Assessment of Radiologists' Agreement on Measurement of Alveolar Bone Dimension in Tomography before Implant Surgeries

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Abstract

Statement of Problem: Different imaging modalities are used for diagnostic objectives in implant treatment and the results are interpreted using individual subjective measurements. The significant differences among the observers' interpretation may result in various treatment outcomes.

Purpose: The present study was done to assess the radiologists' agreement on measurement of alveolar bone dimensions in tomographies before implant surgeries.

Materials and Method: In this observational diagnostic study, 30 digital conventional tomography images in a dental implant clinic were displayed on a monitor and four observers assessed them using "Digora for windows" software. The length and width of the alveolar bone in the implant recipient site were determined by the observers independently. The data were analyzed using paired T-Test and variance for repeated measures.

Results: The means of the predicted length of the alveolar bone were 30.33, 31.48, 30.63 and 30.8 mm and those for the width were 12.0, 11.63, 12.13 and 7.82 mm, as estimated by each observer. The mean predicted value for the width of the implant recipient site was significantly different among observers (p <0.0001), but no significant difference was found for length. The observers' agreement in width assessment with 1mm difference was 3.3% to 40% and 10% to 73.3% with 2mm difference. The observers' agreement in the length detection was 16.7% to 33.3% with 1 mm difference and 33.3% to 60% within 2 mm difference. A higher observer agreement was found in the prediction of the alveolar bone length compared to the width.

Conclusion: The results of the study show that the observers' agreement on detecting the alveolar bone length and width in the implant recipient site is not acceptable. However, a slightly higher agreement was estimated for the length of the alveolar bone as compared to the width.

Key words: Agreement, Alveolar bone length and width, Tomography radiographs