Implementation of breast tomosynthesis in a routine screening practice: an observational study

Rose SL, Tidwell AL, Bujnoch LJ, Kushwaha AC, Nordmann AS, Sexton R Jr.
AJR Am J Roentgenol. 2013 Jun;200(6): 1401-8. doi: 10.2214/AJR.12.9672.

Objective

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

Materials and Methods

Prior to the introduction of 3D Mammography, the screening images were obtained with a Hologic Selenia® digital mammography system. After the introduction of 3D Mammography, both the 2D digital mammogram and 3D mammogram images were obtained under one compression using the Hologic Selenia® Dimensions®.

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.