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[1] Jung RE et al., Clin. Oral Implants Res. 2012; Jun 15 (Epub ahead of print)

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Dr Rolf Vollmer

Practice-oriented implantology

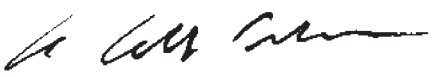
_IDS 2013 has both met and exceeded any expectations implantologists could foster towards the world's leading international dental exhibition. With more than 15 million implants already inserted in Germany alone and over 800,000 implantations every year, implantology is a regular focal point at IDS and many implantologists are among the visitors.

As the oldest European society for implantology, DGZI (German Society of Oral Implantology) took its responsibility as an internationally active organisation for dental implantologists seriously and was present with its own booth. Specialists from around the world were welcome to learn more about the DGZI training programs and DGZI membership. The DGZI booth was also a meeting point for regular members both nationally and internationally. The DGZI executive board, among them DGZI President Prof. Dr Dr Frank Palm, Dr Roland Hille and Dr Rainer Valentin, were available for any requests throughout IDS, providing aspiring and long-term members, cooperation partners as well as the media with information on future events and activities of DGZI.

One of the central topics was of course the 43rd DGZI International Congress from 3 to 5 October 2013 in Berlin. "Practice-Oriented Implantology" will be this year's headline of the traditional DGZI meeting led by Congress President Prof. Dr Dr Frank Palm and Scientific Director Dr Roland Hille. The DGZI International Congress has established itself as a meeting point for novice as well as highly experienced clinicians, presenting the latest scientific insights and evidence-based clinical observations on the current developments in this special field.

With this in mind, the DGZI executive board is happy to have promoted implantology successfully at IDS and strives to reflect DGZI's activities and international orientation again in this issue of *implants—international magazine of oral implantology*. Therefore, we hope you will enjoy reading the specialist articles on the following pages and will be glad to welcome specialists in implantology again in Berlin this fall!

Yours,



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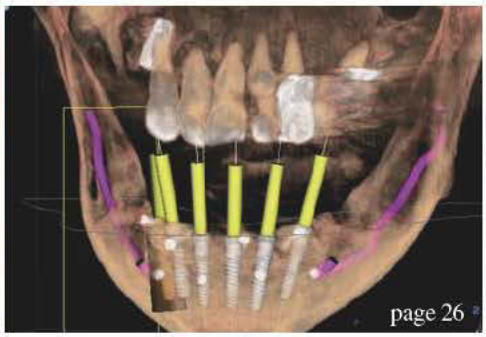
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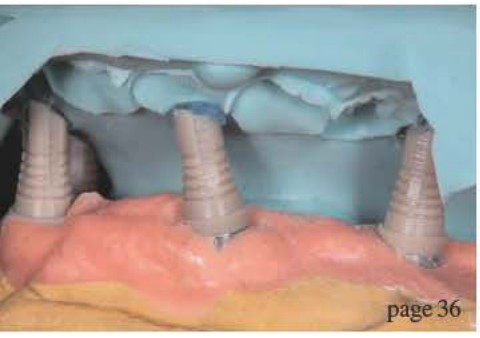
Cover image courtesy of Degradable Solutions AG, www.easy-graft.com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Ridge augmentation for an atrophied posterior mandible—Part II

NanoBone block versus allograft bone block

Authors_Dr Omar Soliman, Prof. Dr Mohamed Nassar, Ass. Prof. Dr Mahmoud Shakal & Ass. Prof. Dr Eman Mohy El-din Megahed, Egypt

Fig. 1_Incision line opening in group A.
Fig. 2_Partial graft exposure in group A.
Fig. 3_Screw exposure.
Fig. 4_Screw loss in group A.
Fig. 5_Complete graft exposure in group A.
Fig. 6_Inflammation in group A.
Fig. 7_Inflammation in group A.


