Evaluation of tongue volume and oral cavity capacity using cone-beam computed tomography

Xuefang Ding, author

Abstrak

ABSTRACT
The aims of this study were to reveal the usefulness of a newly developed method for measuring tongue volume (TV) and oral cavity capacity (OCC) and to assess the relationship between them. The tongue was coated with a contrast agent, and the TV and OCC were determined using cone-beam computed tomography (CBCT). We enrolled 20 adults who were scheduled to undergo CBCT to evaluate the relationship of the third molar roots to the alveolar nerve before molar extraction. Each participants tongue was coated with a contrast agent, and CBCT of the tongue and oral cavity was performed. Using computer software, we evaluated reconstructed 3D images of the TV, oral cavity proper volume (OCPV), and OCC. The mean TV was 47.07 ± 7.08 cm3. The mean OCPV and OCC were 4.40 ± 2.78 cm3 and 51.47 ± 6.46 cm3, respectively. There was a significant correlation between TV and OCC ($r = 0.920$; $p < 0.01$) but not between TV and OCPV. The mean TV/OCC ratio was 91 ± 5%. The proposed method produced CBCT images that enabled effective measurement of TV and OCC. This simple method of measuring TV and OCC will be useful in the diagnosis on the tongues with abnormal size.