

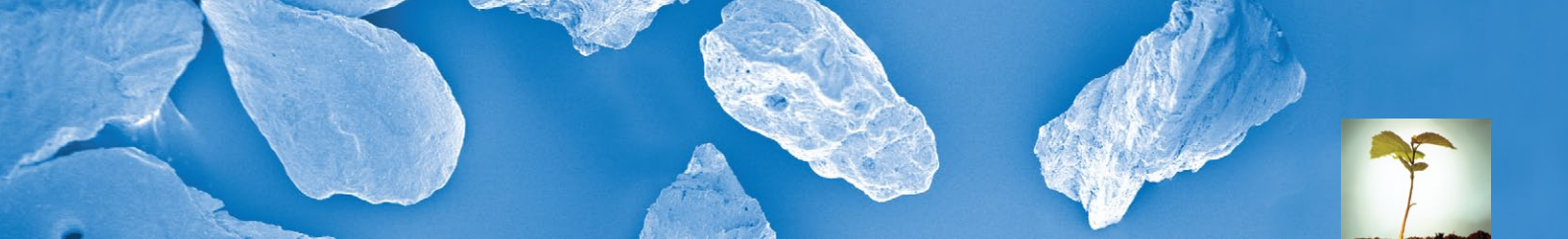
SCIENTIFIC ABSTRACTS

INTERNATIONAL PUBLICATIONS ON OSTEOBIOL® BIOMATERIALS

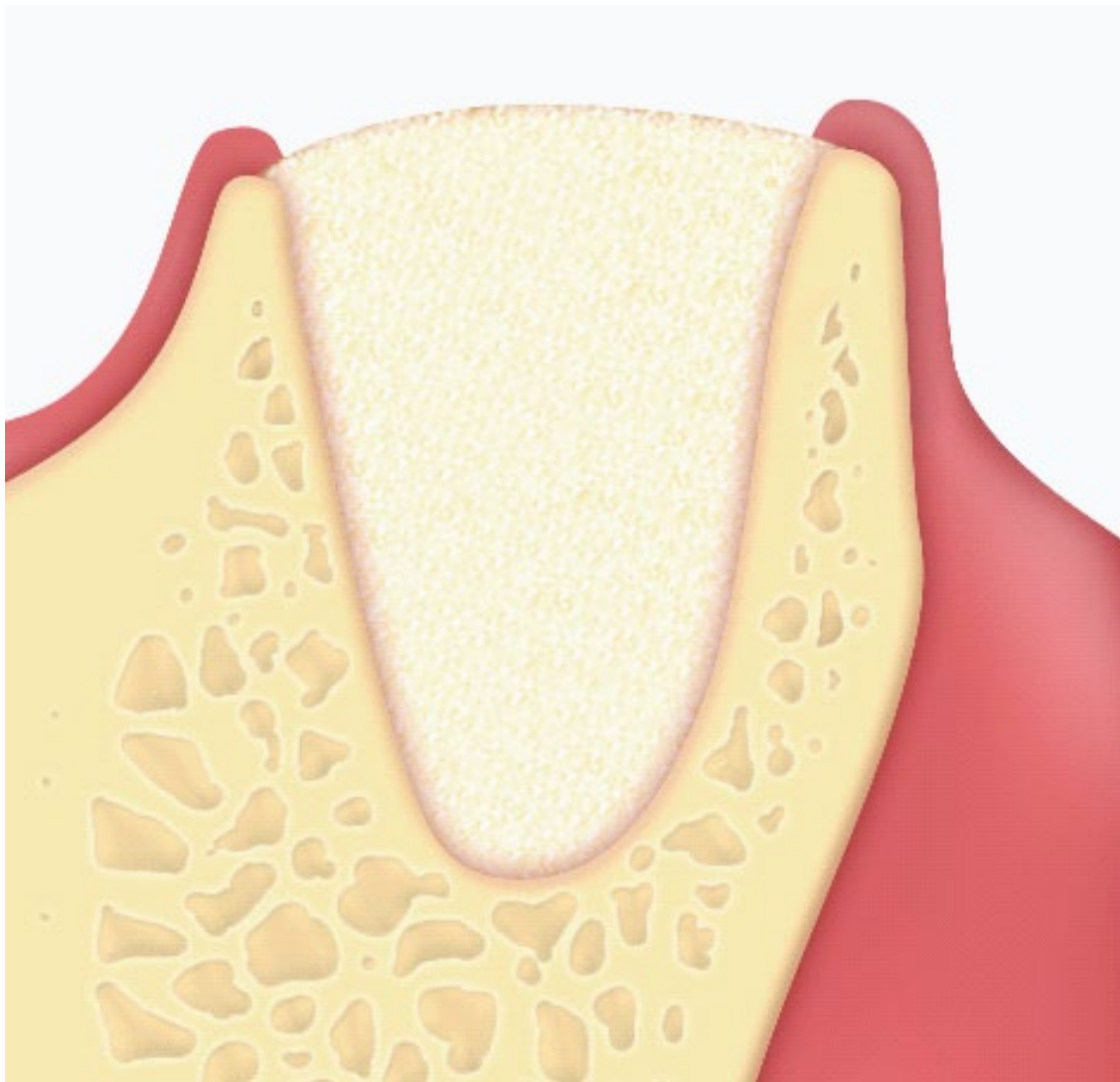
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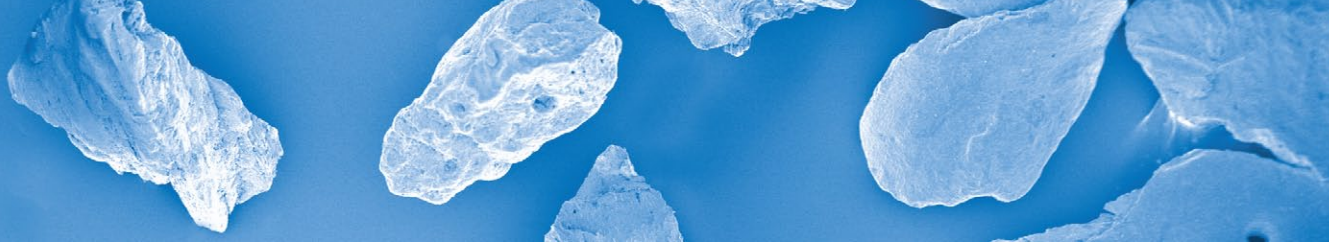
Alveolar regeneration



