Journal Article

Converting conventional radiographic examination data of trabecular bone pattern values into density measurement values using intraoral digital images

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Abstract
Objectives To determine the conversion value of grayscale density measurements from intraoral conventional radiographic examinations of the edentulous maxilla and mandible using intraoral digital radiography.
Methods Periapical radiography examinations with a pararelling technique, both conventional and digital, were performed on 18 male and 34 female patients with edentulous maxillas and mandibles. The trabecular bone pattern of 42 maxillary and 61 mandibular regions of interest (ROIs) was classified into five grades. Grayscale density measurements were made within a marked area of the ROI in the image of the periapical digital radiograph in the same corresponding trabecular region. To obtain conversion values, including the effects of age, gender, and region

an analysis was made to develop regression equations.
Results The kappa value for intra- and interobserver differences was 0.71–0.85. The strength of the radiographic conventional value to predict the grayscale density measurement of digital radiography was gained from the regression analysis, with R^2 = 0.75–0.8. The regression equation for the maxilla and the mandible were separated, and the age, gender, and region of the jaws were included.
Conclusions Conventional intraoral radiographic values of the trabecular bone pattern can be converted to values of grayscale density measurements from intraoral digital radiography. The regression equation for the conversion was obtained by including the effects of age, gender, and region of the jaw.

Keywords Conversion value - Density measurement - Intraoral conventional radiography - Digital radiography - Regression equation

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