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Anatomical Review and Introduction to the Surgical Approach of the Temporal Bone for Undergraduate Medical Students

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Abstract

Background

Medical students often lack in-depth knowledge of the complex anatomy and surgical techniques used in otolaryngology, which can impede learning on rotations and in the operating room. To address this gap, we developed a temporal bone lab course to provide medical students with exposure to complex anatomy and safe operative techniques well beyond typical medical school curricula.

Methods

The course was comprised of a didactics lesson and a dissection session, emphasizing the exploration of anatomy and the identification of surgical landmarks. Video primers were provided before the lab. The didactics lesson covered surgical techniques and temporal bone anatomy. During dissection, students practiced safe techniques with high-speed drills, microscopes, and microsurgical instruments under faculty supervision. Students completed pre- and post-lab confidence surveys and knowledge questionnaires, with open-ended feedback surveys post-course. The course was made possible through grant funding and interdepartmental partnerships for access to instrumentation and reuse of cadaveric material to reduce costs and provide a replicable course model for future students.

Results

Seven students with no prior hands-on otolaryngology experience participated, all of whom were able to demonstrate the safe use of instruments and drills throughout the course. Most successfully identified key landmarks including the lateral semicircular canal, facial nerve, and incus during dissection. Mean confidence survey and knowledge quiz scores increased from 2.57 to 4.57 out of 5 and 7.43 to 8.43 out of 10, respectively.

Conclusions

This project suggests the effectiveness of a temporal bone lab course for medical students and highlights the potential for further development of similar educational opportunities for surgical skill-naïve students. Early exposure to surgical simulation and complex temporal bone anatomy may allow students to engage more effectively during clinical rotations and as junior residents, both in otolaryngology as well as other medical specialties.

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