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ALVEOLAR REGENERATION

018

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ORIGINAL ARTICLE

The International Journal of Periodontics
and Restorative Dentistry
2008 Oct;28(5):469-77

Preservation of the postextraction alveolar ridge: a clinical and histologic study

ABSTRACT

When the treatment planning foresees the placement of an implant following a tooth extraction, it is necessary to preserve the dimension of the post-extraction alveolus. In literature different ridge preservation procedures have been proposed and it has been confirmed that filling and covering the post-extraction alveolus preserve the bone volume in a more predictably way compared to the natural healing. However, some controversy exists regarding the quality of the tissue augmented in the extraction site.

The aim of this investigation was to assess the possibility of preserving the buccal and lingual plates of a post-extraction socket from resorption using a bone filler. Consequently, this study investigated the role of a bone substitute material in preserving the ridge after the extraction of posterior teeth. In order to do this, after the tooth extraction, 10 single sockets in the posterior area were filled with a xenograft material (OsteoBiol® Gen-Os®, Tecnos®, Giaveno, Italy). The granules were then covered with a collagen membrane (OsteoBiol® Evolution, Tecnos®) and the soft tissues were sutured over the membrane without obtaining primary closure.

The histologic analysis performed 4 months after extraction on the specimens harvested from the area previously augmented with bone filler evidenced that about 85% of the initial ridge dimensions was preserved, allowing for a correct implant placement. From a histologic point of view, new bone formation was detected in all sites.

CONCLUSIONS

The results obtained in this investigation confirm that the resorption of the crestal width can be significantly reduced thanks to the use of a filling material and that the augmentation of the alveolus after tooth extraction seems to increase the probability of maintaining the original crestal form, allowing ideal implant placement with optimal bone and gingival tissues. In the Author's opinion, *"the results promote the use of a bone substitute to fill the post-extraction site of posterior teeth to avoid alveolar bone loss"*.

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Dental implants placed in extraction sites grafted with different bone substitutes: radiographic evaluation at 24 months

ABSTRACT

In case of a post-extraction socket, it may be necessary to adopt surgical procedures such as guided bone regeneration, bone allografts, bone autografts, and xenografts in order to ensure the proper biologic and esthetic conditions for the consequent implant placement. For this purpose, different graft materials have been advocated to prevent a bone-volume reduction and the aim of this study was to evaluate radiographic parameters of implants positioned in grafted alveoli with 3 different biomaterials: magnesium-enriched hydroxyapatite (MHA), calcium sulfate (CS), and heterologous porcine bone (PB).

15 patients, 7 women and 8 men, were included in this prospective study, requiring the extraction of 3 teeth for each patient. In total, 45 fresh extraction sockets with three bone walls were selected. 15 sockets received MHA, 15 sockets received CS, and 15 sockets received cortico-cancellous PB (OsteoBiol® Gen-Os®, TecnoSS®, Giaveno, Italy) as a graft material. After 3 months, in all the grafted sites titanium dental implants were placed and the temporary restoration was performed 3 months after the implant placement.

In order to evaluate the marginal bone level, at baseline and 12 and 24 months after implant placement, follow-up examinations, including intraoral digital radiographs, were conducted.

