Artificial Intelligence Enhanced Synthetic Thick Slabs Versus Standard Slices in Digital Breast Tomosynthesis

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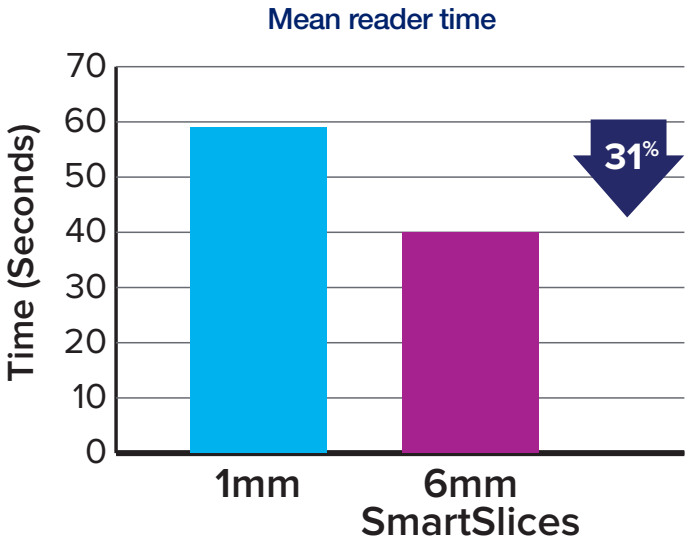
Study Goal

- Retrospective analysis of the impact of reading AI enhanced synthetic 6-mm SmartSlices versus standard 1-mm slices in a diagnostic assessment center in Germany

Study Population

- 111 diagnostic DBT exams from 101 patients (100 female, 1 male)
  - All patients were either symptomatic (19.8%), had a conspicuous finding in a previous examination (41.6%), were evaluated preoperatively for biopsy-proven malignancy (28.7%), or received further assessment during / after cancer therapy (9.9%).
- Inclusion criteria included presence of one or more lesions with either histopathological correlation or benign result as per one-year consistency, definite benign correlate in ultrasound or pure summation artifact (asymmetry).
- Mean age: 59.7 years
- Breast Density:
  - 6.3% Almost entirely fatty (A)
  - 51.4% Scattered fibroglandular (B)
  - 33.3% Heterogeneously dense (C)
  - 9.0% Extremely dense (D)



Key Outcome Measures

- Interpretation time and readers performance
  - 3 readers with 6, 4 and 2 years of breast imaging experience and DBT, respectively

Key Findings

- No significant difference was found between BIRADS categories assigned based on 6mm SmartSlices vs. 1mm datasets ($p \geq 0.317$).
- Diagnostic accuracy was comparable for readings of 6mm SmartSlices and 1mm slices ($p \geq 0.125$).
- Median overall diagnostic confidence of all three readers was at least good for 6mm SmartSlices and 1mm slices.
- Mean interpretation time was found to be substantially reduced for 6-mm SmartSlices compared to 1-mm slices. ($p < 0.001$)
- One reader reported higher confidence with 1 mm slices (R1: $p = 0.033$).

Conclusion

Employing a reconstruction protocol with artificial-intelligence-enhanced synthetic 6-mm SmartSlices instead of 1-mm slices for digital breast tomosynthesis allowed for substantial interpretation time reduction without a decrease in interpretation accuracy in the presented diagnostic setting.