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Effect of genioglossus contraction on pharyngeal lumen and airflow in sleep apnoea patients.

[Oliven A](#), [Tov N](#), [Geitini L](#), [Steinfeld U](#), [Oliven R](#), [Schwartz AR](#), [Odeh M](#).

Bnai Zion Medical Center.

The purpose of this study was to quantify the mechanical effect of genioglossus stimulation on flow-mechanics and pharyngeal cross-sectional area in patients with obstructive sleep apnoea, and to identify variables that determine the magnitude of the respiratory effect of tongue protrusion. Pressure:flow and Pressure:cross-sectional area relationships of the velo- and oropharynx were assessed in spontaneously breathing Propofol-anesthetized subjects, before and during genioglossus stimulation. Genioglossus contraction decreased the critical pressure significantly from 1.2 ± 3.3 to -0.7 ± 3.8 cmH₂O ($p < 0.01$), with the individual decreases ranging from -0.6 to 5.9 cmH₂O. Pharyngeal compliance was not affected by genioglossus contraction. The pharyngeal response to genioglossus stimulation was related to the magnitude of advancement of the posterior side of the tongue, but not to the severity of sleep apnoea, critical pressure, compliance or the shape and other characteristics of the velopharynx. Genioglossus contraction enlarges both the velo- and the oropharynx, and lowers the critical pressure without affecting pharyngeal stiffness. The response to genioglossus stimulation depends on the magnitude of tongue protrusion achieved, rather than on inherent characteristics of the patients and their airway.

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