After 24 months, the results were the following: for the MHA group, a mean mesial bone loss of $-0,21 \pm 0,08$ mm and a mean distal bone loss of $-0,22 \pm 0,09$ mm (mean bone loss: $-0,21 \pm 0,09$ mm) were reported; for the CS group, a mesial bone loss of $-0,14 \pm 0,07$ mm and a distal bone loss of $-0,12 \pm 0,11$ mm (mean bone loss: $-0,13 \pm 0,09$ mm) were measured; for the PB group, a mean mesial bone loss of $-0,15 \pm 0,10$ mm and a mean distal bone loss of $-0,16 \pm 0,06$ mm (mean bone loss: $-0,16 \pm 0,08$ mm) were reported. No statistically significant differences were reported among groups ($P > 0,05$).

CONCLUSIONS

The findings of this study at the moment of the 24-month follow-up showed that all the graft materials allowed the proper conditions for the implant osseointegration and that the placement of implants in grafted sockets was not influenced by the three different biomaterials, as they did not negatively impact the clinical outcome. The absence of statistically significant differences of bone level around implants among groups confirmed the results reported by other studies.

ALVEOLAR REGENERATION

028

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ORIGINAL ARTICLE
Journal of Periodontology
2009 Oct;80(10):1616-21

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ALVEOLAR REGENERATION

035

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ORIGINAL ARTICLE

The European Journal of Esthetic Dentistry
2010; Summer 5(2):172-188

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Planning implants in the esthetic zone using a new implant 3D navigation system

ABSTRACT

When a dental implant replaces a natural tooth, any deficit of soft or hard tissue makes more difficult to achieve a satisfactory and predictable esthetic results.

Nowadays, guided implant surgery has become a clinical reality in implant dentistry and on the market different navigation systems are available for the planning both of the surgical and prosthetic stages. Moreover, the evolution of digital technology and imaging led to new perspectives in planning modern implant-prosthetic therapy, with interesting effects on implant-guided surgery.

In this article, the Authors present a case report planned and executed with the help of a new procedure for the planning of guided surgery using a hybrid approach as an alternative to current CAD/CAM techniques. This is a low-cost and simple technique, based on a presurgical CT scan, that allows the surgeon and the prosthodontist to work in a team to deliver a fixed restoration at the time of the surgical procedure in a minimally invasive and predictable way.

As after the tooth extraction in an esthetic zone the patient showed a bone deficit, the extraction socket was cleaned carefully, extracting all the residual inflammatory tissue, and was grafted with a porcine cortico-cancellous mixed graft (OsteoBiol® Gen-Os®, Tecnos®, Giaveno, Italy) and sealed with a fibrin sponge. The healing was uneventful, and despite the expected buccolingual contraction of the soft tissue, the 6-month follow-up radiograph evidenced the ideal integration of the bone graft.

CONCLUSIONS

Based on the satisfactory results obtained in their clinical experiences, the Authors concluded that *"minimally invasive approaches are very important when dealing with soft and hard tissue management. The conventional flapless approach is known to have good results with less recession of hard and soft tissues. Therefore, planned flapless surgery may become the gold standard for soft and hard tissue regeneration in the future"*.

The procedure described in this article, together with the use of diagnostic three-dimensional software, seems a precise and efficient means of providing a prosthetic device before surgery takes place.

Corticocancellous porcine bone in the healing of human extraction sockets: combining histomorphometry with osteoblast gene expression profiles *in vivo*

ABSTRACT

In case of tooth extraction, significant structural changes and bone resorption - both horizontally and vertically - have been reported, with the detrimental consequence of important dimensional changes in the alveolar bone. In order to preserve the alveolar bone volume, it is common to graft a biomaterial into the socket immediately following the tooth extraction. The aim of this study was to evaluate the use of porcine bone graft in fresh sockets via histomorphometric and *in vivo* gene expression profiling.

For this prospective split-mouth study, 15 patients with a mean age of 53,7 years (range: 32-70 years) requiring the extraction of two teeth - one on each side of the arch in the molar or premolar regions - were selected. The inclusion criteria for the sockets were the presence of three bone walls and loss of the buccal plate. Following a split-mouth design, half the sockets received xenogeneic cortico-cancellous porcine bone (OsteoBiol® Gen-Os®, Tecnos®, Giaveno, Italy) (PB group) and the contralateral sockets were left unfilled (control group). Four months after surgery, four cylindrical specimens were taken from each patient (two from the PB-grafted site and two from the control site) and the samples were processed for osteoblast expansion and *in vivo* gene expression analysis and for histomorphometry. The healing process occurred without complications and the grafted sites showed statistically significantly higher mean vital bone and lower mean connective tissue values than the control sites. The histological examination revealed an absence of inflammatory cells, along with bone formation in all grafted sites ($39,6 \pm 9,4\%$ in PB vs. $29,5 \pm 5,0\%$ in control group) and the presence of biomaterial particles ($34,4 \pm 5,1\%$) and connective tissue ($26,0 \pm 9,9\%$ in PB vs. $57,7 \pm 6,9\%$ in control group). In bone samples taken from PB-group, a better bone matrix formation and a decrease in osteoclastogenesis and bone resorption were observed. The consequent higher amount of new formed bone can be explained by the better mRNA gene expression of proteins such as Osteopontin (OPN) and type I collagen, together with a minor expression of Osteoprotegerin (OPG).

