ALVEOLAR RIDGE DIMENSIONS IN MANDIBULAR POSTERIOR REGIONS: A RETROSPECTIVE COMPARATIVE STUDY OF DENTATE AND EDENTULOUS SITES USING COMPUTERIZED TOMOGRAPHY DATA

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Sufficient alveolar bone volume and favorable architecture of the alveolar ridge are essential to obtain ideal functional and esthetic prosthetic reconstruction following implant therapy. Following tooth extraction the alveolar socket undergoes to a modeling process. This modeling process results in a narrower and shorter ridge [Pinho et al. 2006, Bressan et al. 2016] and the effect of this resorptive pattern is the relocation of the ridge to a more palatal/lingual position. In the mandible, the alveolar ridge resorption is usually more rapid in the premolar and molar region than in the anterior region, because of the lower position of the reversal line.

to comparatively evaluate ridge dimensions at edentulous and dentate mandibular posterior sites.

Computerized tomography scans of 45 patients (22 males; mean age: 54.5 ± 10.9 years, range: 24–71 years) with one edentulous lacuna (including at least two adjacent teeth among second premolar, first molar and second molar) and the contralateral dentate sites were analyzed. On the panoramic slice of each CT scan, a digital line parallel to the CT scan plane was traced passing through the CEJ of the homolateral canine or first premolar. This digital line was visualized on the section of interest (SOI) of dentate and edentulous sites as a reference point (P) to perform vertical linear measurements. On the SOI of edentulous and contralateral dentate sites, the following recordings were performed: relative ridge position (rRP), measured as the distance (in mm) from P to the most coronal point of the alveolar crest (in dentate sextants) or the ridge (in edentulous sextants) (hcrest); bone height (BH), measured as the distance (in mm) from hcrest to the most coronal point of the inferior alveolar canal; bone width (BW), measured as the width (in mm) of the alveolar crest recorded 1 mm (BW1mm), 3 mm (BW3mm) and 5 mm (BW5mm) apically to hcrest; alveolar canal height (ACH), measured as the distance (in mm) from the most coronal point and the most apical point of the inferior alveolar canal; basal bone height (BBH), measured as the distance (in mm) from the most apical point of the inferior alveolar canal to the inferior border of the mandible.

At all positions (i.e., second premolar, first molar and second molar), edentulous sites showed a significantly higher rRP, a lower BH, and a lower BW1mm compared to dentate sites. BW3mm and BW5mm were significantly lower at second premolar and first molar edentulous sites compared to their dentate counterparts. At first molar and second molar, edentulous sites showed a significantly lower ACH compared to dentate sites (p≤ 0.001). The mean difference in BH, rRP, BW1mm, BW3mm and BW5mm between dentate and edentulous sites was not significantly different between males and females. The proportion of patients with sufficient bone dimensions for implant placement without any bone augmentation procedure was 45.8%, 75.5% and 72.4% at second premolar, first molar and second molar edentulous site, respectively. The proportion was always lower in females than in males.

In the posterior mandible, edentulous sites showed lower bone height when compared with contralateral dentate sites. Second premolar and first molar edentulous sites exhibited lower bone width than dentate sites at all positions (i.e., 1, 3 and 5 mm apical to the bone crest), while this difference was more attenuated at second molar sites. The magnitude of the difference between edentulous and dentate sites seems not to be dependent on gender.