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research

Survival of allogenic corticocancellous bone blocks

case report

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Vestibular cortical stabilisation with bone graft





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Dr Georg Bach

Dear colleagues,

Anything but ordinary—Our DGZI family has only recently experienced eventful days in Munich during our 46th International Annual Congress. Extraordinary, no doubt, was the choice of Munich as event location, which certainly is always worth a trip. Moreover, the two congress days were packed with knowledge and expertise of renowned speakers from Germany and abroad, organised by congress makers Prof. Dr Herbert Deppe and Prof. (CAI) Dr Roland Hille. We also experienced an exceptional cooperation among colleagues, within the lecture halls as well as during the evening event on the Oktoberfest Wiesn at the Löwenbräu brewery, which has proven to be an unforgettable event especially for our international guests. Furthermore, we have seen an exceptional congress organisation, which is why I would like to especially thank our headquarters and their leader Dr Torsten Hartmann as well as the OEMUS MEDIA AG team.

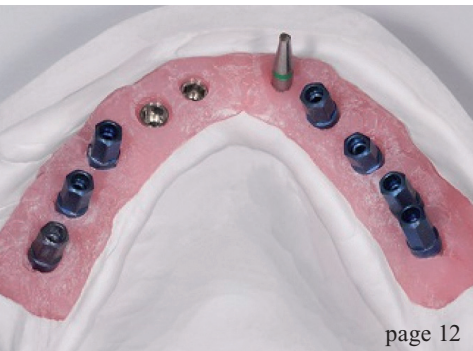
Memorable were the key messages of the congress, which were dedicated to the ambitious topic "Implantology and Aesthetics". While the options for aesthetically oriented implantology have increased, pre-implantological problems of implant planning or implantological education still form the centre of the discussion. If these parameters are not well adjusted, we are prone to reach a high-risk zone of complications and possible failure. That's when "total damage" might be a consequence, both a fact and warning that were highlighted throughout the congress.

Another success parameter formed a key aspect of the scientific contributions and discussions: the contemplation of biological principles. Therefore, the congress posted the provocative question, 'Does biology still play a permanent role implantology?' It does! Which is why I now would like to shed some light on the 2017 DGZI Congress.

The 47th DGZI Congress is going to take place on the last weekend of September 2017 in Germany's capital Berlin. We hope that this event will help us to decide upon this pressing problem of the relevance of biological aspects in implantology. We are looking forward to it!

With warm collegial regards,

Dr Georg Bach



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Survival of allogenic corticocancellous bone blocks

Horizontal alveolar process augmentation for implant placement

Author: Dr Dadi Hrafnkelsson, M.Sc., Denmark

Introduction

Loss of mastication or aesthetics that is to be restored by dental implants requires sufficient volume and quality of alveolar bone.¹⁻³ It is important for the primary stability and the long term success of any dental implant treatment. The famous golden standard remains to be the autologous bone block^{4,5} as it is not involved in any immunological concerns, and contains vital cells. However, the vitality of the graft is highly dependent on the perioperative storage of

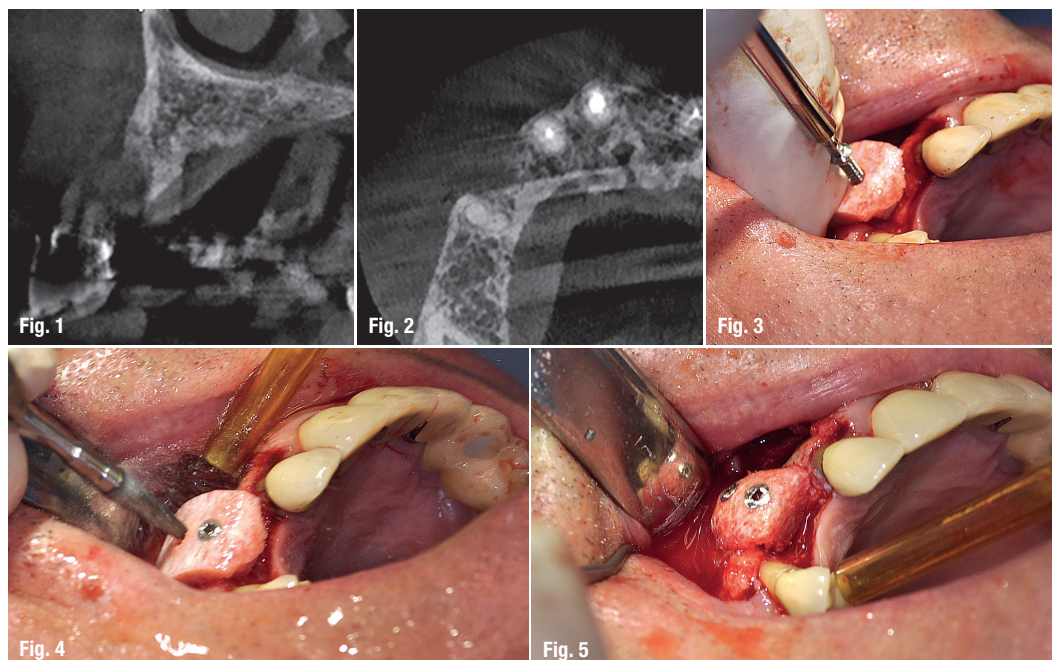
the graft.⁶ It is generally accepted that class IV and V, according to the Cawood and Howell classification,⁷ need block augmentation before implant placement. The use of osseous allograft blocks for alveolar process augmentation is not very well documented in the literature.

Antonio Barone et al.⁸ published his study in 2009 and showed a good success with the osseous allogenic block, 24 blocks were used to augment the maxilla in 13 patients. Five blocks were used for ver-

Figs. 1 & 2: Case 1: Horizontal atrophy of the alveolar process in the maxilla.

Figs. 3 & 4: Allogenic bone block is fixed with two osteosynthesis screws.

Fig. 5: All sharp edges are removed intraorally.



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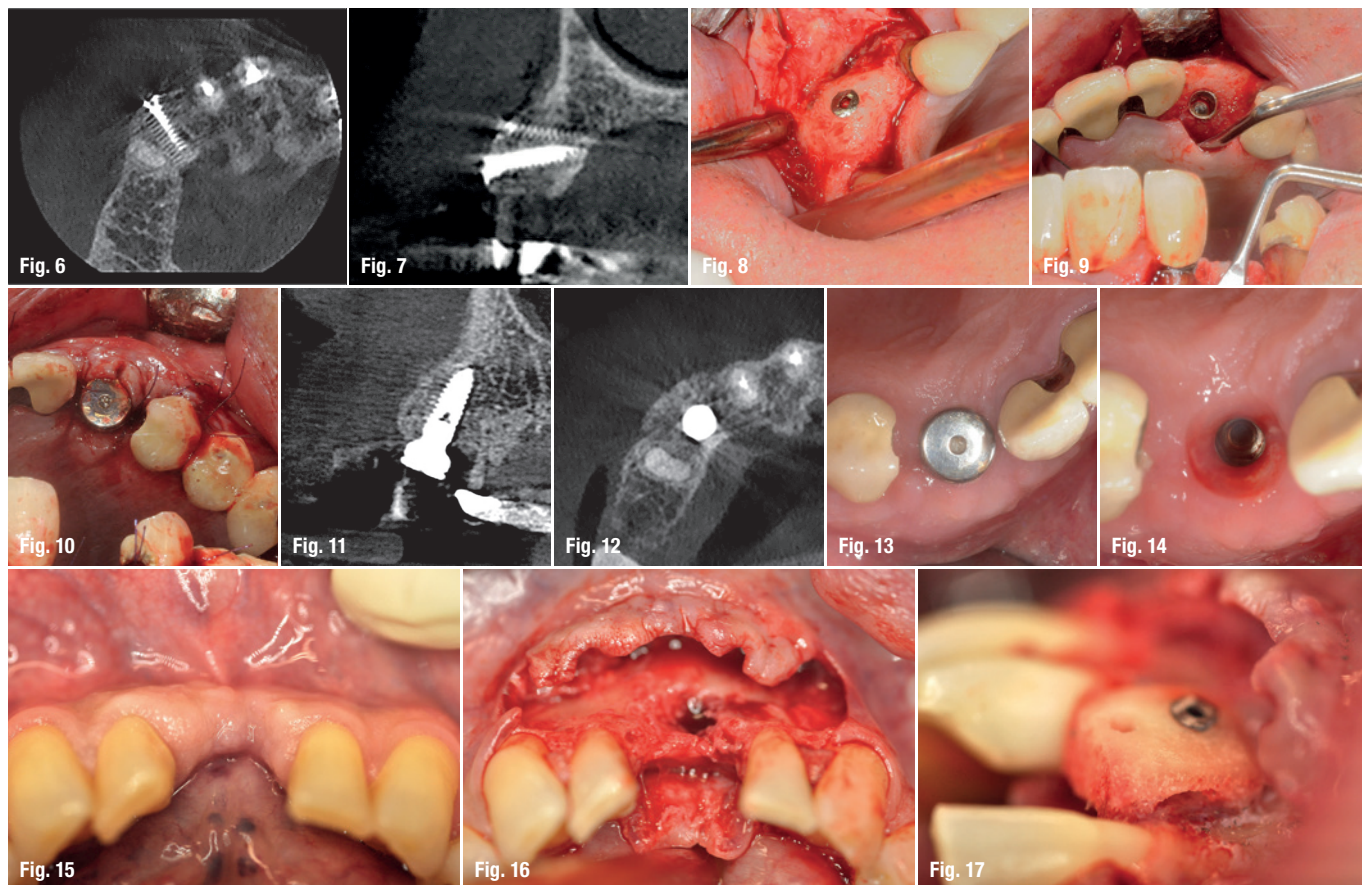
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Figs. 6–8: Six months after bone augmentation.
Figs. 9 & 10: Implant placement.
Figs. 11–14: Healing six weeks after implant placement.
Figs. 15 & 16: Case 2: Preoperative situation.
Fig. 17: Allogenic bone block stabilised with a single osteosynthesis screw. Lateral view, much of the spongy part was removed so there was a gap between residual bone and graft.

tical augmentation. Out of these 24 blocks, two were a failure due to soft tissue exposure and thus completely removed. The remaining blocks were loaded with 38 implants at later stages and all implants achieved good primary stability. Contar et al.⁹ also published their paper in 2009. A total of 34 osseous allogenic blocks were used in 15 patients, one block had an early exposure. A number of 51 implants were placed into the grafted area with sufficient primary stability. None of the implants were lost within an observation period between 24 to 35 months. Carinci et al.¹⁰ published a paper in 2010 where implants placed in the resorbed maxilla, which had been grafted with osseous allogenic blocks and reported a survival rate of 98.3% over a mean follow-up of 26 months. This study showed results comparable to same areas augmented with autologous iliac crest bone.¹¹ In 2015, Krasny et al.¹² published an article in which 21 patients were treated with 26 grafts. In two grafts, there were complications with soft tissue, and one augmentation had to be redone because of iatrogenic causes. After three to six months of healing, 33 implants were placed. Within an average observation time of 36 months (28–50), no implant had been lost. Araujo et al.¹³ published a systematic review on the same matter in 2013, in which a total of 253 osseous allogenic blocks were placed in 194 patients with a mean follow-up of twelve months (3–66). All studies showed good success from 95% to 100%.

Materials and methods

A total of 15 Patients were treated by the same surgeon in Godt Smil Odense from November 2013 to March 2015. Nine Patients were male, six were female. The youngest patient is 26 and oldest patient is 78-years-old. These 15 patients received 19 allogenic bone blocks to horizontally augment the atrophic alveolar process both in the mandible and in the maxilla prior to implant placement. All patients were in good general health, one was a smoker. All patients underwent periodontal therapy, if needed, before surgical intervention.

Surgical procedure

Premedication is 2,000 mg Imdrax (Amoxicillin), 1,000 mg Pinex (Paracetamol) and 400 mg Ibumetin (Ibuprofen) 60 minutes before treatment. All Patients were instructed to rinse their mouth with 0.05% Chlorhexidine solution twice for one minute. The same strength of chlorhexidine solution was used for the perioral skin using a chlorhexidine-impregnated gaze. Local anaesthesia was administered as infiltration buccally and palatally/lingually (Xyloplyin® dental adrenalin 20 mg/ml + 12.5 microgram/ml lidocain hydrochlorid + adrenalin, DENTSPLY). Venous blood was sampled with a so-called butterfly (Vacuette® Greiner bio-one). The blood was collected in 10 ml

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Bone



Tissue

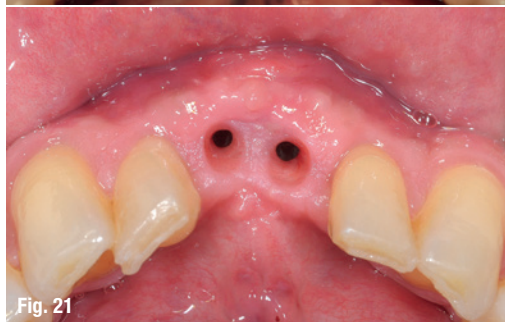
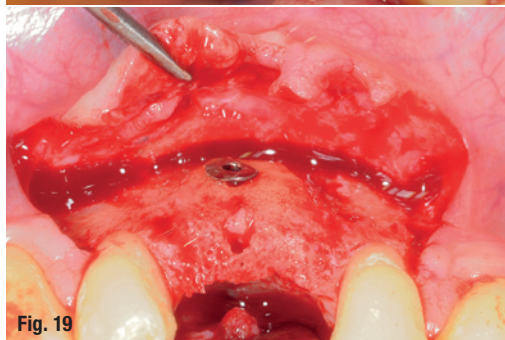
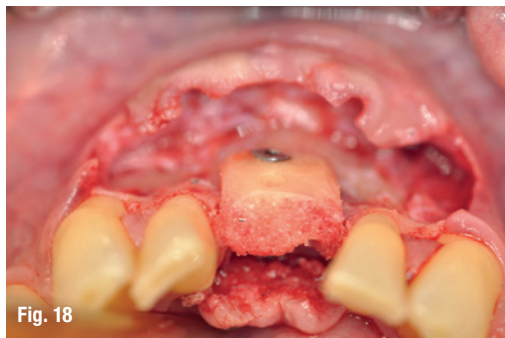
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Fig. 18: Allogenic bone block, occlusal view.

Fig. 19: Allogenic bone block, integrated after six months of healing.

Figs. 20 & 21: Before and after surgical intervention.



tubes (A-PRF[®]+) and centrifuged according to Choukroun's protocol.

A mucoperiosteal trapezoid flap was raised exposing the defect area. Neighbouring teeth were cleaned of any debris. Allogenic bone blocks weather, J bone or Iliac crest, were customised chairside and fixed to the recipient site with osteosynthesis screws. The block was further adjusted after fixation has taken place, making sure there were no sharp edges and keeping the graft at least 1 mm away from any tooth surface. A PRF was placed over the block and healing was done by primary intention. Sutures were Resilon (Glycolon 5-0). Postoperative medication was Imadrax (Amoxicillin), 1,000 mg twice a day for three days, Ibumetin (Ibuprofen, 400 mg) in combina-

tion with 1,000 mg Pinex (Paracetamol) as needed. Six months later, when the implants were installed, survival of the graft was measured only by the integration of the graft from a clinical perspective, including no apparent pathology, bleeding from the graft during osteotomy and the possibility to place dental implants with or without minimal GBR.

Results

None of the patients reported any problems during healing. All 19 bone blocks were integrated to the recipient site and bleeding at osteotomy after six months of healing gave a 100% result. There was great variation in resorption that was measured from the head of the screw: nine cases showed no resorption from the head of the screw, the remaining cases showed resorption ranging from 0.5 to 1.5 mm from the head of the osteosynthesis screw. Peripheral areas of the blocks, however, can exhibit a higher degree of resorption, but they were not measured in any way in this study.

Discussion

It must be noted that none of the grafts were used for vertical augmentation. This sample is a part of a bigger sample that involves more complex bone augmentation with use of more types of biomaterials such as spongy allogenic bone, prefabricated or not. In the bigger sample, there were failures that were not present when the augmentation was strictly horizontal and done by corticospongyous blocks alone, indicating that this is a very predictable procedure when done like described in this case series.

The surgeon's opinion is that resorption is related to width of the augmentation, thickness of the cortex on the corticospongyous allogenic bone block after modification in the mouth, and area of the mouth, whereas the mandible showed more resorption. However, the surgeon's opinion is per se of low evidence, and these topics should be investigated more in well-planned studies.