CONCLUSIONS

Due to the absence of inflammatory signs around the graft particles, the close contact between graft particles, and the newly formed lamellar bone present in the specimens, this study suggests that cortico-cancellous PB can be used successfully for ridge preservation. Moreover, the histological examination and the biomolecular evaluation confirmed the good biocompatibility and the high osteoconductivity of xenogeneic porcine bone. At any case, the Authors suggest that further studies are needed to better understand the long-term clinical and biological outcomes of this biomaterial.

ALVEOLAR REGENERATION

044

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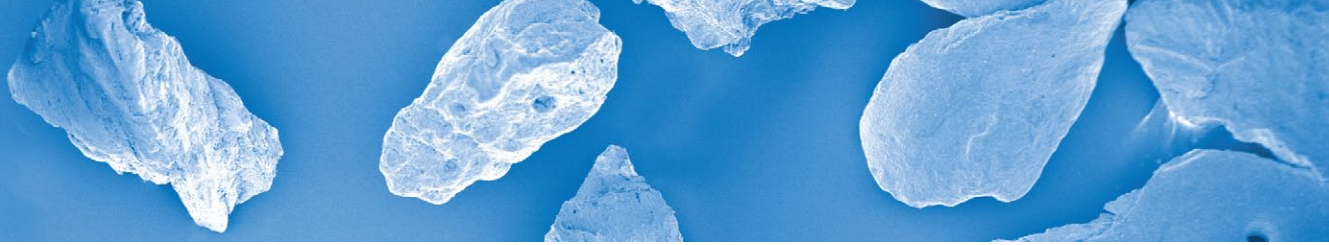
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ORIGINAL ARTICLE

International Journal of Oral and
Maxillofacial Implants
2011 Jul - Aug; 26(4):866-72

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ALVEOLAR REGENERATION

050

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ORIGINAL ARTICLE
Clinical Implant Dentistry
and Related Research
2013 Oct;15(5):707-13

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Porcine-derived xenograft combined with a soft cortical membrane versus extraction alone for implant site development: a clinical study in humans

ABSTRACT

Following a tooth extraction, there is a significant reabsorption of the alveolar ridge with quantitative and qualitative changes of its profile. Often, the reabsorption is more pronounced on the buccal aspect of the ridge than on its lingual/palatal counterpart, with dimensional changes in size and shape. In this article, the Authors report the results of a study performed on 15 patients who required double extraction of contralateral premolars and delayed implant placement who were randomly selected to receive alveolar ridge preservation (ARP) procedure compared with extraction alone (EXT). In this split-mouth study, the test sites (ARP) included 15 sockets treated according to the GBR principle for the ARP procedure with a cortico-cancellous porcine bone xenograft in combination with a soft cortical membrane. The xenogenic bone substitute consisted of cortico-cancellous porcine bone (OsteoBiol® Gen-Os®, Tecnos®, Giaveno, Italy) in the form of mixed granules with a diameter ranging from 250 to 1000 μm . The membrane was a soft cortical lamina (OsteoBiol® Lamina, Tecnos®) with a porcine bone origin and a plastic consistency. Horizontal and vertical ridge dimensions were recorded at baseline and 6 months after extractions. After 6 months of healing, it was possible to place implants in all sockets, although some EXT sites had a slight buccal dehiscence requiring bone regeneration procedures after implant insertion. The use of porcine-derived xenograft as intrasocket graft combined with a membrane reduced significantly the bone loss: the mean width for the ARP sites showed a reduction of $1,8 \pm 1,3$ mm versus a reduction of $3,7 \pm 1,2$ mm for the EXT sites. Moreover, a significant vertical reduction was demonstrated in the EXT sites for mid-buccal and mid-palatal/lingual measurements ($3,1 \pm 1,3$ mm and $2,4 \pm 1,6$ mm respectively), whereas in the ARP sites the ridge height remained relatively unchanged ($0,6 \pm 1,4$ and $0,5 \pm 1,3$ mm).

CONCLUSIONS

Based on the results of this study, the Authors concluded that *"it must be considered that the use of a xenograft in combination with a membrane reduces buccal reabsorption in a ridge crest, which naturally tends to a more palatal/lingual position following tooth extraction, thus decreasing possibility of dehiscence and favoring an ideal implant placement. The ARP approach using porcine bone in combination with a soft cortical membrane significantly limited the bone dimensional changes after tooth extraction when compared with EXT. Therefore, even if some EXT sites allowed an implant placement, the most predictable maintenance of the horizontal and vertical ridge dimensions was achieved only with the ARP procedure"*.

