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Patients looking for approved specialists in implantology

Dr Roland Hille
Vice-President, DGZI

Dear colleagues,

the structured post-graduate education in implantology—the Curriculum Implantology—is becoming increasingly significant in terms of certified advanced training. The success story of nearly 6,000 colleagues in Germany, who are trained in implantology, makes way for new standards in this therapy, which mostly does not form part of the university curriculum. Acceptance and request by patients increase notably in view of good prospects of success.

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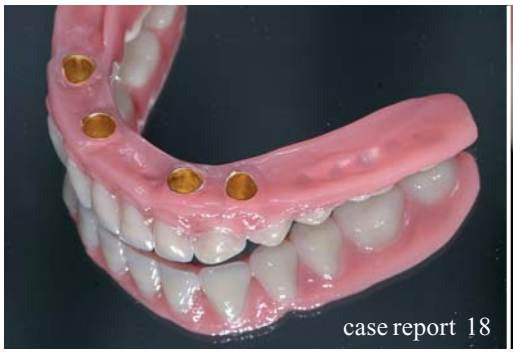
Dr Roland Hille
Vice-President, DGZI



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Ceramic Implants in the Edentulous Maxilla—An Alternative for Patients with Multiple Incompatibilities?

Clinical report with review of the literature

authors_ Manfred Nilius, Mirela Nilius, Rainhard Goeken, Germany, and Anas Damlakhi, Syria

_In the past few years the demand for biocompatible materials in implant dentistry has increased. Despite the good results of ceramic implants in the esthetic rehabilitation of single teeth, nothing has so far been found in the literature concerning the treatment of complete maxillae/mandibles with ceramic implants.

Patients with multiple material incompatibility and holistic pretreatment are asking more and more often about the possibility of being treated with ceramic materials. The use of one-piece zirconia implants in the edentulous jaw for support is a relative contraindication but may be an alternative for such patients. At the present moment evidence-based studies on the osseointegration of ceramic implants are not yet available. Nor do we know anything about the ideal time of loading or the survival rate of ceramic implants. The present case report describes the treatment of a multi-allergic patient with a fixed maxillary prosthetic restoration by means of ceramic implants and bridges and concludes with a critical review of the studies currently available on the subject of ceramic implants. It is to be stressed that, for forensic reasons, the patient has to be fully and extensively informed and that the surgeon/dentist must be fully aware of the risks involved.

_Case history

A 47-year old female high-school teacher with a reduced residual dentition in the maxilla presents to our clinic requesting a fixed maxillary restoration. The case history revealed multiple allergies to a number of materials including latex, bupivacaine, articaine, lidocaine, chromium-cobalt-molybdenum alloys. The bioresonance analyses showed a metal incompatibility. Her attending physician, a general and nature-cure practitioner, strongly advised against a definitive treatment with titanium implants. The patient asked for advice with respect to a fixed dental restoration made of biocompatible ceramics.

_Clinical findings

The clinical examination showed a retruded position of the maxilla with a periodontically severely compromised non-vital upper right central incisor (with core and post) and left central incisor, a right lateral with an extended carious lesion, and amalgam tattoos of the gingiva in the region of the left lateral and canine. In all, there was transverse vertical and horizontal bone loss with an alveolar mucosa of about 3 mm increasing in thickness in posterior di-

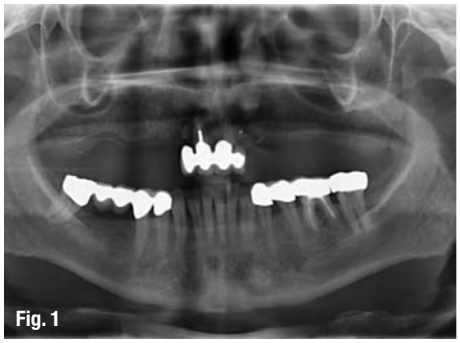


Fig. 1

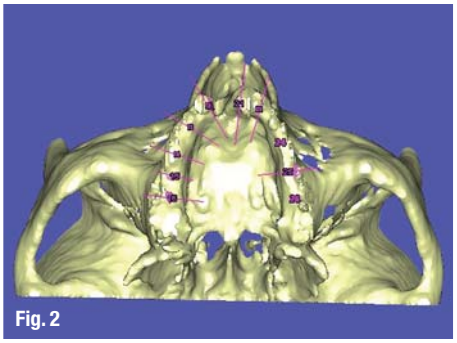


Fig. 2

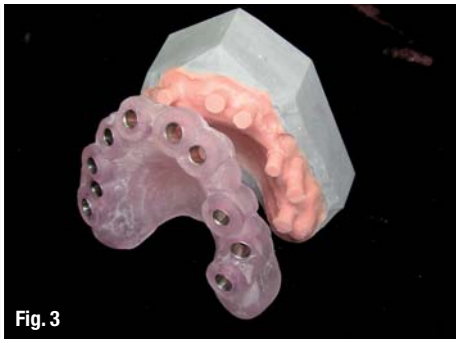


Fig. 3

rection. The mandibular teeth had adequate fixed crowns and bridges. On the lower left second molar and the root-tip resected lower left first molar a carious lesion was detected mesially.

_X-ray findings

An OPG was made (Fig. 1). The radiological findings showed a mandibular dentition treated by conservative therapy and prosthetic restorations with proximal radiolucencies indicating caries at the margins of the metal restorations of the lower left first and second molar. In the maxilla there was a remaining root with an apical cystic radiolucency at the right lateral incisor and metallic artifacts after an apicoectomy in the region of the left lateral. After extraction of the residual maxillary teeth, a three-dimensional dental CT (Fig. 2) was made for further treatment planning. This showed a pronounced osteolysis in the area of the maxillary anterior teeth with reduced transverse and horizontal bone supply.

_Diagnosis

Maxillary retrognathism with hopeless right and left central incisor. A retained root in the region of the upper right lateral incisor, crown margin caries at the lower left first and second molar. Multiple allergies to dental materials and anesthetics and metal incompatibilities.