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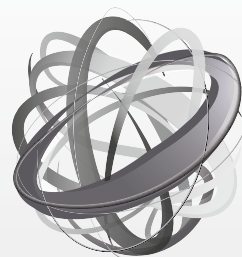
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Straightforward advanced complex in dental implantology

Authors: Dr Rolf Vollmer, Dr Patricia Wieschollek and the laboratory team of Michael Anger, Germany

Introduction

SAC (Straightforward Advanced Complex) defines the level of difficulty in dental implantology. Originally created by the ITI team in order to describe difficulties in dental implant surgery, this term has also been applied and adapted to dental prosthetics. This article presents a surgically moderately difficult but prosthetically highly demanding case. The special difficulty arose when the implant position was planned in a perfect alignment but impeding the prosthetic restoration. In close cooperation with the dental laboratory and due to backward planning, the patient could be provided with an individual, if not even unconventional solution.

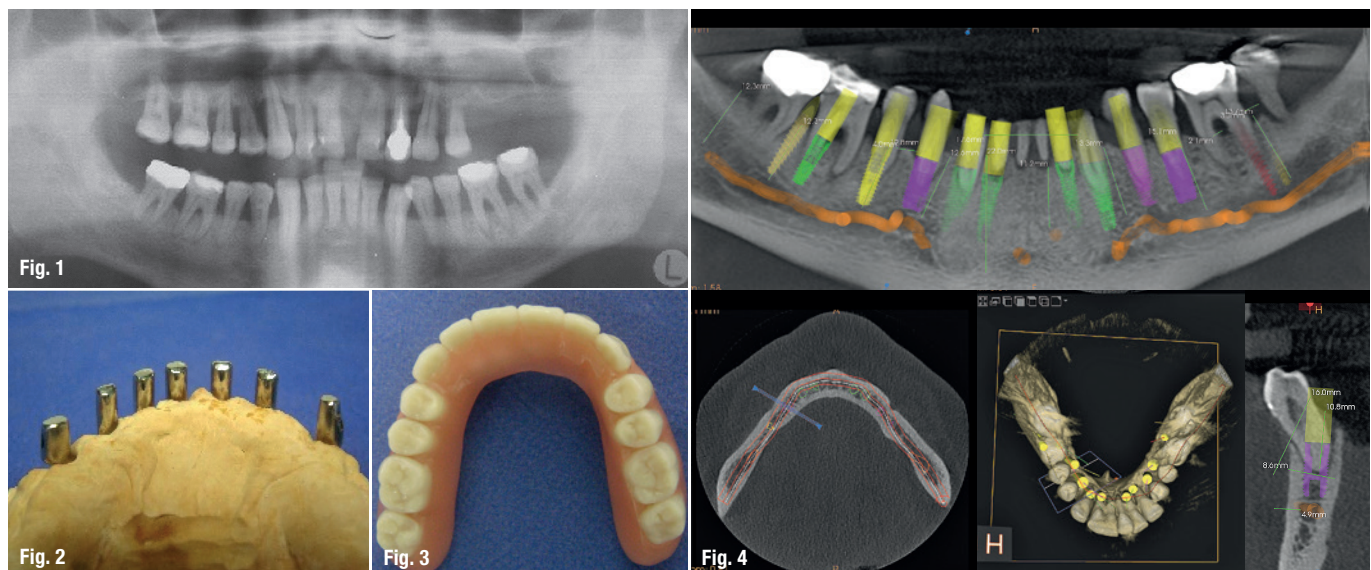
served in the patient (Fig. 1). In 2011, when the patient was 43 years old, the removal of all teeth in the maxilla and the insertion of a full denture took place. Since his sensations of taste were strongly affected by the palate cover, the decision was made for implantation of seven implants in the maxilla, supplied with a removable cover denture telescope prosthesis with bonded secondary parts in Galvano or electroforming technique (Figs. 2 & 3).

In 2015, there was a recurrent severe periodontitis in the mandible and extremely strong loosening of all the lower teeth in the now 47-year-old patient (Fig. 4). So, definitive treatment planning for the mandible was necessary. The mandibular incisors had to be removed in advance because of their missing stability. Due to the patient's severe gag reflex, implantation under general anaesthesia was provided. The removal of all remaining teeth with simultaneous implantation and insertion of two

Case presentation

Years of progressive refractory horizontal bone loss with alternating acute periodontitis were ob-

Fig. 1: Initial situation in maxilla and mandible.
Figs. 2 & 3: Insertion of a full denture in 2011.
Fig. 4: The CBCT planning shows the scheduled implant positions in the mandible and the exit points of the abutments in relation to the teeth before extraction.



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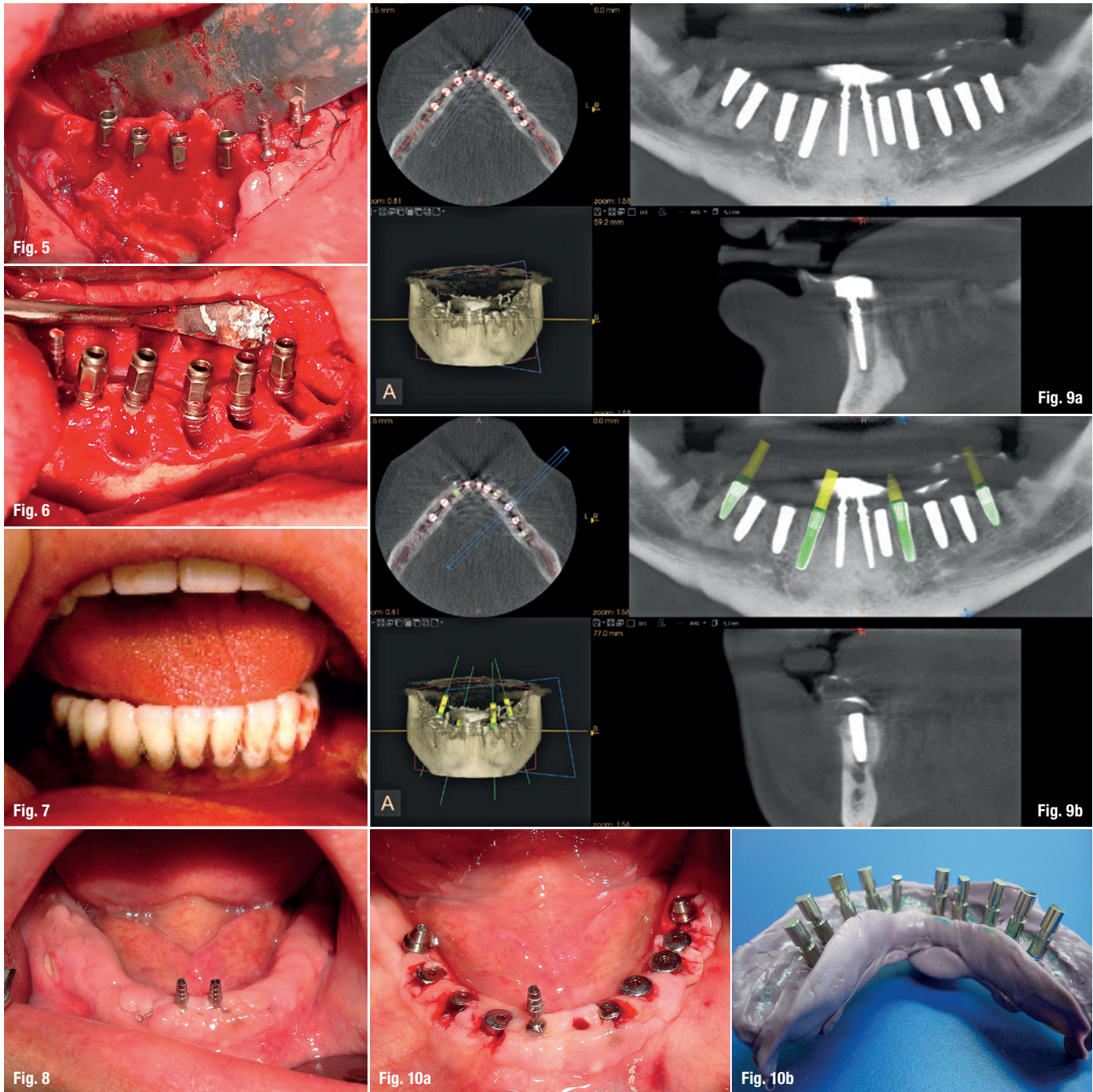
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Figs. 5 & 6: Insertion of five definite implants on the left and four definite implants on the right side.
Figs. 7 & 8: Healing period.
Figs. 9a & b: Control DVT and comparison to planning software.
Figs. 10a & b: Implant uncovering and fixing of the interim prosthesis.

interim implants was planned. On Fig. 5, one can see that the implant axes and the exit points would differ significantly from the later position of the original teeth. Implantation in the axis of the existing teeth was not possible since otherwise, this would result in a lingual perforation. Nevertheless, a solution had to be found to give the patient a corresponding tongue space later. A prosthetic restoration with telescopic crowns, in this case, was not an option, since it would result in an arch being at least 5 mm smaller on each side.

During implant surgery, five definite implants on the left side and four definitive implants in the right

side, as well as two auxiliary implants for immediate restoration and loading with a temporary immediate prosthesis, were inserted (Figs. 5 & 6).

Subsequently, the healing was unproblematic and the patient was bridged with the interim prosthesis for the transition period fixed on the two auxiliary implants (Figs. 7 & 8). To verify that there has been no nerve injury as the patient was under general anaesthesia during surgery, a control CBCT was made post-op, showing the respective distance to the nerve canal (Figs. 9a & b). Longer implants could not be introduced due to the aforementioned angulation problems, which would have resulted in an

even more unfavourable axial direction. An overlay with the planning software indicates that the implants were inserted into the pre-planned position and direction accurately. Again, the problem of implant-platform exit points which are situated too far lingually is illustrated.

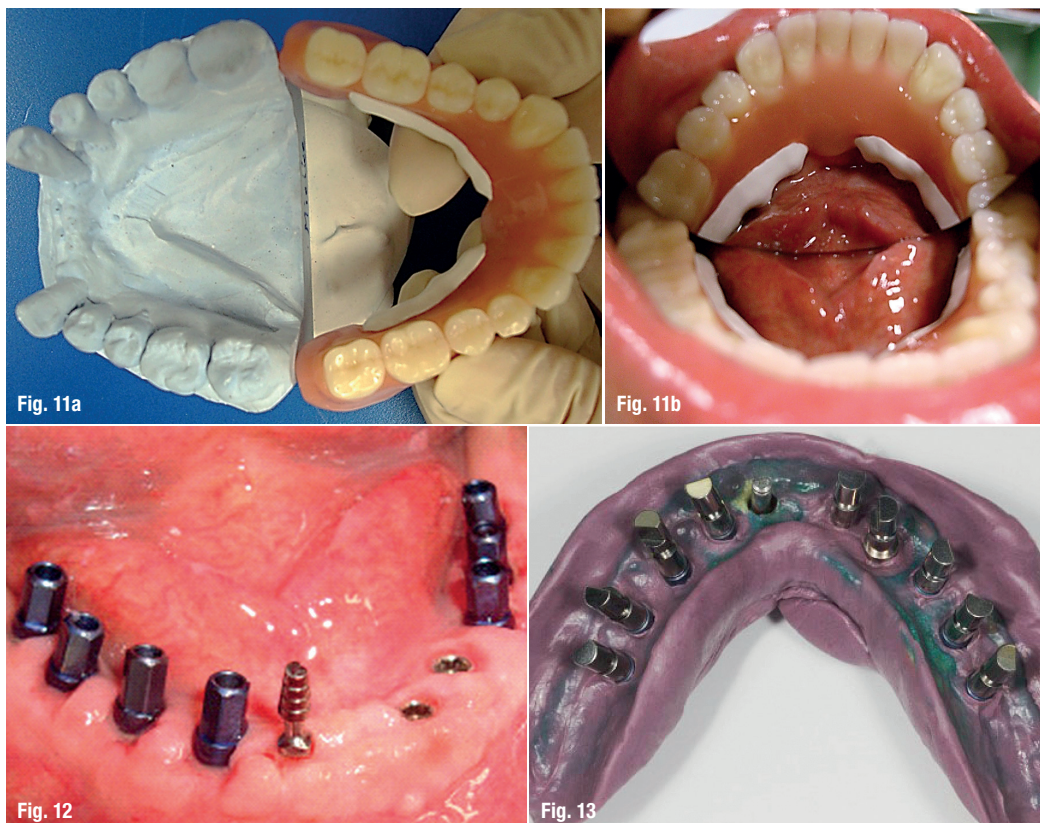
Three months later the implants were uncovered and the interim prosthesis was fixed at the distal implants with snap attachments (acc. to Dr R. Laux) and a silicone relining was done. One auxiliary implant (41) remained (Figs. 10a & b). The auxiliary implant in position 31 had become loose after three months and was removed during the exposure of the definitive implants. The impression was taken as a closed-tray procedure. The follow-up panoramic radiograph shows the good and tension-free seating (passive fit) of the bar-designed superstructure. The remaining auxiliary implant is still very stable. The auxiliary implant will be removed at the time of insertion of the final prosthesis.

The juxtapositioning of the original model to the newly produced prosthesis with PEEK abutments shows that, according to the initial situation, enough room had been created for the tongue (Figs. 11a & b). The final images show the good fitting and seating of the prosthesis. The lingually in white colour visible, delicately designed PEEK abutments do not restrict the patient in any way.

Laboratory Part (ZTM Michael Anger)

The task here was to allow the patient enough space for his tongue. In spite of digital CBCT-planning, a different positioning of the implants and their axial inclination was not possible because of the bone range. Therefore, we have decided to apply a bar construction instead of telescopic attachments in this case, so the friction parts could be located more lateral and not in correspondence with the position of the implant platform.

Figure 12 illustrates the situation several days after the exposure of the implants and the healing progress. Here, the healing caps were used as impression copings. In these pictures, the strong lingual inclination of the implant abutments is already visible. Because of the bone volume, a different positioning without augmentation was impossible. The implant impression was made with Impregum®. The taste of this material is not very convenient for the patient and it must harden for at least seven minutes in the mouth. On the other side, the thin texture results in an exact capture of the oral situation and its high final hardness provides the best-possible fixation of the impression posts. Figure 13 depicts the implant impression after disinfection before the injection of the gingiva. All mucosal parts should be displayed flawlessly. If there are any impression errors, they can be repaired with wax. Ideally, we produce a coherent gingival mask to avoid transitions in



Figs. 11a & b: Juxtapositioning of original model and prosthesis with PEEK abutments.

Fig. 12: Final image. Mouth situation after exposing the healing-caps. In the front, the last auxiliary implant is visible.

Fig. 13: Implant-impression after disinfection before the injection of the gingiva.

Fig. 14: Jacketing of the model-implants and impression-posts with gingival mask material.

Fig. 15: Gingival mask after preparation.

Fig. 16: The gingival masks and the plaster form clean transitions.

Fig. 17: The metal bar on the model with the gingival mask.

Fig. 18: The bar-body extends far into the vestibular area for static support among the teeth.

Figs. 19 & 20: The PEEK framework before completion.

Fig. 21: PEEK-frame when placed on the milled bar.

