AB162. 234. Application of virtual and augmented reality to the visualisation of mesenteric anatomy

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Background: Emerging applications of virtual (VR) and augmented reality (AR) show promise in the teaching of spatially challenging anatomical knowledge. The 3-dimensional (3D) orientation and mapping of mesenteric anatomy remains a difficult area to visualise. We aimed to develop advanced graphical interface modules to better visualise mesenteric anatomy.

Methods: 3D models were obtained from the visible human project. Cadavers were examined for intraabdominal pathology; then fixed, frozen and milled into cross-sections. Manual delineation of regional anatomy was performed in Fiji (v1.51, NIH, USA). Digital sculpting of rendered 3D models was performed using a cross-interface of ZBrush (Pixologic) and Cinema4D (Maxon Computer GmbH). Models were exported and handled with Unity and Vuforia to generate VR and AR anatomy modules.

Results: 3D outputs from cross-sectional datasets generated interactive modules of the mesenteric anatomy. Anatomical models of the mesentery, extending from oesophagogastric junction to distal rectum, consisted of colour-coded subdivisions to allow for identification of mesenteric regions. Interactive exploration of modules facilitated clear display of typically challenging anatomical areas. Furthermore, accelerometer usage allowed for further exploration and spatial immersion.

Conclusions: The use of 3D mesenteric anatomical models in a VR or AR environment facilitates visualisation of challenging anatomical zones. This platform is well suited to the teaching of associated viscera and neurovascular anatomy. Visuospatial representation of mesenteric anatomy in this manner represents better operative anatomy than traditional teaching media.

Keywords: virtual (VR); augmented; reality; mesentery; education

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