

Abstract Submitted
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Perception of Better Nasal Patency Correlates with Increased Mucosal Cooling after Surgery for Nasal Obstruction GUILHERME GARCIA, CORBIN SULLIVAN, Medical College of Wisconsin, DENNIS FRANK-ITO, Duke University, JULIA KIMBELL, University of North Carolina at Chapel Hill, JOHN RHEE, Medical College of Wisconsin — Nasal airway obstruction (NAO) is a common health problem with 340,000 patients undergoing surgery annually in the United States. Traditionally, otolaryngologists have focused on airspace cross-sectional areas and nasal resistance to airflow as objective measures of nasal patency, but neither of these variables correlated consistently with patients' symptoms. Given that the sensation of nasal airflow is also associated with mucosal cooling (i.e., heat loss) during inspiration, we investigated the correlation between the sensation of nasal obstruction and mucosal cooling in 10 patients before and after NAO surgery. Three-dimensional models of the nasal anatomy were created based on pre- and post-surgery computed tomography scans. Computational fluid dynamics (CFD) simulations were conducted to quantify nasal resistance and mucosal cooling. Patient-reported symptoms were measured by a visual analog scale and the Nasal Obstruction Symptom Evaluation (NOSE), a disease-specific quality of life questionnaire. Our results revealed that the subjective sensation of nasal obstruction correlated with both nasal resistance and heat loss, but the strongest correlation was between the NOSE score and the nasal surface area where heat flux exceeds 50 W/m². In conclusion, a significant post-operative increase in mucosal cooling correlates well with patients' perception of better nasal patency after NAO surgery.

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