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LETTER TO THE EDITOR

In reply to Xu: the role of upper airway morphology in apnea versus hypopnea predominant obstructive sleep apnea patients: an exploratory study

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(The Editors do not hold themselves responsible for opinions expressed by correspondents)

To Editor,

We would like to thank Dr Jintao Xu for the interest shown in our paper. The letter written by Dr Jintao Xu about our article requires some points of clarification about the patient's head position during the CT scanning.

The standard paranasal sinus CT position routinely used in our clinic was also used for obstructive sleep apnea (OSA) patients in this study. All patients were lied on a 64 multidetector CT scan table in the supine position (for both head and trunk). While the patients were awake, in the case of mouth closed and slowly breathing from nose and in neutral position of the head and neck (without extension or flexion of neck), CT images were obtained. They were warned to do not move and swallow. One-millimeter slices of reformatted coronal and sagittal sections in axial images were obtained by the software. The reference anatomic landmarks related to the upper airway morphology such as anterior nasal spine and posterior nasal spine need to be identified on the midsagittal plane for defining accurately the superior and inferior borders of velopharynx. When a precise right midsagittal plane is identified, the anatomical points for the upper airway measurements are standardized for each patient. If the midsagittal plane of upper airway is not on the desired anatomical landmarks, sagittal sections on coronal images were re-oriented using tilt or rotation to find the correct plane.

When considering the subjects have not always an excellent symmetric facial skeletal anatomy or surface, we think that it is necessary for only

a few degrees of correction in coronal image to find appropriate midsagittal plane. In otherwise, the results would not be reliable when the standard anatomical landmarks are not used for the upper airway measurements based on CT was repeated.

On the other hand, different head and neck positions of subjects can cause different volumetric measurements in the upper airway. In normal subjects with a three different head/body position ("supine", "supine with the head rotated" and "lateral recumbent"), significant volumetric changes in the retroglossal region were obtained in MRI.¹ In a recent study, the upper airway volume was assessed by cone beam CT with the patients sitting in upright position or by multidetector CT while lying in supine position and highest degree of variation with the postural change was determined in the oropharynx.² Postural movements observed in oropharyngeal structures were defined by the effect of gravity. Cone beam CT images of OSA patients in supine vs upright position described the significant difference in total volume and cross-sectional area of upper airway.³

In conclusion, key measurements of upper airway in a standard supine head position derived from multidetector CT, which are closely related to reference anatomic landmarks are reliable and reproducible.

Kind Regards,

Dr Tülay Özer

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