

IMMEDIATE IMPLANTATION OF TITANIUM DENTAL IMPLANTS ASSOCIATED TO AN INJECTABLE BONE SUBSTITUTE IMMEDIATELY AFTER TOOTH EXTRACTION

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INTRODUCTION: Two surgical techniques are currently used for placing dental implants. On one hand, implantation may be performed 4 or 6 months after the tooth extraction when alveolar bone healing is achieved. On the other hand, immediate implantation may also be performed allowing a faster prosthetic restoration. With regards to the various morphology of the receiver bone site, which rarely allows immediate implantation, the differed surgical protocol is mostly used. In this context, the use of bone substitution materials associated to dental implantation could allow to perform immediate implantation more frequently. In the present work, we investigated for the first time bone regeneration around dental implants placed immediately in extraction sites in association of a new injectable bone substitute (IBS).

METHODS: IBS consisted in a suspension of a mineral phase in a polymeric carrier. The mineral phase was a biphasic calcium phosphate (BCP) with a 60/40 HA/ β -TCP weight ratio. The carrier was a 2 % hydroxypropylmethylcellulose gel (HPMC) in water. Animal experiments were performed on 3 Beagle dogs. Each third and fourth mandibular premolars were extracted. A 5-mm-height bone defect was created at the mesial side of the socket before receiving 10-mm-long, 3,3-mm-diameter titanium implants (*Esthetic plus* TPS, Straumann ITI, Waldenburg, CH). In left sites, IBS was injected in bone defects to cover the mesial exposed part of implants (Fig 1). The right defects were not filled. Animals were sacrificed 3 months later. Implants were observed in scanning electron microscopy (Fig 2). Bone-to-implant contact (BIC) and peri-implant bone density (PBD) were evaluated using a semi-automatic image analyzer (Quantimeter 500, Leica, cambridge, UK).

RESULTS: BIC was superior in the sites filled with IBS as compared to the control sites (48% \pm 12 vs 38% \pm 12). Furthermore, BIC observed in the filled defects was not significantly different from that observed in the distal side of the socket

where no defect was created (48% \pm 12 vs 49% \pm 10,5). Similar results were observed with the PBD measurement (44 % \pm 11 in mesial control site, 58,5% \pm 13 in mesial filled defect and 59,5% \pm 13 in distal sites).



Fig 1: Injection of IBS around dental implant into the bone defect.

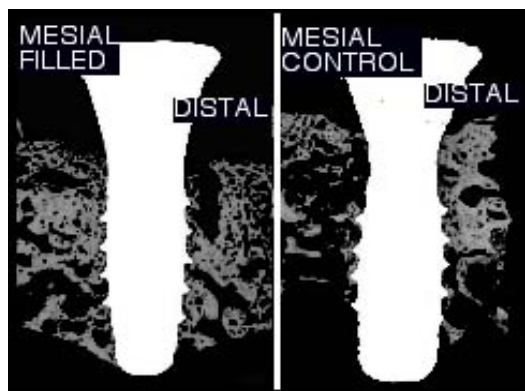


Fig 2. Bone regeneration around dental implant into filled socket (left) and control sites (right)

DISCUSSION & CONCLUSIONS: Our results strongly suggest that IBS used as a reconstructive material in case of bone damages improve the bone regeneration around titanium dental implants. The development of IBS in dental implantology may favour the use of immediate surgical procedure which in turn may reduce the time necessary for prosthetic rehabilitation.

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