_Treatment planning

First, the patient was informed about a conservative treatment of the maxilla, a total denture, and implants. To demonstrate the possibilities offered by implant dentistry, a two-part titanium implant with angulated ceramic abutment was compared with an all-ceramic restoration (crown/bridge). The advantages of two-part implants in cases of insufficient bone supply and the options of subgingival or transmucosal healing were pointed out to the patient. Special emphasis was placed on the many studies the results of which indicate very good and predictable osseointegration and healing of modern titanium implants. The patient was also told that there were no reliable studies available as yet related to implants made of ceramic materials and that so far no case reports have been published dealing with the full maxillary rehabilitation by means of ceramic implants. The possibilities of computer-aided treatment planning and navigated implant insertion were also demonstrated. After different materials had been tested by a specialist, a treatment with zirconia implants (bredent whiteSKY®, bredent, Senden, Germany) was planned. Based on computer tomograhy, a mucosa-supported implant template (Materialise, Leiden, Belgium) was fabricated (Fig. 3). To protect the one-piece ceramic implants, a coverdenture on temporary implants (JMP-Implantate®, JMP-Dental, Essen, Germany) was made. In the final fixed restoration ceramic compensation caps were to be placed on the zirconia implants as a mesostructure and aligned according to the path of insertion of the bridge(s) to compensate for the axial diversion (Fig. 13).

_Surgical therapy

Due to multiple local anesthetics intolerance, the implants were placed under general elimination of pain and by means of three surgical templates (Materialise, Leiden, Belgium). The templates were fixed to the maxillary bone using anchor pins (Anchor Pins, Nobel Biocare, Gothenburg, Sweden) (Fig. 4). After initial transgingival implant site preparation with a pilot drill, the site was enlarged using the subsequent two surgical drilling templates. Then the implant bed as such was prepared with drills of 3.5 mm and 4.3 mm diameter and 10 mm to 12 mm length. Seven 3.5 x 12 mm zirconia implants were placed transgingivally in the region of the upper right second molar, second premolar, first premolar, upper left central, canine, first premolar and second premolar (Fig. 5). In the region of the upper right first molar, right lateral and left first molar 4.3 x 12 mm whiteSKY implants were placed (Fig. 7). The implants were inserted mechanically following a fixed protocol (Mod. KaVo INTRAsurg® 1000, KaVo, Biberach, Germany) with a max. speed of 12 rotations per minute, water cooling and a max. torque of 35 Ncm (Fig. 6). An "insertion protocol" was made for each implant insertion. Four temporary JMP implants (M1[2.0 x 12 mm], JMP-

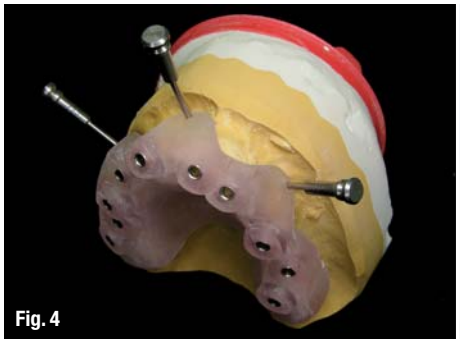
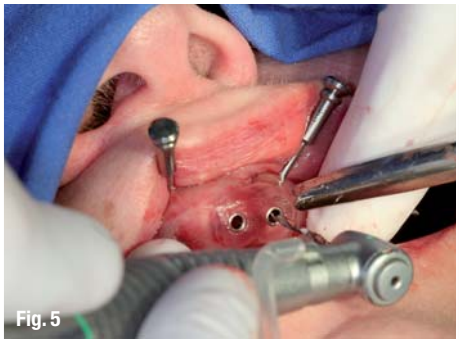


Fig. 4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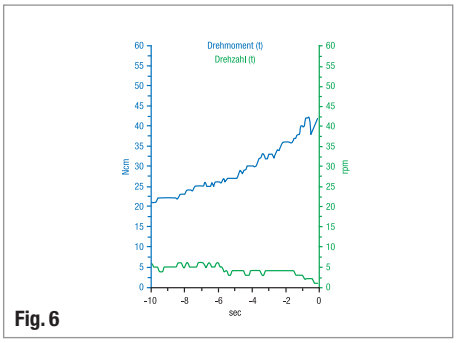

Fig. 6

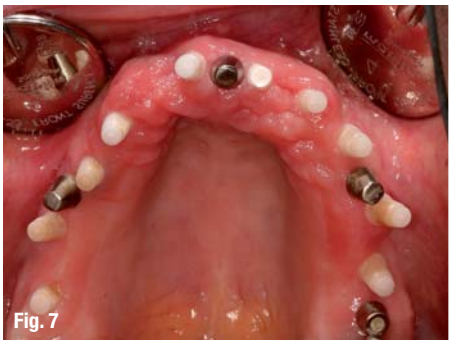
Fig. 7

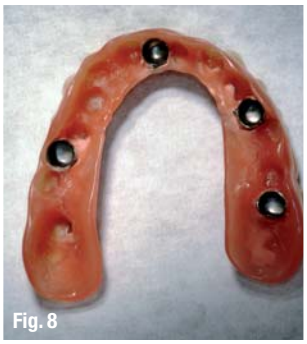
Fig. 8


Fig. 9

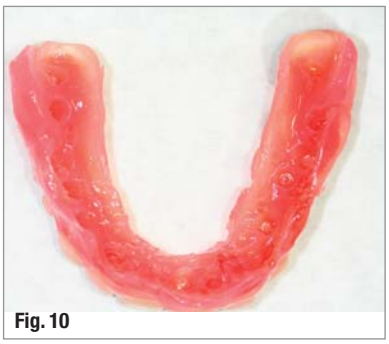
Fig. 10

Dental, Essen, Germany) were placed manually in the region of the upper right second/first premolar, left first/second premolar, first/second molar and interincisally between the upper right and left central incisor.

_Progress

Immediately after the surgery, a coverdenture (non-precious metal base, remanium® star, Dentaurum, Hanau, Germany; Pala Xpress®, Heraeus Kulzer, Hanau) was placed on the four temporary JMP implants and polymerized JMP implant retention inserts (Fig. 8). To avoid any contact with the mucosa, the non-precious metal base was completely embedded in the denture acrylic. The patient was seen on the first, third and seventh postoperative day, then at two-week intervals. It was planned to place the final implants after a healing period of at least six months, according to the specifications of the manufacturer. After four weeks a mucosal irritation was observed near the denture indicating incompatibility with the denture material. Moreover, herpes zoster of the first right division of the trigeminal nerve developed within a few days. A non-medical practitioner tested the material samples and an intolerance of the non-precious metal base of the coverdenture was diagnosed. Therefore a new denture was made as a coverdenture bridge placed on a titanium framework (rematitan Plus®, Dentaurum, Ispringen, Germany). In addition, VITA ZETA® (VITA, Bad Säckingen, Germany) and Pala Xpress® (Heraeus Kulzer, Hanau) were used. Due to the divergent ceramic implants the lateral movements during oral hygiene and at removal of the denture had to be limited, and therefore Soft Reliner®, Tough Medium (Tokuyama-Dental GmbH, Altenberge, Germany), a permanently soft denture acrylic, was applied (Figs. 10–12). At the follow-up examination 12 weeks after implantation, the implant at the site of the upper left canine had become loose. The loose implant was "screwed" out of the implant bed with a torque of $x < 10$ Ncm. Intraorally the implant bed was lined completely with non-irritated gingival tissue, and the periimplant tissue was normal. Extraorally the implant did not show any signs of incomplete osseointegration or osseoadaptation (Fig. 9). The failed implant was replaced by a 5.0 x 13 mm ceramic implant (zit-z®, ziterion, Uffenheim, Germany) and inserted with a torque of 32 Ncm. This implant had good primary stability after implantation. After adaptation of the coverdenture the patient was checked regularly. Within a follow-up period of six months, an attachment loss of not more than one millimeter was found on only two ceramic implants. No attachment loss was found around any of the other implants (Figs. 7, 14, 15).

