Institute of Experimental Morphology, Pathology and Anthropology with Museum
Bulgarian Anatomical Society

Acta morphologica et anthropologica, 23
Sofia ● 2016

Intra- and Interobserver Measurement Error of Linear Measurements on Three-dimensional Computed Tomography Models of Dry Mandibles

D. Toneva[1], S. Nikolova[1], I. Georgiev[2,3], A. Tchorbadjieff[3]

[1] Institute of Experimental Morphology, Pathology and Anthropology with Museum, Bulgarian Academy of Sciences, 1113 Sofia, Bulgaria
[2] Institute of Information and Communication Technologies, Bulgarian Academy of Sciences, 1113 Sofia, Bulgaria
[3]Institute of Mathematics and Informatics, Bulgarian Academy of Sciences, 1113 Sofia, Bulgaria

The study aimed to establish the precision of linear measurements taken on 3D models of human mandibles created by computed tomography and to compare the measurement error with the one obtained for the corresponding measurements taken directly on the dry mandibles. Ten mandibles were scanned through computed tomography. The polygonal models in STL format were generated using VG Studio Max 2.2 software. Ten linear measurements were taken on both dry mandibles and 3D models. The conventional measurements of the mandibles were taken with a digital caliper and the digital measurements were accomplished on the 3D models using the software Geomagic Verify Viewer. All parameters were measured twice by two observers. The intra- and interobserver measurement error was estimated using the technical error of measurement and the reliability of the mandibular measurements was assessed with the coefficient of reliability. All digital measurements showed acceptable measurement error. According to the coefficients of reliability, most of the digital measurements had values above 0.95, indicating high reliability.

Key words: 3D models, mandible, computed tomography, technical error of measurement, coefficient of reliability.