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Dental Implant Monitoring Using Resonance Frequency Analysis (RFA) and Cone Beam Computed Tomography (CBCT) Measurement

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Abstract

Dental implants commonly practiced replacing edentulous teeth. However, it is still challenging to evaluate the progress of osseointegration during the healing process after implant placement. This study aims to measure the implant stability of pre- and post-crown placement to monitor osseointegration during the healing process and correlate it with the bone quality and quantity and other parameters. Resonance Frequency Analysis (RFA) method as a standard method has been used to monitor implant stability. Ten patients from Hospital Universiti Sains Malaysia have been involved with and treated by immediate implant placement procedures on their mandibular jaw system. Monitoring was also conducted by measuring the density of bone estimated based on Cone Beam Computed Tomography data. On the basis of the study, RFA and density monitoring show that there are at least three classes of patients: Class 1 are the patients who have a significant increment of implant stability; Class 2 are the patients with constant implant stability; and Class 3 are the patients who have negative implant stability progress, or their implant stability was decreasing. On the basis of the result, monitoring of implant stability by measuring the density is still challenging, the correlation between secondary implant stability and density is not significant statistically. It is recommended in future research to evaluate the implant stability by involving more patients from different races and also correlating the implant stability with the dynamic properties such as stress distribution. © 2020. All Rights Reserved.

Author Keywords

CBCT; Density; Dental implant; Osseointegration; RFA

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