Sequential healing at implants installed immediately into extraction sockets. An experimental study in dogs

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Abstract

Objective: To compare the sequential healing at implants installed in a healed alveolar bony ridge or immediately after tooth extraction without functional load.

Material and methods: In the mandible of 12 dogs, the mesial roots of the first molars were endodontically treated, the tooth hemisected, and the distal roots extracted. After 3 months, the mesial roots of the fourth premolars were endodontically treated, the tooth hemisected, and the distal roots extracted in one side of the mandible. Implants were placed immediately into extraction sockets (IPIES) of the fourth premolar and in the healed sites in the molar regions. Healing abutments were placed, and the flaps were sutured to allow a non-submerged healing. The time of surgery and of sacrifices were planned in such a way to obtain biopsies representing the healing after 1 and 2 weeks and 1 and 3 months, respectively. Ground sections were prepared for histological evaluation of tissues components on the implant surface and the coronal termination level of osseointegration (M-B).

Results: New bone apposition on the implant surface was slightly higher at the healed compared to the IPIES sites, being 7.4% and 4.1% after 1 week, and 67.3% and 65.3% after 3 months, respectively. Old bone was progressively resorbed, from 27.0% and 21.9% after 1 week, to 2.5% and 2.0% after 3 months, at healed and IPIES sites, respectively. M-B was 1.4 mm and 2.6 mm after 1 week, 1.2 mm and 1.2 mm after 3 months, at healed and IPIES sites, respectively.

Conclusions: Similar patterns of sequential osseointegration were found at implants installed in healed alveolar bone or in alveolar sockets immediately after tooth extraction. The coronal termination level of osseointegration, that was different after 1 week, was found similar at the 3-month observation.

Keywords: animal study; extraction sockets; histology; implants placed immediately into extraction sockets; sequential healing; wound healing.