_Prosthetic restoration

A study model was made which showed an angulation of $x > 30°$ of the implant direction vectors. As the manufacturer did not offer any prefabricated angulation caps, customized ceramic compensation caps (Fig. 13) were made by the dental technician. The initial intention of fabricating a cross-arch ceramic bridge in the maxilla on an intermediate mesostructure of ceramic compensation caps could not be realized. After a treatment period of six months after


Fig. 11

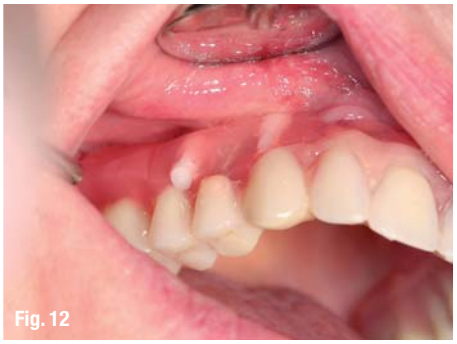
Fig. 12

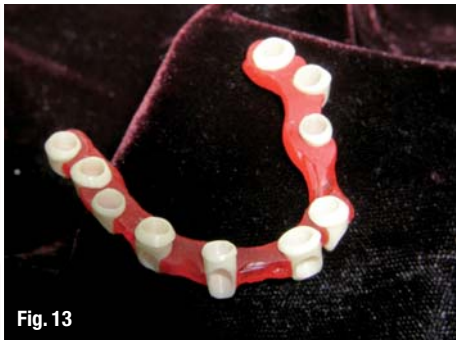
Fig. 13

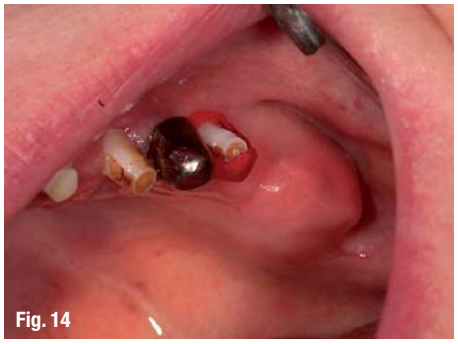
Fig. 14

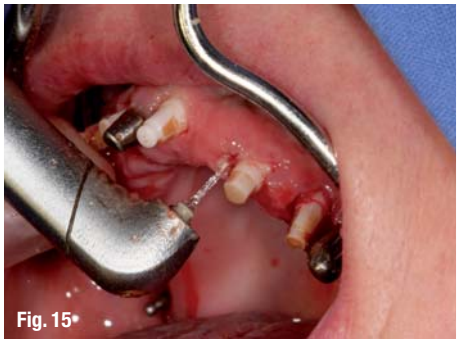
Fig. 15

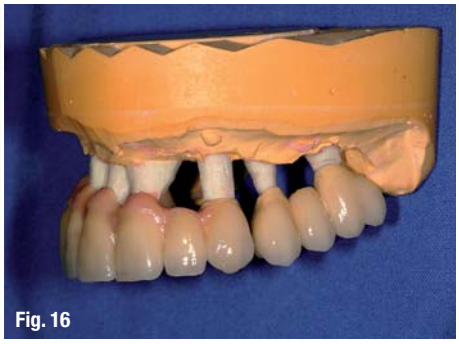
Fig. 16

implantation, the dental laboratory was changed upon the patient's wish and one closer to her home was chosen. The follow-up examination at that time revealed a loosened implant at the site of the upper right second molar which was removed using a torque of x < 20 Ncm without being replaced. The prosthetic treatment plan was revised. In view of the esthetic wishes of the patient, it was now planned to fabricate three bridges which were then to be adhesively bonded to each other intraorally. To protect the one-piece implants, the incorporation of bridge attachments was tested on the model, but the idea was dropped for esthetic reasons. It was decided to prepare the parts of the implants extending into the oral cavity. After taking an anatomical impression, the bridge abutments were aligned in the parallelometer on the model, and grinding copings were fabricated for the preparation of the one-piece ceramic implants (Fig. 14). A gingivectomy using a laser (YSGG-Millennium Waterlase, Biolase Europe GmbH, Floss) was performed to position the copings and obtain a good customized impression (Fig. 15). The copings were placed and the grinding process started with maximum water cooling to prevent damage due to overheating.

After taking a precision impression of the new situation, three zirconia bridges were made (Cercon®, DeguDent, Hanau) and veneered with Ducera Cercon Kiss® (DeguDent, Hanau). At the esthetic try-in of the first bake the JMP implants were removed, and the maxillary bridge the patient had used until then was relined with a permanently soft material (Fig. 10). As a result, the zirconia implants were functionally loaded for a period of approx. four weeks (Figs. 10–12). On the interproximal surfaces between the bridges and inside the Cercon crowns the bond was improved by surface conditioning with alumina (110 micron). Due to the retromaxillary anomaly, several esthetic try-ins were required before the final bridges were fabricated (Figs. 16–17). The bridges were fixed to the ceramic implants by means of Multilink (Ivoclar Vivadent, Ellwangen/Jagst, Germany). They were fixed to each other in the same way (Fig. 18). Figure 19 shows the postop-opG after insertion of the final suprastructure.

