A maxillary ridge-splitting technique followed by immediate placement of implants: a case report.

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Maxillary alveolar atrophy often limits the placement of dental implants. This article reports on a refinement of a technique for widening the atrophic ridge by splitting the alveolar bone longitudinally. Treatment of a patient with a severely resorbed edentulous maxilla is described. Six 4-mm wide by 13-mm long threaded Osseotite implants were placed immediately within the split ridge and surrounded with a mixture of autogenous tuberosity and bovine bone. The advantages of this technique for patients include less surgical trauma and condensed treatment time.

Ridge splitting technique in atrophic anterior maxilla with immediate implants, bone regeneration and immediate temporisation: a case report.

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Narrow alveolar ridges remain a serious challenge for the successful placement of endosseous implants. This article reports a technique for widening the atrophic ridge by splitting the alveolar bone longitudinally and filling the bone gap with collagenised pig bone, treatment of ridges as thin as 2.5mm at the alveolar crest and simultaneous placement of dental implants. Treatment of a 22-year-old female patient with a severely resorbed anterior maxilla is described. 4mm wide by 13mm long threaded Osseotite implants were immediately placed within the split ridge and surrounded with a mixture of autogenous tuberosity and collagenised pig bone. The advantages of this technique for patients include less surgical trauma and reduced treatment time.

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This report details surgical procedures for ridge expansion by means of splitting the crest of an edentulous ridge. Atrophic bony ridges present a unique challenge to the dental implant surgeon. In the past, onlay grafts of bone harvested from the hip, maxillary tuberosity, symphysis of the chin, or external oblique ridge have all been used with success in reconstruction of atrophic ridges. However, bone onlay grafting procedures require a secondary surgical site, which exhibits typical postoperative morbidity associated with bone harvesting performed with chisels and burs. Additionally, onlay grafts often require a healing period of 6 months to a year before dental implants can be placed, and the onlay graft sometimes fails to fuse to the augmented site. The segmental ridge-split procedure provides a quicker method wherein an atrophic ridge can be predictably expanded and grafted with bone allograft, eliminating the need for a second surgical site.


Implant rehabilitation of the edentulous maxilla may be somewhat problematic because of anatomic situations involving insufficient bone thickness. One approach in this situation is localized ridge augmentation with the split crest technique. This surgical approach allows the external cortical plate of the maxilla to be moved in a labial direction to gain an increase in width to introduce implants of appropriate diameter. This ongoing prospective study evaluated: (i) the surgical advantages that the new ITI TE implants have showed compared with the ITI standard solid-screw implants when placed in conjunction with the split crest technique and (ii) the implant success rate associated with 42 ITI TE implants and 40 ITI standard solid-screw implants placed in 40 patients in conjunction with the split crest technique. ITI TE implants have shown direct and indirect advantages in reducing the risk of fracture of the labial cortical plate during all the three fundamental surgical steps of this technique: (a) the ridge expansion with osteotomes; (b) implant site preparation with drills and (c) implant insertion. The overall success rates of ITI TE implants and standard screw implants were 100% and 95%, respectively. Based on the preliminary results of the present study, it can be concluded that ITI TE implants inserted in conjunction with split crest technique seem to be a promising surgical procedure to treat selected anatomic situations involving insuffcient maxillary bone thickness.


Dental implants placed in expanded narrow edentulous ridges with the Extension Crest device. A 1-3-year multicenter follow-up study.

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OBJECTIVE: This study has been designed to evaluate the capability of a new surgical device (Extension Crest) to widen narrow edentulous alveolar ridges and to allow a correct placement of endosseous implants in horizontally atrophied sites. MATERIAL AND METHODS: Forty-five patients, 20 males and 25 females, aged 20-66 years, affected by edentulism associated to horizontal resorption of the ridges, were treated by means of a sagittal osteotomy and expansion of the ridge with a new surgical device (Extension Crest) to obtain a wider bony base for ideal implant placement. In the same procedure in 33 patients, and 1 week afterwards in 12 patients, 110 endosseous titanium implants (ITI TE) were placed. Three to four months later, the patients were rehabilitated with implant-supported prostheses. RESULTS: The success rate of the expansion technique was 97.8%. A total of 110 implants were inserted in the expanded ridges. The mean follow-up after the start of prosthetic loading was 20.4 months. Three implants were removed before the start of prosthetic loading, because of non-integration, while no other implants failed after the completion of the prosthetic rehabilitation. Three implants, although integrated and in function, did not fulfill success criteria: cumulative success and survival rates at the end of the observation period were 95.4% and 97.3%, respectively. CONCLUSION: Within the limits of this study, this technique appeared to be reliable and simple, with reduction of morbidity and times of dental rehabilitation as compared with other techniques such as autogenous bone grafts and guided bone regeneration. Survival and success rates of implants placed in the treated areas are consistent with those placed in native bone.
with fixed partial dentures was successful in all cases. DISCUSSION: In the mandible, greenstick fracture during widening with osteotomes has not been controllable to date because of cortical thickness of the bone; the risk of malfracture during single-stage ridge splitting was high. With this approach, the location of the greenstick fracture is predetermined, and the perfusion for the buccal segment remains intact, although vascularization shifts from internal perfusion from spongy bone after the first intervention to external perfusion from the periosteum after the second intervention. The buccal cortical segment remains a pedicled graft after ridge splitting. CONCLUSION: The preliminary results of this report indicate that staged ridge splitting can be a safe technique which overcomes the problems associated with single-stage ridge expansion/ridge splitting procedures without causing significant delay in treatment.


