Osseodensification is a Novel Implant Osteotomy Preparation Technique That Increases Implant Primary Stability By Compaction and Auto-grafting Bone

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Introduction

- Bone-implant primary stability is crucial for osseointegration.
- There are many factors which can affect stability, including surgical technique and bone quality.
- The bone-implant interface is linked directly to the histological structure of bone and BMD.
- Maintaining sufficient bone bulk and density during the implant site preparation is essential to achieve necessary initial bone-implant contact and biomechanical stability.

Densah® Bur Technology

Densah® Bur is a new, multi-fluted osteotome design that can be used to prepare an implant site in bone by removing bone (analogous to a standard rotary bur), or through non-extraction bone preparation when rotating in the reversed, non-cutting direction.

The objective of this study was to validate a novel non-extraction bone preparation technique that is highly controllable, fast and efficient, which we have termed “Osseodensification”.

Results

- No difference in ISQ between groups.
- 3°C increase during drilling and 6°C for OD.
- OD Ø was 0.5 mm smaller than ED Ø.
- BMD increased around the periphery and bottom of OD holes.
- Bone particles auto-grafted into walls and bottom, creating smoother OD holes.
- Bone-implant contact area was increased ~3x for OD versus SD.

Discussion

- Osseodensification has similar clinical safety to drilling when proper rotary speed, penetration speed and irrigation are used.
- Osseodensification creates a smaller hole than drilling due to recovery of elastic strain and creates a densification crust by compacting and auto-grafting bone along the entire depth of the hole.
- Osseodensification increases the bone-implant contact and primary stability.