

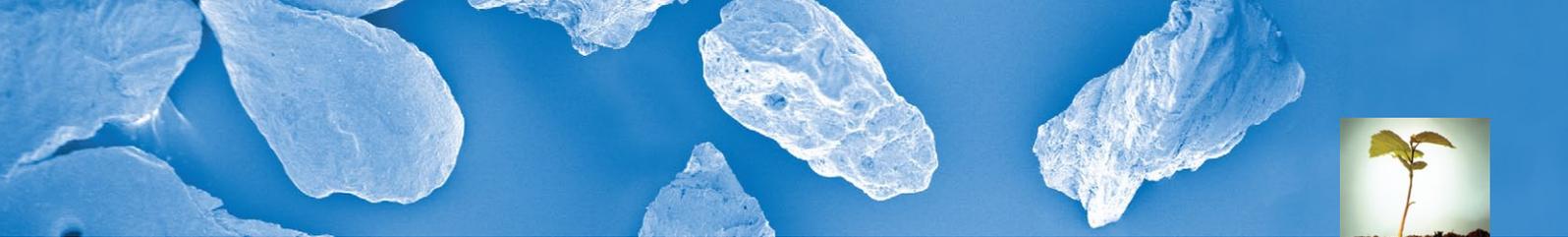
SCIENTIFIC ABSTRACTS

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VERTICAL AUGMENTATION

037

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ORIGINAL ARTICLE

Clinical Oral Implants Research
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Vertical ridge augmentation of atrophic posterior mandible using an inlay technique with a xenograft without miniscrews and miniplates: case series

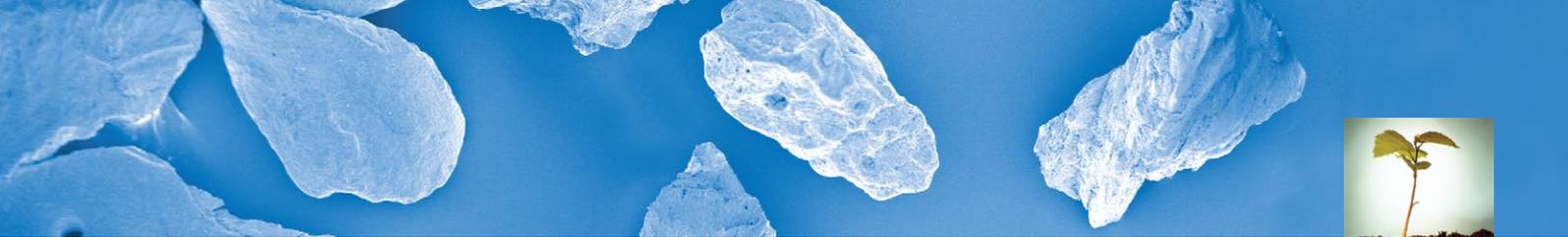
ABSTRACT

Even if the rehabilitation of partially or totally edentulous posterior mandible with implant supported prosthesis has become a common practice, local conditions of the edentulous ridges may be unfavorable for implant placement and a vertical and horizontal augmentation may be necessary. In case of an horizontal osteotomy with the interposition of bone in the form of a "sandwich" to augment the alveolar ridge, it has been reported that the use of miniscrews and miniplates increases the risk of fracture of the osteotomy segments. The purpose of this study was to use an inlay technique, without the use of miniscrews and miniplates for stabilization of the transported bone fragments. 9 consecutive patients (6 men and 3 women) aged between 26 and 51 years were enrolled in this study. A horizontal osteotomy was performed 2-3 mm above the mandibular canal, and two oblique cuts were made using a piezosurgery device. As the patients refused the harvesting of autogenous bone, an inlay procedure was proposed using blocks of collagenated cancellous equine bone (OsteoBiol® Sp-Block, TecnoSS®, Giaveno, Italy) without miniscrews and miniplates. The blocks were inserted mesially and distally between the cranial osteotomized segment and the mandibular basal bone. The residual space was filled with particles of cortico-cancellous porcine bone (OsteoBiol® Gen-Os®, TecnoSS®). A resorbable collagen membrane (OsteoBiol® Evolution, TecnoSS®) was applied above the buccal surface of the surgical site.