_Conclusion

Planning a fixed restoration on one-piece implants in the edentulous maxilla represents a special challenge. Three-dimensional CT-supported planning provides a better picture in cases of an atrophic ridge, but does not always offer a clear impression of the bone quality found clinically. Mucosa-based templates facilitate minimally invasive implant placement, but are not available for all current types of implants. Due to the resilience of the mucosa and in patients with flattened atrophic alveolar processes (bone quality D1) there is the risk of the implant slipping towards the cortical bony edge despite osseous fixation of the implant templates. In the present case, this is demonstrated by the drifted position of the implant at the site of the upper right second premolar. In contrast to restoring an edentulous ridge segment between natural teeth or replacing a single tooth, there is at present no indication of full rehabilitation of complete upper or lower jaws with one-piece ceramic implants. The situation is different in case of a

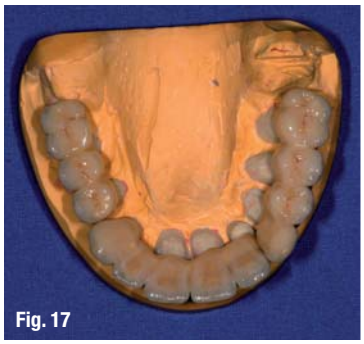
Fig. 17

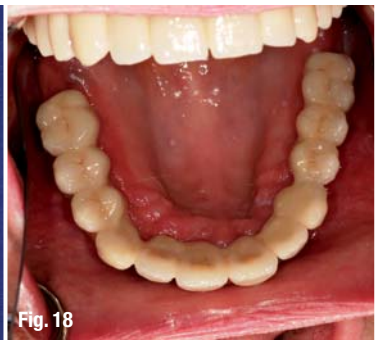
Fig. 18

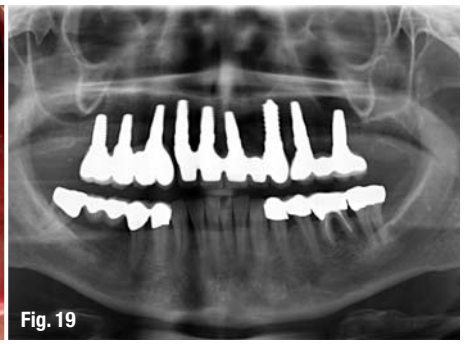
Fig. 19

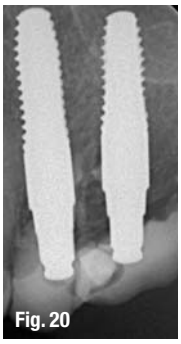
Fig. 20

denture incompatibility and/or multiple allergic reactions. If conventional total dentures fail to restore the masticatory function or if there is a multiple intolerance of dental materials, alternatives are needed. One crucial condition in such cases is to ensure the protection of the ceramic implants during the healing period. Therefore, the case described here is a relative contraindication as a fixed suprastructure was placed on ceramic implants in a patient with a diagnosed titanium intolerance.

_Literature analysis from the practitioner's point of view

No evidence-based studies on the osseointegration of ceramic implants in humans have so far been published. Healing and the long-term prognosis of the implants are considered to be "operator-dependent". This is why for a comparative study of the success rates of each case the insertion protocol supplied by the manufacturer should be strictly implemented and documented. This applies in particular to the compromised maxilla. In the case described here, the bone supply was reduced (class D-E) with a cortical bone quality of class D1.[18]

Most operators will have to get used to a max. insertion torque of 35 Ncm in D1 bone, as mentioned above. All the more so, as in animal experiments with ceramic implants after twelve weeks of healing a removal torque of 25 Ncm (!) was mentioned.[10] In the case described above, one implant (upper left canine) also loosened after twelve weeks. Comparative studies have shown an average maximum removal torque of 150 Ncm for titanium implants after four weeks of healing.[4, 19]

Remodeling and bone healing

Such observations are explained by remodeling processes. Related to the present case this means the following: The surgical trauma may cause a necrosis of the bone extending up to 1 mm around the implant. Only in the cortical areas where osteocytes are strongly anchored to the bone surface, bone remodeling is said to take place. The rest of the transcortical implant surface is affected by a periimplant necrosis and bone tissue lysis which is clinically demonstrated by implant loosening. Four to five months after implantation the remodeling activity has reached its peak.[23] The explanation for bone healing is the combination of osteoconduction (migration of matrix-synthesizing cells to the implant surface), the formation of new matrix, and remodeling. This combination is essentially determined by the design of the implant itself.[6] This is why in the case described the loosened implant (bredent whiteSKY®, bredent, Senden) at the site of the upper left canine was replaced by a zirconia implant of a different design (zit-z®, ziterion, Uffenheim). Using a bigger implant

of the same system is also possible. However, at the time of implantation such an implant was not offered by the manufacturer. How ZrO_2 grows into the bone and the morphologic response of the adjacent tissue are not conclusively explained in the literature, neither in themselves nor by a comparison. The studies quoted also differ in terms of models, types of animals and raw materials.[3,5,11,13,16,22,24] In this connection some authors discussed the findings of other studies with their own results and arrived at the conclusion that zirconia does not negatively affect the cellular reactions.[15]

Taking X-rays of ceramic implants

An objective evaluation of the bone density or the quality of the bone directly surrounding the implant is not possible. Zirconia implants have a striking radiopacity (fig. 20). Zirconia implants can be distinguished from natural tooth substance in the X-ray without any problem. Structures around clinically "loosened" implants can be identified rather reliably as radiolucency in the X-ray. In such cases a resorptive zone at the neck of the implant can be clearly identified. In the X-ray of an osseointegrated implant no lytic processes can be seen and no soft tissue between the bone and most of the implant surface.

