Larynx Region Surgical Education and Simulation Using A Three-dimensional virtual model Based on the Chinese Visible Human

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ABSTRACT

Background: Anatomical knowledge of the larynx region is critical for understanding laryngeal disease and performing needed interventions. Virtual reality is a useful method for surgical education and simulation. However, medical students are confronted with few cadaver-based human anatomy courses because of the increasing student enrolments and the decreasing cadavers. The objective of this study was to build the virtual model and the larynx region based on Chinese visible human (CVH), which can be used for anatomical education and surgical training.

Materials and methods: The segmented cross-section slices of the larynx region were
from Chinese visible human dataset. The laryngeal structures were precisely segmented manually as 2D images, then reconstructed and displayed as 3D images in the virtual reality Dextrobeam system. Using visualization and interaction with the Virtual Reality Maker Language (VRML) model, digital laryngeal anatomy instruction was constructed using HTML and JavaScript languages.

Results and conclusions: The volume larynx models thus display an arbitrary section of the model and provide the virtual dissection function. This networked digital laryngeal anatomy teaching system can be read remotely, displayed locally, and manipulated interactively.

**Keyword:** Larynx; three-dimensional reconstruction; image registration; image segmentation; virtual reality; Chinese Visible Human (CVH)