Prospective Evaluation of a Novel Powered Nasal Irrigator Device in the Post-FESS Cadaver Model

R. Peter Manes, MD, Pete S. Batra, MD

From the Department of Otolaryngology – Head and Neck Surgery,
University of Texas Southwestern Medical Center
Dallas, Texas

Introduction: The objective of this study was to evaluate the distribution of aerosol delivered via a powered nasal irrigator device in 5 fresh frozen-cadaver heads (10 total sides).

Methods: The NasoNeb^{TM} nasal irrigator (Medinvent, St. Paul, Minnesota) was used to deliver 10 ml of saline stained with 0.1 ml of 10% fluorescein solution. Aerosol distribution was assessed in 3 clinical trials: (1) unoperated nose; (2) post endoscopic sinus surgery (ESS); and (3) post ESS with endoscopic modified Lothrop procedure (EML). Two independent observers rated the distribution of the fluorescein-dyed saline in the anterior nasal cavity (ANC), olfactory cleft (OC), middle meatus (MM), sphenoethmoid recess (SER), nasopharynx (NP), maxillary sinus (MS), ethmoid cavity (EC), sphenoid sinus (SS), frontal sinus (FS) and frontal neo-ostium (F-NEO).

Results: The irrigator consistently delivered aerosolized saline to the ANC, MM/EC and SER/SS across the 3 trials. A statistically significant increase in delivery was noted in the MS+EC compared to the MM ($p=0.044$) post ESS. In addition, a statistically significant increase in delivery to the F-NEO was noted relative to the FS post EML ($p=0.001$). Multiplicity adjustment done for the ESS group showed statistical superior delivery to the EC vs OC ($p=0.031$) and FS ($p=0.02$) and the SS vs FS (0.031).

Multiplicity adjustment after EML improved delivery to the FS resulting in no statistical difference in aerosol delivery between F-NEO and EC or SS.

Conclusions: The novel irrigator device consistently delivered aerosolized saline to multiple nasal subsites, with improvement in delivery seen to the F-NEO after EML. This has important implications for the delivery of topical medications to the paranasal sinuses and frontal neo-ostium.