Single post-extractive ultra-wide 7 mm-diameter implants versus implants placed in molar healed sites after socket preservation for molar replacement: 6-month post-loading results from a randomised controlled trial

ABSTRACT

Immediate placement of implants into fresh extraction sockets is an option for replacing missing teeth, with the advantage of reducing the number of surgical interventions required for treatment and the time interval between dental extraction and the placement of implant-supported prostheses. However, this technique involves numerous challenges related to site-specific anatomic, occlusal and biomechanical factors. The present randomised controlled trial (RCT) was conducted with the aim of understanding which procedure would be preferable after having extracted a hopeless molar in both jaws, between immediate post-extractive ultra-wide 7 mm-diameter implants in combination with socket preservation procedures, and socket preservation procedures alone, with delayed implant placement. The aim was to test the hypothesis that there is no difference in clinical, radiographic and aesthetic outcomes positioning single post-extractive ultra-wide 7 mm-diameter implants or waiting 4 months to place the same diameter implant, after molar extraction and socket preservation procedure. Patients requiring one implant-supported single restoration to replace a failed tooth in the molar region of both maxilla and mandible were selected and randomised according to a parallel group design into two arms: implant installation in fresh extraction sockets augmented with cortico-cancellous heterologous bone and porcine derma (group A) or delayed implant installation 4 months after tooth extraction and socket preservation using the same materials (group B). After tooth extraction, the residual alveolar socket around the implant was grafted with cortico-cancellous heterologous bone, with a graft particle size between 250 and 1000 μm (OsteoBiol® Gen-Os®, Tecnos®, Giaveno, Italy). Then, the bone graft was covered with a porcine derma (OsteoBiol® Derma, Tecnos®), shaped according to the shape and dimension of the alveolar socket and stabilised with suture. Outcome measures were implant success and survival; complications; horizontal dimensional changes measured on cone beam computed tomography (CBCT) scans; peri-implant marginal bone level (MBL) changes; implant stability quotient (ISQ); and pink esthetic score (PES).

CONCLUSIONS

The results of this study revealed statistically significant differences both in MBL and horizontal marginal bone level changes between the two investigated approaches, with lower values for socket preservation procedure alone, with delayed implant placement. Both procedures achieved successful results, however, waiting 4 months after tooth extraction and socket preservation procedure was associated with less marginal bone loss. A possible explanation was that a wider diameter implant reduces the positive effect of the socket preservation.

ALVEOLAR REGENERATION

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ORIGINAL ARTICLE
European Journal of Oral Implantology
2016;9(3):263-275

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Molecular, cellular and pharmaceutical aspects of filling biomaterials during the management of extraction sockets

ABSTRACT

After a tooth extraction, both hard and soft tissues undergo dimensional changes and the aim of grafting and/or guided bone regeneration procedures is to counteract these changes by using different biomaterials and surgical techniques. In this article, the Authors reviewed the clinical, histological, volumetric and molecular results reported in different studies, so to evaluate which are the best surgical techniques and biomaterials for ridge preservation procedures.

Among the biomaterials tested for bone augmentation procedures, the one made of cortico-cancellous granules of porcine bone showed to be very similar to human mineral bone. Its natural micro-porous consistency is supposed to facilitate new bone tissue formation in defect sites and accelerate the regeneration process. Moreover, the studies evaluated in this review reported that this biomaterial is gradually resorbable and able to preserve the original graft shape and volume (osteoconductive property). Other important observations about porcine bone are related to the integration of collagenated porcine bone graft with the new bone and its capability to support the new bone formation when used in extraction sockets. Among the advantages of porcine bone, osteoconductivity and absence of adverse reaction and inflammatory response were mentioned. The histomorphometrical analysis of the reviewed studies showed that the percentage of new bone tissue was 22.5% of the total bone.

CONCLUSIONS

In their review, the Authors pointed out that cortico-cancellous porcine bone satisfied the characteristics of osteoconductivity and volume maintenance during the healing period, allowing new bone formation and reabsorption of the xenograft, without any signs of inflammatory cells.

ALVEOLAR REGENERATION

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ORIGINAL ARTICLE

Current Pharmaceutical Biotechnology
2017;18(1):64-75

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Traditional post-extractive implant site preparation compared with pre-extractive interradicular implant bed preparation in the mandibular molar region, using an ultrasonic device: a randomized pilot study

ABSTRACT

Immediate post-extraction implant placement for replacing multi-root teeth can be a clinical challenge, especially if insufficient bone tissue volume does not allow to reach the proper primary stability. As implant bed preparation is a critical procedure, the aim of this study was to compare two different approaches: implant bed preparation before and after root extraction. To do this, 22 patients, who needed an implant-prosthetic rehabilitation, were selected and randomly assigned to the test group (implant bed preparation before molar extractions) or control group (bed preparation after molar extractions). A guided bone regeneration (GBR) procedure was performed with bone porcine particles (OsteoBiol® Gen-Os®, TecnoSS®, Giaveno, Italy) applied around the implant into the alveolous and covered by a membrane (OsteoBiol® Evolution, TecnoSS®). The implant stability quotient (ISQ) and the position of the implant were evaluated and a statistical analysis was carried out.

