

Implementation of Breast Tomosynthesis in a Routine Screening Practice: An Observational Study

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OBJECTIVE

To assess the changes in performance measures after the introduction of tomosynthesis into clinical practice.

MATERIALS AND METHODS

In an observational screening study, recall rates, biopsy rates, cancer detection rates, and positive predictive values were computed and compared for six radiologists who interpreted screening mammography studies without ($n = 13,856$) and with ($n = 9499$) the use of tomosynthesis. Analyses were performed to account for reader variability, age of participants, and whether the exam was a baseline.

RESULTS

The introduction of tomosynthesis systems in the clinical practice resulted in the following changes in performance measures.

- A significant 37% drop in recall rates – from 8.7% to 5.5% ($p < 0.001$).
- A 35% increase in cancer detection rates - from 4.0 to 5.4 per 1,000 screenings ($p = 0.18$).
- A 53% increase in invasive cancer detection rates - from 2.8 to 4.3 per 1,000 screening examinations ($p = 0.07$).
- A 115% increase in the positive predictive value for recalls - from 4.7% to 10.1% ($p < 0.001$).
- An 11% drop in biopsy rates - from 15.2 to 13.5 per 1,000 screenings ($p = 0.59$)

CONCLUSION

The study results demonstrated a significant reduction in recall rates (~37%) along with an increase in the cancer detection rate (35% overall, 54% for invasive cancers) after the introduction of tomosynthesis in the clinical practice.

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