The Effect of Combined Conventional-Piezosurgery Implant Site Preparation on Implant Stability: A Randomized Controlled study

A Thesis

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Abstract

Background: Stability is required clinically for long-term implant success, it relies on the quantity and quality of surrounding bone, implant topography, and the surgical procedure used. The surgical technique of implant site preparation is considered as one of the essential factors influencing osseointegration and dental implant success.

Aims of the study: this study aims at comparing the effect of conventional implant site preparation technique and a combination of conventional-piezosurgery preparation on implant stability measured at different time intervals, insertion torque and preparation time.

Materials and methods: A randomized controlled study was designed, it included (26) patients (17) females and (9) males aged from (19-65) years old. They received (54) dental implants randomly assigned to two groups; in the control group, (28) implants were installed after conventional preparation with drills whereas the study group received (26) implants after combined conventional-piezosurgery preparation. The outcome variables included; implant stability measured immediately after implant insertion, at 8 weeks and at 16 weeks postoperatively, insertion torque and preparation time. All investigated variables were analyzed statistically using the paired and unpaired Student t-test for two independent means, the X^2 test, Fisher's exact test, analysis of variance (one-way ANOVA) and Mann-Whitney U test, the differences were considered significant at $P \leq 0.05$.

Results: implant stability showed a similar pattern in both groups which consists of a statistically significant decrease in ISQ values at 8^{th} week

followed by a statistically significant increase at the 16th week, where the ISQ values return close to those of primary stability. The two groups revealed a statistically not significant difference in insertion torque and implant stability changes throughout the study period, whereas the preparation time was significantly longer in the study group than the control group.

Conclusions: Within the limits of this study, combined conventional-piezosurgery method of implant site preparation offers no additional advantage to the conventional drilling method in terms of values of insertion torque and patterns of implant stability change throughout the healing period.