Real World Breast Cancer Screening Performance with Digital Breast Tomosynthesis Before and After Implementation of an Artificial Intelligence Detection System

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Materials and Methods

Compared performance of nine dedicated breast radiologists reading screening DBT two years before installation of ProFound AI for Digital Breast Tomosynthesis (DBT) (pre-AI: n=54,440; 383 cancers) and two years after installation of ProFound AI for DBT (post-AI: n=48,742; 399 cancers).

Results

Outcomes

	Pre-AI		Post-AI		Difference		
	Observed	95% CI	Observed	95% CI	Observed	95% CI	*p* value
CDR per 100	5.77	(5.17, 6.44)	7.08	(6.37, 7.86)	1.31	(0.33, 2.29)	0.0047
Recall Rate %	6.97	(6.76, 7.19)	6.96	(6.74, 7.19)	-0.01	(-0.32, 0.30)	0.4696
PPV1%	8.28	(7.44, 9.197)	10.17	(9.20, 11.24)	1.90	(0.55, 3.24)	0.0031
Sensitivity	81.98	(77.81, 85.52)	86.47	(82.74, 89.49)	4.48	(-0.62, 9.59)	0.0523
Specificity	93.56	(93.35, 93.77)	93.70	(93.48, 93.91)	0.14	(-0.16, 0.44)	0.1854

Conclusions

Interpretation of screening DBT exams by dedicated breast radiologists after implementation of AI resulted in an increase in cancer detection rate (CDR), ppv1 and sensitivity without a change in recall rate or specificity. There is improvement of cancer detection with use of an AI detection system in clinical practice.

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