

**Republic of Iraq
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Mandibular Radio-morphometric indices and alveolar bone evaluation in pre-implanted area for osteoporotic females using Cone Beam Computed Tomography

A thesis submitted to the college of dentistry, University of Baghdad
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Abstract

Background: Osteoporosis is a common metabolic bone disease recognized by decreased bone mineral density and increased risk of fractures especially of the hip, spine and wrist, it occurs more in females. On the other hand Cone Beam Computed Tomography is an imaging technique that resemble Computed Tomographic scan, but it is cheaper and gives very good and sharp images with much less radiation. This technique is often used in dental implantation as a routine examination.

Aim of the study: This study aims to use Cone Beam Computed Tomography measurements as a method for early predicting of patients with osteoporosis. Also to evaluate some of mandibular radio-morphometric indices, radiographic density and alveolar bone height in pre-implant site using Cone Beam Computed Tomography in healthy and osteoporotic females detected by Dual Energy X-ray Absorptiometry (DEXA) analyzing. And lastly to differentiate between the aging effect on mandibular bone in comparison with postmenopausal osteoporosis effect.

Materials and Method: Sixty females were divided according to their age and bone mineral density status into three groups: Group1 (non-osteoporosis 20-30 years old), Group2 (non-osteoporosis 50 years old and above), and Group3 (osteoporosis 50 years old and above), Cone Beam Computed Tomography scan was done for each patient and gonial angle index, mandibular cortical width at mental foramen, radiographic density, and alveolar bone height were studied.

Results: Using Receiver Operating Characteristics (ROC) curve analysis, Radiographic Density had the best diagnostic reliability for osteoporosis with excellent results (AUC=0.914), followed by mandibular cortical width which gave very good results (AUC=0.890), alveolar bone height was only sufficient

with non-significant result ($p < 0.05$) whereas gonial angle index had no relation to osteoporosis.

Conclusion: Using Cone Beam Computed Tomography Radiographic Density and Mandibular Cortical Width can be beneficial in predicting patients with osteoporosis with high reliability.

This would give benefit in elevating the success rate of the implantation.