

Description

Title: 1028 - Osseodensification Burs: Impact on Implant Insertion and Removal Torque

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Abstract:

Objectives: Osseodensification (OD) is a biomechanical bone osteotomy preparation technique that uses specially designed burs (Densah® bur, Versah LLC, Jackson MI) that preserve and compact autograft alveolar bone in the osteotomy preparation site. OD has been reported to enhance bone density and bone-to-implant contact and also to increase implant insertion torque (IT). IT measured at time of implant placement is associated with primary mechanical stability. A failure to achieve primary stability results in implant micro-motion yielding lower implant success and survival rates. Low-density alveolar bone is associated with the lowest implant success/survival rates when implants are placed with conventional osteotomy preparation techniques. This study examined the effects of OD versus conventional osteotomy drilling technique on initial insertion torque and removal torque of dental implants placed in low-density human cadaveric bone.

Methods: Eight human cadaveric edentulous jaws were block sectioned and imaged with CBCT (iCAT Next Generation Hatfield, PA) to measure their bone density. OD osteotomies (N=7) were prepared (1200 RPM/water irrigation) using the Densah bur "cut-cut/densify-densify" protocol. Conventional osteotomies (N=7) were prepared (1200 RPM/water irrigation) using a Taper Kit for the 4.5x10mm Hiossen ET-III dental implant (Hiossen Inc., Fairless Hills PA). Fourteen implants were randomly placed into osteotomies using the Hiossen ratchet wrench and insertion torque values were measured with an analog torque wrench (Sanhe Measuring Instrument Co., Ltd). One sample for each group had removal torques values measured. Results were analyzed using a Student's T-test with $\alpha=0.05$.

Results: One control sample was removed from the study due to excess cortical bone. Raw initial insertion and removal torque values for implants placed into OD sites were higher than values for implants placed into conventionally prepared osteotomies, although the difference did not rise to the level of significance. Further samples and analyses are underway in our laboratories.

Conclusions: Use of the OD technique may provide greater enhancement of initial stability for implant placement in low density human alveolar bone.

Table(s):

	Test Group: Osseodensification	Control Group: Conventional Osteotomy
Initial Insertion Torque (N/cm)	48.28 ± 10.05	26.67 ± 15.85
Immediate Removal Torque (N/cm)	66.0 ± 3.3	19.0 ± 0.95

Student Presenter

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