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ORIGINAL ARTICLE

Ridge preservation in maxillary molar extraction sites with severe periodontitis: a prospective observational clinical trial

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Abstract

Objectives To assess alveolar bone changes and treatment modality alterations after ridge preservation on maxillary molar extraction sockets with severe periodontitis, compared to natural healing.

Material and methods Thirty-six maxillary infected-molar teeth either receiving ridge preservation (RG group) or undergoing natural healing (NT group) were investigated. Cone-beam computed tomography (CBCT) scanning was performed immediately after surgery (the baseline) and repeated 6 months later to measure the linear and volumetric changes of the sockets.

Results Based on radiographic measurements, alveolar bone width decreased by 1.58 ± 4.61 mm in the NT group but increased by 3.74 ± 4.17 mm in the RG group ($p < 0.05$). Significant increases in ridge height at the center of both the NT (7.54 ± 4.54 mm) and RG (9.20 ± 3.26 mm) groups were observed. Mean sinus pneumatization was 0.19 ± 0.45 mm in the RG group and 0.59 ± 0.63 mm in the NT group ($p < 0.05$). The relative increase in total ridge volume was 8.0% and 35.5% in the NT and RG group, respectively ($p < 0.05$). Implant placement with additional sinus augmentation procedure was performed in 16.7% of the RG group cases, whereas 50% in the NT group cases.

Conclusions Ridge preservation in the maxillary molar extraction sockets with severe periodontitis can improve alveolar ridge dimensions and decrease the necessity of advanced regenerative procedures at implant placement compared to natural healing.

Clinical relevance Ridge preservation on maxillary molar extraction sockets with severe periodontitis maintained the vertical bone height more efficiently and resulted in less need for sinus augmentation procedures at 6 months compared to natural healing.

Keywords Advanced periodontitis · Extraction site · Bone grafting · Socket preservation · Cone-beam computed tomography · Implant treatment modalities

Introduction

Ideal functional and esthetic prosthetic rehabilitation following implant therapy is possible when there is availability of sufficient alveolar bone volume and favorable architecture of the residual alveolar ridge. However, in the edentulous posterior maxilla, the residual ridge dimensions were often compromised [1–4]. Residual ridges with less than 8 mm in height were commonly observed at edentulous first and second maxillary molar sites [3]. More than 50% of the maxillary posterior implants were associated with sinus augmentation procedure [5].

A number of studies have clearly shown that tooth extraction changes the residual alveolar bone [6, 7]. Schropp et al. [7] have described that up to a 50% reduction in residual alveolar ridge may occur 12 months after tooth extraction. Healing dynamics in periodontally

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