Fig. 1

_Introduction

The aim of the present study was to compare the clinical outcome and radiographic bone changes in augmented ridges utilising a synthetic NanoBone block versus an allograft bone block, and to investigate histologically the success of a synthetic NanoBone block versus an allograft bone block for ridge augmentation.

In the previous issue of implants: international magazine of oral implantology, the authors gave a detailed introduction to their topic and explained the materials


Fig. 2


Fig. 3


Fig. 4


Fig. 5


Fig. 6


Fig. 7


Fig. 8a


Fig. 8b

Figs. 8a & b_Inflammation in group B.

and methods used in their study. In this issue, their report is completed by the results of their investigations and an extensive discussion.

_Results

Clinical results and complications

- Group A: During intra-operative procedures, NanoBone augmentation was associated with fracture of the NanoBone block during augmentation in one case because it was fragile and fractured easily. In the post-operative period, soft-tissue complications such as the incision line opening (one case, Fig. 1), a small perforation of the mucosa over the grafted bone (two cases, Fig. 7), and graft infection (one case, Fig. 6) occurred. In addition to partial graft exposure (Fig. 2), screw exposure (Fig. 3) and screw loss (Fig. 4), one block graft was completely exposed (30 days after surgery) and lost (Fig. 5). Treatment was initiated as soon as possible. Necrotic soft tissue was removed, and the NanoBone block was leveled with the soft tissue using a high-speed bur. The area was immediately and thoroughly irrigated with chlorhexidine. Patients were prescribed an additional week of oral antibiotics and instructed to apply chlorhexidine gel over the affected area twice a day, as well as to refrain from chewing on the grafted site until mucosal healing was complete.

- Group B: No intra-operative complications were present during the allograft augmentation. In addition, no post-operative complications were present after the ridge augmentation or at the time of the implant surgery, except for one case of infection (Figs. 8a & b).

- Both groups: The regenerated ridges healed uneventfully and no evidence of serious adverse local reactions, that is, foreign-body reaction, pain, dysaesthesia, inflammation was observed in any patient throughout the study.

Bone-gain clinical measurements

Analytical data regarding the increase in alveolar bone height and width was obtained before and after ridge augmentation and at the time of implant placement. The mean and standard deviation of the augmentation volume obtained were calculated (Table 1 & Fig. 12).

In group A, the amount of bone height gained was 2.25 ± 1.31 mm ($P < 0.001$) and bone-width gain was 2.3 ± 1.49 mm ($P < 0.002$), while the amount of bone height gained was 0.75 ± 0.97 mm ($P < 0.001$) and bone-width gain was 0.45 ± 0.55 mm ($P < 0.002$) in group B. In group A, the amount of bone-height loss was 2.75 ± 1.31 mm ($P < 0.024$) and bone-width loss was 2.9 ± 1.88 mm ($P < 0.037$), while the amount of bone-height loss was 4.05 ± 1.01 mm ($P < 0.024$) and bone-width loss was 4.4 ± 0.93 mm ($P < 0.037$) in group B.

CBCT evaluation (Figs. 10a, b & d)

It was surprising that Nanobone density was greater in group A after grafting. This was because of the presence of mineral in NanoBone, which acts as a scaffold, degrading progressively and being replaced by new bone. The new bone is premature with a low mineral density and is therefore not radiopaque after six months.

Figs. 9a–d_Histological evaluation.

