

Introduction

Objective: To develop a simulation model for endoscopic endonasal repair of skull base cerebrospinal fluid (CSF) leaks.

Methods

Design: A perfusion human cadaveric model with a deliberate CSF leak was utilized. Trainees performed a standard endoscopic endonasal approach with fluorescein intrathecal administration to repair the CSF leak using a combination of fat, fascia lata, and pedicled nasoseptal flaps.

Setting: USC/Keck School of Medicine Fresh Tissue Dissection Laboratory.

Participants: Neurological Surgery and Otolaryngology Residents, n=15

Main Outcome Measures: A 5-point questionnaire was used to assess pre- and post-training confidence scores

Results

Intrathecal perfusion of fluorescein-dyed saline into the ventricular/subarachnoid spaces served as a realistic model for intraoperative CSF leak repair. Residents developed the psychomotor skills required to achieve CSF leak repair using fat and fascial grafts, in addition to preparation and rotation of vascularized nasoseptal flaps. Fluorescein was useful in confirming adequate repair of the CSF leak in all cases. All trainees reported a realistic experience that was accomplished with the perfusion model.

Conclusions

As endoscopic skull base surgery continues to rapidly evolve, achieving competency in skull base reconstruction and repair of high flow CSF leaks will be an increasingly essential component of the neurosurgical training process. The addition of a fluorescein-dyed intrathecal perfusion system to a cadaveric simulation scenario can produce a realistic training model for developing CSF leak repair skills using various grafts and pedicled naso-septal flaps.

Learning Objectives

Repair of skull base CSF leaks

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