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## A prospective, controlled clinical trial evaluating the clinical radiological and aesthetic outcome after 5 years of immediately placed implants in sockets exhibiting periapical pathology

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### Abstract

**Objective:** The aim was to compare the clinical, aesthetic and radiological outcome of immediately placed implants in sockets with or without periapical pathology 5 years after placement.

**Materials and methods:** Twenty-seven patients were followed 5 years after immediate implant placement (test-group: 12 patients with periapical pathologies; control-group: 15 patients without periapical pathology). Clinical (FMBS, FMPS, CAL, keratinized mucosa), aesthetical (length of clinical crown, Papilla index), and radiological (vertical distance implant shoulder to first bone to implant contact (IS-BIC)) parameters were assessed. Both 95% confidence intervals, as well as results of statistical tests (one-sample, two-sample, paired *t*-test) were provided.

**Results:** After 5 years the implant survival rate was 100% for all 27 implants. In the test group the width of the keratinized mucosa increased significantly over the observation period ( $0.8 \pm 1.0$  mm). Concerning aesthetic parameters at the 3-month as well as at the 5-year examination no statistically significant difference could be found between the two groups. In the control-group the papilla mesial and distal to the implant increased statistically significant during the observation period by  $0.5 \pm 0.5$  and  $0.4 \pm 0.6$  index score points, respectively. The position of the gingival margin at the implant site and the two neighboring teeth remained stable. At the 5-year visit IS-BIC measured between  $1.4 \pm 0.5$  mm (mesial, control) and  $1.7 \pm 0.7$  mm (distal, test), no significant difference could be found between the two groups. Over the observation period no statistically significant change of IS-BIC could be found in the test- as well as in the control-group. None of the examined radiographs revealed any signs of retrograde peri-implantitis.

**Conclusion:** The replacement of teeth exhibiting periapical pathologies by implants placed immediately after tooth extraction can be a successful treatment modality with no disadvantages in clinical, aesthetical and radiological parameters to immediately placed implants into healthy sockets.

Immediate implant placement at the time of tooth extraction has been introduced for many years to reduce the amount of surgical interventions and to possibly preserve the pre-extraction contours of the alveolar process (Becker et al. 1994; Lang et al. 1994; Bragger et al. 1996). It has been documented that without concomitant therapies (i.e. bone augmentation or soft tissue augmentation) immediate implants cannot preserve the alveolar ridge dimensions after tooth extraction (Botticelli et al. 2004; Araujo & Lindhe 2005). As a possible consequence of this

remodeling process a mean buccal mucosa recession after immediate implantation and provisionalization between 0.5 and 1.5 mm after 6–12 months must be anticipated (Grisman et al. 2003; Kan et al. 2003; Ryser et al. 2005; Chen et al. 2007; Evans & Chen 2008). This has led to a general agreement that immediate implants in the aesthetic zone are of higher risk for aesthetic complications and should, therefore, be used only in selected indications.

An additional factor, which has been discussed controversially in terms of immediate

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