

Use of Augmented Reality in Learning Lumbar Spinal Anatomy for Labour Epidural Training: A pilot study

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Background

Augmented Reality (AR) has gained popularity to complement teaching and learning in medicine. However, there is limited use of AR in anaesthesia. We aimed to explore the usefulness of AR in learning spinal anatomy relevant to epidural insertion with feedback from trainers and learners.

Methodology

A pilot study was conducted in KKH Department of Women's Anaesthesia from January to March 2022. Anaesthetists with varying experience were recruited after informed consent. Computer Tomography images were obtained from an epidural mannequin trainer, reconstructed, and uploaded to an AR device (Microsoft HoloLens 2) by industrial collaborator (Holoeyes Inc., Japan) (Figures 1a, 1b). The AR device was then provided to the participants for AR experience, with pre- and post- user surveys conducted.



Figure 1 (a) Hologram overlay of an epidural mannequin trainer; and (b) Anatomy of lumbar spinal bone.

Results

Thirty-one participants were recruited with mean (SD) 7.9 (6.2) years of anaesthesia experience. Twenty-five (80.6%) were aware of AR but the majority (80.6%) had no prior experience with AR-based learning. Only 12 (38.7%) had played AR games and 2 (6.5%) had experience in computer programming. Thirteen (41.9%) had >2 hours of daily use of electronic devices for learning.

Using Likert scale (1 being strongly disagree, 5 being strongly agree), post-study survey showed median scores of ≥ 4 in all questions on AR-based learning. The majority (92%) agreed that functions on 'obtaining clear visualization of anatomy', 'rotating 3D structure', 'changing magnification' and 'selecting specific parts to focus' should be included in the AR software. Feedback include need for familiarization of manipulating holographic images and the need for haptic device link for task training.

Conclusion

Our study showed potential for AR use in facilitating anatomy learning related to epidural insertion training. Linkage of a haptic device link could enhance task training in future.