CONCLUSIONS

In this study is shown how preparation of implant sites with an ultrasonic device before tooth extraction, allows implant placement in an ideal prosthetic position. This procedure is simple and allows to reach a higher stability in selective cases compared with traditional technique of extraction and placement.

ALVEOLAR REGENERATION

113

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ORIGINAL ARTICLE

Int Journal of Oral and Maxillofacial Implants
2017 May/Jun;32(3):655-660

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ALVEOLAR REGENERATION

122

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ORIGINAL ARTICLE

European Journal of Oral Implantology
2017; 10(3): 263-278

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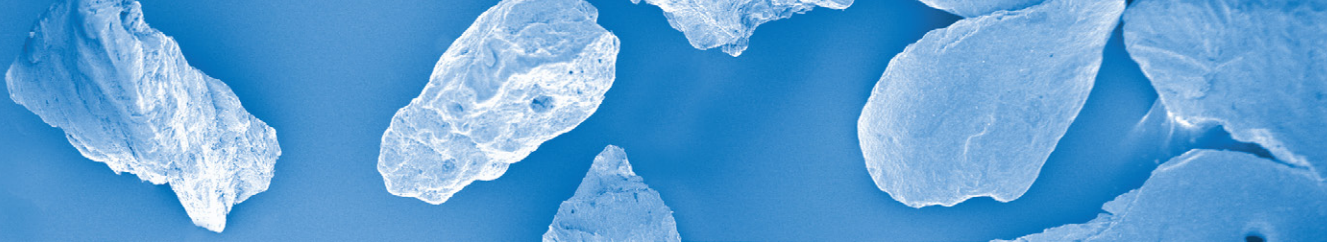
Wide diameter immediate post-extractive implants vs delayed placement of normal-diameter implants in preserved sockets in the molar region: 1-year post-loading outcome of a randomised controlled trial

ABSTRACT

In case of tooth loss, in order to minimise the risk of implant failures and complications, delayed implant placement after complete socket healing is generally preferred, usually associated with different ridge preservation procedures, ranging from soft tissue grafts to autogenous or bone substitutes grafts. As it would be useful to know if it is possible to have similar or better clinical outcomes by placing immediately wide diameters implants in post-extractive sites, the aim of this single-centre randomised controlled trial (RCT) was to compare the effectiveness of 6.0 to 8.0 mm-wide diameter implants placed immediately after tooth extraction, with conventional diameter implants placed in preserved sockets after 4 months of healing in molar sites. In the delayed group, the sockets were loosely packed with a mixture of cancellous and cortical porcine-derived bone granules with a granulometry of 250 to 1000 μm (OsteoBiol® Gen-Os® Tecnos®, Giaveno, Italy). In order to cover the socket, a resorbable collagen membrane derived from equine pericardium (OsteoBiol® Evolution, Tecnos®) was trimmed and adapted on it. Included in the outcomes measures there were the peri-implant marginal bone level changes. Marginal bone levels at implant insertion (after bone grafting) were 0.04 mm for immediate implants and 0.11 mm for the delayed ones, and this was statistically significantly different. One year after loading, the loss was on average 1.06 mm in the immediate group and 0.63 in the delayed group, with a statistically significant difference. From an aesthetic point of view, the total PES score was statistically significantly better at delayed implants both at 4 months (9.65 ± 1.62 in the immediate group and 10.44 ± 1.47 in the delayed group) and at 1 year (9.71 ± 2.71 in the immediate group and 10.86 ± 1.37 in the delayed group). With reference to failures, 5 implants out of 47 failed in the immediate group (10.6%) and 2 out of 44 in the delayed one (4.6%), with a difference not statistically significant. About complications, in the immediate group 10 patients reported complications vs 4 patients in the delayed group (difference not statistically significant). To be noted that 7 patients (14%) in the immediate group developed vestibular bone dehiscence from 3 months after implant placement to 9 months postloading.

CONCLUSIONS

The present study supports the notion that post-extractive immediately loaded implants could be at a higher risk of failure than delayed implants, as confirmed by other RCTs. The results show ridge preservation and delayed conventional implants placement yielded better aesthetic outcomes compared to immediate placement of larger diameter implants. At 1 year after loading, immediate implants lost 0.43 mm more bone than delayed implants and this difference was statistically significant.



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ORIGINAL ARTICLE

Int Journal of Oral and Maxillofacial Implants
2017 Sep/Oct;32(5):1001–1017

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Histomorphometric results after postextraction socket healing with different biomaterials: a systematic review of the literature and meta-analysis

ABSTRACT

In this article, the authors present a systematic review of the literature with data about histomorphometric outcomes after alveolar socket healing following tooth extraction with or without the placement of a bone substitute material. The primary outcome was the percentage of new bone formation. Secondary outcomes were percentage of biomaterial, connective tissue and non-mineralized tissue still present as measured through histomorphometric analysis of samples.

