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Editorial

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3D Printing: The Shedding of Light Through Surgical Training

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A broad range of additive manufacturing technology is available to develop the orientation and training of surgical anatomy in the field of otorhinolaryngology. In the history of CNT surgical education, 3D-printed simulators created a change, providing new directions in customized interventional treatments.

Compared to other applications, temporal bone dissection simulators dominate the literature . By reviewing the literature until 2017, identifying otologic, nasal, and laryngeal simulators, they extended their research on ENT educational models for surgical procedures. Models for congenital aural atresia practice, endoscopic ear procedures, atrial replacements, nasal and sinus operations and skull base interventions are some of the described subjectsskull base interventions are some of the described subjects

But for the above teaching resources, more peer validation is required, as stated. The anatomically normal and pathological models of the pediatric larynx were training models concerning the laryngeal region described in this research. These simulators have been evaluated favorably for high anatomical precision and low cost, but have proven poor in tissue simulation. More recently, another systematic analysis by Canzi et al. attempted to summarize the literature on 3D-printed ENT surgery educational applications, showing that the majority of studies reported concentrated on otological models for surgical and preclinical education. Compared with 7 and 5 studies in the fields of rhinology and head and neck, 23 studies documenting educational approaches in the field of otology were collected. The studies were also classified according to each field of interest, demonstrating different simulators used for training in temporal bone dissection and endoscopic sinonasal and skull-based training. In order to prevent complications or morbidities, lip and palate cleft repair remains a daunting procedure with elevated surgical time requirements. In order to evaluate its effect on helping medical students understand anatomical relationships, a teaching model of these deformities was developed. This study recruited 67 medical students from various institutions and showed that anatomical lip and palate cleft 3D-printed models were superior to traditional 2D anatomy atlas images.Although the conversion of anatomical image data into printable content has some drawbacks, the low cost of this model, estimated at $32, makes this technique more feasible than other alternatives for use in the curriculum of universities.

With respect to palatoplasties, a clearer understanding of the anatomy involved is the first step in enhancing the knowledge of surgeons. The next move is to simulate this surgical procedure to gain confidence, resulting in better clinical results. A silicone-based cleft palate model that was validated as an educational tool for its fidelity and usefulness was prototyped.Without using excessive manufacturing resources, model features such as anatomical and tissue enforcement can be accomplished, estimating the cost per model lower than $10, enabling low-income health systems to include it in their training programs. In addition, they proposed high reproducibility of these models in different cleft forms, enabling training on various techniques of surgery.

Limitations regarding lack of bleeding, muscular layers, and high time development, however, were highlighted. For inexperienced surgeons, rather than more seasoned ones, this model was of greater benefit. The poor sample size of participants had other limitations. A key aspect of this new paradigm is the ease of transportation, fostering collaboration between many medical departments around the world, improving health outcomes even in developed countries.