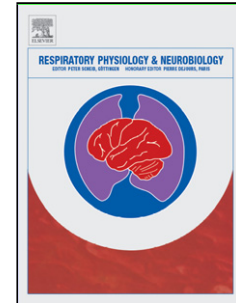


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Study of the Upper Airway of Obstructive Sleep Apnea Patient using Fluid Structure Interaction

Yang Liu^a, Jennifer Mitchell^b, Yitung Chen^{a,*}, Woosoon Yim^a, Wenxiao Chu^a, Robert C. Wang^b

^a Department of Mechanical Engineering, University of Nevada Las Vegas

^b School of Medicine, University of Nevada Reno

* Corresponding author

Department of Mechanical Engineering, University of Nevada Las Vegas
4505 S. Maryland Parkway. Las Vegas, NV 89154-4027
Tel: 702-895-1202
Fax: 702-895-3936
Email: yitung.chen@unlv.edu

Highlights

- Three-dimensional fluid-structure interaction was applied to model one specific patient's upper airway to identifying the precise location of the obstruction.
- Areas that are prone to collapse and precipitate apneic episodes were identified at the tip of the soft palate and base of the tongue, with intrathoracic pressure as low as -1370 Pa.
- This study is the first to completely model the whole upper airway without consideration of the nasal cavity, and can allow virtual modification of the airway prior to actual treatment.

Abstract

Up to 14% of the U.S. population is estimated to have obstructive sleep apnea (OSA), while the outcomes of the treatments have variable results. In the current study, a three-dimensional fluid-structure interaction modeling was applied to simulate the upper airway to identify the precise location, severity, and characteristic of airway collapse. This was accomplished using Simpleware[®] and ANSYS[®] software applied to a 3-D rendering of the airway in a real patient

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