Horizontal and vertical ridge augmentation for implant placement in the aesthetic zone.

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Lack of sufficient bone to place an implant at the functionally and aesthetically most appropriate position is a common problem, especially in the upper anterior jaw. A surgical technique is proposed to augment the alveolar ridge for vertical and horizontal defects through a localized alveolar osteotomy and interpositional bone graft. Three bone cuts (two vertical and one horizontal) are made in the alveolar bone. This portion of bone is carefully down-fractured. The gap between this bone box and the alveolar bone is filled with an interpositional bone graft. An on-lay bone graft is placed in the buccal side of the defect and fixed with titanium osteosynthesis screws. The aim of this surgical technique is to achieve bone graft healing in a short period of time. The broad vascular pedicle on the palatal side is maintained to ensure a nutritional supply for the down-fractured bone and interposed bone graft. The on-lay bone graft augments the palatal-buccal dimension and the interposed graft guarantees vertical augmentation.

OBJECTIVE: This study has been designed to evaluate the capability of a new surgical device (Extension Crest) to widen narrow edentulous alveolar ridges and to allow a correct placement of endosseous implants in horizontally atrophied sites. MATERIAL AND METHODS: Forty-five patients, 20 males and 25 females, aged 20-66 years, affected by edentulism associated to horizontal resorption of the ridges, were treated by means of a sagittal osteotomy and expansion of the ridge with a new surgical device (Extension Crest) to obtain a wider bony base for ideal implant placement. In the same procedure in 33 patients, and 1 week afterwards in 12 patients, 110 endosseous titanium implants (ITI TE) were placed. Three to four months later, the patients were rehabilitated with implant-supported prostheses. RESULTS: The success rate of the expansion technique was 97.8%. A total of 110 implants were inserted in the expanded ridges. The mean follow-up after the start of prosthetic loading was 20.4 months. Three implants were removed before the start of prosthetic loading, because of non-integration, while no other implants failed after the completion of the prosthetic rehabilitation. Three implants, although integrated and in function, did not fulfill success criteria: cumulative success and survival rates at the end of the observation period were 95.4% and 97.3%, respectively. CONCLUSION: Within the limits of this study, this technique appeared to be reliable and simple, with reduction of morbidity and times of dental rehabilitation as compared with other techniques such as autogenous bone grafts and guided bone regeneration. Survival and success rates of implants placed in the treated areas are consistent with those placed in native bone.


Narrow dentoalveolar ridges remain a serious challenge for the successful placement of endosseous implants. This case series describes a modification of previous ridge-splitting techniques using a microsaw blade. The approach enables treatment of ridges as thin as 2.5 mm at the alveolar crest and simultaneous placement of dental implants. In one extreme case reported here, where the crest width was less than 2.5 mm, a two-stage approach was used; implants were placed about 1 month after ridge expansion. In the 10 patients treated in this series, 27 dental implants were placed and achieved successful integration.


Computerized tomography scan interpretation of a bone expansion technique.

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Bone expansion can be defined as the manipulation of bone to form a receptor site for an implant without the removal of any bone from the patient. The way this technique is used provides a number of advantages to patients. There is a marked decrease in the need to graft ridges, even those as narrow as 1 mm. This results in less surgical time for the surgeon and much less cost to the patient. It also allows for the significant improvement of atrophic arch morphology and interarch relationships for the restorative phases. Soft tissue revisions at the time of implant placement allow for the development of keratinized tissue surrounding the implant, thus saving the patient the morbidity and cost of another surgical procedure. Cortical bone is preserved by not raising the periosteum during the manipulation of bone.