

Soft tissue integration to dental implants

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av

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1. Berglundh, T., Abrahamsson, I., Welander, M., Lang, N.P., Lindhe, J. (2007) Morohogenesis of the peri-implant mucosa: an experimental study in dogs. Clin Oral Impl Res 18, 1-8.
2. Welander, M., Abrahamsson, I., Linder, E., Liljenberg, B., Berglundh, T. (2007) Soft tissue healing at titanium implants coated with type I collagen. An experimental study in dogs. J Clin Periodontol 34, 452-458.
3. Welander, M., Abrahamsson, I., Berglundh, T. (2008) The mucosal barrier at implant abutments of different materials. Clin Oral Impl Res 19, 635- 641.
4. Welander, M., Abrahamsson, I., Berglundh, T. (2008) Subcrestal placement of two-part implants. Clin Oral Impl Res In press.
5. Welander, M., Abrahamsson, I., Berglundh, T. (2008) Placement of two-part implants in sites with buccal bone defects. J Periodontol Submitted

Abstract

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Soft tissue integration is a prerequisite for implant success. The role of the soft tissue barrier at implants is to provide an effective seal that protects the underlying bone and prevents access for microorganisms and their products.

The objectives of the present series of experimental studies were to examine the morphogenesis of the mucosal attachment to titanium implants (study 1) and healing to titanium implants coated with type I collagen (study 2) and to implant abutments made of different materials (study 3). Healing around 2-part implants placed in a subcrestal position (study 4) and in sites with buccal bone defects (study 5) was also studied.

The dog model was used in all experiments. Following extraction of premolars implants that represented different implant systems were placed in the edentulous premolar regions. After varying periods of healing block biopsies were collected and prepared for histological examination.

It was demonstrated that the formation of a barrier epithelium was initiated after 1-2 weeks of healing and completed at 6-8 weeks after surgery. The collagen fibers in the connective tissue became organized after 4-6 weeks of healing. The findings indicated that the overall dimension of the soft tissue interface to titanium, i.e. "biological width" was established after 6 weeks following surgery (study 1).

Similar soft tissue dimensions and composition of the connective tissue were found at collagen coated and un-coated titanium implants after 4 and 8 weeks of healing (study 2). Abutments made of titanium and zirconia promoted proper conditions for soft tissue integration, while abutments made of gold-alloy failed to establish appropriate soft tissue integration (study 3)

Bone formation coronal of the junction between the implant and the abutment was possible when 2-part implants with sufficient surface characteristics were placed in a subcrestal position. The connective tissue interface to abutments with a TiOblast surface was comprised of a higher density of collagen and a lower fraction of fibroblasts than at abutments with a turned surface (Study 4).

Different marginal bone levels at the lingual and buccal aspects were obtained when 2-part implants with suitable surface characteristics were placed in sites with buccal bone defects (Study 5).

Key words: connective tissue, dental implants, epithelium, gold alloy, histology, peri-implant mucosa, subcrestal placement, titanium, zirconia

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