Morphometric Characteristics of rat Mandibular Bone: Radiologic Study of a Widely Used Animal as Experimental Model Through CBCT

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Abstract

The rat jaw is one of the most interesting anatomical structures in dental science research, due to its similarity to the human jaw. The aim of this study was to morphometrically characterize the mandible of rats by CBCT. The cone beam examination of 20 healthy adult female rats was analyzed. Using the examination software, it was possible to isolate the right and left mandible from the other structures and adequately perform the morphometric measurements of interest. In the comparison of both sides, only two measures presented significant differences. The distance from the deepest point of the sigmoid notch to the deepest point of the notch at the lower margin of the mandible was greater on the left side than on the right. And the distance between the most superior point of the condyle to the mandibular base, in the perpendicular projection of the mandibular plane, was greater on the left side than on the right. According to the measurements obtained, we can determine that the rat jaw is an elongated structure, with larger dimensions in the anteroposterior direction compared to the vertical measurements. Knowledge of the anatomy of the rat mandible and its variations per side allows researchers to have adequate references for studies involving this structure, such as research that requires the application of anesthetic techniques, study of orofacial pain, pathophysiological study of the TMJ, study of bone growth, testing of dental biomaterials or in the study of pathophysiological processes related to dental or periodontal tissues. The rat mandible is a good animal model due to its reproducibility and low cost. The right and left mandible are similar in their anteroposterior dimensions, but not the vertical ones.

Author keywords

Animal model; Cone-beam computed tomography; Morphometry; Rat mandible