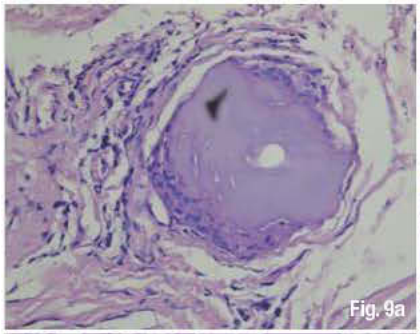


Fig. 9a

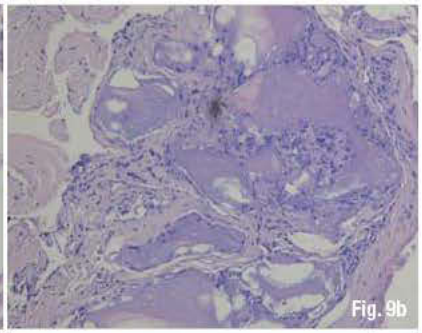


Fig. 9b

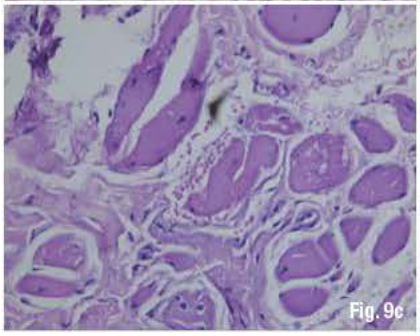


Fig. 9c

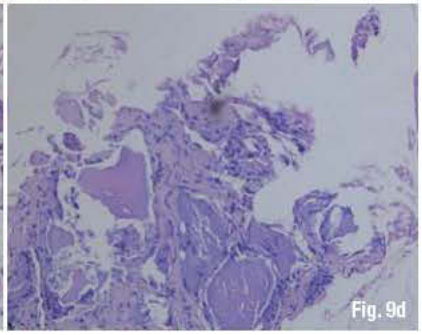
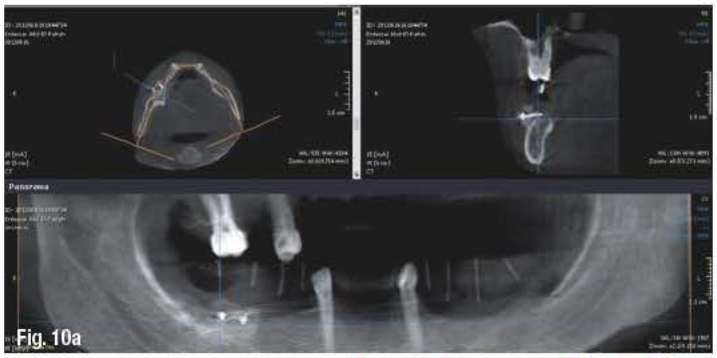
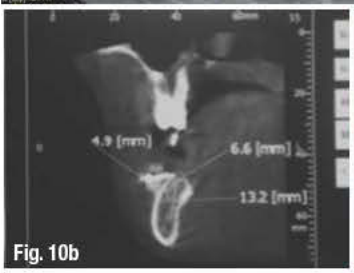
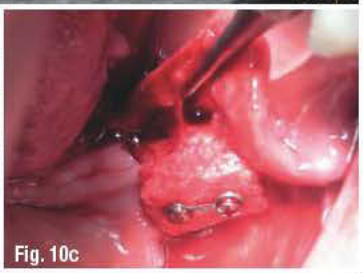
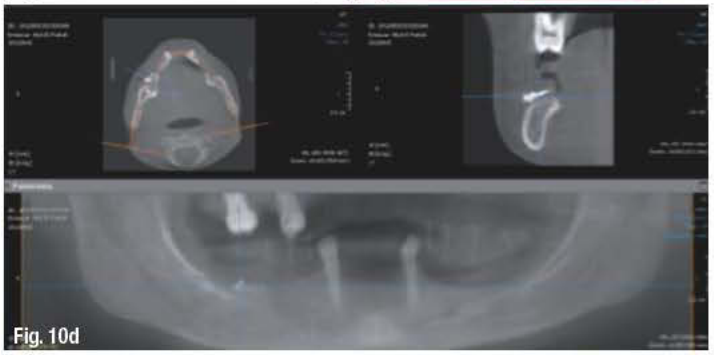