4 months after surgery, the Authors proceeded with the implants insertion. The postoperative course was uneventful in 7 of the 9 patients. No dehiscence of the mucosa was observed at the marginal ridge of the mobilized fragment. Newly formed bone was present near the osteotomized segments, and was observed to be in close contact with the particles of biomaterials. No gaps or connective tissue were present at the bone-biomaterial interface. Histomorphometrical results showed: $44 \pm 2,1\%$ newly formed bone, $18 \pm 0,8\%$ marrow spaces, $33 \pm 2,4\%$ residual grafted material.

CONCLUSIONS

From the results of this study, it is possible to suggest that the equine collagenated block can be considered as a good material for bone regeneration in inlay grafting procedures in atrophic posterior mandibles. As noted by the Authors, "the rigidity of the equine collagenated block allowed to eliminate the use of miniscrews and miniplates and simplified the technique. Besides, the rigidity of the block allowed maintenance of the space".



Vertical ridge augmentation of the atrophic posterior mandible with a 2-stage inlay technique: a case report

ABSTRACT

In case of atrophic posterior mandible, the application of the inlay technique showed to be able to achieve good augmentation results. Instead of using autogenous bone, some authors have suggested to use inorganic bovine bone blocks for inlay bone grafting in atrophic posterior mandibles, obtaining histological and clinical outcomes comparable to those achieved using autogenous bone.

In this article, the use of a 2-stage inlay technique in atrophic posterior mandible with more than 10-mm thickness and less than 5-mm height above the inferior alveolar nerve is described. The Authors performed an inlay procedure using a cancellous equine bone block (OsteoBiol® Sp-Block, Tecnos®, Giaveno, Italy) in order to allow the subsequent implant placement for prosthetic rehabilitation of the affected region. The first surgical procedure was a basic corticotomy of the buccal and lingual bone. One month later, a complete inlay procedure was performed. The cancellous equine bone block graft material was shaped and placed between the cranial osteotomized segment and the mandibular basal bone and a resorbable collagen membrane (OsteoBiol® Evolution, Tecnos®) was applied to the buccal surface of the surgical site.

CONCLUSIONS

After the inlay technique application, computed tomography and conventional radiography showed a mean vertical bone gain of 11,5 mm. This 2-stage inlay technique avoids the use of chisels to complete bone osteotomy and reduces postsurgical nerve disturbances in atrophic posterior mandibles.

The Authors concluded that *“a randomized controlled clinical trial is necessary to compare outcomes using this modification of the inlay technique with those obtained using the original procedure.”*

VERTICAL AUGMENTATION

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ORIGINAL ARTICLE

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VERTICAL AUGMENTATION

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ORIGINAL ARTICLE

The International Journal of Periodontics & Restorative Dentistry, 2013;33(2):159-166

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Vertical ridge augmentation of an atrophic posterior mandible with an inlay technique and cancellous equine bone block: a case report

ABSTRACT

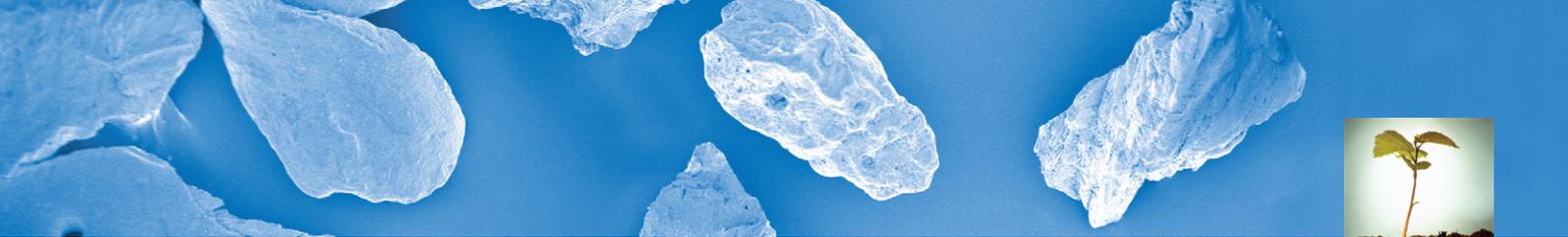
In the augmentation of atrophic posterior mandible, the inlay technique proved to be reliable and successful. For this technique, both autogenous bone and xenografts are used with similar results. Nevertheless, the use of xenografts has been associated with some disadvantages, such as persistence of residual material due to their slow rate of resorption and the need of their stabilization by means of titanium bone plates and miniscrews. In order to overcome the postsurgical patient morbidity, researchers have examined new graft materials, for examples a cancellous equine bone graft that does not require miniplates or miniscrews, thereby avoiding the need for subsequent surgery to remove these components.

