

AAO Foundation Award Final Report

Principal Investigator	Ki Beom Kim
Co-Investigator	John Huynh,
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Award Type	AAOF Fellowship Award
Project Title	Pharyngeal Airflow Analysis in Obstructive Sleep Apnea Patients Pre- and Post-Maxillomandibular Advancement Surgery
Project Year	2008
Institution	Saint Louis University
Summary/Abstract (250 word maximum)	<p>The purpose of this study was to evaluate pharyngeal airflow in obstructive sleep apnea (OSA) patients following maxillomandibular advancement (MMA) surgery using computational fluid dynamics (CFD). Computerized models of 4 OSA patients, pre- and post-surgery, were created using cone beam computed tomography scans. CFD was used to model airflow at inspiration rates of 340, 400 and 460ml/s. The relative pressure, eddy viscosity coefficient and total area-averaged pressure drops were selected for comparison.</p> <p>Results show a decrease in airway resistance of over 90% for 3 out of 4 patients. In these three patients, the MMA surgery decreased the Reynolds number in stenotic areas which resulted in lower local turbulence and lower total area-averaged pressure forces required to move a constant volumetric flow between pre- and post-surgery models. CFD analyses on airways of OSA patients provide data that suggest an improvement in airflow following MMA surgery with less effort required for maintaining constant flow.</p>
Were the original, specific aims of the proposal realized?	Yes
Were the results published? If not, are there plans to publish? If not, why not?	2009 Journal of Fluids Engineering
Have the results of this proposal been presented? If so, when and where? If not, are there plans to do so? If not, why not?	Not yet. If I have a chance to speak to a regional or national meeting, I am going to present the results of this and previous studies.