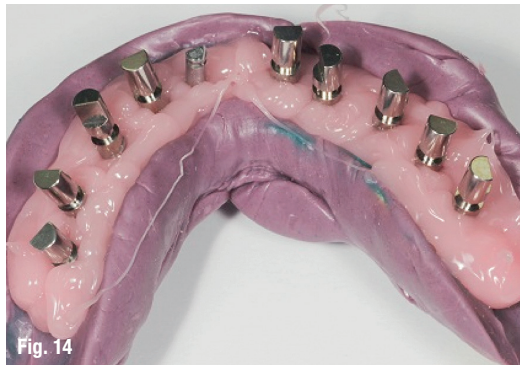


Fig. 14

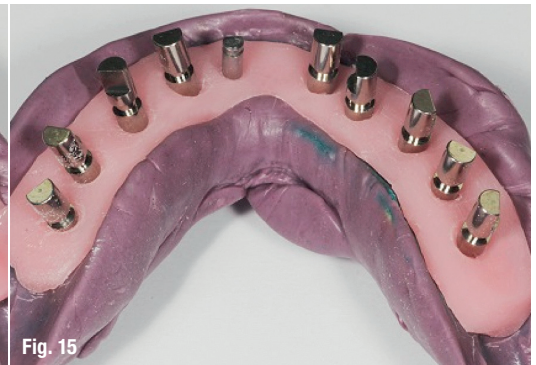


Fig. 15



Fig. 16

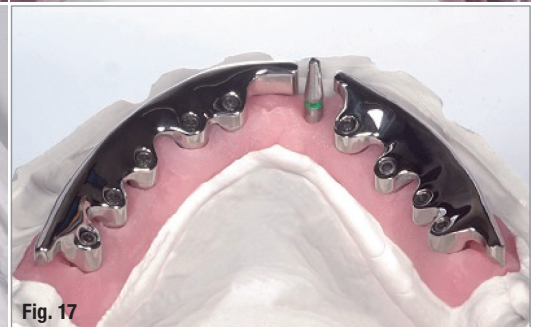


Fig. 17

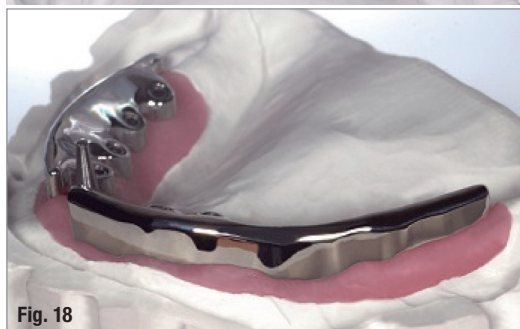


Fig. 18



Fig. 19



Fig. 20



Fig. 21

plaster silicone. Figure 14 depicts the jacketing of the model implant analogues and impression posts with gingival mask material: the implant impression after injection of the gingiva-mask. The material should be bubble free and clean when applied.

We use Shera-Gingival® for the gingival masks. This material is pressed from a mixing tip with a fine syringe and has a natural appearance. Before casting with plaster, the gingiva must be removed from the impression to eliminate all banners and undercuts, thus easy removal and more importantly—a safe repositioning is ensured. To take the gingival mask from the model, the model implants should be unscrewed before, so that the impression copings are

not changed in their position. This work must be carried out very carefully and cautiously. Figure 15 shows the gingival mask after preparation. The edges are smoothed with abrasive belts and rubber. In the plaster, the implants remain safe and there are neither flags nor undercuts which would make it difficult to reposition.

The gingival masks and the plaster form clean transitions (Fig. 16). The clear edges between gypsum and gingival mask are crucial for the clean repositioning after removal of the implant mask during processing. The casting technique was applied in manufacturing the bridge with burnout-able plastic auxiliary parts. Preventing sharp edges on the PEEK-facing side is



Figs. 22a & b: The finished prosthesis in different views; the obliquely-lingual view shows the polished transitions between the prosthesis plastic and PEEK-framework.

Fig. 23: After being placed on the model, the edges close cleanly and tightly.

Fig. 24: The unit was conditioned with plastic before finishing and pretreated with pink opaque.

important. The metal bar on the model with the gingival mask can be seen on Figure 17. The drill just shows the position of the provisional auxiliary implant. The bar is extended far into the vestibular area to afford static support among the rows of teeth (Fig. 18).

The PEEK framework before completion is depicted on Figures 19 and 20. Figure 21 shows the PEEK-frame when placed on the milled bar.

Low Shrinkage

The secret behind the completion of PEEK-based products is making sure that the plastic is subjected to a minimum of polymerisation-shrinkage during completion. For this purpose, the author uses polymers with a more flour-like grinding, such as FuturaGen® by Mani Schütz Dental. Furthermore, the monomer is less likely to become subject to shrinkage than other monomers and does not tend to discolour. The minimal shrinkage furthermore causes a much lower stress for the implants and is therefore especially preferable for immediate loading.

Conditioning the surface PEEK

For a stable bond between PEEK and plastic, the author applies a bonding such as Dialog Bonding-Liquid®, Mani.Schütz Dental. Figure 22 shows the finished prosthesis in different views.

In an oblique lingual view, the polished transitions between the prosthesis plastic and PEEK-framework can be identified (Fig. 22a). The thin lingual coverings of this design allows enough space for the tongue and

are perfectly functionally adapted. After being placed on the model, the edges close cleanly and tightly (Fig. 23). According to our instructions, the unit was conditioned with acrylic before finishing and first covered with a pink opaquer (Fig. 24). The notches in the model show the position of guides for the silicone key.

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The atrophic crest

Vestibular cortical stabilisation with bone graft

Authors: Dr Paolo Borelli & Dr Massimiliano Favetti, Italy

Introduction

The insertion of implants in atrophic bone crests can easily create fenestrations in the coronal part of the implant site. For this reason, many authors advocate using GBR (guided bone regeneration) to prevent possible dehiscence in the post-surgical phase and to guarantee the survival of implants, which is attributed to adequate bone thicknesses in the cortico-vestibular portion of the crest.¹⁻² Vestibular bone loss is frequently caused by the technique used to prepare the implant site, that, for insertion of an implant of $\varnothing 3.75$ mm diameter, usually anticipates an osteotomy with a drill of at least $\varnothing 3.2$ mm diameter.³ In these cases, the use of self-tapping implants and auto-condensers enables us to reduce the osteotomy to a $\varnothing 2.8$ mm diameter drill, making it possible to save at least 0.4 mm of vestibular cortical bone, fundamental in obtaining an optimal aesthetic and functional result that is long-lasting.⁴

Case overview

A patient, female, 45-years old, non-smoker, without any particular problems in her medical history, presented complaining about a problem in the mandibular left quadrant. The physical examination revealed bridge decementation of the teeth 35, 36 and 37. Simply redoing this bridge as impossible, due to the absence of an adequate ferrule as well as uncertainty regarding the long-term prognosis for tooth 37. It was decided, therefore, to replace tooth 36 with an implant and GBR with a resorbable membrane and heterologous graft.

Extraoral examination

The patient was normotrophic with regard to soft tissues and the perioral musculature without significant asymmetries of the face.

Intraoral examination

Intraoral examination showed a good level of oral hygiene, some signs and facets of dental wear as well as an absence of mobility problems (Fig. 1).

X-ray examination

The preoperative oral X-ray (Fig. 2) suggests that tooth 37 has an uncertain long-term prognosis as bridge abutment. The CBCT (Figs. 3a & b) shows the crestal bone to be very thin, but of adequate height for the insertion of an implant of 13 mm in length.

Materials used

- The following materials were applied:
- NeO implant $\varnothing 3.75 \times 11.5$ mm (Alpha-Bio Tec., Israel) in zone 36
 - Resorbable collagen membrane
 - Xenograft
 - PTFE 4-0 suture (Omnia, Italy).

Treatment objectives and work plan

The treatment plan included a pre-implant hygiene session. Proper positioning of the implant will require

Fig. 1: Frontal view of the patient.

Fig. 2: Ortho-panoramic X-ray.



Fig. 1



Fig. 2

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Figs. 3a & b: CBCT with implant planning.

Fig. 4: Flap incision.

Fig. 5: Occlusal view of the gap.

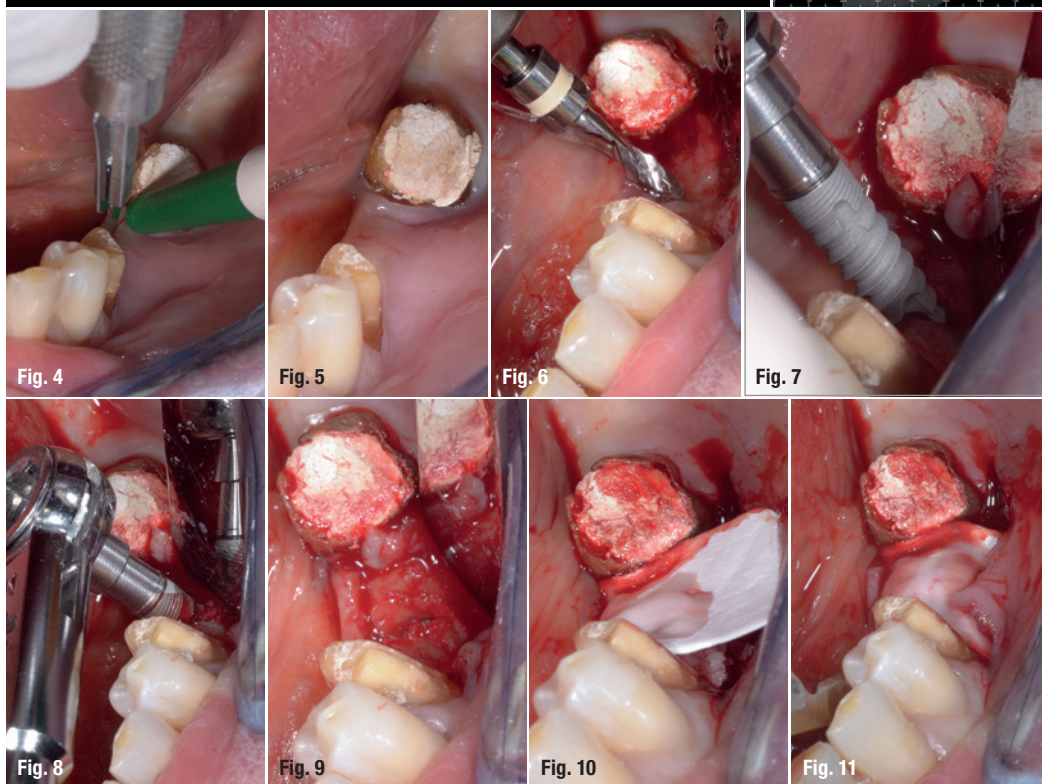
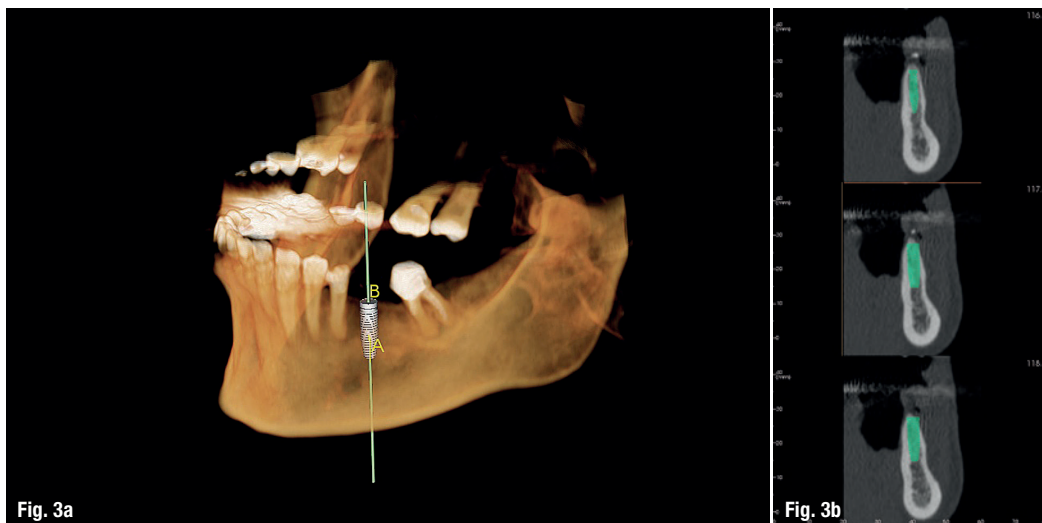
Fig. 6: Preparation of implant tunnel.

Fig. 7: Manual insertion of the implant.

Fig. 8: Subcrestal insertion of the implant.

Fig. 9: Subcrestal insertion of the implant.

Figs. 10 & 11: Regeneration with resorbable membrane and heterologous bone.



an increase in volume from the vestibular side for the restoration of correct tissue harmony and a correct emergence profile of the prosthetic crown. Several post-surgical follow-up visits are planned at two, four, seven and 14 days to disinfect the incision with chlorhexidine and to check for possible dehiscence of the flap. The prosthetic phase will be carried out approximately four months after the positioning of the implant and consists of a zirconia and ceramic crown on a titanium abutment.

Surgical phase

After plexus anaesthesia, performed with mepivacaine 1:100.000 both in the vestibular and lingual fornx, a crestal incision was made without releasing

cuts, so as not to reduce the vascularisation of the flap, as predicted by the CBCT (Figs. 3a, b & 4).

Flap incision

The bone crest appears very thin, but of adequate height for the insertion of an implant of 13 mm (Fig. 5). In order to minimise possible vestibular fenestration in the sub-crestal positioning of the implant of $\varnothing 3.75 \times 11.5$ mm, we decided upon a 13 mm preparation of the site, beginning the drilling sequence with a 2 mm stop drill. The osteotomy was stopped at the 2.8 mm diameter drill (Fig. 6). The implant was inserted using a manual ratchet and stabilised in a sub-crestal position with approximately 50 Ncm of torque (Figs. 7-9).

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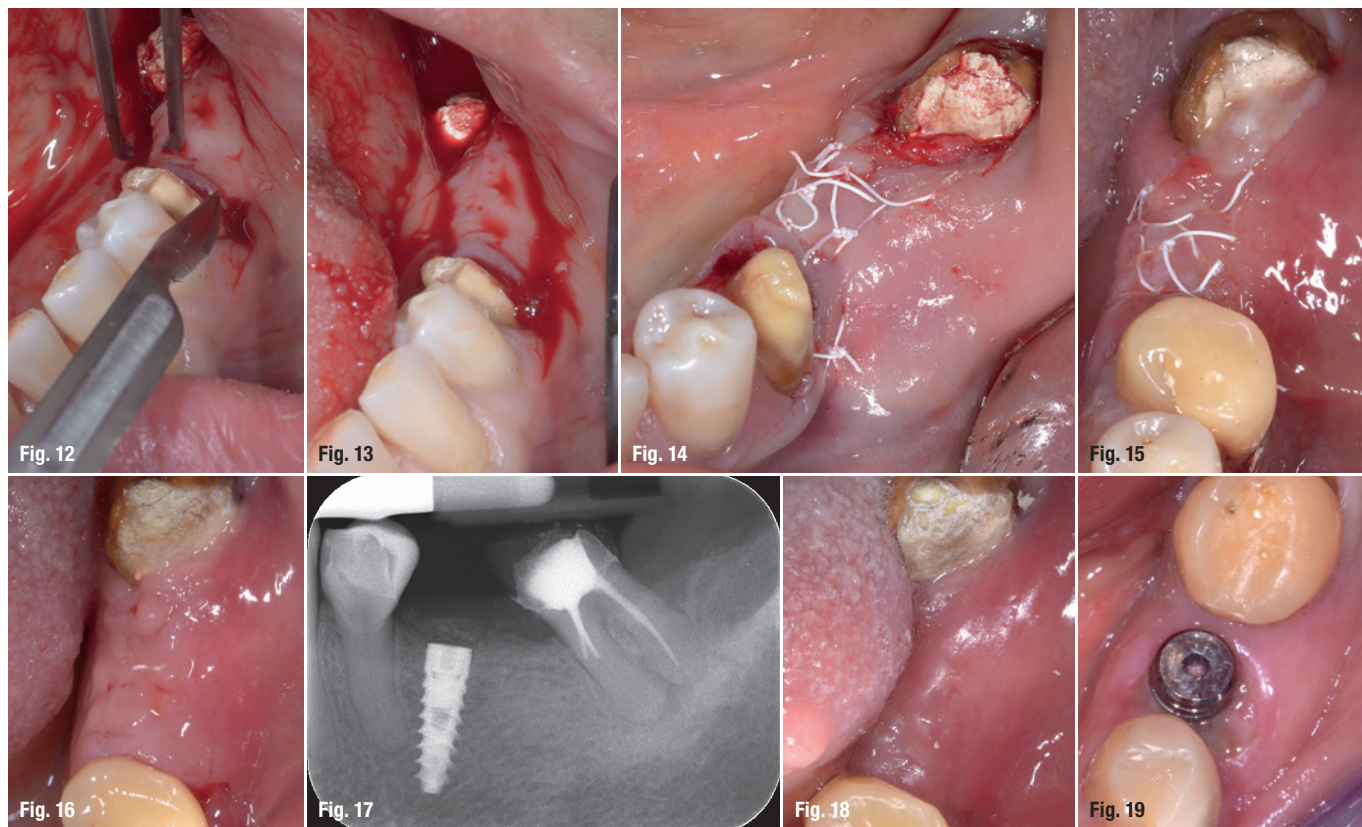
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Figs. 12 & 13: Release of the flap and primary intention closure.
Fig. 14: Suture.
Fig. 15: Suture follow-up at 15 days.
Fig. 16: Suture removal at 15 days.
Figs. 17 & 18: X-ray and tissue healing after four months.
Fig. 19: Healing abutment.