Grinding the implants

The zirconia-based ceramic materials used in the case described are called "medical-grade zirconia". Just as other industrially used ceramics, zirconia has a microstructure that is never free of small cracks or fissures which can further propagate even under minor tensile or bending stresses. This process is called "subcritical crack propagation".[12,14,20] Even if exposed to a purely static load, ceramic materials are showing a "fatigue behavior". "In the process, a crack of an initial size of ai will slowly propagate up to the critical load-depending size ac at which point an unstable critical crack propagation will be initiated."[21] This finally means implant fracture. What is special about zirconia is its bending strength and fracture toughness and its resistance to stress corrosion cracking. In order to estimate the life expectancy of ceramic implants, it is important to consider the combination of material composition, microstructure and history of the material.[20] In combination with heat treatment, some types of surface treatment have an influence on the heterogeneous phase distribution and the resulting mechanical properties of the ceramic material.[9,17] These include the implant insertion technique, grinding and the subsequent fixation of the suprastructure. On the one hand, this explains the low insertion torque (max. 35 Ncm) of implantation. On the other, mechanical treatment of the surface means that surface crystallites change from the tetragonal to the monocline phase with a tendency to expand. This leads to compressive stress in the surface, and the material gets stronger. Therefore, treating the surface with alumina for surface conditioning and greater bonding strength makes sense. Some authors think it is inevitable to condition the oral surface of the implant for optimum bonding of the adhesive and the denture.[22] Heat treatment above the transformation temperature causes the monocline phase to change back into the tetragonal phase, and bending strength deteriorates. The material becomes brittle. Therefore the implant must be prepared with utmost care and maximum water cooling and in one session, if possible. Grinding and heat may lead to the formation of micro cracks on the implant surface and finally to fracture, but can also contribute to a more rapid moisture-induced transformation under load.[8] In the case described, the manufacturer had not treated the implant surface in any way. The internal surfaces of the bridges and the interproximal surfaces were mechanically roughened by the dental technician in order to improve adhesive bonding. The adhesion to the mechanically untreated ceramic bridge material and the adhesive bonding of the three bridges in the mouth actually compensated for the reduced bending strength of individual implant bridge abutments.

_Outlook

On the basis of a current literature analysis, zirconia and titanium do not essentially differ with regard to their capability for osseointegration. Thus, for certain indications zirconia implants represent at present a white alternative to titanium implants. If the surface is further modified, zirconia implants, similar to the development of titanium implants, can be expected to markedly enhance their osseointegration properties. Studies dealing with the improvement of surface roughness and predictability of osseointegration processes would be useful. As a result, the current limitation for the indication of ceramic implants to interdental edentulous spaces and single-tooth restorations could in future be extended to include pontic spans, cantilever situations and edentulous ridges in cases of intolerance of dental materials._

The reference list can be requested from the editorial office.

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Innovative tissue regeneration with dimensionally stable, defect-congruent β-TCP composite

author_ Ronny Gläser M.Sc., Germany

Fig. 1_ β-TCP granules in applicator syringe + biolinker in eye-dropper bottle after removal from the sterile packaging (easy-graft™ 400).
Fig. 2_ The mixture of β-TCP and biolinker is ready to use immediately. Before use, the excess biolinker simply has to be discarded onto a sterile swab.

_**Bone defects** are a common finding in oral and maxillofacial surgery. These defects can arise as a result of pathological cavities (cysts), bacteria causing periodontal disease (periodontitis) or following the removal of teeth that are not worth saving (extraction sockets). In addition, bone deficits are caused by age-related bone atrophy as well as inactivity atrophy after tooth loss. Oral and mandibular trauma may also lead to substantial bone loss. Modern dental implantology has become well established not only as a possible alternative, but often as the treatment of choice, also favoured by patients, owing to a statistically high success rate in relation to the osteointegration of oral implants. As a result, there is considerable demand for methods that will compensate for the bone loss that arises. There are numerous methods available to the clinician, such as distraction osteogenesis, onlay grafts, open and closed sinus lift as well as GBR and a wide variety of materials (autologous, allogenic, xenogenic or alloplastic) with all their advantages and disadvantages. Increasingly, however, a preventive approach to bone defects has emerged as a better option. This includes the technique known as ridge or socket preservation. The aim is to prevent the five wall bone defect from collapsing in height and width, by filling the well curetted extraction socket, and thus to create favourable preoperative conditions for delayed implant insertion or other prosthetic treatments such as bridge pontics. In most cases this means that time consuming, costly and often more risky bone reconstruction at a later stage can be avoided to the benefit of the patient. A technique of socket preservation is presented below, in which soft tissue coverage of the augmentation material or placement of a membrane can be omitted in most cases because of the special properties of the bone augmentation material used.

_Material and method

The material used for this purpose is a phase-pure β-TCP with high microporosity and interconnecting pores which is coated with a thin layer of polylactide-co-glycolide (PLGA-coated) (easy-graft™). Mixing an organic solvent (biolinker) with the coated granules in an applicator syringe produces an augmentation material with a pasty con-

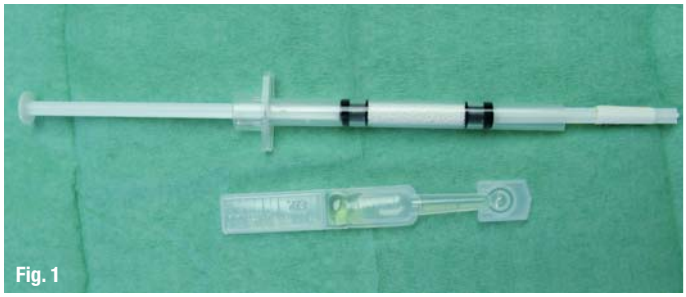


Fig. 1


Fig. 2

sistency (Figs. 1 and 2). When in contact with an aqueous liquid (e.g. saline) or blood, this material hardens within 30 to 120 seconds to form a stable filler or padding. Before application, the excess volume of biolinker from the mixture of β-TCP granules and biolinker is dripped from the syringe onto a sterile swab. The sterile syringe opening can then be placed directly onto the socket entrance and the syringe contents fed into the bone lumen. The defect should be completely filled in a single action, as far as possible, and slightly compressed in site by condensing with a flat plugger. The top layer of the material is then proper condensed in the crestal portion. This creates a marginal pseudomembrane and, after the material has hardened, a dimensionally stable, alveolus congruent β-TCP filler which stabilizes the five wall bone defect and acts as a guide to osseointegration (osteoconductor). A crossed vertical mattress suture can be placed over the filling material to appose the wound margins. In most cases, flap mobilisation or coverage with a membrane is unnecessary. It is important to ensure that the mixed material does not come into contact with fluids or blood before application because the material will start to harden before the defect has been filled, preventing proper handling.

