

**Republic of Iraq  
Ministry of Higher Education  
and Scientific Research  
University of Baghdad  
College of Dentistry**



**Relationship between the Bone Density estimated by  
cone-beam computed tomography and the primary  
stability of dental implants by using implant stability  
meter IST®.**

A Thesis

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By

**Mustafa Faisal Al-Jamal**

B.D.S.

Supervised by

**Assist. Prof. Dr. Hassanien Ahmed Al-Jumaily**

B.D.S,C.A.B.M.S

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## **Abstract**

**Backgrounds:** The use of dental implants to restore edentulous parts of the jaws is a common and well-documented treatment method which becomes widespread after osseointegration has been introduced, effective dental implants treatment is known to be affected by both the quality and the quantity of bone required for implant placement, bone quality is a critical factor to consider when predicting stability of implants. Thus, stability of the initial implant and the possibility of early loading could be predicated using CBCT scans & primary stability parameters before implant placement.

**Objectives:** The aims of this study was to objectively assess bone density values obtained by CBCT. and to determine the correlations between bone density and primary stability of dental implants and insertion torque. Evaluate Implant stability meter device analysis immediately after implant placement and to explore possible correlations among these parameters

**Material and Methods:** A total of 40 implants were placed in 16 patients (9 males and 7 females with mean age group  $(40.44 \pm 12.31)$  years) (range: 22-61 years). The bone densities of implant recipient sites were preoperatively recorded using CBCT. The maximum ITV of each implant was measured during implant placement. Then compared to the primary stability for every implant using implant stability meter device IST®, to evaluate the relationship among these parameters.

**Results:** A statistically significant correlation were found between bone density values from CBCT, primary implant stability and insertion torque.

**Conclusions:** This study demonstrated, Bone density assessment using CBCT is an efficient method and significantly correlated with primary implant stability using implant stability meter (Any check device ®) and insertion torque.