

Temporary Implant-Supported Restorations: A Prosthetic Concept



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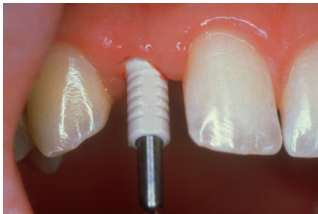
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Introduction

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 uncoverty 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.

Chairside Temporary Crown



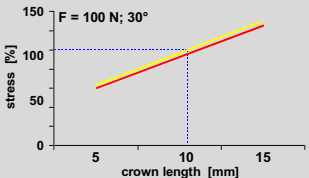
Retaining screw placed in FRIALIT[®]-2 ProTect abutment for stabilization of provisional restoration



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

Influence of Crown Length on Bone Deformation

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



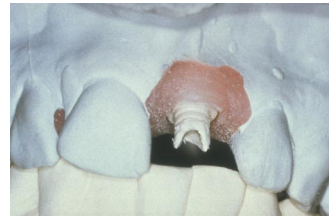
Increasing height of crown enhances stress level of cortical bone level linearly

Laboratory Fabricated Bridge



Temporary bridge restoration with FRIALIT[®]-2 ProTect abutments: prefabricated plastic material of ProTect in soft tissue contact

Laboratory Fabricated Acrylic Crown



Abutment before direct acrylic application for customization of soft tissue profile



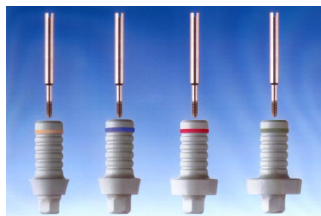
Allowance of limited occlusal forces and ideal soft tissue support by flexible FRIALIT[®]-2 ProTect abutment



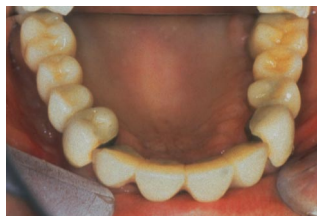
Cemented temporary crown in situ - note excellent esthetics of soft tissue margin

Conclusion

There are two decisive factors to prevent overloading and the 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 using acrylic restorations on temporary abutments. Only one third of the stress moments are created in the bone compared to standard titanium abutments of 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. Short-term chairside restorations and long-term laboratory fabricated restorations are introduced for customization of the restoration emergence profile and ideal soft tissue adaptation.



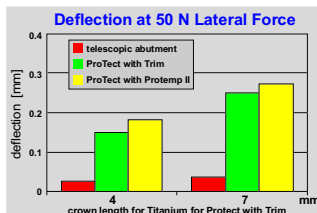
FRIALIT[®]-2 ProTect abutments



Temporary restoration stabilizes occlusion but limits transversal forces

References

- Misch CE. Density of bone: Effect on treatment plans, surgical approach, healing and progressive bone loading. Int J Oral Implantol. 6:23-31, 1990
- Vizethum F, Adam J, Stoil 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
- Gomez-Roman G, Schulte W, d'Hoedt B, Axmann-Kramer D. The FRIALIT[®]-2 implant system: Five-year clinical experience in single-tooth and immediately postextraction applications. Int J Oral Maxillofac Implants 1997; 12:299-309



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