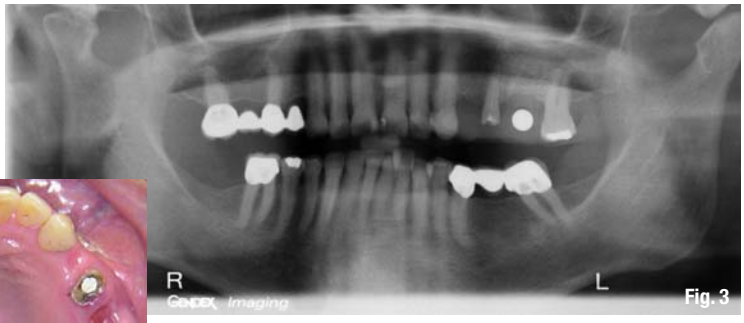


Fig. 3

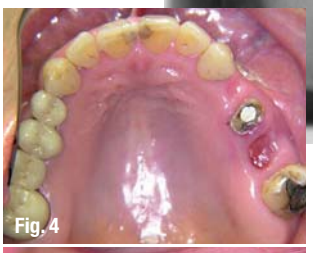


Fig. 4

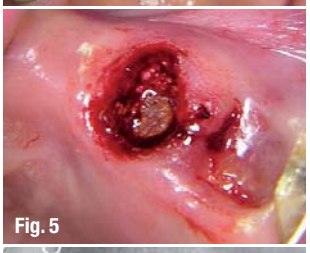
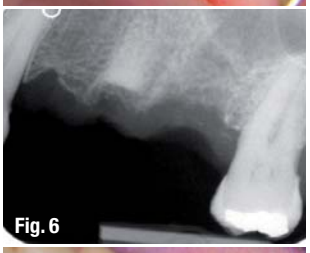


Fig. 5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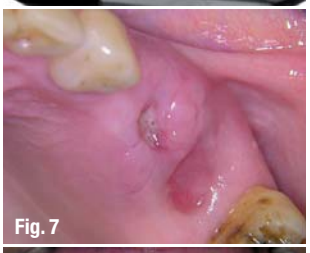
Fig. 7

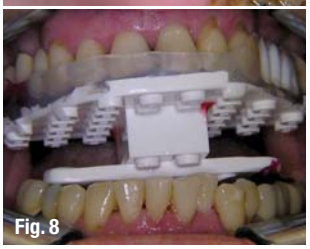
Fig. 8

_Case study

At the beginning of treatment the 57-year-old patient presented with an unremarkable general medical history. The oral examination revealed an inadequate cantilever bridge (25, 26 with abutment 24) in the 2nd quadrant which, after the loss of tooth 26 owing to massive secondary caries, had simply been temporarily fixed onto the root remnant of 25 around two months earlier. This root remnant, which had already undergone previous endodontic treatment, already displayed increased loosening and was sensitive to pain, especially in response to percussion (Figs. 3 and 4). The patient wanted a fixed restoration, if possible, without bridge pontics or extension abutments in order to support oral hygiene. Analysis of clinical and radiological findings revealed advanced, transverse bone resorption in the region of 24 and limited bone height in the region of 26. The patient stressed her desire for the safest possible procedure during planning and surgery. This was the indication for a CT-based 3-D planning should be used. Before the implant treatment started, the inadequate remaining root in region 25 was removed and the extraction socket was filled up with a dimensionally stable β-TCP composite (easy-graft™ 400) for the purpose of socket preservation and was left without membrane coverage to allow open granulation of the soft tissue (Figs. 5 and 6). One advantage of this approach, as well as preserving the bony parts of the alveolar ridge, is the additional profit of soft tissue over the augmenta-

Fig. 3_ Initial Panoramic X-ray with measuring ball in region 26. The reduced vertical bone stock in region 26 is clearly visible.
Fig. 4_ Clinical situation (occlusal view) before the start of treatment without the bridge in the 2nd quadrant.
Fig. 5_ Condition immediately after socket preservation. Region 25 filled with easy-graft™ 400.
Fig. 6_ Postoperative check X-ray after socket preservation region 25. The β-TCP material inserted up to approx. 2 mm below the crest can be seen.
Fig. 7_ Condition 10 days post op. Early soft tissue granulation over the augmentation material.
Fig. 8_ CT planning template in situ. A reproducible, non-rocking position is important to ensure the same seating of the template during CT imaging and operation.
Fig. 9_ 3-D planning region 24: the minimal transverse bone quantity is noticeable.
Fig. 10_ 3-D planning region 25: the augmented alveolar area is radiologically visible and not yet fully transformed into bone. However, good preservation of the alveolar crest is visible (3 months after socket filling).
Fig. 11_ 3-D planning region 26: the minimal height of residual bone is visible as well as a harmonious course of the maxillary sinus floor without interference from any antral septa.