Although no vestibular fenestration was observed at the time of surgery, it was decided to increase the vestibular cortical bone thickness, since some portion of this bone is usually resorbed after implant placement. First, the resorbable membrane was stabilised lingually and, after filling the relevant zone with heterologous bone, the membrane was folded down on the vestibular side to protect the graft (Figs. 10 & 11).

The surface of the membrane was then disinfected with a 0.2% chlorhexidine solution, and the flap was closed passively in order to obtain a first degree closure without traction on the suture (Figs. 12 & 13).

Two lines of sutures were executed, the first with horizontal external mattresses, later stabilised by a second line of separate points more coronal to the first (Fig. 14). The patient was discharged with the following drug regimen: rinses with 0.12% chlorhexidine dielugonate for 60 seconds twice a day, antibiotic therapy with amoxicillin and clavulanic acid—one tablet of 875 mg twice a day, ice on the first day and a semiliquid diet for the first week. At 15 days after surgery, follow-up was performed to verify the healing of the tissues (Fig. 15).

After removal of the suture, the site did not show signs of dehiscence of the wound (Fig. 16). The successful osseointegration of the implant is visible on the four-month follow-up X-ray and all tissues ap-

pear to be well healed (Figs. 17 & 18). A healing abutment was then inserted (Fig. 19).

Outcome

The case will be finalized and updated in the next few months with the delivery of the final prosthetics to the patient.

Acknowledgement: Thanks to Dott. A. Careno & E. Careno from Vercelli.

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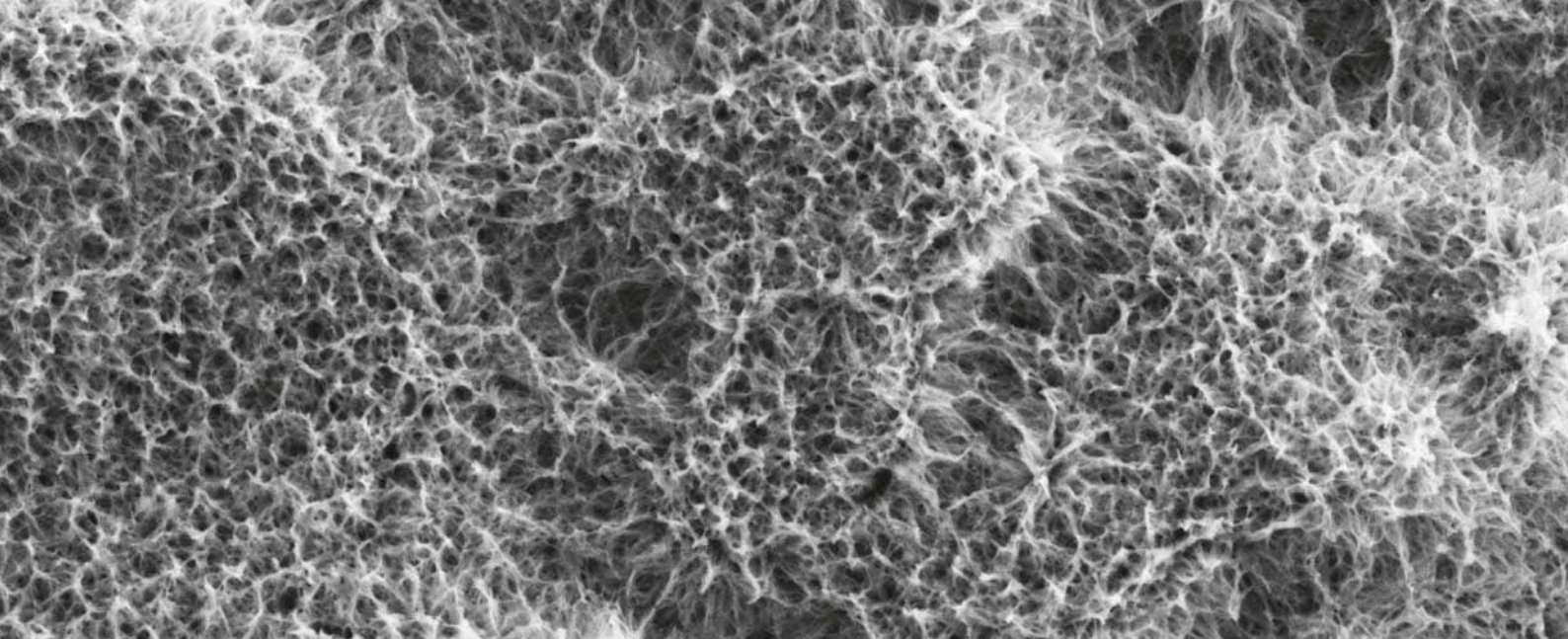
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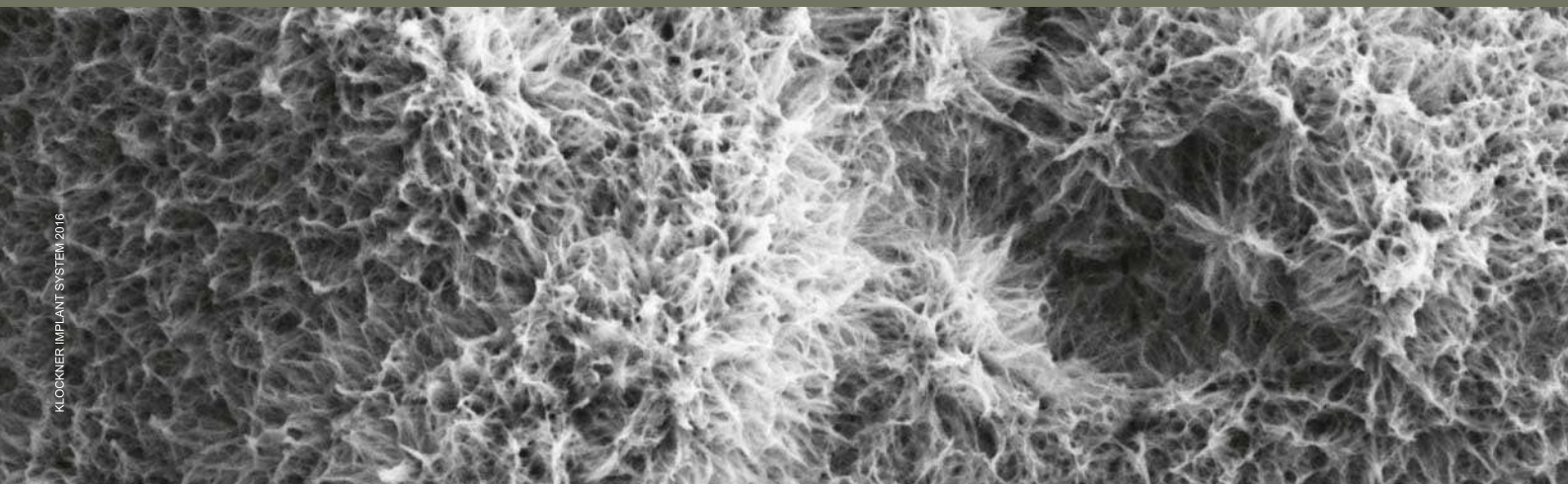


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The use of narrow implants

Author: Dr Huub van't Veld, Netherlands

The development of very narrow implants can provide a solution for interdental spaces in the aesthetic zone that are smaller than 5–6 mm and in which implantology is indicated to fill the diastema with an implant-supported crown. Increasingly, in the choice of the implant not only the quantity (> 1 mm) and quality of the surrounding bone are important but also the support function of the bone to obtain a good mucosal seal. The major implant brands have developed small diameter implants for these narrow spaces. Nobel has the 3.0 mm NobelActive implant, about which many publications have already appeared; Astra has the OsseoSpeed 3.0 mm implant and DENTSPLY has the Xive 3.0 implant.

In 1976, the FDA already defined implants with a diameter of 3.0 mm and greater as conventional dental implants. In 1997, this institute defined implants with a diameter smaller than 3.0 as SDI (small diameter implants). This mainly concerns one piece implants used in very narrow jaws for a removable device or as an anchor for orthodontics. These implants often consist of one piece due to the fragility of the connection between the implant and abutment in such a narrow diameter. Unfortunately, they offer too few options for a crown because it is not possible to choose abutments with different angles for a perfect prosthetic solution. Therefore, the practitioner has to choose an implant with a sepa-

rate abutment. Most narrow implants have a conical connection between the implant and abutment. This connection is screwed together. Stress tests have shown that the screw is the most limiting factor with stress. A solid abutment and a conical connection with a Morse taper of sufficient length and a cone of between 1.5 and 4 degrees result in a nearly leak-proof and rigid connection between abutment and implant. This is a so-called 'cold weld'. This makes such an implant almost as strong as a one-piece implant.

I would like to talk you through the treatment procedure for two patients I treated with a 2.8 mm Anthogyr Axiom implant, and share the final result with you.

Case 1

The first patient was referred to me by her dentist due to a persistent 53 (Fig. 1), which occasionally caused pain and also began to show mobility. 13 is agenic, as is 23, which I had already replaced with an implant with a crown in 2011 (Fig. 2). At the time, the left side of the upper jaw still had sufficient space for a 3.4 mm implant (Ankylos). In the top right at 53, I only measured an interdental space of 4.8 mm. I decided to use a 12x2.8 mm implant with 4 mm 1.5° Morse taper. I chose this implant on the one hand be-

Fig. 1: Initial situation with the strongly resorbed 53 in situ.

Fig. 2: OPT at intake.



Fig. 1

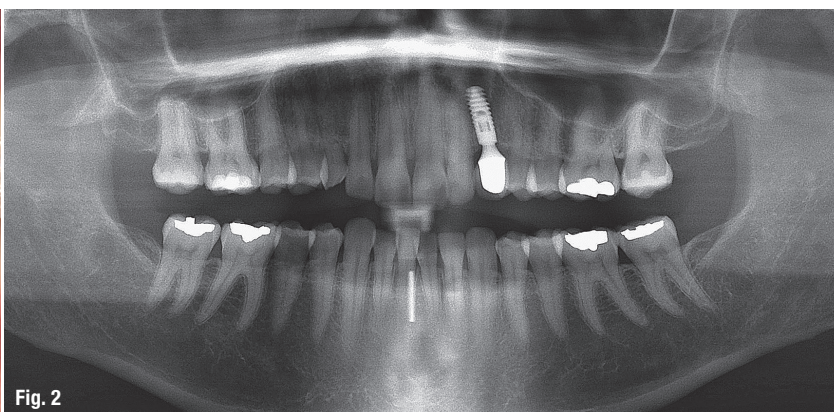


Fig. 2

cause the manufacturer promised that considerable primary stability could be achieved due to the aggressive threading in the lower third section of the implant, and on the other hand because I had to deal with a very short residual root of the 53. The latter allows a small extraction alveole and thus sufficient bone for a good primary stability, and thus the possibility of inserting a temporary crown immediately after implantation.

Procedure

I removed element 53 atraumatically; the mesial and distal papillae remained intact. By using a very sharp osteotome (Netwig) as a guide, I determined the location (more to palatal) and the direction of the preparation (Fig. 3). I gently tapped this osteotome to approximately 8 mm (according to calibration) into the jaw bone, and by rotating it slightly, I achieved a good guide preparation. After this, I used the Dentak K-system for further preparation (Fig. 4). This set consists of a hollow drill shaft containing a grinder in which, during further preparation, the bone is collected and then used to fill the space around the preparation and the residual alveolar bone. I drilled to no more than two-thirds of the desired preparation length. The narrowest K-drill has a 3.2 mm diameter so that the preparation at the top is slightly wider than the 2.8 mm implant to be used. This gives the option to adjust the implant somewhat in the axial direction if necessary. I used a 2.6 drill of the Anthogyr implant system (Fig. 5) to bring the preparation to the correct length. The total length of the preparation is 13 mm so that the implant can be placed 1 mm under the bone edge (Fig. 6). There is very good primary stability (>35 Ncm) (Fig. 9).

After fitting a temporary abutment made of PEEK (polyether ether ketone, Fig. 7), I made a temporary composite crown. The PEEK temporary abutment is easy to construct using composite or temporary resin. This temporary abutment also has a 1.5° Morse taper, which provides good friction retention and does not damage the cone in the implant. Before placing the temporary crown, I applied the bone obtained in the hollow drill shaft on the labial side and condensed it so that the alveolus is filled properly (Fig. 8). The temporary crown was shaped in such a way in the cervical area that the alveolus was completely covered. Of course, I checked that no functional stress occurred (Fig. 10). At the follow-up check a week later, a good adaptation of the mucosa was already visible. The patient had no problems at all.

After ten weeks, I removed the temporary crown with abutment. This is easy using a crown removal pliers vertically. Using a pop-in impression coping, I made an impression in a closed tray. The lab then



Fig. 3

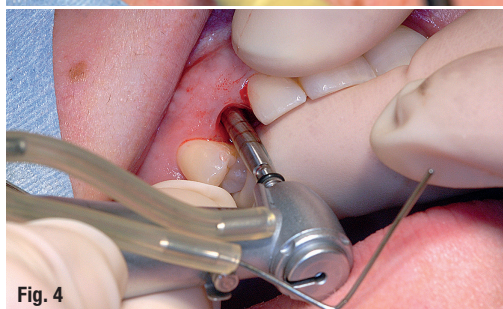


Fig. 4

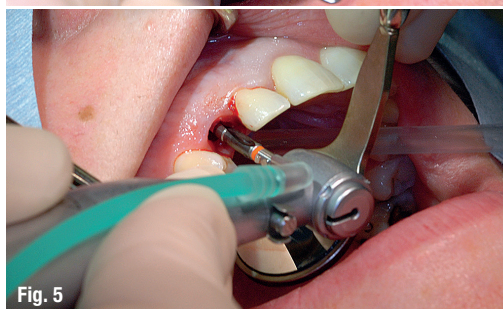


Fig. 5

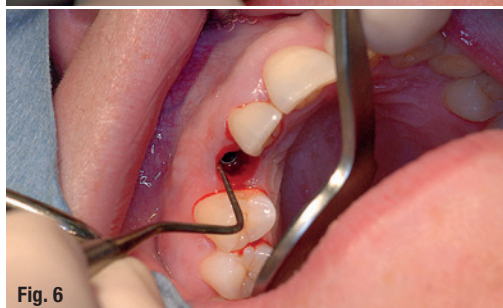


Fig. 6



Fig. 7

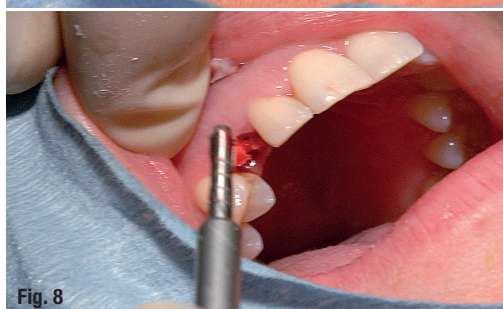


Fig. 8

Fig. 3: The preparation was performed precisely using Netwig-osteotome.

Fig. 4: The autologous bone was crushed and harvested using the Dentak K-system.

Fig. 5: The preparation was inserted at the depth using a 2.6 drill.

Fig. 6: Insertion of the implant 1 mm under the bone crest level.

Fig. 7: The PEEK abutment in situ.

Fig. 8: The harvested bone was attached around the implant with Dentak K.

Fig. 9: X-ray after implantation.
Fig. 10: The temporary crown in situ.
Fig. 11: a) Transfer of the abutment with a transfer key, b) Structure impaction using Safe Lock.
Fig. 12: a) Result six months after starting treatment; b) Result 20 months after starting treatment; c) X-ray 24 months after starting treatment.
Fig. 13: Clinical image of the initial situation with bonded bridge in situ.
Fig. 14: X-ray of the initial situation.
Fig. 15: Clinical image after six months with temporary solution.



made the permanent crown. The temporary crown with PEEK abutment was easily repositioned. In this case, I arranged for the crown to be returned from the lab separately from the abutment. The construction then had to be fitted from the model of the mouth with a transfer key (Fig. 11a) because the structure is not indexed (therefore, it can be cemented in several ways because there is no internal indexation such as a trilob or internal hex). After fitting the crown, which was optimum in both colour and shape, the structure was 'fixed' using Safe-Lock (Fig. 11b). This device is connected to the micro-motor and gives short micro-strokes after activation using the foot pedal. Five strokes are enough to lock

the abutment in place in the implant. The cold weld is then complete. I then cemented the crown accurately in the mouth with luting cement. At the six-month (Fig. 12a) and 20-month (Figs. 12b–c) check-ups, a good adaptation of the mucosa was seen, and the results were considered to be good.

