

A Prosthetic Concept for Temporary Implant-Supported Restorations

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Introduction

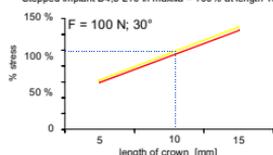
Bone possesses the capacity for functional adaptation due to its capability to respond to changes in loading with a remodeling of internal structure. Such bone adaptation after reentry operation of endosseous implants can achieve an optimum biomechanical situation as long as the loading forces are not excessive.

Temporary acrylic restorations are used to limit occlusal forces and to reshape the emergence profile of gingival tissue. FRIALIT®-2 ProTect flexible abutments are used at time of implant uncover to produce temporary acrylic restorations. A procedure is described which is able to limit occlusal load transfer and allows to customize peri-implant soft tissue contour at stage II surgery.

Influence of crown length on bone deformation

Influence of length of crown on bone deformation

Stepped implant D4.5 L10 in maxilla = 100% at length 10 mm

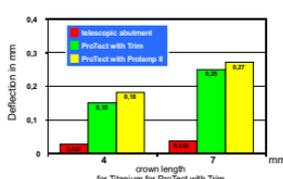


Increasing height of crown enhances stress level of cortical bone level linearly



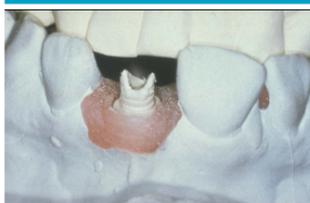
FRIALIT®-2 ProTect abutments

Deflection at 50 N Lateral Force



Mechanical properties of abutment material are valuable parameters to limit transversal load

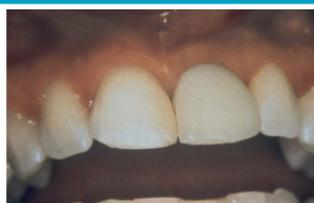
Laboratory fabricated acrylic crown



Shortened FRIALIT®-2 ProTect according to occlusal height



Clinical try-in of customized FRIALIT®-2 ProTect abutment



Cemented temporary crown in situ - note soft tissue margin

Chairside temporary crown



Placement of FRIALIT®-2 ProTect abutment for direct screw-retained provisional restoration



Acrylic crown on FRIALIT®-2 ProTect for customization of soft-tissue emergence profile

Conclusion

Two factors are considered as decisive to prevent overloading and resulting peri-implant bone resorption: Occlusal load and restoration-abutment flexibility. While occlusal load can hardly be limited, the transversal load transfer to the bone can be reduced by the use of acrylic restorations on temporary abutments. Only one third of the moments are created in the bone compared to standard titanium abutments at the same deflection at the occlusal plane. Besides biomechanical benefit the use of customized temporary crowns enables the clinician to manage the soft tissue in esthetically challenging cases. The poster presents a rationale to gradually load implants with a temporary abutment (FRIALIT®-2 ProTect) after the initial bone interface has been established.

Laboratory fabricated bridge



Temporary bridge with FRIALIT®-2 ProTect abutment



Temporary restoration stabilizes occlusion but limits transversal forces

Literature

1. Misch CE: Density of bone: Effect on treatment plans, surgical approach, healing and progressive bone loading. Int J Oral Implantol. 6:23-31, 1990.
2. Vizethum F, Adam J, Stoll CH. Remodeling of bone around dental implant-simulation by 3 D-Finite Element Method. Scientific Poster International Society of Biomechanics XIV th Congress, Paris, July 4-8, 1993.
3. Gomez-Roman G, Schulte W, d'Hoedt B, Axman-Kramer D. The FRIALIT-2 implant system: Five-year clinical experience in single-tooth and immediately postextraction applications. Int J Oral Maxillofac Implants 1997; 1:299-309.

Poster Presentation

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