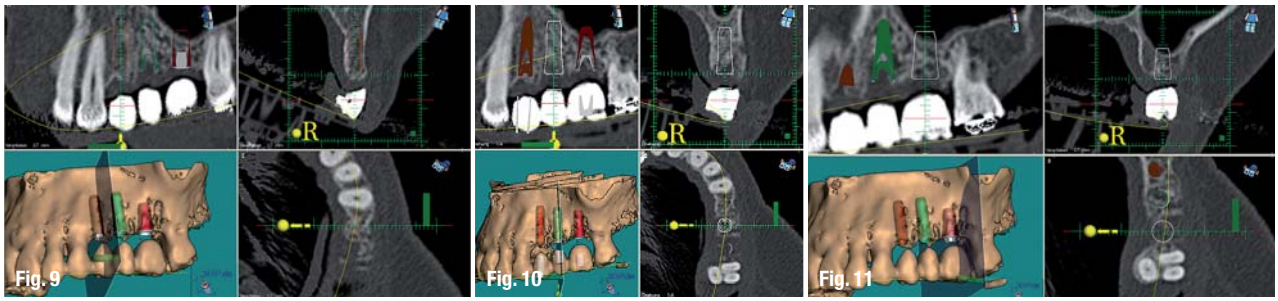

Fig. 9 Fig. 10 Fig. 11

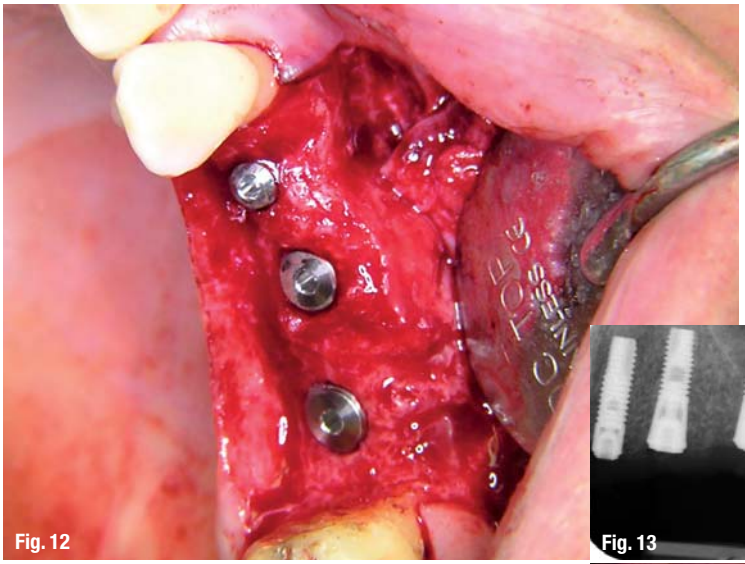
Fig. 12

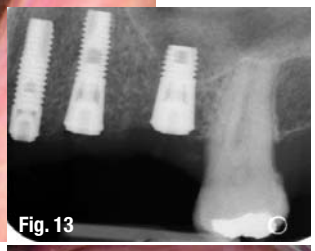
Fig. 13


Fig. 14

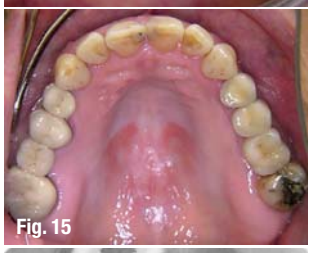
Fig. 15

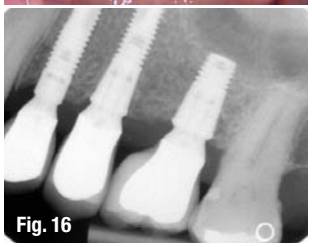
Fig. 16

Fig. 12_ Situation after bone spreading region 24, internal sinus lift region 26 and simultaneous implant insertion region 24, 25 and 26 (3.5 months after extraction and socket filling region 25).
Fig. 13_ X-ray check after implantation and internal sinus lift region 26 with autologous bone. Extraction and socket preservation in region 25 was performed about 3.5 months earlier.
Fig. 14_ Situation after prosthetic treatment: zirconium oxide crowns region 24, 25 and 26 approx. 5 months after implantation and internal sinus lift (lateral view from the left).
Fig. 15_ Situation after prosthetic treatment: zirconium oxide crowns region 24, 25 and 26 approx. 5 months after implantation and internal sinus lift (occlusal view).
Fig. 16_ Periapical X-ray after prosthetic treatment (5 months after implantation and approx. 8 months after socket preservation).

Special thanks to Dentallabor Gäßler, Ulm, Germany.

tion material (Fig. 7) because no soft tissue coverage is required to stabilise the material (internal tissue engineering). Furthermore, since the periosteum must not be detached, the supply of blood to the buccal bone lamella remains intact and there is no displacement of the mucogingival border. After about three months' consolidation of the augmentation material, a CT data set was prepared with an integrated planning template (Fig. 8). Based on these data, alignment of the implant positions could be optimised with the aid of planning software (med3D) (Figs. 9–11). The transverse bone width in region 24 was adequate for insertion of an implant 3.5 mm in diameter, which was further optimised intra operatively by targeted bone spreading. In the region of 26, however, lifting of the sinus membrane with augmentation by approx. 4 mm was necessary to achieve an adequate vertical bone height. After 3-D examination of the sinus in this region, a closed procedure in the form of an internal sinus lift by the Summer's technique seemed possible and was performed. First the pilot drill was used for deterning the implant positions with the support of a navigation template.

The final preparation of the implant cavities was done with appropriate osteotomes. In the region of 26 the cavity was first prepared up to 1 mm before the sinus floor and the induced fracture of the thin bone lamella was performed with the last osteotome. For sinus augmentation, autologous bone harvested from the operating field was inserted through the prepared implant cavity with the osteotome (Figs. 12 and 13). Simultaneous insertion of the implants in the region of 24, 25 and 26 followed.

After a operative procedure without any complications, the three inserted implants were left covered and stressless for around 4.5 months to become incorporated. Throughout the treatment period, the patient was fitted with a temporary prosthesis. The implants were exposed by a slit incision and formation of a split flap in the region of 24–26. The final restorations (zirconium oxide single crowns) were inserted two weeks after exposure and after open impression taking with a custom tray (Figs. 14–16).

_Conclusion

The complex treatment process shows that, by collaborative team work (implantologist, dental technician, radiologist), a predictable aesthetic outcome can be achieved with modern techniques in preventive augmentation (socket preservation) using suitable materials as well as prosthetic and surgical planning (3-D analysis). Good horizontal as well as vertical ridge preservation can be achieved by socket filling. Compared with the untreated extraction socket in the region of 26, better dimensional preservation of bone was found radiologically (Fig. 13) and clinically (Fig. 12) in the region of 25. This allows optimum functional and aesthetic alignment of the implant position. The cleanability of the zirconium oxide single crowns is good, so that a positive long-term prognosis is possible with regular checkup procedures, professional hygienist treatment and the best possible oral hygiene at home. _

_contact implants

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Implant Surgery Using Short Implants with Sintered, Porous Surface

author_ Peter Ghaussy, M.Sc., Germany

_In conjunction with the clinical parameters, the implant surface has a considerable effect on the integration of the implant within the surrounding bone tissues. The use of short, root-shaped implants with porous surface is a predictable treatment method for an implant restoration even in difficult anatomical situations. Our case reports document the very effective function of short (5 mm and 7 mm) sintered press-fit implants with porous surface. In comparison with the majority of screw-type implants[4, 6, 9] the sintered implants with porous surface also in short lengths in general show a good performance. This is probably the result of their integration mechanism by ingrowth of the bone into the porous surface.[8, 3]

_The Endopore Implant System

A number of surface treatments is available for implants which create a rough surface and thereby enlarge the surface for contact with the bone. The additional porous multilayer of spherical titanium alloy particles of a defined size enables the ingrowth of the bone into the existing rough structure of the surface. A three-dimensional mechanical bond between bone and implant is achieved (Fig. 1). This mechanism of osseointegration is unique and only possible with a porous surface and was used in orthopedics for iliac endo-prosthetics in early 1970. All other types of surface treatment have only minimal or no porosities, and the implants are stabilized only by friction.[8] The Endopore implant (Oraltronics/Sybron Implant Solutions, Bremen) was developed in 1983 at the University of Toronto and shows a well-defined surface topograph.[7] The aim of this development was to create a predictable implant anchorage by bone ingrowth into a porous surface which was produced by a sintering process. The implant consists of a titanium alloy (TiAl6V4), has a conical root shape and achieves primary stability by press-fit. The multilayer generates a significant increase in the surface due to multiple undercuts (Fig. 2) and provides a three-dimensional mechanical connec-

Fig. 1_ Histological specimen of an implant with porous surface 18 months post-op. The majority of surface porosities is filled with ingrowing bone substance (magnification 25x).
Fig. 2_ Comparison of surfaces: tooth, machined, Endopore implant.

