-detected soft-tissue mammographic abnormalities.

Materials and methods: Participants underwent single-view DBT (Siemens MAMMOMAT Inspiration) in addition to assessment with one or more supplementary mammographic views. All outcomes were proven by histology or >2 year follow-up. 230 cases were available for analysis. Eight accredited UK NHSBSP readers, blinded to assessment outcome, retrospectively read all cases with A: screening mammograms plus DBT, and B: screening mammograms plus SSM. Readings were 9 weeks apart to avoid recall bias. Reading condition order was reversed in half the readers. Statistical analysis included ROC curves, compared by Chi Squared test.

Results: Based on the area under the ROC curve, the two methods are not significantly different (auROC 0.87 for DBT vs 0.86 for SSM, p=0.49). DBT sensitivity was not significantly different from SSM sensitivity (90% vs 86%, p=0.10) whereas DBT specificity was significantly lower than SSM (59% vs 64%, p=0.0002).

Conclusions: Overall, Siemens DBT is as accurate as standard supplementary mammography for assessing screen-detected, soft-tissue, mammographic abnormalities. It is therefore suitable for optional implementation subject to practical evaluation. The accuracy of DBT in this study was driven by higher sensitivity compared with SSM, while specificity was lower.

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