Management of atrophic alveolar ridge for Implant placement: Ridge splitting and bone expansion.

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IMPLANT THERAPY OUTCOMES, SURGICAL ASPECTS

Abstract

Atrophic narrow edentulous alveolar ridges are a real challenge for dental implant placements. Ridge splitting and bone expansion osteotomy is a simple and safe procedure for management of narrow ridge cases and allows simultaneously placement of implants. In this particular case, where the anterior mandibular incisors were lost due to periodontitis and the ridge was atrophic and narrow at buccolingual direction, the purpose was to obtain sufficient bone width at the narrow ridge for dental implant placement and to obtain prosthetic rehabilitation of the area. The edentulous narrow ridge was splitted in horizontally with piezo-surgery and vertical osteotomies were applied the bone plate to be expanded. Two dental implants (Ø 3,3mm, L 12mm) were placed. At the end of the postoperative 4th month, edentulous area was restored with a ceramic bridge prosthesis supported by standard abutment post. Postoperative 6th month CBCT evluation of the area revealed no signs of bone resorption. Moreover, the ridge splitting with piezo-surgery reduces the surgical trauma to bone and thereby aims to reduce the bone resorption after ridge expansion. The advantages of this technique also include shorter overall treatment time, and no need to harvest autologous bone.

Background

In the recent decades, dental rehabilitation of partially edentulous regions through implants has become common practice with reliable long-term results. However, due to bone atrophy, periodontal disease, and trauma sequelae, alveolar ridges are more often compromised with horizontal deficiency, which affects implant placement. The aim of this case is to report on the technique of the piezo- electric hinge–assisted ridge split procedure alternative way for augmenting anterior mandibular alveolar ridge deficiencies.

Case Report

• 55 years-old male patient was referred to Department of Periodontology, Faculty of Dentistry, Gazi University at *July 2016*. Patient was systemically healthy and non-smoker and diagnosed with chronic periodontitis. Patient received periodontal treatment. Anterior mandibular region was assessed by cone beam computer tomography (CBCT). Anterior mandibular incisors (42, 41, 31, 32) had Class 2 to 3 mobility, severe attachment losses and bone resorption. Anterior incisors were extracted and flap sutured.

• **After 2 month**, edentulous region was evaluated with CBCT. Bone height was sufficient for implant placement, however, the buccolingual width was as narrow as 3 to 4 mm at the ridge top, bone quality was D2.

- Mandible were treated with the piezoelectric hinge–assisted ridge split procedure (Tang et al., 2015). The edentulous narrow ridge was splitted in horizontally with piezo-surgery. Also two vertical tension-release osteotomies were applied mesially and distally to the bone plate to be expanded(Stricker et al., 2014). Total bone width of the ridge expanded to 7.0 mm with using osteotomy hand piece set.
- Two dental implants (Ø 3,3mm, L 12mm) were placed, and width of preserved bone at the vestibular and lingual aspects of the implant was approximately 1,5-2mm. Hollow space between separated cortical bone plates were filled with allogenic & xenogenic graft material and covered with collagen barrier membrane. Flaps sutured primarily.

- Antibiotics, NSAIDs and antiseptic mouth rinse were prescribed postoperatively. Healing was uneventful and sutures were removed after 10 days.

- At the end of the **postoperative 4th month**, peri-implant area was evaluated with CBCT, healing cups were placed and soft tissue healing expected.

- Prosthetic process was proceeded and the implants were restored with a metal-ceramic bridge prosthesis supported by standard cementable abutment post. Impression was taken with open –tray impression technique .

- **Postoperative 6th month** evluation of the area revealed no signs of bone resorption, and showed that alveolar ridge maintained the expanded width.

Conclusions

For rehabilitation of the atrophic alveolar ridges, same session ridge splitting, bone expansion procedure together with simultaneous implant placement, is a very efficient clinical application which should be taken into consideration in our daily practice. Moreover, the ridge splitting with piezo-surgery reduces the surgical trauma to bone and thereby aims to reduce the bone resorption after ridge expansion. This technique requires shorter overall treatment time, and may obviate the need for autologous bone.

References

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