Original Article

Relationship between Facial Alveolar Bone Thickness and Root Position of Maxillary Anterior Teeth Using Cone Beam Computed Tomography

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Abstract

This study purposed to assess the average of the facial alveolar bone thickness at the facial root surface of the maxillary anterior teeth, along with its relationship to the root position by using cone-beam computed tomography (CBCT) in a group of Thai population. Seventy CBCT scans (420 teeth) were randomly selected from the CBCT database at School of Dental Medicine, Rangsit University. The exclusion criteria were the subjects with extensive dental caries, fixed coronal restoration, severe root resorption, and destructive periodontal disease in maxillary anterior region. After recruitment, 406 teeth were used to measure facial alveolar bone thickness and sagittal root position (SRP). The data of the facial alveolar bone thickness was collected in cross-sectional dimensions. The measurements were performed at three reference points, which were 4 mm apical to CEJ (R1), midpoint between 4 mm to CEJ and mid-root (R2), and mid-root (R3). The results revealed that the facial alveolar bone thickness seemingly decreased apically in every type of tooth. The mean facial bone thickness of maxillary teeth was between 0.67±0.75 to 1.04±0.67 mm. The majority of examined teeth in this study exhibited Class I SRP (overall 92.87 %; central incisor 93.87 %, lateral incisor 89.85 %, and canine 95.56 %). Class II SRP was found to be 5.4 %, 5.22 % and 2.27 % in lateral incisor, central incisor and canine respectively. Class IV SRP was found only 1.73 % (lateral incisor 1.45 %, central incisor 1.50 % and canine 2.22 %). But Class III SRP did not present in this study. Simple correlation test showed no statistically significance between the facial alveolar bone thickness and root position. In conclusion, the anterior maxillary teeth have a high prevalence of thin facial alveolar bone wall. These findings may consider risking of facial alveolar bone dehiscence, fenestration or soft tissue recession after immediate implant placement. The majority of the root position is SRP class I which is favorable for the implant – alveolar bone engagement of immediate implant placement.

Keyword: Facial alveolar bone thickness, Root position, Dental cone beam computed tomography, Anterior maxilla