In this article, the Authors describe a successful implant prosthetic rehabilitation in an atrophic left posterior mandible in a 62 year old man using a cancellous equine bone block as grafting material. In order to allow subsequent implant placement for the prosthetic rehabilitation, an inlay procedure using a cancellous equine bone block (OsteoBiol® Sp-Block, TecnoSS®, Giaveno, Italy) was proposed. After the cancellous equine bone block graft material have been shaped and placed between the cranial osteotomized segment and the mandibular basal bone, a resorbable collagen membrane (OsteoBiol® Evolution, TecnoSS®) was applied to the buccal surface of the surgical site. As underlined by the Authors, *“the block used in the present study was produced following a method that avoids a ceramic coating of hydroxyapatite crystals, thereby enhancing the speed of physiologic resorption. The presence of collagen makes these blocks more compact and less fragile than other commercial blocks, allowing them to be shaped and fixed without a high risk of breakage and placed without bone plate fixing. Furthermore, the presence of collagen promotes blood clotting and invasion of regenerative and reparative blood cells”*.

CONCLUSIONS

The histological evaluation showed new bone formation within the cancellous portion of the blocks and no foreign body reaction and the computed tomography and conventional radiography showed a 5 mm mean vertical bone gain. The new bone was in intimate contact with the biomaterial at all sites; no empty space was observed between the bone and the biomaterial at high magnification. The vertical bone gain obtained allowed the surgeon to insert an implant of adequate length for a reliable fixed prosthetic rehabilitation.

Based on these results, the Authors concluded that *“Cancellous equine bone grafts may be an effective alternative to autogenous bone and inorganic bovine bone grafting for reconstruction of the posterior mandible using the inlay technique”*.



Early volumetric changes after vertical augmentation of the atrophic posterior mandible with interpositional block graft versus onlay bone graft: a retrospective radiological study

ABSTRACT

When the residual height of the edentulous ridge in the posterior mandibles is not adequate to place implants, it is necessary to perform surgical augmentation treatments in order to gain a sufficient bone height for an implant placement in bone over the inferior alveolar nerve. Autologous bone grafting is considered the “gold standard” for bone augmentation techniques. However, the donor site morbidity, the increased operative time, the soft-tissue injuries and deficiencies in the quality and quantity of augmented available bone represent the disadvantages of this technique. The aim of the present study was to evaluate volumetric and clinical outcomes of atrophic posterior mandibles treated with xenogeneic bone material inlay and autologous bone onlay grafting techniques. 20 patients were retrospectively sorted into two groups: the inlay group, in which the atrophic posterior mandible was grafted with equine xenogeneic interpositional cancellous bone block (OsteoBiol® Sp-Block, Tecross®, Giaveno, Italy); the onlay group, in which the atrophic posterior mandible was onlay-grafted with autogenous bone block from the iliac crest. Bone volumes at baseline and at 4 months after surgery were measured by computed tomography scans. Peri-implant marginal bone loss at 1 year was also recorded. After surgery, the height index showed a mean vertical augmentation height of 6.0 mm in the inlay-group and of 7.4 mm in the onlay-group. With reference to loss of vertical bone height during the graft healing, it was registered in both groups, but with no significant differences between the two groups.

CONCLUSIONS

The success rate of the autogenous onlay blocks (82.4%) seemed to be lower than that recorded in patients who had undergone vertical augmentation with interpositional blocks of cancellous equine bone (93.8%); moreover, implants placed in onlay autogenous grafts showed greater bone loss than those inserted in inlay-augmented areas. Based on the results of this study, the Authors affirm that there is a significant role for the interpositional technique in cases of atrophic posterior mandible. In their opinion, “*xenogeneic cancellous bone blocks grafted in a posterior mandible presenting vertical defects from 3 to 7 mm, performed with an interpositional technique, appeared to be an effective surgical procedure, showing a volumetric bone remodeling similar to that recorded for autogenous bone grafted with an onlay block procedure*”.