Case 2

The second patient (25 years of age) approached me at the initiative of a dental student who had read an interview about my first experiences with narrow implants. This patient was no longer satisfied with the bonded bridge that replaced her 22 due to agenesis.



Fig. 16



Fig. 17



Fig. 18

Fig. 16: Insertion of a pop-in impression after removal of the temporary crown. – **Fig. 17:** Bonding of the permanent crown. – **Fig. 18** Safe Lock with tips.

She also found that her jaw increasingly had a 'dent' at that location (Fig. 13). The X-ray taken at intake showed significant convergence of the radices of 21 and 23. The interdental space was 7.4 mm but only 5.2 mm apical (Fig. 14). I approached this challenge with a 2.8 mm implant. I immediately took an impression to make a temporary crown later.

Procedure

After I had removed the bonded bridge, I made a crestal sulcular incision, after which I tried to remove as little mucosa as possible. Again, I started by making a guide with the osteotome (Netwig) which allowed me to determine the position and direction. By always using a slightly larger condenser, I very carefully pressed the labial wall down. As there was no large alveolus (no extraction had been done), applying autologous bone using the Dentak K-system was not necessary, and I only needed to use the condensation technique. Again, the preparation was made to the correct length using the 2.6 drill. I made a direct temporary crown on a PEEK abutment and paid much attention in the cervical area to creating the shape and a proper emergence profile. In this case, an additional complication was that I had to convince the patient of the robustness and reliability of the temporary crown because of her six-months stay in Africa immediately after insertion of the temporary crown on

the implant. I was able to give her my experience that I gained from seven implants using this method as an assurance.

After six months, she returned to the practice and said that she had not experienced any problems. I observed a good adaptation of the mucosa (Fig. 15). After removing the temporary crown, I made a pop-in impression coping (Fig. 16), which also showed an excellent emergence profile with healthy mucosa. The lab again provided the structure with the separate crown. However, in this case, I decided to insert the crown as a whole after having fitted it satisfactorily and bonded it outside the mouth. This allowed me to avoid any embedding of cement residues (Fig. 17). However, I did exercise some restraint because I now had to tap the Safe-Lock directly on the zirconium dioxide porcelain crown to fix the abutment. A special attachment is available for this, which allowed fixing to take place without a problem (Fig. 18).

For this patient, I paid much attention to the cervical gingival line. The 12 was a cone tooth that was constructed with composite, and that was too small. I corrected the patient's cervical gingival line satisfactorily with an electrotome and reconstructed element 12 with composite. This achieved a good result (Figs. 19–20a).

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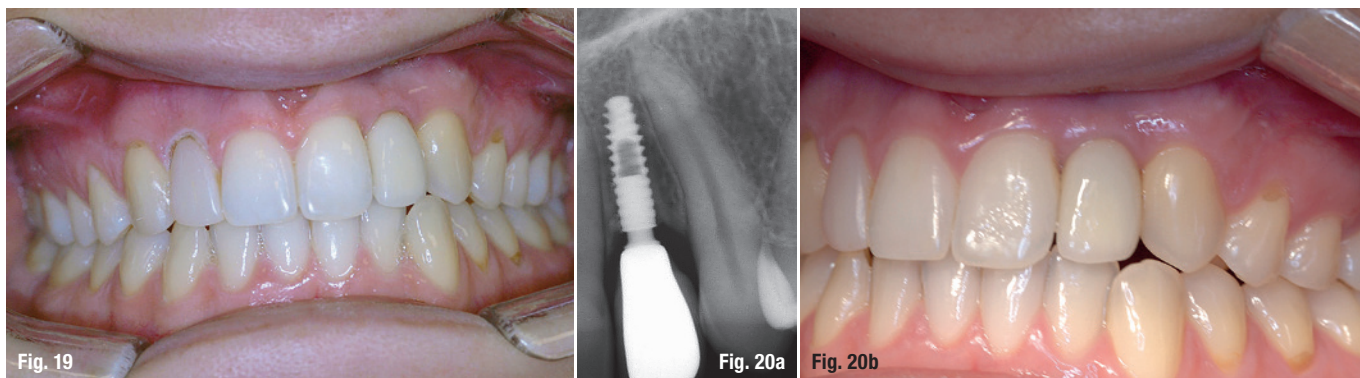


Fig. 19: Clinical picture immediately after insertion of the permanent crown and adjustment of gingival line.

Fig. 20a: X-ray image three months after inserting the crown.

Fig. 20b: Clinical image three months after inserting the crown.

Conclusion and commentary

I inserted the first 2.8 implant in 2013. Initially, I had some doubts about implants of such small diameter and had questions such as: Is the construction strong enough? Will it not break? Will the abutment-implant connection remain intact? However, although the use of such narrow implants remains a challenge, it has so far only yielded positive results. Nevertheless, I would like to make some comments following these experiences:

1. All the major brand implant systems marketing narrow implants have paid much attention to the root shape of the implant with windings that have a condensing effect. This significantly increases the primary stability, which enhances osseointegration.
2. This primary stability also results in greater usability in immediate placement and also provides the option to make a temporary crown immediately.
3. The PEEK abutment used in this system has proven to allow trouble-free retention over a longer time. Because in this case, the implant was placed subcrestally and despite the small space, there is still enough bone around, I observed good support of the mucosa and the presence of a good mucosal seal. In this case, a 2.8 mm platform was used as a superstructure with a platform switch. As a result, a proper emergence profile was achieved with the temporary crown.
4. Particularly with regard to reduced mesiodistal spaces, the use of an implant with a small diameter is a solution, but only in the aesthetic zone, where no extreme transverse stress can be placed on the implant.
5. I believe that with excessive stress and large forces, because the implant is so narrow, the abutment-implant connection could be the limiting factor.
6. The faciolingual bone thickness is less restrictive in the application of a narrow diameter implant because with several techniques, such as bone-splitting, harvested autologous bone with the Dentak K-system or possibly with a bone graft, more volume can be created in a less invasive way.

7. To achieve a good result, it is necessary for the practitioner to have the choice of different abutments. Therefore, one of the two-piece implant systems will be chosen. A narrow one-piece implant is less suitable for the aesthetic zone.
8. The solid connection between abutment and implant with the Morse taper connection is indeed strong and gives no risk of screw fracture, but there is no way back. The implant becomes a 'one-piece implant' with the solid abutment. By using a grade 5 titanium, strength is also assured: extensive stress tests have been carried out up to 200 N. The positioning and permanent fixing of the restoration do require more attention than with a screwed abutment. For instance, a break in the crown may only be repaired by taking the abutment as a new impression of the crown stump. It is unfortunate that only titanium abutments are available (due to the strength). However, this is so narrow that there is enough body for the crown to make this aesthetically pleasing.

The use of a narrow implant in a very limited space requires a well thought-out diagnosis, great precision of work, and a good use of and experience with different implant techniques. These practical examples did not use any guided surgery, but this could be recommended for precise implant positioning.

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Comparison of bone-graft substitutes

Risks and benefits of synthetic and bovine derivate materials

Author: Dr Robert J. Miller, MA, DDS, FACD, DABOI

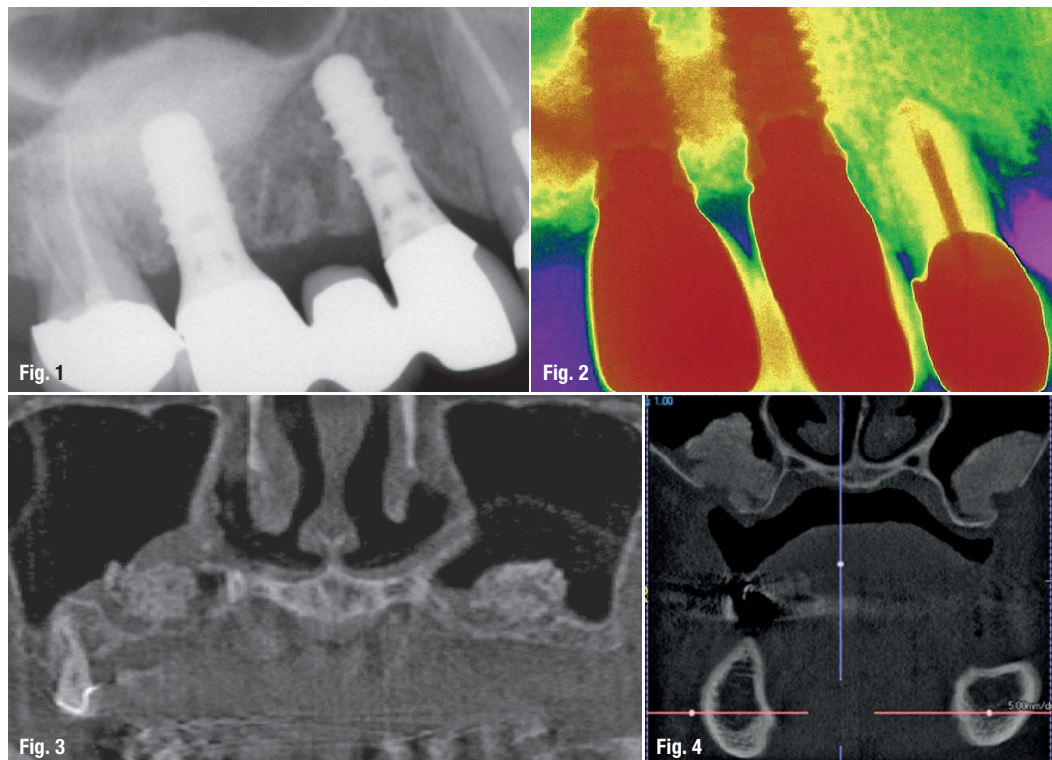
The topic bone graft substitutes or bone regeneration and the question whether to apply xenografts, allografts or synthetically created materials still causes controversial discussions in oral and maxillofacial surgery. Yet, there are no doubts about the progress and the good clinical experiences made with biomimetic materials in the last two decades. The main discussion in this product group concerns a substitution with persisting volume and no or extremely slow resorption versus a complete degradation of the inserted material and transformation to vital bone with the unavoidable attendant symptom of controlled loss of volume. The following article shows risks and

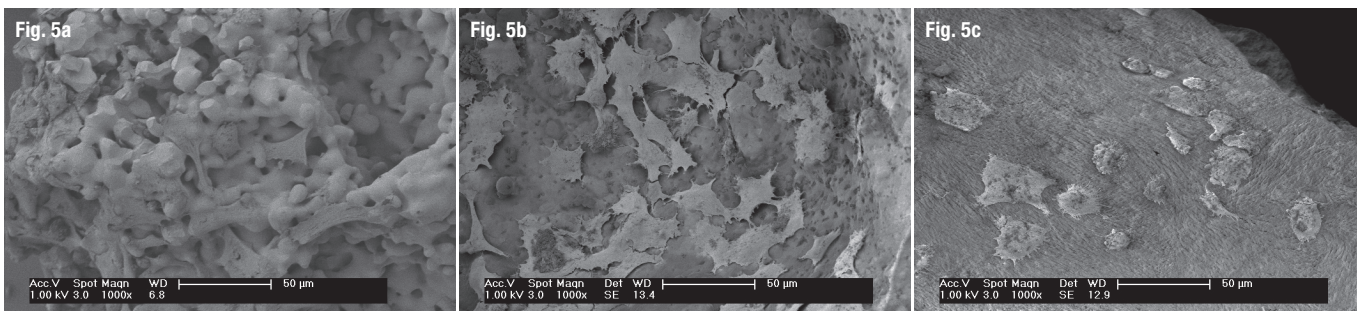
benefits of established bone-graft materials and why the author prefers synthetic bone regeneration.

Alloplasts and xenografts look the same both macroscopically and radiographically, and have almost identical handling characteristics. But here the similarities end. The measurement parameters for a successful grafting are the radiographic interpretation and the maintenance of volume of the regenerated ridge. More challenging is the interpretation of resorption rate, the percentage of vital bone and mineral density. Also important is the rate of complications and failures and if the material provides

Figs. 1 & 2: In the radiographs of the first case we can see two materials compared after seven years.

Figs. 3 & 4: Clinically the bone graft shows no vitalisation and no connection with the host bone.





osteoinductive properties or if it is only osteoconductive.

Case examples

In the radiographs of the first case we can see two materials compared after seven years. Both materials provide volume for durable dental implants, but while the synthetic material is completely transformed to vital bone, the bovine material shows no signs of resorption or transformation (Figs. 1 & 2). Although the bovine material is not resorbed in this case, we find a stable situation for the implants.

The second case shows the main complication associated with bovine bone substitute. The bone graft is rejected with a cover of inflamed connective tissue. Clinically, the bone graft shows neither vitalisation nor connection with the host bone (Figs. 3 & 4).

Highly resorbable alloplasts like pure β -tricalcium-phosphate do not show these reactions. Cerasorb®M, a more than 99% pure β -tricalcium-phosphate with a polygonal, open cell structure and interconnecting pores allows a fast migration of osteoblasts and a complete transformation to endogenous, vital bone within six to nine months. As it has no biological his-

tory and the manufacturing process guarantees the highest-possible absence of microbes and pyrogens, the use of the material is regarded as uncritical.

In cell cultures the β -tricalcium-phosphate shows a significant advantage against bovine materials in colonisation with osteoblasts and an early biologisa-

Figs. 5a–c: Comparing test of different ceramic biomaterials for bone grafting with human osteoblasts (SAOS-2).

Ca²⁺-pump in ER membrane Ca²⁺-binding molecules in cytoplasm active Ca²⁺ import in mitochondrion

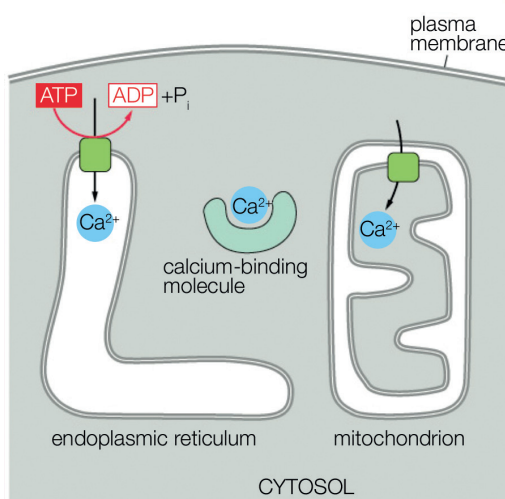


Fig. 6: Ca²⁺ function.

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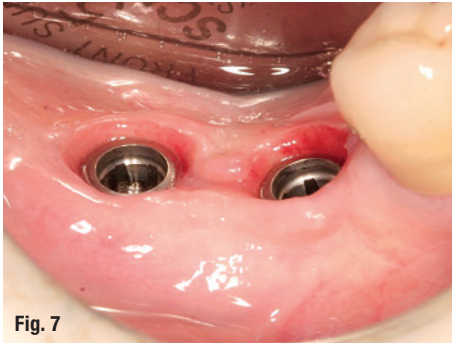


Fig. 7



Fig. 8

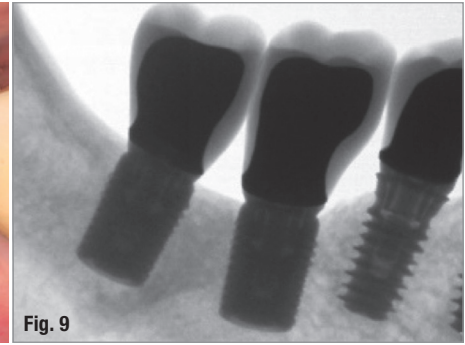


Fig. 9

Fig. 7: The image shows healthy soft tissue conditions and solid incorporated dental implants.

Figs. 8 & 9: After one year we can see an inflammation-free soft tissue and a complete bone regeneration in the augmented area.

tion, as it is shown by the studies of Bernhard A. et al. in 2010 (Figs. 5a–c).¹

An important reason for the use of a highly resorbable alloplast is the biologic effect of the resorption of calcium phosphate materials (Fig. 6). During the resorptive phase, there is a contribution of the release of free ionic Ca^{2+} . Several studies^{2–4} certify the importance of calcium for proliferation of osteoclasts and osteoinduction which is important for bone formation.⁶ Further parameters for the evaluation of a bone regeneration material or a bone substitute are:

Primary particle size

To avoid cellular degradation, a primary particle size of 10 μm is required. It provides mechanical stability of the framework and also interconnecting microporosity. Grains lower than 10 μm stimulate phagocytosis from macrophages⁸ and lead to an unintended anticipated loss of the bone graft material in the defect. As a result, a complete biological bone regeneration remains undone.