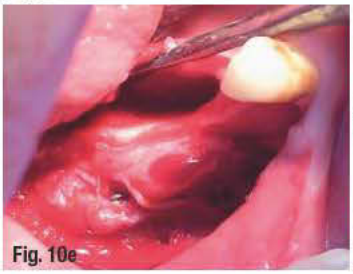
Fig. 9d











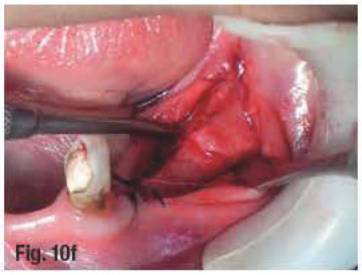


Fig. 10a_ CBCT immediately after ridge augmentation (Nanobone on the right side and Fisiograft on the left side)

Fig. 10b_ measurements of CBCT immediately after Nanobone ridge augmentation.

Fig. 10c_ Clinical view of Nanobone block fixation during augmentation procedures.

Fig. 10d_ CBCT six months after ridge augmentation (Nanobone in Rt side and Fisiograft in Lt side; NB. Nonobone graft not appears radiopaque in CBCT cross section).

Fig. 10e_Clinical view of Nanobone graft six months after augmentation (at the time of implant placement).

Fig. 10f_ Clinical view of Fisiograft six months after augmentation (at the time of implant placement).

By comparing CBCT scans before and six months after the augmentation procedures (Figs. 10 a, b & d), it was found that CBCT is not a suitable means of evaluation for ridge augmentation with either NanoBone or allograft bone blocks.

Histological results

Histological evaluation showed rapid incorporation of the NanoBone block graft at six months, as evidenced by newly formed bone containing viable osteocytes.

_Discussion

Reconstruction of the posterior mandible is challenging since deficiency in bone and mucosa is required due to the deformity.[27] Unlike the maxillary sinuses, the alveolar ridge does not provide a natural cavity to contain particulate grafting material.[28] Therefore, the graft must have sufficient strength and rigidity to attach to the recipient site and 3-D stability to withstand muscular forces.[29] The availability of autogenous bone block grafts from intra-oral sites is often a limitation in treatment possibilities.[30] Among the alternatives to autogenous bone blocks are the synthetic NanoBone and allograft bone blocks. Studies have reported that allograft fresh-frozen bone may provide results equivalent to those achieved with autogenous bone grafts.[30–33] Currently, however, only insufficient evidence is available regarding treatment efficacy of allograft bone blocks, for example volumetric changes and remodelling/incorporation within the host bone, and the long-term survival rates of subsequently inserted implants,[30] and few studies have been conducted on the innovative NanoBone block.[23] The success of grafting procedures highly depends on primary soft-tissue closure, which warrants healing by primary intention and entails only marginal soft-tissue collagen formation and remodelling. In addition, it reduces postoperative discomfort and provides a significant step in predictable bone regeneration. Incision line opening is the most frequent postoperative complication in the initial healing phase of intraoral bone grafting.[34] It results in contamination or loss of the graft as well as a delay or abolition of the vascularisation and may halt bone growth.[35] The high frequency of incision line opening in bone block grafting is caused by the strain on the overlying tissue, which must cover larger quantities of bone. Furthermore, the local growth factor of the soft tissue is low under the reflected flaps which are positioned over a graft material or barrier membrane and not on the host bone.[36] In the present study, we used Kazanjian's vestibuloplasty instead of a crestal flap. Whether to make crestal or vestibular incisions during bone-block augmentation depends on the following factors. Vestibular incisions may be more advantageous than crestal incision because of better protection of the underlying grafted bone.[22] They are also claimed to increase the blood supply to the lingual flap from the floor of the mouth. In addition, the lingual flap is not completely dissected from the inner aspect of the mandible and helps maintain the vestibule. This decreases muscle tension, preventing movement on both sides of the wound, which prevents wound dehiscence and incision line opening.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