

VSBR31-16

Scientific Papers

Comparison of Digital Mammography (FFDM) and FFDM Plus Digital Breast Tomosynthesis in Mammography Screening for Cancer Detection According to Breast Parenchyma Density

Tuesday, 11:40 - 11:50 AM

Location: Arie Crown Theater

PARTICIPANTS:

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CITE THIS ABSTRACT

PURPOSE

To compare cancer detection using full-field digital mammography (FFDM) versus FFDM plus digital breast tomosynthesis (DBT) in a population-based screening according to 81-RADS density.

METHOD AND MATERIALS

The prospective screening trial was approved by Ethical Committee. All women signed a written consent. 25,547 women age 50-69 y. underwent FFDM and DBT. Prospective independent readings were performed, using a 5-point rating scale for probability of cancer (1-5) for each breast. Eight radiologists participated in the interpretation alternating between the two modes. The trial had 4 arms including one arm offering FFDM+CAD and another offering synthetic 2D in lieu of conventional FFDM. This analysis includes only two arms, namely FFDM alone versus FFDM+DBT. All cases with a positive score by at least one reader were discussed at arbitration meeting before final decision whether to recall the woman for diagnostic workup. At arbitration meeting case-based consensus 81-RADS density scores were recorded. Cancers detected on FFDM and FFDM+DBT were stratified by breast density. McNemar test was used to compare detection in each of the density groups by mode.

RESULTS

257 screen-detected malignancies were found: 20 in breasts with density 1; 105 in density 2; 110 in density 3; and 22 in breasts with 81-RADS density 4. Overall, a true positive (TP) score under the FFDM alone mode was 163/257 (63%) compared with 211/257 (82%) under the FFDM+DBT mode ($p < 0.05$). For women with "fatty breast" (81-RADS density 1 or 2), the number of cancers detected by FFDM alone and FFDM+DBT were 85/125 (68%) and 105/125 (84%), respectively ($p < 0.05$) and in women with "dense breast" (density 3 or 4), the detected cancers were 78/132 (59%) and 106/132 (80%), respectively ($p < 0.05$). Stratifying the "fatty breast" into 81-RADS density 1 and 2 showed no difference in detection between FFDM and FFDM+DBT in 81-RADS density 1 (17/20 versus 16/20 detected cancers, respectively). The higher detection rate in "fatty breasts" by FFDM+DBT was solely attributed to higher detection in women with breast density 2.

CONCLUSION

Tomosynthesis has the potential to significantly increase the cancer detection rate in mammography screening of women with breast density BI-RADS 2-4. We observed no increase in women with BI-RADS density 1.

CLINICAL RELEVANCE/APPLICATION

Tomosynthesis may significantly improve the cancer detection rate in mammography screening of women with BI-RADS density 2-4.