Stability of the framework

An early break-up in micro particles provokes the activity of phagocytosing macrophages and giant cells. This initiates an unspecific immunological reaction which deranges the regeneration and leads, in the worst case, to an excessively inflammatory reaction.

Open cell and spongy, interconnecting structure

These properties provide a continuous migration of blood vessels and osseointegration.

Biocompatibility

The biocompatibility of a bone-graft material is already demonstrated *in vitro* by an accelerated settlement with vital cells.⁷ Materials with a structure similar to cancellous bone have an advantage in this regard.

Indications and examples

Filling and reconstruction of multi-wall bony defects, e.g. cysts, ridge- and socket preservation or sinus floor augmentation are typical indications for the use of Cerasorb®M.

Alveolar ridge augmentation with dental implants

The image shows healthy soft tissue conditions and solid incorporated dental (Fig. 7).

Final results

After one year we can see an inflammation-free soft tissue and a complete bone regeneration in the augmented area (Figs. 8 & 9).

Summary

Today we have different bone graft materials for preservation and reconstruction of the alveolar bone that allow a vast range of therapeutic approaches. After more than 20 years of experience with synthetic bone grafts and the excellent results achieved with Cerasorb®M no disadvantage can be seen in materials of biological origin. The obvious disadvantages of bovine materials are a low percentage of vital bone with a lower stress bearing modulus. They do not release free ionic calcium, are not resorbable and their only function is that of a filler. The main disadvantage is that they may experience foreign body-reaction and require an intensive patient information.

Cerasorb®M is highly resorbable and replaced by autogenous bone at a rapid rate. It releases free ionic calcium (osteoinductive) and leads to a high percentage of vital bone. Also it provides a higher stress bearing modulus from an increased density. Last but not least, there is no foreign-body reaction and now risk of transmitting prions—it is safe.

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Author details



“Powerful, but remarkably gentle to the bone”

Georg Isbaner, editor of implants, talked to Prof. Moses Ofer from Alpha-Bio Tec about the company's new implant system NeO implants. They also discussed how thread design and implant surface properties effect osseointegration and trends in implantological research and clinical applications.

The company has introduced its NeO implant system as a new technology and a sensation in oral implantology. What does that entail?

Users will know what we mean with “sensational” from the sensation when they first insert our implant into the bone. It is very light, and is easily inserted into the bone due to several features: one is its ability to centralise itself. Furthermore, the direction of the threads is opposite to that of the other implant threads. Contrarily to conventional implants, our new NeO implant features an advanced coronal part. Another related feature is its coronal flute, which acts like a scraper and improves the cutting efficiency of the coronal part. This means that the bone is rather spread than squeezed by the implant, leading to bone particles being collected at the implant, which leaves a lot of new bone in this area to help stabilise the implant mechanically in the first stage. In the second stage, there is more osseointegration in this part of the flute area.

Better and more osseointegration?

Yes. And the bone particles themselves are autologous bone grafts. We had it tested by Prof. Dr Dieter Bosshardt from Bern. We already have the results, including a scientific article on the positive outcome of the analysis: NeO is a comprehensive implant that can easily penetrate and navigate the osteotomy of all bone types while preserving the bone.

You said it's the thread design “pulls” the implant. How much torque would you use exactly?

If you follow the preparation recommended by Alpha-Bio Tec, you will not have to apply more than 40 Ncm. If you use more, you might create a problem, such as compression necrosis.



How important is research for you as a scientist?

Simply to prove the theory, which makes NeO clinically applicable. NeO's more than 28 years of proven clinical know-how, which root it safely in the company's values of high-quality, innovation and simplicity.

Can you describe the surface technology of the implant more detailed?

NeO features a SLActive surface. This special implant surface accommodates osseointegration on a biochemical level, as its hydrophilic and chemically active properties promote accelerated osseointegration and earlier secondary stability. Furthermore, NeO's rough surface results in more BIC, more coronal direction and therefore less crestal resorption.

Prof. Ofer, thank you very much for the interview.

contact

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Fig. 1: Georg Isbaner, editorial manager of implants: international magazine of oral implantology, and Prof. Moses Ofer during their interview at the EAO Congress in Paris by the end of September.

“The surface that the bone was waiting for”

Interview with Klockner Implant System

Klockner Implant System recently launched their new implants surface Contacti in Barcelona/Spain, a city renowned for its spectacular architecture and timeless design. On the occasion of this product launch, Klockner Implant System discussed their products, scientific standards and a company philosophy which likewise strives for a unique design and consistent scientific properties in their products. In their interview with implants: international magazine of oral implantology, they also gave an outlook on future developments of the international implant market.

How would you describe Klockner Implant System's current situation?

Klockner Implant System is experiencing a key moment: We are about to complete 30 years of history, consolidating our position in the market as a company whose mission is to help doctors achieve excellence and offering the best products for each of the phases of implantological treatment. Moreover, this year has been packed with novelties: We have recently signed our 5th university chair and we have reached an agreement with the company Integration Diagnostics Sweden to sell their product PenguinRFA. Internationally, we have initiated activities in Italy through

Klockner Italy and we have signed numerous distribution agreements in the Middle East. Moreover, we have launched our new titanium Optimum that improves mechanical properties of the implants. To end a great year, we have just introduced our new surface Contacti after 15 years of research. With all these developments, we manage to face the future of the company with optimism and look forward to completing our biggest challenge of being present in 25 markets by the year 2019.

Elaborating on the new surface Contacti. What is expected from this launch?

Contacti places Klockner Implant System at the forefront of worldwide implantology. It has taken 15 years of research to develop a surface that greatly accelerates biological stability, allowing implant loading within four weeks. In addition to working on treatment time by shortening the period of instability that exists between the mechanical and biological stability, Contacti makes the surface ideal for immediate and early loading. Contacti also ensures bone formation, providing safety in risky patients. Klockner is very proud to finally be able to offer a product of such

Figs. 1 & 2: Inspired by nature and the harmonious architecture of Barcelona, where the company's new implant surface Contacti was launched, Klockner Implant System strives for modern, biocompatible products which accelerate implant stability.

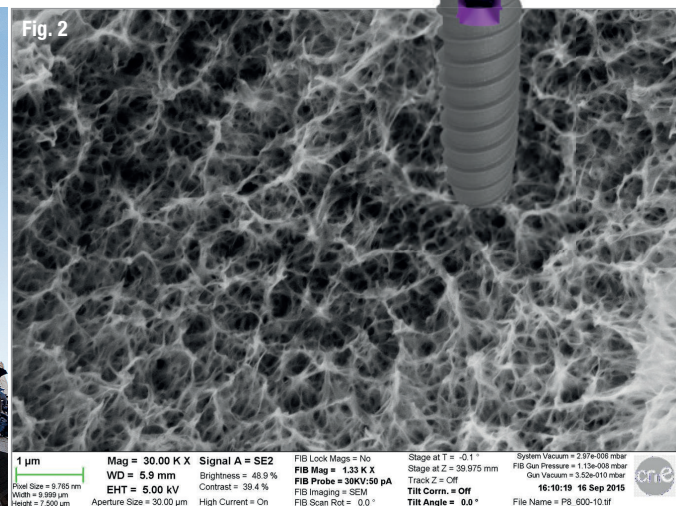




Fig. 3: The Klockner family with the Scientific Committee members and company owners Mercedes Roldán and Alejandro Padrós as well as Daniel Díez, the CEO of Spain and Portugal, during the launch of ContactTi in Barcelona in September.

quality and relevance to the market, which brings many benefits to doctors and patients. There is no way to expect anything other than a very large market acceptance.

Can you explain Optimum to us?

Optimum is a project jointly developed between ZAPP and Klockner Implant System that started in 2012. In summary, it is a new way to treat titanium that allows to improve the mechanical properties of it. As a consequence, we are able to provide the market with all guarantees for our 3.0mm platform switching implant.

What are the main requirements for Klockner when launching a new product?

There are two main points that we want to highlight in all our products: quality and scientific rigor. Regarding quality, our production features the lowest tolerances and adjustments on the market according to internal studies. With respect to science, we work on three important areas: a) Scientific support: We want to be known as a scientific company and for that we need that all our products to have scientific support due to scientific publications in dental magazines. b) Product development: taking in to account the input from the market, universities, KOL and R&D, and based on the scientific literature we decide if we have to develop new products for our systems or not. c) Innovation: like with ContactTi, our company is able to launch a 100 per cent original and unique product on the market.

How do collaborations with external entities contribute to the development of new products?

Since its foundation 30 years ago, Klockner Implant System has been renowned for investing in science, and we have been working with university chairs from the very beginning. Today, we have five university chairs and more than 30 collaborations with other

educational institutions. Without research in these institutions, there would be no other way to achieve the quality and scientific rigor of Klockner Implant System products. We are proud to have chair directors Dr Pablo Galindo (University of Granada), Dr Jose Maria Manero (UPC Barcelona), Dr José Nart (UIC Barcelona), Dr Pedro Bullón (Universidad Sevilla) and Dr Manuel Fernández (San Pablo CEU).

What is the strategy of your company in terms of education?

Every year, Klockner Implant System develops an education plan with more than 100 courses in different formats, such as workshops, monographic courses, masters, clinical courses, participation in external events and organising small and large events such as Meeting Friends that, in 2015, received more than 1,000 attendees. In this sense, we are mainly striving for two things: to teach our customers how to get the maximum of versatility from our product portfolio, which is designed to provide solutions for all clinical cases in each phase of the treatment. We also seek to promote the constant development of dental medicine, helping doctors to update and improve their knowledge.

Thank you for the interview. _

contact

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Alpha-Bio Tec.

The comprehensive dental system

Alpha-Bio Tec presents its newly-developed NeO dental implant system. NeO presents a range of advanced design features, including a unique coronal cutting flute, innovative shape of variable threads combined with two micro threads and a patent-pending centering feature of the apical part.

The implant's distinct clinical benefits are:

high and firm primary engagement, high primary stability in complex cases, and reduced pressure on the cortical plate, easy penetration and long-term aesthetic results. With primary-stability enhancers matched with bone stress reduction elements, NeO is powerful and, yet, remarkably gentle to the bone. NeO includes two smart choice platforms: a narrow Conical Hex Connection (CHC) for Ø3.2mm and Ø3.5mm and a standard Internal Hex Connection (IH) for Ø3.75mm, Ø4.2mm and Ø5mm, both ideal for a wide variety of clinical indications. "Alpha-Bio Tec has once again gone one step further by developing the next sensation in implantology: the NeO implant system.

neO

AlphaBio^{TEC}
Implantology

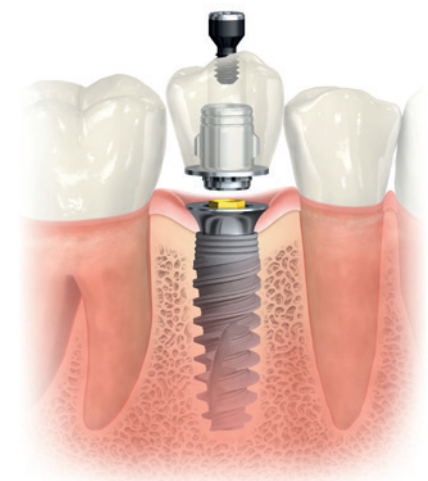


As always, our innovative product guarantees state-of-the-art technology, reliability, simplicity and fair pricing. I truly believe that NeO will be the next sensation and I invite you to be a part of this success," said Mr. Yuval Grimberg, General Manager, Alpha-Bio Tec. For more information, visit the website at: www.alpha-bio.net.

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Nobel Biocare

Introducing the On1 restorative concept



An important new addition to Nobel Biocare's assortment is the On1 concept.¹ This innovative modular solution bridges the gap between the surgical and prosthetic workflows. The On1 Base connects to the implant at surgery and then remains in place throughout the healing process,

prosthetic work and then the lifetime of the restoration. This leaves the soft tissue attachment undisturbed for optimised healing without compromising restorative flexibility.

With two height options available, there is the flexibility to change the On1 Base should the thickness of the soft tissue require it in the short or long term—an option not available with tissue-level implants. As the healing cap of the On1 concept supports an intraoral scanning approach, conventional impression-taking procedures for delivery of the final crown can be eliminated.

[1] The On1 Concept is under FDA 510(k) review and is currently not available in the US.

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COMFOUR™ is CAMLOG's new system for occlusally screw-retained restorations in edentulous or partially edentulous jaws. Due to its many technical highlights, COMFOUR™ allows the realisation of several treatment concepts. In addition to occlusally screw-retained bridges for immediate and delayed restorations, the multi-optional system also permits bar and single-tooth restorations on straight and angled bar abutments.

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restorations considerably for dentists and dental technicians and increases the wear comfort for patients. The aligning tools are used for finely adjusting cam alignment during implantation and the visual representation of the screw access channels of the prosthetic restoration. Useful additional components are the titanium caps for both temporary and definitive restorations.

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NucleOSS

T6 implant system introduced to the global market

From October 21 to 23, NucleOSS, Turkey's biggest and most-popular implant manufacturer, invited more than 750 dentists, implantologists and distributors from all over the world to the Sheraton Cesme Hotel Resort & Spa in Cesme, Turkey to celebrate the launch of their new T6 Implant system.

Salih Sanli, CEO and founder of NucleOSS, welcomed the selected guests to an exclusive event that introduced the new T6 Implant system with a unique and stunning light installation. As part of the event, Prof. Dr. M. Kemal Ünsal, President of the Turkish TFI-Academy (Together for Implantology) as well as various other members of the academy demonstrated in short presentations the advantages of the new T6 Implant system. The lectures were rounded off with prizes being awarded to TFI-academics for their outstanding achievements and all-important research work. The crowning glory of the event was the evening's



gala dinner, featuring traditional food and music, and an exclusive concert by Turkey's most famous pop singer Isin Karaca.

The new T6 implant system represents the sixth generation of NucleOSS implants that are known for their easy application and multiple solutions. NucleOSS will participate in next year's IDS

2017 in Cologne. Please visit NucleOSS at booth number D060 located in hall 4.1.

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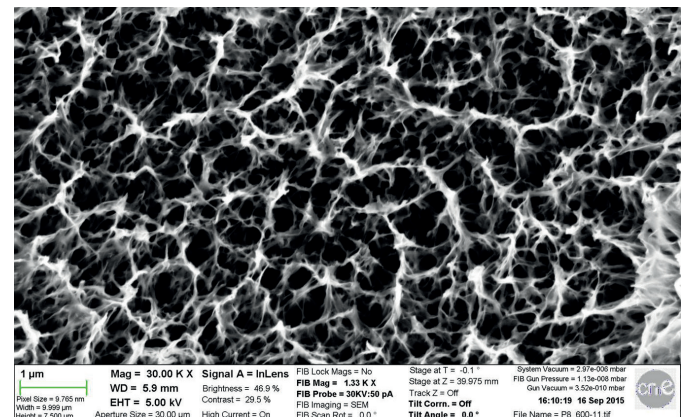
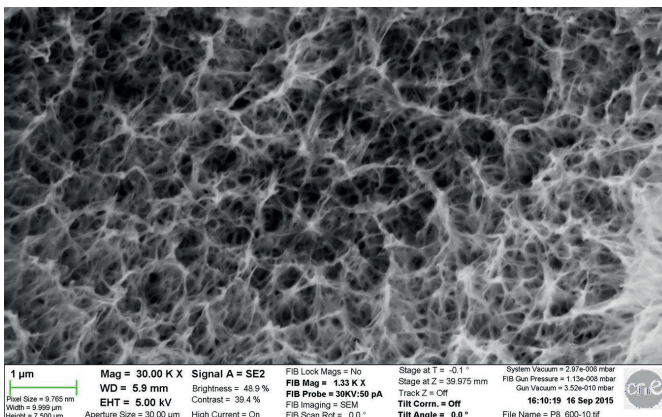
Klockner

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capacity, bioactivity, osteoconductivity and protein adsorption results in an acceleration of the biological stability, obtaining optimal ISQ values for implant loading in four weeks. Thus, contacti® provides an ideal surface for immediate and early loads and is especially recommended for treatments of patients at risk.

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Hypro-Sorb® X a powerful haemostatic which ensures accelerated wound healing, optimal cell adhesion, blood absorption and excellent handling.

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Planmeca

Planmeca Minute— 3-D printing with Planmeca Creo™

We introduced our new Planmeca Minute video series earlier this year. These short and visually appealing videos have been well received, with each one highlighting a specific feature or product from the Planmeca portfolio.

