SUMMARY

Mammographic compression and its association with lesion conspicuity for calcification-only lesions

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Why it matters

This large study found optimal compression pressure—not force—improves the conspicuity of lesions on mammograms. The TruPressure™ algorithm in Volpara Analytics™ provides insight to help technologists modify technique and achieve adequate compression for optimal screening performance.

Key takeaways

This is the largest study to associate compression pressure and lesion conspicuity in real patient images. Conspicuity, or the lesion visibility compared to the surrounding background, was demonstrated to be positively associated with mammographic compression pressure for lesions whose only image feature is calcification. This suggests that adequate compression pressure is essential to good screening performance.

Study location

Study by Volpara Health, France & NZ

Study dataset

586 studies from 2 UK screening sites

Study design

Retrospective evaluation of IQ indicators associated with lesion visibility.

Methods

- 586 cases (37 benign/547 malignant) with biopsy-proven lesions whose only image feature was calcification, and with expert ratings of lesion conspicuity of Obvious, Subtle, or Very Subtle were identified from the OPTIMAM* database (*use under license from Cancer Research Technology)
    - screening between 2012 and 2017 on Hologic equipment
- Analytics software (Volpara Imaging Software, v3.4) was used to objectively measure breast positioning and compression image quality (IQ) for all images.
- Statistical analysis was performed to test for IQ indicators from the MLO view that are 1) individually associated with conspicuity, and 2) that are predictive of conspicuity in a multivariate model.

Study results

- Among non-modifiable patient and imaging factors, conspicuity was associated with breast volume, volumetric breast density, the annotated lesion size, and the screening site.
- For modifiable positioning and compression factors, only compression was a significant predictor of lesions conspicuity. Compared to Obvious lesions, the odds of Subtle or Very Subtle conspicuity are reduced by 15% and 19%, respectively, for each 1 kPa pressure.
- Analytics software revealed important findings on breast compression that can be implemented in clinical practice to optimize mammography screening performance.