

Immediate loading of the upper right lateral and central incisors

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Fig. 1



Fig. 2

Introduction

In recent years, greater biomechanical demands have been placed on restorative solutions as the use of implants for single-tooth replacement in posterior regions of the mouth has become more widespread and new restorative designs based on axial and tilted implants have been introduced. These restorations require a stronger connection in order to withstand higher torque, lateral loading stress and to minimize forces on the retaining screw and prosthetic components.

Internal connection components

In order to improve the biomechanical characteristics of the complete restoration, the internal connection concept was introduced to the world of implant design; but in its first iterations, the internal connection compromised the strength of both the connection and the implant itself.

Finite element analysis reveals that stresses resulting from functional loading are concentrated in the neck area of the implant. Up until now, internal connections have exacerbated this stress due to the weakness of implant walls and deficient load distribution to the bone, resulting from the designs themselves. The wall thickness of the implant in the critical stress zones has to be able to resist material fatigue and breakage under prolonged use while neither sacrificing "osseointegratable" threads at the neck nor reducing the diameter of the connecting screw.

Case presentation

In the following commentary, I would like to share a case of anterior restoration in a 50-year-old



Fig. 3



Fig. 4

woman, who had no parafunctional habits, but two inadequate root canal treatments and severely discolored teeth (Fig. 1). This is what she presented: vertical fracture of the upper right lateral and central incisors after an incident of trauma. The extraction of both of the damaged teeth was necessary.

I decided to place two NobelReplace Conical Connection implants (3.5 x 16 mm and 4.3 x 16 mm) immediately after tooth extraction 1 mm below the buccal crest level, in order to create mesial and distal bone peaks for papilla support (Fig. 2). We followed an immediate loading protocol including prefabricated abutments and provisional crowns for optimal shape and gingival architecture. The final abutments were placed four months after surgery. Depicted here, we used two customized NobelProcera Abutments in shaded zirconia (Fig. 3).

Directly afterwards, we cemented two IPS e.max® CAD Crowns by NobelProcera onto the NobelProcera Abutments. The CAD/CAM design of the individualized prosthetic restorations was done by A. Bonaca, and the veneering by P. Paglia and M. Moretti, all three of Rome, Italy. The final result shows excellent soft tissue development and bone formation (Fig. 4). The X-ray of the final restoration was taken one year after surgery (Fig. 5).

Conclusion

The clinician can now produce a natural-looking restoration accompanied by healthy, soft tissue architecture, and do so with fewer soft tissue grafting procedures. It is, however, my conviction that modern bone-anchored treatment should be characterized by a minimally invasive surgical approach, high biocompatible prosthetic accuracy and unparalleled patient comfort.

The anti-rotational design of the conical connection minimizes torsion forces and allows the application of high insertion torques on the implant without

incurring distortion. By equipping the clinically well-proven implant body with platform shifting and a tight prosthetic connection, the clinician has a better chance to secure healthy soft tissue around the implant in a predictable way.

The tight conical connection and platform shifting both are intended to improve the volume and health of gingival tissue. The tight conical connection can preserve the marginal bone by minimizing micro-movements and eventual micro-leakage, leading to enhanced pink esthetics. The bottom line: quick and predictable implant treatment with long-term functional and esthetic stability. _

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Fig. 5

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implants

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