VERTICAL AUGMENTATION

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VERTICAL AUGMENTATION

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Interpositional augmentation technique in the treatment of posterior mandibular atrophies: a retrospective study comparing 129 autogenous and heterologous bone blocks with 2-7 years follow-up

ABSTRACT

In case of insufficient bone height following tooth loss, the implant rehabilitation of atrophic posterior mandible is challenging. The ideal approach seems to be the vertical bone augmentation performed with different techniques, as guided bone regeneration, alveolar distraction osteogenesis and onlay bone grafting. The aim of this retrospective study was to evaluate the clinical and radiological results of inlay augmentation procedure with three different types of block bone graft: autogenous bone block harvested from iliac crest (ABB), deproteinized bovine bone mineral block (BBB) and collagenated equine bone block (EBB). Following osteotomy, the different types of blocks were shaped and placed between the cranial osteotomized segment and the mandibular basal bone. Residual gaps were filled with particulated ABB, BBB or EBB taken from the respective blocks. The grafted areas were then covered with a resorbable collagen membrane (Bio-Gide®, Geistlich, Wolhusen, Switzerland; OsteoBiol® Evolution, Tecnos®, Giaveno, Italy). A total of 115 patients were treated and 129 inlay surgeries were performed (10 surgeries with ABB, 61 with BBB and 58 with EBB). The results showed a mean postoperative vertical bone gain of 5,55 mm, with the greatest augmentation obtained in the EBB group, followed by BBB and ABB. Anyway, these differences were not statistically significant. The Authors underline that EBB probably allows for a greater augmentation for its rigidity, due to the presence of a collagen matrix. At 7 years after loading, ABB and BBB showed 1.34 and 1.37 mm of peri-implant marginal bone loss respectively, while EBB lost 0.61 mm 3 years after loading. The result on implant survival rates with a 4.2-year mean follow-up were comparable (94.4% for ABB, 91,1% for BBB and 96.0% for EBB).

CONCLUSIONS

Within the limitations of this study, the Authors concluded that: *“the use of collagenated blocks should be considered with this technique involving a lower adjustment of the coronal segment on the block itself. As a consequence, heterologous biomaterials might be considered ideal in the inlay technique for the posterior mandible”*.



Short vs longer implants in mandibular alveolar ridge augmented using osteogenic distraction: one year follow-up of a randomized split-mouth trial

ABSTRACT

In case of tooth loss, the consequent atrophy of the alveolar bone can hinder the success of a fixed rehabilitation, as the implant placement in a jaw with a low bone level is not predictable. In these cases, the clinician can choose between essentially three options: bone augmentation procedures, use of zygomatic implants in case of maxillary jaws and use of so-called short implants. The aim of this randomized split-mouth trial was to compare the implant survival rate of short implants, with an intrabony length of 6 mm, with the implant survival rate of longer implant, with an intrabony length of 10 mm, placed in posterior atrophic mandibles. Thirty-six patients with bilateral posterior edentulous mandible and presenting a bone availability height less than 9 mm from the mandibular canal were enrolled in this study and their hemiarches were randomized to receive both 6-mm-long and normal-length implants (10 mm). The technique used for the vertical bone augmentation was the “sandwich” technique, using a bone substitute block as graft. The graft material used was the bone block graft OsteoBiol® Sp-Block (Tecnoss®, Giaveno, Italy) of dimensions 10x10x20 mm. At the 1-year post-loading follow-up, loss of implants and complications were assessed. The total loss around long implants was low, but the morbidity and complication rate was higher compared with the short implant outcomes.

CONCLUSIONS

The results from this trial lead the Authors to the conclusion that “both assessed techniques provided good and similar outcomes up to 1 year after loading. In addition, the short implant type can represent a preferable therapeutic choice to vertical bone augmentation for the placement of longer implants, because of the offered advantages in time, morbidity, and economics”.

VERTICAL AUGMENTATION

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ORIGINAL ARTICLE
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