The newest Planmeca Minute video focuses on our new Planmeca Creo™ 3-D printer, which has been designed for creating dental models and surgical guides from medically approved materials with true precision and efficiency. Take a look!

In the near future, Planmeca Creo will also support the creation of other dental objects of intricate detail, such as dental splints, temporary fillings, and orthodontic models.



The 3-D printer uses Digital Light Processing (DLP) technology to create objects out of UV curable resin. It has its own dedicated software, which is included as part of all deliveries. Planmeca Creo is already available for orders—the first deliveries will take place soon.

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Fig. 1

46th International Annual DGZI Congress in Munich

How much **aesthetics** do we need in implantology?

Author: Dr Georg Bach, Germany

Fig. 1: Full house at the 46th International Annual DGZI Congress.

The DGZI's 46th International Annual Congress was dedicated to quite a provocative topic. For this year's congress, the Deutsche Gesellschaft für Zahnärztliche Implantologie (DGZI) picked the best-possible location with Bavaria's Wiesen metropolis Munich.

The scientific directors of the two-day event chose high-calibre speakers to approach and discuss a topic which has been interpreted differently over the past two decades of oral implantology, ranging from the purely surgical implantology of the early years with an almost total neglect of aesthetic needs over an exaggeration of aesthetic aims via oral implants up to the pragmatic juxtaposition of both positions.

"Congress makers" Prof. Dr Herbert Deppe and Prof. Dr Roland Hille have succeeded in their endeavour to

present this practice-oriented and at times controversial topic in its entirety, giving important impulses for its implementation to the dental practice. In their introductory speech, the two scientific directors pointed out that while dental implantology was scientifically approved 30 years ago and can hence look back on a long history, some of the initial problems have remained unsolved in spite of the numerous achievements in this discipline. Europe's oldest dental society wants to face those challenges and offer some possible solutions.

The start of the congress: a strong signal

Not only was the presence of numerous associated implantological societies from abroad, among them delegations from Japan, Eastern Europe and Northern



Fig. 2



Fig. 3



Fig. 4

America and the Arab region a strong indication of the congress' success, but already its introductory session was made to set an example of scientific brilliance: Prof. Dr Ralf Smeets (Germany) and Prof. Dr Suheil M. Boutros, Dr Nick Caplanis and Dr Glenn Bickert (USA) presented their extensive implantological knowledge and experience, with Prof. Dr Ralf Smeets giving an impressive speech on his implantological findings. Prof. Dr Suheil Boutros, who has been closely associated with the DGZI for many years, had chosen an especially delicate topic with the replacement of the upper central incisors. His fellow speakers Dr Caplanis and Dr Bickert agreed with him on the fact that an extensive implant planning should have the highest priority in successful implantology, along with a sound implantological education.

After completing the introductory session of the congress, participants were given the opportunity to attend various podiums such as the congress' main podium, its international podium, corporate podium or the Munich Forum for Innovative Implantology. Choosing among this plethora of scientific events constituted most certainly a luxury problem of this congress weekend. Some participants made a virtue out of necessity by choosing exclusive speeches from each podium, thus frequently travelling around in Munich's Westin Grande Hotel.

Switching speeches paid off, with three renowned German implant prosthodontists Prof. Dr Thomas Weischer, Dr Peter Randelzhofer and Prof. Dr Peter Pospiech participating in the main podium alone. Taking the discussions into account, one thing is certain: digital implantology has established itself in prosthetic dentistry and features many options and opportunities while also making intense and thorough education and technical affinity mandatory. This firework of prosthodontic topics appealed to dentists and dental technicians alike.

DGZI has been closely associated with dental technicians, thus organising a curriculum on implant-based prosthetics in cooperation with Fundamental GmbH (Germany), resulting in a great number of graduates as well as committed DGZI members. To put it briefly: the DGZI's interface between dental technology and implantology is very much alive.

In addition, the international podium of the congress featured renowned speakers such as Prof. Dr Jeff Johnston, Prof. Dr Suheil Boutros and Dr Edward Sevetz. While Japanese speakers had dominated the international podium during last year's event, speakers from Northern America prevailed at this year's congress.

Implantological complications were the central topic in the US trio's reports, with Prof. Johnston giving a general overview and Prof. Boutros elaborating on Sinus complications. Dr Sevetz spoke on restorations in the edentulous maxilla without augmentation. The speakers' key messages were: There is definitely a trend towards minimally invasive procedures, augmentation is not a necessary requirement, and extensive preoperative planning is the key to success. The best trouble shooting is the complication that never occurs.

The cooperative podium has a long long-standing tradition at DGZI Congresses and has become a fixed component of the scientific programme on Fridays. It mostly features practice-oriented speakers, for example delegates from industrial partners. However, this does not preclude the possibility of innovative and ambitious topics—quite the contrary. With speeches on hyaluronic acid in periimplantitis treatment by Prof. Dr Frank Liebaug (Germany) or tissue management by Dr Stefan Neumeyer and Dr Henrik-Christian Hollay (Germany), among others, the contributions to the cooperative podium captured the

Fig. 2: The OEMUS MEDIA AG team presented in traditional Bavarian attire.

Fig. 3: At the table of congress main sponsor OT medical during the evening event at the Löwenbräu brewery.

Fig. 4: The DGZI executive board with international DGZI delegates.

audience's continued attention. In addition, Dr Ulf Meisel (Germany) illustrated his experiences with the bone-level tapered implant, which he finds to be a helpful addition to the product portfolio in certain situations. Christian Möller, MS. (Germany) introduced his findings on the minimally invasive alveolar ridge preservation while Dr Thilo Damaskos (Germany) spoke about digital backward planning.

The fourth podium held on the first congress day, the Munich Forum for Innovative Implantology, is a project very dear to DGZI President Prof. Dr Herbert Deppe. Not only is Prof. Dr Deppe Chairman of the Forum, but he also contributed the first speech to its scientific programme. In his report on the relation between dental implants and systemic diseases, Prof. Dr Mauro Marincola (Italy) spoke in favour of "shorties". His research, as well as the research of other authors, suggests that short implants can be a reliable therapy option in these cases.

Speakers Dr Eduard Krahe and dental technician Bernhard Zierer (Germany) paid tribute to the congress topic by promoting a paradigm shift in implantology due to medical indications as well as aesthetic criteria. Last but not least, Prof. Dr Gabriele Kaepler (Germany) talked about 3-D X-Ray procedures in dental implantology.

The evening was concluded by a unique Bavarian night with Oktoberfest flair, which particularly delighted the Japanese and American delegations. "Today was one of the most enjoyable nights in my life—and that in 'serious' Germany!", an American participant summarized. After all, this was one of the rare occasions to witness the DGZI members of the board dance in traditional costume atop of the Oktoberfest ale-benches...

Different approaches—DGZI Controversial!

Traditionally, the second congress day of the 46th International Annual DGZI Congress is dedicated to controversial discussions. This year, this tradition matched well with the overall congress topic, causing many speakers to present their findings which culminated in the successful panel discussion "DGZI Controversial". With Dietmar Weng and Michael Stimmelmayer (Germany), the DGZI Congress makers were able to sign up two of the most renowned scientific representatives of the field. They introduced different approaches for the preservation of the alveolar process and discussed their application in the dental practice.

Before, private lecturer Stimmelmayer had given an overview on efforts and limitations of ridge preservation in the aesthetic zone, pointing out that extensive planning, surgical expertise and the patient's individ-

Fig. 5: Prof. (CAI) Dr Rolf Vollmer and Prof. Dr Mario Rodrigues-Tizcareno.



Fig. 5

Fig. 6: Master dental technician Michael Anger is awarded the "Tätigkeitsschwerpunkt zahntechnische Implantatprothetik – DGZI".

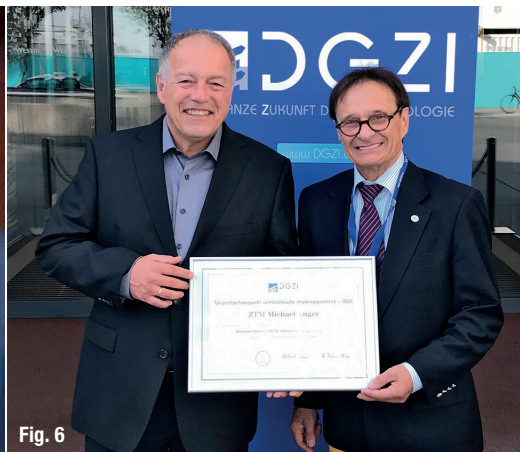


Fig. 6

Fig. 7: Practical workshops were part of extensive congress further education programme.

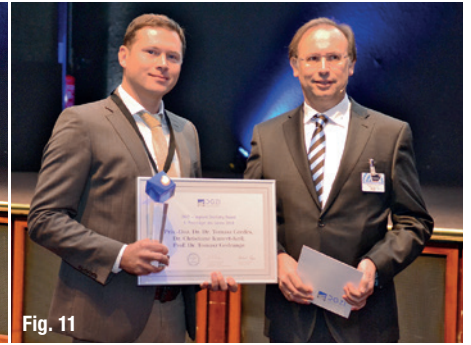


Fig. 7

Fig. 8: Dr Mazen Tamimi at the Schütz Dental Booth.



Fig. 8



ual condition play an enormous role in the decision-making process for an aesthetically "successful or failed" case. "There are only two options to respond to bone loss", said Stimmelmayer, one on the bone level and one on the soft-tissue level. There was no doubt that Stimmelmayer favoured a soft-tissue based response, paying special attention on the double-arm Punch soft-tissue implant, which he had developed in order to improve the compromising situation in all dimensions. While Stimmelmayer introduced numerous extensively documented case reports which supported the benefits of this procedure, its success appeared to be limited by a missing buccal bone lamella or difficult initial situations such as prominent Jugae alveolariae.

Private lecturer Dietmar Weng followed a different path, leading him away from technophilic, complex augmentations and towards simplification: "Simplify your augmentation!" (Do not rebuild, refill!). Seizing the opportunity, Weng took up Stimmelmayers postulation that socket preservation was impossible in the aesthetical zone and explained that implants today are inserted differently from the techniques applied a few years ago. "Previously documented procedures are mostly techniques developed by oral surgeons for oral surgeons", Weng claimed and consequently stated his preference for simple and predictable methods. Immediately after extraction, there are usually three or four defect walls, which can be loosely filled (no cramming!) and covered by a membrane in order to achieve a bundle-bone effect. A gelatine sponge is used for coverage towards the oral cavity. After six months, implantology can take place in a well-prepared surrounding. In short: Simplify your implantology!

In this session, the President of the DGZI contributed a well-received speech about surface morphology of dental implants after insertion to the jawbone, while Dr Stefan Röhling (Germany) posted that ceramic implants were no fashion phenomenon, but constitute a serious alternative to titanium implants, especially in the aesthetic zone. This speech was followed by Prof. Dr Dr Knut Grötz, who defined differential implant-design indications with regard to aes-

thetics and function. He stated that individual patient conditions, for example periodontitis or systemic diseases (diabetes etc.) need to be taken into account for an accurate prognosis of the long-term success of implantation. Consequently, implant design should be chosen individually for each patient, according to Grötz, who thus subscribed himself to individualised medicine. His advice: When in doubt, apply a tissue-level implant. He also pointed out that the biological basis has to be adequate, as aesthetically successful results are impossible without socket healing or preservation. This notion was fully supported by Prof. Dr Mario Rodrigues-Tizcareno (Mexico) in his speech. Grötz focused on the bone bundle, which he defined as a part of the periodontium: "If the desmodontium is destroyed, for example in case of severe periodontitis, the buccal bone bundle inevitably will follow".

DGZI member of the board Prof. Dr Dr Kai-Olaf Henkel (Germany) touched a controversial topic by illustrating complications in implantology. He started his speech by stating that "failure is a part of implantology". However, Henkel claims, failure also constitutes a chance, for example to form a friendship with the patient after successful complication management.

The two congress days were packed with vast information, constantly demanding a high level of attention and concentration from congress makers and auditorium alike. And yet—or perhaps exactly for that reason—participants left the congress halls with contented faces having gained a great deal of new impulses and knowledge: While Munich is always worth a trip, so was the 46th International Annual DGZI congress. It certainly lived up to its high expectations and sparked anticipation for next year's congress.

Figs. 9–11: Prof. (CAI) Dr Roland Hille (right) presented the DGZI Awards to Dr Kristian Kniha, 1st winner of the DGZI Poster Award (Fig. 9), Dr Dr Istabrak Hasan, 3rd winner of the DGZI Implant Dentistry Award (Fig. 10) and Dr Dr Tomasz Gredes, 1st winner of the DGZI Implant Dentistry Award (Fig. 11).

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SOIA symposium Sudan

Author: Dr Rolf Vollmer, Germany

Dr Ahmed Fadl, president of the Sudanese Oral Implantology Association (SOIA), invited participants from around the world to a symposium in Khartoum/Sudan on 26 May 2016. The former DGZI master is now among the leading Sudanese implantologists. With more than 1,000 implants placed, Dr Fadl is one of the so-called "heavy users" in Sudan. His dental practice is equipped with modern technology, including dental lasers, CAD/CAM and CBCT and thus forms an ideal training facility.

implantologist himself, has been a special honour for the German participants. The foreign minister followed specialist speeches with great interest. Presentations by DGZI representatives Dr Rolf Vollmer, Dr Rainer Valentin and Dr Mazen Tamimi completed the programme and illustrated the state of the art of implantology.

Of course, Dr Rolf Vollmer did not miss the chance to invite his colleagues to the 46th International Annual DGZI Congress in Munich from 30 September to 1 October 2016. This implantological event will attract colleagues from around the world, especially because of the many international relations of the DGZI. The worldwide DGZI network has resulted in many friendships, for example between colleagues from Japan, the USA or Eastern Europe and Arabia.

Fig. 1: Dr Rolf Vollmer and Dr Ahmed Fadl looking forward to the symposium.

Fig. 2: Interested participants.

Fig. 3: Dr Rainer Valentin and foreign minister Prof. Dr Ibrahim Ghandour follow the presentations eagerly.

Friends, colleagues and acquaintances attended the symposium in order to catch up on activities and education concepts of the DGZI.

Being introduced to the Sudanese foreign minister, Prof. Dr Ibrahim Ghandour, who is both a dentist and



Fig. 1



Fig. 2



Fig. 3



Fig. 1



Fig. 2



Fig. 3



Fig. 4

Millions of happy smiles

Author: Dr Rolf Vollmer, Germany

With the theme "Making millions smile together", the Ukrainian city Kharkov hosted this year's DGZI Dental Days from 2 to 4 June 2016 at the Palace Premier Hotel.

Next to Kiev, Kharkov is the second-largest city of the Ukraine at 1.4 million inhabitants (2015). With 42 universities and academies, the city also forms the most important science and education centre of the country. Kharkov is situated in Northeastern Ukraine, where the River Charkiw flows into the River Lopan and the River Lopan flows into the River Udy. The city also is an industrial centre for electrical, food and chemical industry as well as engineering and rail vehicle manufacturing. Featuring six museums, Kharkov also is a cultural focal point.

The congress in Kharkov from 2 to 4 June 2016 marked the beginning of a new era in Ukrainian dentistry. Kharkov Dental Days were organised by the Association of Private Practice Dentists of the Ukraine (APPDU), represented by its president Taravnekh Shaker. The event's main aim was to provide a stable basis for high quality standards in dentistry in the Ukraine to accommodate international standards.

Latest trends in dentistry were presented to the attending Ukrainian dentists.

Dr Rainer Valentin and Dr Mazen Tamimi represented the DGZI at this year's Dental Days in Kharkov, in cooperation with the company Sprint Dental. A similar agreement was formed with regard to the relations to the Ukraine.

The DGZI specialist speeches were received with great interest and enthusiasm, which will result in more Ukrainian representatives being present at DGZI events.

Dr Mazen Tamimi addressed problems in the management of the severely atrophied mandible, while Dr Rainer Valentin reported on his success story of more than 30 years of practicing sinus lift procedures. Other speakers had travelled to Kharkov from Spain, Greece, Turkey, Russia and Germany. The event also featured a dental exhibition in which various international companies presented their products. An evening gala completed the DGZI Dental Days, uniting participants from different countries and the dentists from the Ukraine with a family feeling.

Fig. 1: The DGZI specialist speeches were received with great interest.

Figs. 2 & 3: DGZI representatives Dr Rainer Valentin and Dr Mazen Tamimi are presented their certificates of appreciation.

Fig. 4: The Dental Days gala evening formed the event's grand finale.



