CBCT Evaluation of Bone Density in Maxillary Canines and Premolars Area in Patients with Periodontitis

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Objectives: to evaluate alveolar bone density in maxillary canines and premolars areas in patients with periodontitis according to cone-beam computed tomography examination.

Materials and methods: 42 cone-beam computed tomograms of adult patients with generalized and molar-incisor pattern periodontitis aged from 19 to 58 years (mean age 37.8±12.3) were obtained and examined at Dental Medical Center of Bogomolets National Medical University. Measurements of CBCT bone density of 3 mm^2 area of medullar, vestibular and palatal cortical bone surrounding maxillary canines and premolars were made by InVesalius v.3.1 software. Results in Hounsfield units (HU) were presented as means and standard deviations and statistically analyzed with t-test using MedStat v.5.2 software. Statistical significance was set at $p<0.05$.

Results: The mean values of CBCT bone density were as follows: 634.5±272.5 HU (medullar bone), 1524±305.4 HU (vestibular cortical bone), 1312±260.3 HU (palatal cortical bone) in canines area and 512.4±167.6 HU (medullar bone), 1452±305.7 HU (vestibular cortical bone), 1088±222.7 HU (palatal cortical bone) in premolars area. There was not revealed statistically significant difference in bone density values between maxillary canines and premolars areas.

Conclusions: even though the values of bone density of individual patients in canines area were a little bit higher than in premolars area, it was not found a statistically significant difference between bone density values in maxillary canines and premolars areas among examined population. Further research is needed in order to find more evidence and use bone density values for prognosis of periodontitis course and treatment planning.

Keywords: cone-beam computed tomography, bone density, periodontitis, cuspid, bicuspid.

The authors declare the absence of any conflict of interest.

Fixed Partial Dentures Supported By Mini Dental Implants: Case Report

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Introduction: Many patients prefer fixed partial dentures (FPDs) to replace missing teeth. However, lack of bone volume, deficiency in interdental space, financial resources, compromised health, are predominant factors that prevent patients from receiving FPDs by standard sized implants (SDIs). The introduction of mini dental implants (MDIs) has created more treatment options for a variety of clinical situations. This case report presents the MDIs supporting FPD in the mandibular incisor region.

Case description: A 65-year-old patient came to the clinic requesting mandibular incisor replacement. In the maxilla patient was missing posterior teeth and wearing removable partial denture. Upon clinical and cone-beam computed tomography (CBCT) examination, buccolingual bone width on the anterior mandible was found to be less than 5 mm. The patient declined SDIs supporting FPD due to the need for additional surgery and cost, so an alternative treatment option using three MDIs supporting FPDS was presented and approved by patient. Provisional acrylic bridge was made. After osseointegration final splinted metal ceramic restorations was made and cemented using a zinc phosphate cement. The MDIs supported FPDs have been in function successfully for 10 years. Marginal bone loss (MBL) was very low during the observation period.

Discussion: In this case report, 3 MDIs were placed in the incisor's site of the anterior mandible due their narrow diameter to avoid long-lasting treatment procedures needed for SDIs placement. MDIs were splinted to withstand MBL and/or implant body fracture. Namely, MDI is a one-piece implant without any abutment screw and the same force that causes screw loosening with SDI possibly may cause these complications. Small amounts of MBL recorded could also be due to low occlusal forces and higher bone density in the anterior mandible. The MDIs have been shown to be a predictable treatment option for the replacement of mandibular incisors for this patient.

Keywords: mini dental implants, fixed partial denture, one-piece implants, inadequate bone volume There is no potential conflict of interest.

Acknowledgment: To Croatian: Scientific Foundation for Funding Project No. 1218 from 2015 to 2020„Mini Dental Implants"