**ABSTRACT**

The profound and detailed knowledge of the anatomy of the temporal bone is a primordial point for the otologist. This end is gotten through exhausting dissection of temporal bones, assisted surgical training and with surgical experiences acquired along the years. For the surgeon in formation, the use of books and manuals of dissection sometimes don’t allow the understanding of the complex structures as recesses and small structures of the ear and mastoid. We will show in this work the use of Stereoscopic three-dimensional (3D) images of the temporal bone for teaching purposes and documentation, detailing the acquisition method and processing of images. The use of 3D stereoscopic images was shown to be an applicable, easily and useful method applicable in transmission of anatomical knowledge of otologic surgery in our center.

**INTRODUCTION**

The anatomy of the human temporal bone is considered to be amongst the most complex structures in the body. Critical nervous, vascular and another structures are closely related to each other, often by only a few millimeters. An understanding of complex systems such as the transport of sound, facial nerve connections and the structures of the Optic Capsule are an important part of otologic surgery. Long training periods, exhaustive temporal bone dissection and surgical observation have traditionally formed the basis for education. Residents in our training program have had difficulty, at some stage during their education, in comprehending the anatomy when shown through only theoretical anatomy lectures. Three dimensional (3D) images may allow a better understanding of the important relationships among the structures within the temporal bone.

**OBJECTIVES**

a) Demonstrate stereoscopic 3D images of the human temporal bone.

b) Demonstrate 3D anatomical image applications in an ENT resident training program.

**MATERIAL, METHODS AND RESULTS**

Fourteen (14) temporal bones were dissected in the Anatomical Laboratory of the Professor Edmundo Vasconcelos Hospital, São Paulo-Brazil. Two (2) were selected surgical photographs of each temporal bone for the cadaveric specimens selected, by the senior authors, featured important surgically relevant anatomical features. Two (2) digital images of each surgical landmark were taken with a digital camera (SONY Cyber-Shot DSC-W50). The anatomical landmarks chosen were those found in a logical “step-by-step” temporal bone dissection including structures in the middle ear such ossicles, facial nerve and landmarks chosen were those found in a logical “step-by-step” temporal bone dissection. Tridimensional images may allow a better understanding of the important anatomy when shown through only through theoretical anatomy lectures. Three dimensional (3D) images may allow a better understanding of the important anatomy when shown through only through theoretical anatomy lectures. The use of StereoDIC images was shown to be an applicable, easily and useful method applicable in transmission of anatomical knowledge of otologic surgery in our center.

**DISCUSSION**

Tridimensional images have been advocated for a better understanding of selected anatomical structures (5,7,8,10) during medical training. A review of the medical literature reveals several studies/reports of similar use of tridimensional images to facilitate anatomy education (1-10). In the last decade, increasing difficulties in obtaining cadaveric specimens for dissection has limited many residents’ training opportunities. At our institution, we attempted to compensate for this decreasing cadaveric exposure with more didactic lessons but had limited success. The use of tridimensional images in conjunction with our lessons achieved greater comprehension in our theoretical classes. There were minimal difficulties in capturing and generating the images. Standard consumer digital cameras are suitable. The Calipppayan 3D version 2.6 is a freeware program and can be acquired easily from http://www.calipppayan.com/bd.html.

Among the methods used for generating stereoscopic 3D images, a simple and popular technique is the analogical method (1). This was employed in our work and consists of overlaying two digital images of the same structure coloring the images (figure 6) then using a special filter of a similar color used for each image prior to 3D processing (figure 7), usually red and blue (1,12).

**CONCLUSION**

The use of three dimensional imaging during education and training may have its greatest applicability in the complex anatomy of the skull base, in particular, the temporal bone. Using this technique, we were able to provide a comprehensive visualization of the anatomy and allow for a better understanding of complex structures like the tympanic sinus and facial recess of the middle ear. The use of 3D stereoscopic images may enhance resident anatomical knowledge in otologic surgery. These images can be obtained without great difficulty or cost in their production.

**REFERENCES**