A total of 802 papers were screened and after the application of the inclusion and exclusion criteria, 40 articles were included in the quantitative synthesis and 11 were included in the meta-analysis of comparative studies. In 16 studies, no bone substitute material was used. Bovine bone (BB) was used in 14 studies; allograft (AG) was used in 5 studies; porcine bone (PB) was used in 4 studies; hydroxyapatite (HA), was used in 6 studies and HA enriched with magnesium in 4 studies; freeze-dried bone allograft (FDBA) was used in 4 studies; calcium sulphate (CS) was used in 4 studies, beta-tricalcium phosphate (β -TCP) was used in 2 studies and other biomaterials were used in 7 studies.

The meta-analysis of the results showed that the use of BB is associated with a lower proportion of vital bone compared to ungrafted sockets, while PB and magnesium-enriched HA seemed to enhance bone formation. Sites grafted with AG showed a proportion of new bone comparable to that of sites that did not receive any bone substitute.

CONCLUSIONS

Within the limits of this review, from the results it is possible to conclude that there is no evidence for the superiority of a given biomaterial over the others in terms of new bone formation. With reference to new bone volume, comparative studies reported that BB caused a reduced proportion of new bone volume (NBV), while PB and magnesium-enriched HA induced a significantly higher amount of NBV, compared to sites healed without bone substitutes.



ALVEOLAR REGENERATION

127

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ORIGINAL ARTICLE

J Periodontol. 2018;89:46–57

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Combination of bone graft and resorbable membrane for alveolar ridge preservation: a systematic review, meta-analysis, and trial sequential analysis

ABSTRACT

It is well known that, after tooth extraction, the alveolar ridge undergoes remodelling and resorption, with the undesired result of a reduction of the height and width of the residual ridge. Consequently, alveolar ridge preservation (ARP) techniques are advocated in order to counteract these events and a variety of grafting materials has been tested in the postextractive socket. The aim of this systematic review was to analyze evidence regarding potential benefits of ARP procedures performed with allogenic/xenogenic grafts in combination with a resorbable membrane coverage in comparison with spontaneous healing. Consequently, in this paper seven studies comparing the use of a bone substitute combined with a resorbable membrane in the test group and spontaneous healing of the extraction socket in the control group were included. Materials used in the included studies were the following: six studies reported use of xenogenic grafting materials consisting of cortico-cancellous porcine bone, collagenated cortico-cancellous porcine bone, and bovine bone mineral associated with a collagen membrane, whereas one study reported the use of FDBA combined with a collagen membrane. In all studies, the control group was characterized by spontaneous healing. Horizontal ridge width reduction (HRWR) and vertical ridge height reduction (VRHR) were investigated as primary outcomes and volume changes (VC) as a secondary outcome. Meta-analysis revealed that the combination therapy resulted in a lower rate of resorption for both HRWR (−2.19 mm, 95% confidence interval [CI]: −2.67 to −1.71 mm) and VRHR (−1.72 mm, 95% CI: −2.14 to −1.30 mm).

CONCLUSIONS

According to the results of the meta-analysis, the evidence currently available in the literature is strong enough to conclude that filling postextraction sockets with a bone substitute covered by a resorbable membrane results in a lower rate of resorption, both in vertical and horizontal dimensions, compared with spontaneous healing. The Authors concluded that *“further studies should be directed to compare use of different bone substitutes and membranes and investigate potential and significant variability related to them, as well as to flap design”*.

Influence of the presence of alveolar mucosa at implants: a histological study in humans

ABSTRACT

In case of tooth loss, in order to minimise the risk of implant failures and complications, delayed implant placement after complete socket healing is generally preferred, usually associated with different ridge preservation procedures, ranging from soft tissue grafts to autogenous or bone substitutes grafts. As it would be useful to know if it is possible to have similar or better clinical outcomes by placing immediately wide diameters implants in post-extractive sites, the aim of this single-centre randomised controlled trial (RCT) was to compare the effectiveness of 6.0 to 8.0 mm-wide diameter implants placed immediately after tooth extraction, with conventional diameter implants placed in preserved sockets after 4 months of healing in molar sites. In the delayed group, the sockets were loosely packed with a mixture of cancellous and cortical porcine-derived bone granules with a granulometry of 250 to 1000 μm (OsteoBiol® Gen-Os® Tecnos®, Giaveno, Italy). In order to cover the socket, a resorbable collagen membrane derived from equine pericardium (OsteoBiol® Evolution, Tecnos®) was trimmed and adapted on it. Included in the outcomes measures there were the peri-implant marginal bone level changes. Marginal bone levels at implant insertion (after bone grafting) were 0.04 mm for immediate implants and 0.11 mm for the delayed ones, and this was statistically significantly different. One year after loading, the loss was on average 1.06 mm in the immediate group and 0.63 in the delayed group, with a statistically significant difference. From an aesthetic point of view, the total PES score was statistically significantly better at delayed implants both at 4 months (9.65 ± 1.62 in the immediate group and 10.44 ± 1.47 in the delayed group) and at 1 year (9.71 ± 2.71 in the immediate group and 10.86 ± 1.37 in the delayed group). With reference to failures, 5 implants out of 47 failed in the immediate group (10.6%) and 2 out of 44 in the delayed one (4.6%), with a difference not statistically significant. About complications, in the immediate group 10 patients reported complications vs 4 patients in the delayed group (difference not statistically significant). To be noted that 7 patients (14%) in the immediate group developed vestibular bone dehiscence from 3 months after implant placement to 9 months post-loading.

