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Soft and hard tissue alterations around implants placed in an alveolar ridge with a sloped configuration

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Abstract

Aim: The aim of this study was to evaluate soft and hard tissue alterations around implants placed in healed, sloped ridge sites.

Materials and methods: In this prospective multi-center study, 65 patients between 20 and 74 years of age and with a need for a single tooth replacement were included. All patients presented with a recipient implant site demonstrating a lingual–buccal bone height discrepancy of 2.0–5.0 mm and with a neighboring tooth on its mesial aspect. Implant placement (OsseoSpeed Profile implants; Astra Tech AB, Mölndal, Sweden) was performed using a non-submerged installation procedure. The implants were placed in such a way that the sloped part of the device was located at the buccal and most apical position of the osteotomy preparation. As the buccal rim of the implant was positioned at the crestal bone level, the lingual rim became situated either below or at the level of the lingual bone crest. Clinical assessments of bone levels at the buccal and lingual aspects of the implant were carried out immediately after implant installation and at a surgical re-entry procedure performed 16 weeks later. Crowns were placed at 21 weeks after implant placement. Radiographs were obtained immediately after implant placement, at 16 and 21 weeks and at the 1-year re-examination. Clinical assessment of probing pocket depth and clinical attachment levels were carried out at 21 weeks and at 1 year of follow-up.

Results: The alterations of the bone levels that occurred between implant placement and the 16-week surgical re-entry were -0.02 mm (lingual) and -0.30 mm (buccal). The average change in interproximal bone levels between implant placement and the 1-year re-examination was 0.54 mm. Clinical attachment level changes between the 21 week and the 1-year examinations varied between 0.1 mm gain and 0.1 mm loss.

Conclusion: Implant placement in an alveolar ridge with a sloped marginal configuration resulted in minor remodeling with preserved discrepancies between buccal and lingual bone levels.

The selection of dental implants is influenced by the morphology and dimensions of the recipient site of the alveolar ridge. The presence of local defects or insufficient bone dimensions calls for the attention of using either resective or ridge augmentation procedures to correct the bone morphology prior to implant placement. The reasons for the appearance of bone defects of varying dimensions are many, and it is well known that the alveolar ridge undergoes extensive remodeling after tooth extraction. Data reported in clinical studies indicated that an overall reduction in the horizontal dimensions occurred following tooth extraction and that

the resorption of the buccal part of the ridge was more pronounced than the lingual part (Pietrokovsky & Massler 1967; Schropp et al. 2003). Similar observations were also made in histological evaluations in an animal experiment by Araújo & Lindhe (2005). Thus, the resulting morphology of the healed alveolar ridge following tooth extraction is often presenting with a discrepancy in bone height between the buccal and lingual aspects of the ridge. Previous attempts to prevent bone resorption and thereby overcoming this problem by placing implants in fresh extraction sockets have failed, as demonstrated in experimental (Araújo et al. 2005; Araújo et al.

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