Novel low-cost 3D printed microlaryngeal surgery trainer

Training otolaryngologists in microlaryngeal surgery can be challenging due to the delicate nature of the procedures so simulation activities are often used to prepare trainees prior to actual surgery. However, simulation activities may not adequately recreate some aspects of the surgery, such as ergonomics or patient positioning, and whole cadaver specimens are not feasible in many training environments. Prior work in microlaryngeal simulation has shown the feasibility of a tissue mount to enable use of isolated laryngeal tissue. These approaches have had variable success in ergonomic accuracy, cost, and feasibility. We present the development of a low-cost, open access, 3D printed microlaryngeal trainer that enables the use of isolated laryngeal tissue and realistic operative ergonomics during the simulation of microlaryngeal surgery. The trainer is compatible with a wide range of operative laryngoscopes and can be used with a variety of different tissue types. This trainer has successfully been incorporated into an otolaryngology resident simulation curriculum and improved iteratively. A formal study is ongoing measuring the face, content, and construct validity of activities utilizing the trainer. Anticipated results, based on prior pilot work, will demonstrate an easy-to-use, low-cost, open access 3D printed microlaryngeal surgical trainer with validated use during resident education.