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Initial investigation of reading efficiency from experienced radiologists interpreting digital breast tomosynthesis (DBT) images

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Abstract Title:

Initial investigation of reading efficiency from experienced radiologists interpreting digital breast tomosynthesis (DBT) images

Abstract text:

Introduction: Digital Breast Tomosynthesis has several advantages over traditional 2D mammography. However, the cost-effectiveness to implement the DBT modality into breast screening programmes is still under investigation. The DBT modality has been integrated into a regional breast screening program in Italy for several years. The purpose of this study is to examine the experienced Italian DBT readers' visual search behaviour and reading efficiency.

Methods: Seven Italian radiologists, with 2-7 years of DBT screening experience, read two sets of 20 DBT test cases comprising normal, benign and malignant appearances. As well as their reporting decisions about each case, their visual search behaviour, mouse usage and response pad control were all recorded.

Results: The results showed that there was no significant difference in time between examining normal and abnormal cases. The eye movement patterns revealed that experienced DBT readers covered more areas on the 2D view and fixated longer and with more dwells in the lesion area in the 3D view. Based on these findings it is argued that by understanding the visual search patterns of experienced DBT radiologists, it could potentially help DBT trainees to develop more efficient interpretation approaches.

Conclusions: This pilot study examined several approaches to both visualize and analyze DBT interpretation behavior by experienced DBT radiologists. This finding may help DBT trainees to learn a more effective DBT reading strategy.

References:

- [1] Skaane, P., Bandos, A. I., Gullien, R., Eben, E. B., Ekseth, U., Haakenaasen, U., & Niklason, L. T. (2013). Comparison of digital mammography alone and digital mammography plus tomosynthesis in a population-based screening program. *Radiology*, 267(1), 47-56.
- [2] Ciatto, S., Houssami, N., Bernardi, D., Caumo, F., Pellegrini, M., Brunelli, S., ... & Montemezzi, S. (2013). Integration of 3D digital mammography with tomosynthesis for population breast-cancer screening (STORM): a prospective comparison study. *The lancet oncology*, 14 (7), 583-589.
- [3] Bernardi, D, Pellegrini, M, Valentini, M, Fanto, C, Houssami, N, The STORM II (Screening with Tomosynthesis or Mammography II) Trial: Interim Comparison of