CONCLUSIONS

The present study supports the notion that post-extractive immediately loaded implants could be at a higher risk of failure than delayed implants, as confirmed by other RCTs. The results show ridge preservation and delayed conventional implants placement yielded better aesthetic outcomes compared to immediate placement of larger diameter implants. At 1 year after loading, immediate implants lost 0.43 mm more bone than delayed implants and this difference was statistically significant.

ALVEOLAR REGENERATION

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ALVEOLAR REGENERATION

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Platelet-Rich Fibrin with bone grafts for regeneration of bony defect following extraction of supernumerary teeth: a case report

ABSTRACT

In case of abnormalities during tooth development, supernumerary teeth can occur as hyperdontic variants that exhibit diverse nature in terms of prevalence among races and location in human jaws. In this article, the Authors present a case report of partly erupted supernumerary teeth in regions 35 and 36 with its surgical management and regeneration of residual bony defect. In a 41-year-old male patient the presence of two supernumerary teeth was confirmed through occlusal and periapical radiographs. After a complete clinical examination, the surgical removal of supernumerary teeth was planned. The bone defect that ensued after removal was significantly large and, as a bony dehiscence was observed in relation to the lingual aspect of tooth 35 and the mesio lingual aspect of tooth 36, a combination of bone grafts (autograft, allograft (Puros, Zimmer Dental, CA, USA), xenograft (Osteobiol® Gen Os®, Tecnos®, Giaveno, Italy) and platelet-rich fibrin (PRF) was placed to augment the bony defect. Over the 1-year period post operatively, gingival recession was seen on the grafted site; anyway, bone was present until two-thirds of the roots radiographically, suggesting adequate bone fill.

CONCLUSIONS

In this approach, the Authors used a combination of autograft with cortico-cancellous bone in the form of allograft and xenograft, ensuring not only sufficient bone fill, but also provided osteogenic, osteoinductive and osteoconductive effects to the surgical site. Hence, the Authors feel that this approach can be used as a viable option for management of such situations.



ALVEOLAR REGENERATION

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Microarchitectural study of the augmented bone following ridge preservation with a porcine xenograft and a collagen membrane: preliminary report of a prospective clinical, histological, and micro-computed tomography analysis

ABSTRACT

It is universally known that the loss of teeth results in the alveolar ridge resorption and atrophy. When the atrophy is severe, it creates unfavourable conditions for implant positioning, needing a proper ridge augmentation. Therefore, following tooth extraction, it is advisable to adopt one of the several techniques and biomaterials described in the literature so to preserve the alveolus. In literature there are reports of the successful application of several bone graft materials in ridge preservation. One of these materials is a xenograft of porcine origin that has recently been studied. It is a particulated, high-porosity, cortico-cancellous xenograft, maintaining the structure and composition of the natural collagen and hydroxyapatite. The aim of this prospective study was to investigate the integration of porcine xenografts used in ridge preservation by histological and micro-CT analysis, focusing on whether socket grafting interferes with natural bone healing. The patients enrolled in the study were categorized into two study groups: in the test group (group 1; nine patients) patients underwent socket preservation, while the sockets in the control group (group 2; eight patients) were left to heal without the use of socket preservation techniques. In group 1, the cortico-cancellous porcine bone graft (OsteoBiol® Gen-Os®, TecnoSS®, Giaveno, Italy) was packed into the socket and a porcine collagen membrane (OsteoBiol® Evolution) was used as occlusive barrier. After a 6-month healing period, bone core biopsy samples were obtained and implants were placed in all sites. Histological analysis of the bone core biopsy samples obtained from the augmented sites of group 1 revealed that particles of the bone substitute material were surrounded by newly formed trabecular bone in 8 out of the 12 cases. Histological analysis of the 12 bone core biopsy samples obtained from the non-augmented sites in group 2 revealed healthy bone formation in the extraction sockets. The findings of the micro-CT analysis were consistent with those of the histological analysis.

CONCLUSIONS

After a 6-month healing period, the bone volume was sufficient for implant placement in all sites. The analyses performed revealed that the particles of the xenograft interfere with bone healing in the augmented sites. However, socket preservation using a combination of porcine xenografts and collagen membrane successfully maintained the vertical and horizontal dimensions of the ridge. Therefore, the Authors concluded that *“in this study, socket preservation with the combination of a porcine xenograft and collagen membrane to maintain the bone volume of four-wall bone defects prior to implantation was utilized successfully”*.