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Use of Computational Fluid Dynamics Nasal Airflow Measurement to Design Septoplasty: A Pilot Study

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Abstract

Deviation in the nasal septum that obstructs airflow is a source of discomfort to patients. Areas of nasal malformation then, need to be identified before performing surgery. In the present study, the authors introduce the computational fluid dynamic (CFD) technique to predict regions of limited airflow based on CT scan reconstruction of the nasal cavity. The present study proposes to use CFD to identify regions of obstructed airflow and design a surgical procedure to correct them. The authors report three cases with obstructed nasal airflow together with CFD measurements before and after the surgery. Results indicate that CFD is useful to verify the areas of airflow abnormality and conform with the results obtained using other methods.

Keywords: Computational fluid dynamics, Septoplasty, Deviated septum, Nasal obstruction, Nasal airflow

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