1st Joint Congress of GLIPD and DGZI in Georgia

Author: Dr Rolf Vollmer, Germany



Together with its Georgian partner society GLIPD (Georgian League of Implantology Professional Development), the DGZI held their first joint congress from 10 to 11 July 2016 in Kakheti, which is situated about 80 km near Tiflis. The DGZI executive board was represented by Dr Rolf Vollmer, Dr Rainer Valentin and Dr Mazen Tamimi. GLIPD has been a DGZI partner since 2015, including a cooperation agreement concerning congresses and curricular further education.

The implantological programme was comprised of contributions by Georgian speakers as well as speakers and DGZI members of the board from abroad. Also speaking was DGZI member Dr Michael Hopp from Berlin, Germany. Impressive speeches, such as those by MD PhD Kakha Metreveli, MD PhD Dea Vadachkoria, MD PhD Levan Tadumadze, MD PhD Ramaz Orjonikidze, Dr Galaktion Makhviladze und Dr George Makharadze, illustrated the event's high academic level and the state of the art of implantology in Georgia. Digital radiography, CBCT or CAD/CAM technology—Everything is possible in Georgia, surgically as well as prosthetically. Prosthetic solutions which match the patient and his/her financial back-

ground were introduced, including contemporary materials such as PEEK. Last but not least, Georgia showed an exemplary hospitality, which contributed in making this first joint congress a special highlight. Wine tastings and an introduction to the secrets of golfing completed the event's programme.

Moreover, the event organisers confirmed that they will take part in this year's Oktoberfest and the 46th International DGZI Congress in Munich from 30 September to 1 October 2016.

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Fig. 1: The congress speakers enjoyed the successful event.

Fig. 2: Members of the DGZI welcoming Georgia's hospitality.



25th Annual EAO Congress

Source: ZWP online



From 28 September to 1 October 2016, the European Association for Osseointegration (EAO) hosted their 25th Annual Congress. This year, the prestigious scientific congress took place at the Palais des Congrès in Paris and was attended by more than 2,600 international delegates and industry partners.

On the occasion of their 25th annual congress, the EAO announced the five winners of the special scientific awards and the candidates who had successfully completed the EAO certifying programme. Against the backdrop of a festive ceremony, the scientists were awarded with their prizes and certificates by EAO President Björn Klinge, whose position is now held by Alberto Sicilia.

Again, many scientific abstracts were handed in to apply for the EAO award. A total of 609 abstracts had been accepted for presentation at the congress, 68 of which were shortlisted for a number of scientific awards. All submissions were published in a special

supplement of *Clinical Oral Implants Research*, a peer-reviewed EAO journal.

In the course of the ceremony, five candidates were awarded an EAO Certificate for implant-based therapy. This is the only standardised recognition of implantological skills and expertise in Europe. Every candidate has to submit six clinical cases, pass a multiple-choice exam and answer detailed case-related questions. This year's winners were Dr Edith Groenendijk (Netherlands), Dr José Pinheiro Torres (Portugal), Dr Emmanouil Symeonidis (Greece), Dr Weihua Yang (China) und Dr. Sawako Yokoyama (Japan). Prof. Niklaus P. Lang, founding editor of *Clinical Oral Implants Research*, was given a medal and was granted honorary membership of the EAO.

Furthermore, the European Association for Osseointegration's (EAO) Junior Committee has elected two new members. Sven Mülhemann, from Switzerland, and Tommie Van De Velde, from Belgium, are fill-

Figs. 1 & 2: More than 2,600 participants attended this year's 25th Annual EAO Congress.



Fig. 1



Fig. 2

ing vacancies left by Nele Van Assche and Daniel Thoma.

The Junior Committee is a group of young scientists working in the field of implant dentistry. They represent the junior section of the EAO and support the Board of Directors with a range of projects. These include developing new ideas for the growth of the association. The committee consists of eight members from eight different European countries. Each member is elected for a two-year period.

Today at the EAO's 25th scientific meeting in Paris, the Junior Committee presented a unique session called '7 Minutes to Convince'. It featured a series of short presentations showcasing new research submitted by members of the public. Of the 39 candidates who applied, only seven were selected to present during the session. The audience had the chance to vote for the one they thought was the best.

The winning presentation was 'Point of view perspective of a dental implant patient' by Mustafa Ozcan (Turkey). His discussion featured an innovative recording of an implant procedure from the patient's perspective using a head-mounted camera. His re-

search highlighted patient anxiety as a factor in post-operative satisfaction rates and gave dentists a point of view which may be unfamiliar to them. Dr Ozcan was presented with an award for his success in the competition.

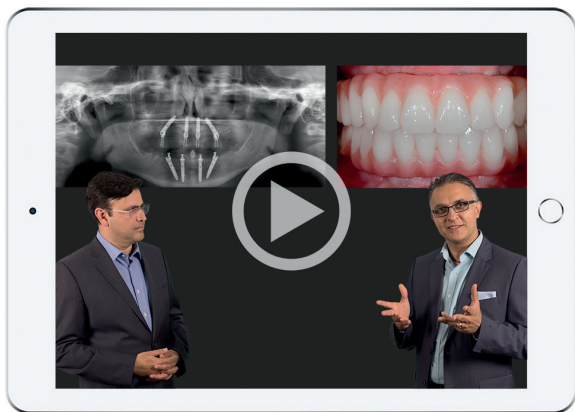
You can view the one-minute application videos at the EAO's YouTube channel: https://www.youtube.com/channel/UCpB-t6R4nQcO_yZskip1lqA._

contact

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 Tel.: +33 1 42366220
 info@eao.org
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Premier online course reveals

Secrets of the All-on-4® treatment concept



For those looking to learn more about the evidence-based All-on-4® treatment concept¹⁻⁴, a new free online course offers a way to build knowledge that's essential for a successful start with this proven protocol. The training, offered by Nobel Biocare, has been developed for any clinician looking to increase their understanding of this established concept. The perfect complement to hands-on and classroom training, the free three-hour online course introduces the concept and covers the key



who would like more information, should visit nobelbiocare.com/all-on-4course.

Source: Nobel Biocare

considerations, from diagnostics to planning, implementation and follow-up.

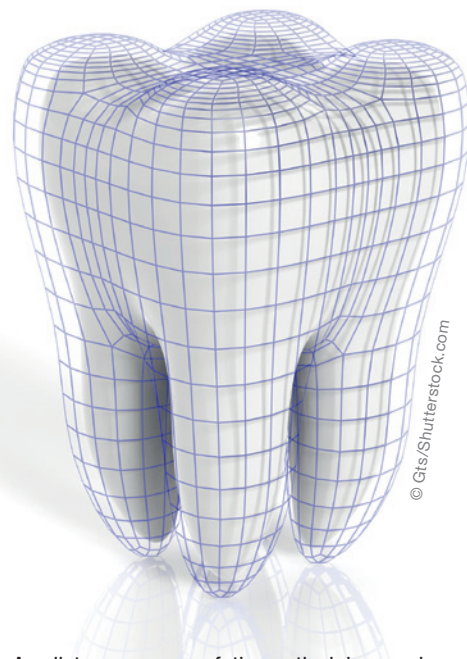
The course has been developed with Dr Saj Jivraj, a leading prosthodontist, and Dr Hooman Zarrinkelk, an experienced, board-certified oral and maxillofacial surgeon, who host the videos that make up the course. As colleagues in California, US, the two experts have been successfully treating patients with the All-on-4® treatment concept for ten years, and are experienced educators in the required techniques.

On completion of the course, participants will earn three CE credits⁵ and a certificate from Nobel Biocare. Those interested in registering for the training, or

Study compares accuracy of

Optical scans and silicone impressions

Aiming to evaluate the accuracy of digital impressions for use in implant placement, researchers from Iwate Medical University in Japan have compared optical impression scans from an intra-oral scanner with conventional silicone impressions. The analysis showed that the distance error of the optical impressions was slightly greater than that of the conventional method. The evaluation was limited to the use of optical impressions for implant placement. For this purpose, the researchers placed two implant abutments (Nobel Biocare), one 5 mm and one 7 mm in height, in a master model.



As distance errors of the optical impression were slightly greater than that of the conventional impression, the researchers concluded that currently digital impressions are not equivalent replacements of conventional impressions for restorative procedures. However, they predicted that the development of information technology would most likely lead to improvement in the accuracy of optical impressions in the near future.

The study, titled "Examination of the position accuracy of implant abutments reproduced by intra-oral optical impression", was published online on 5 October in the PLOS ONE journal.

Plaque-identifying toothpaste to reduce

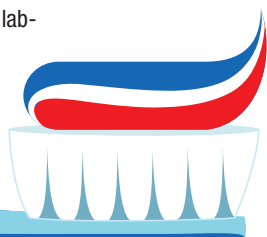
Risk of heart disease and stroke

Health experts worldwide agree that oral health and inflammatory diseases, such as cardiovascular disease and stroke, are correlated. A recently published study has shown that users of a toothpaste that identifies plaque build-up on teeth also exhibited lower levels of a heart disease marker, suggesting that the toothpaste resulted in statistically significant reductions in dental plaque and inflammation throughout the body.

An analysis showed that the plaque-identifying toothpaste reduced the mean plaque score by 49 per cent compared with a 24 per cent reduction in the placebo group. In addition, laboratory tests in a pre-specified subgroup of 38 participants found that the plaque-identifying toothpaste

reduced levels of high-sensitivity C-reactive protein (hs-CRP), a sensitive marker for future heart attacks and strokes, by 29 per cent, while hs-CRP levels increased by 25 per cent in individuals using the placebo toothpaste.

The researchers concluded that the observed reduction supports the hypothesis that Plaque HD could reduce the risk of cardiovascular disease. However, a large-scale randomized trial of sufficient size and duration is needed to verify the results, they stated. The study, titled "Randomized trial of plaque identifying toothpaste: Dental plaque and inflammation," was published online on Oct. 19 in the American Journal of Medicine ahead of print. It was conducted at Florida Atlantic University in the US.



Congresses, courses and symposia



International symposium Osteology Barcelona

17–18 February 2017
Venue: Barcelona, Spain
www.osteology-barcelona2017.org



IDS 2017

21–25 March 2017
Venue: Cologne, Germany
www.ids-cologne.de



ITI World Symposium

4–6 May 2017
Venue: Basel, Switzerland
www.iti.org/worldsymposium2017



3rd Annual Meeting of ISMI

5–6 May 2017
Venue: Konstanz, Germany
www.ismi-meeting.com



47th International Annual DGZI Congress

29–30 September 2017
Venue: Berlin, Germany
www.dgzi-jahreskongress.de

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T6

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Micro threads

Two angled abutment-implant contact surfaces positioned at different levels.

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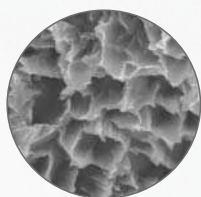
2. 15° Angled First Contact Surface:

Secondary barrier positioned 2 mm deep within the implant for resisting the forces in case unexpected coronal bone loss. A design feature for additional safety.

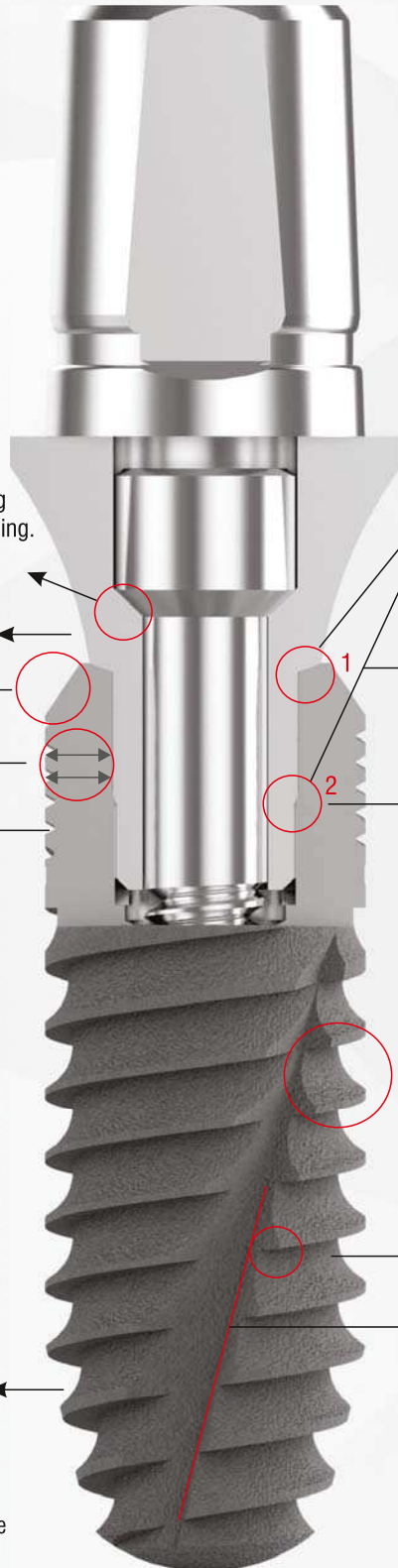
Double thread and reverse buttress design allows easier insertion.

Self cutting threads

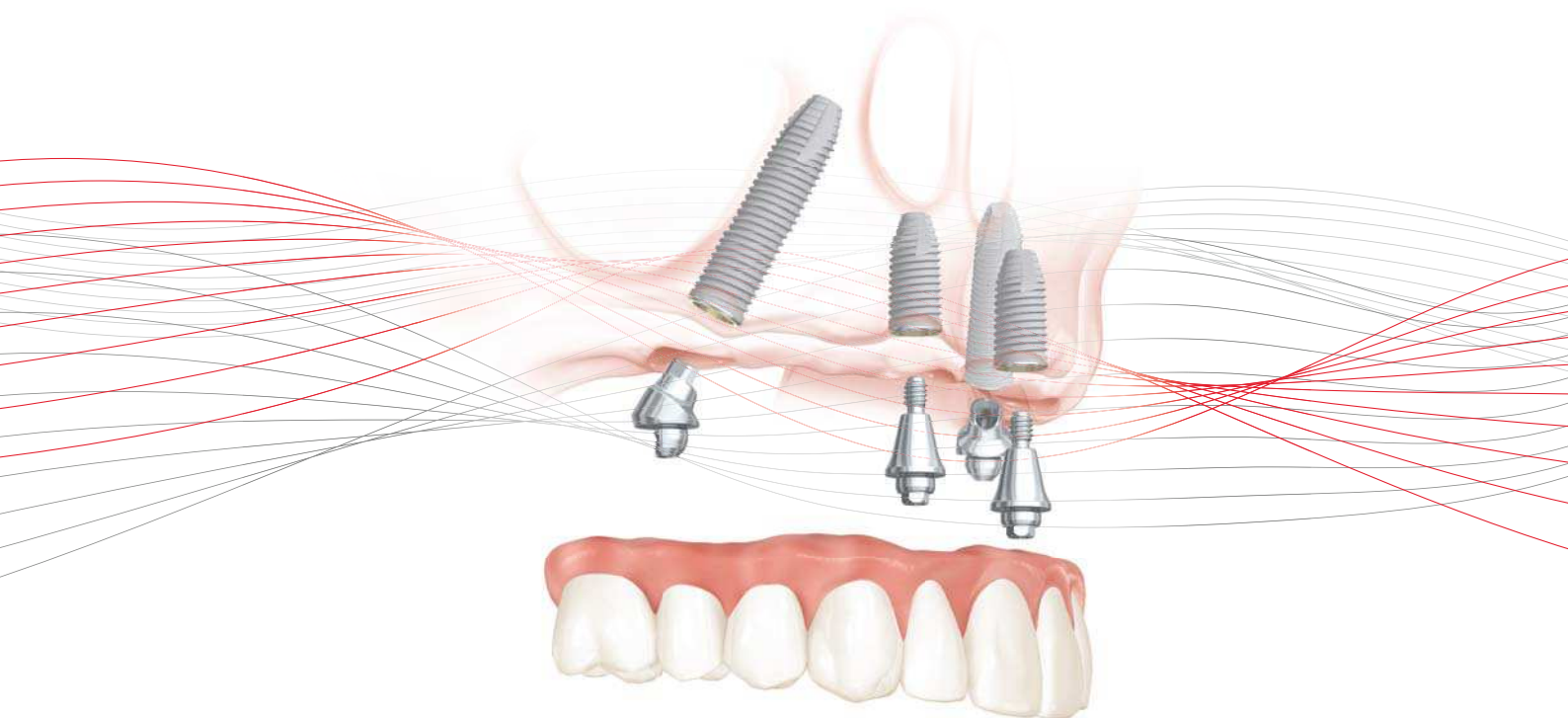
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