

Osseodensification increases primary implant stability and maintains high ISQ values during first six weeks of healing.

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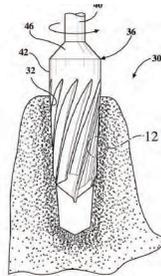
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INTRODUCTION

- Implant stability is critical for osseointegration
- Surgical technique, bone quantity and quality, and implant design all affect primary stability since bone-implant contact provides initial mechanical stability^{1,2}
- Maintaining bone during the osteotomy preserves bone density, leading to increased bone-implant contact, increased primary mechanical stability, and accelerated healing^{3,4}
- Secondary implant stability is affected by bone modeling/remodeling, implant surface characteristics, and primary stability⁴
- Higher insertion torque values (ITV) result in reduced micromotion, which is indicated by higher implant stability quotients (ISQ)^{5,6}

SUMMARY

Osseodensification (OD) is a non-excitation osteotomy preparation method. Unlike traditional standard drilling, Osseodensification compacts and auto-grafts bone in its plastic deformation phase. Osseodensification maintains and conserves bone density and creates more bone-implant contact resulting in higher insertion torque values, higher ISQ values over six weeks, and earlier restorative loading capability.

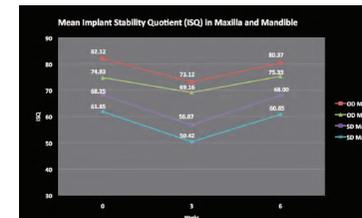


METHODS

- 77 consecutive private practice patients consented to receive 120 implants utilizing osseodensification
- 12 of those patients required two or more implants and consented to having one implant placed using Standard Extraction Drilling (SD) and the other placed using Osseodensification (OD)
- 28 implants of two different macro designs were placed—16 mandible, 12 maxilla (SD group 14 implants, OD group 14 implants)
- Each osteotomy was prepared to a diameter of 0.2-0.5mm less than the implant body diameter
- Insertion torque peak values (ITV) were recorded using torque indicator
- Implant stability quotients (ISQ) were measured at placement and weekly for 6 weeks with Osstell ISQ meter. The average value of buccal, lingual, mesial, and distal was recorded.
- OD implants were subjected to 30Ncm reverse torque test (RTT) at 4 weeks (mandible) / 6 weeks (maxilla)
- Paired T test was performed to analyze results

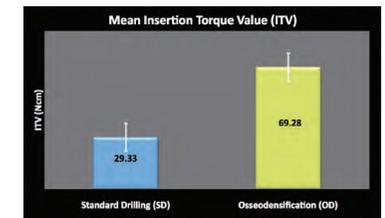
RESULTS

- 28 implants osseointegrated and were successfully restored
- OD implants subjected to reverse torque test displayed no detectable movement/rotation or patient discomfort
- Osseodensification produced higher ITV and ISQ throughout healing (P < 0.0001) with less of a decrease in ISQ at 3 weeks when compared to standard extraction drilling



DISCUSSION

- According to Trisi et al, immediate implant loading can be recommended when ITV is at least 45Ncm and ISQ is at least 68^{5,6}
- Osseodensification technique can be recommended to enhance primary stability and possibly allow for earlier loading due to higher ITV and ISQ than standard extraction drilling
- Further study is needed to validate the predictability of early loading using Osseodensification



Edentulous ridge #12-14 (12 weeks after extraction of tooth #14)



Completed osteotomies (#14 OD was not included in study due to indirect sinus lift)



Implant placement #12,13,14



Implant placement #12,13,14



ISQ values for sites #12, 13, 14



Osseodensification facilitates indirect sinus autograft



Final Denshaq burrs at sites #13,14 with indirect sinus lift at site #14



Implant placement #12,13,14



Final restoration #12,13,14 (10 weeks after implant placement)



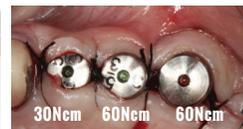
Osseodensification of site #14



Peak ITV was measured with torque indicator (15-80Ncm)



Initial and weekly ISQ readings of SD and OD implants were recorded with Osstell meter



Single stage implant surgery



Final restoration #12,13,14 (10 weeks after implant placement)

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Disclosure

Dr. Huwais is the inventor of the Denshaq bur system
Dr. Olin is the scientific research and development advisor at Versah

References

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