A Clinical Method for Prediction of Alveolar Bone Mineral Density in the Area between the 2nd premolar and 1st molar in Iraqi Adults with Class I Occlusion

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ABSTRACT

Orthodontic mini-implants are increasingly used in orthodontics and the bone density is a very important factor in stabilization and success of mini-implant.

The aim of this study was to observe the relationship among maximum bite force; body mass index; face width, height; masseter muscle length, width and thickness; and bone density in an attempt to predict bone density from these variables to eliminate the need for CT scan which have a hazard on patient.

Computed tomographic images were obtained for 70 patients (24 males and 46 females) with age range 18-30 years. The cortical and cancellous bone density was measured between maxillary and mandibular 2nd premolar and 1st molar at two levels from the alveolar crest (3 and 6 mm). Face height and width and masseter muscle length, width and thickness were measured from CT. Clinically; Maximum bite force was measured on first molar region unilaterally by a digital device. The sample was divided into two groups according to the body mass index into; normal and overweight.

The results that were obtained showed that there were no significant differences in bone density or maximum bite force in both genders. Only the cortical bone density in maxilla in overweight group tended to be higher than normal body mass index group. The face width and height correlated significantly negatively with or maximum bite force which correlated significantly positively with cortical bone density and masseter muscle width.

It was concluded that a prediction of cortical bone density of preselected areas can be made from maximum bite force, body mass index and inter-zygomatic width.