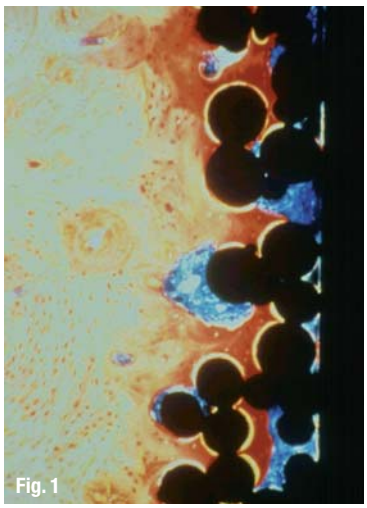


Fig. 1

Fig. 2

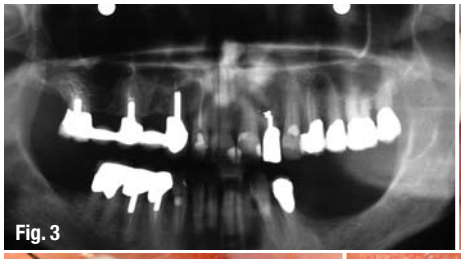


Fig. 3

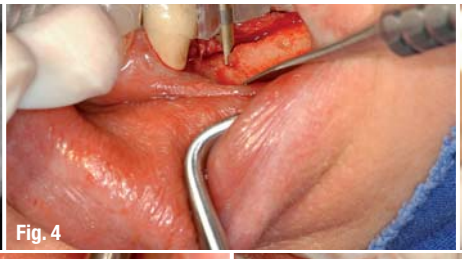


Fig. 4

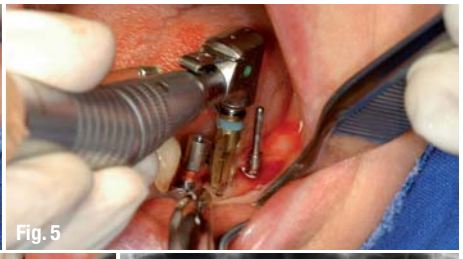
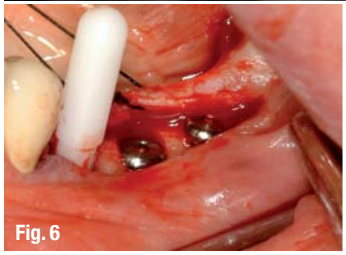


Fig. 5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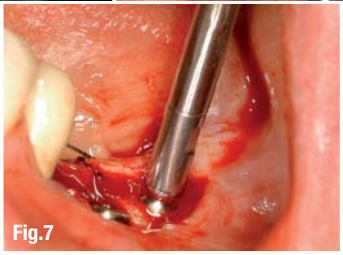


Fig.7

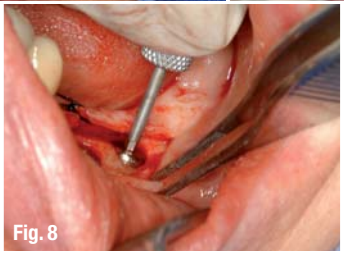


Fig. 8

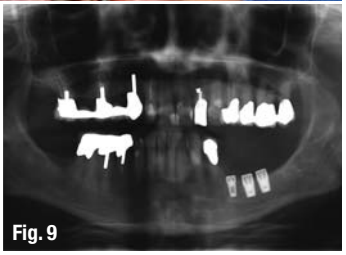


Fig. 9

tion between bone and implant. In difficult anatomical situations such as severe atrophy of the alveolar bone, it is in many cases possible for an implant-prosthetic restoration to avoid an extensive augmentation or bone transplantation. Since the total surface of the implant is increased by the porous structure, we can predictably use shorter implants.[1,2] Based on the number and the scientific methodical quality of clinical investigations of the Endopore Implant System, these documentations comply with the criteria of extensive clinical documentation.[5] Six centers in four countries have conducted long-term studies. A total of 1,352 implants were controlled over a period of up to eight years after surgery. The total rate of success of the six centers is 95.9 %.[1,2]

_Case Report of a prosthetic restoration with fixed dentures at extreme atrophy of the posterior mandible

A female patient (59 years) in good general state of health was referred to us, she asked for a prosthetic rehabilitation with fixed dentures. After restoration of the maxilla and finalizing the necessary preparatory measures, we planned an implant-supported restoration with crowns in the lateral maxilla. The teeth 35, 36 and 37 were missing.

The vertical available bone was limited due to a severe atrophy, and a significant horizontal bone loss was ascertained (Fig. 3). The preoperative diagnostics revealed a limited available bone of 6 mm in region 36 and 37 and of 8 mm in region 35. The patient was informed about alternative treatment methods, especially vertical and horizontal augmentation, and she decided for an implant insertion of short implants. We selected an Endopore implant of 7 mm length (diameter 4.1 mm) for region 35 and two Endopore implants of 5 mm length (diameter 5 mm).

The implant surgery was scheduled for June 2006. After anesthesia a crestal incision was made in region 35–37, the mucoperiosteal flaps and the supporting bone prepared. The implant positions were determined (Fig. 4) and the pilot drillings made. The insertion direction of the implants was controlled by using the parallel indica-

Case 1

Fig. 3_ Preoperative X-ray.
Fig. 4_ Determination of implant positions and pilot drilling.
Fig. 5_ Preparation of the implant bed.
Fig. 6_ Implant insertion.
Fig. 7_ Final implant position using the punch handle.
Fig. 8_ Checking the primary stability and cover screw.
Fig. 9_ Post-operative X-ray control after implant insertion.

Fig. 10_ Abutments inserted, control at re-entry surgery.
Fig. 11_ Post-operative X-ray after exposure.
Fig. 12_ Preparation and procedure for impression-taking.
Fig. 13_ Finished denture on the model.
Fig. 14_ Denture inserted.
Fig. 15_ Control of the inserted restoration.

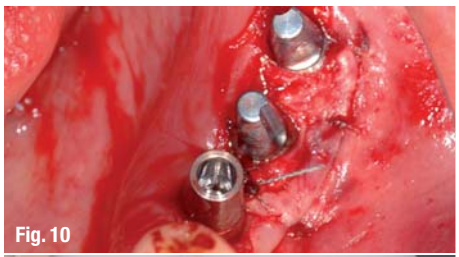


Fig. 10

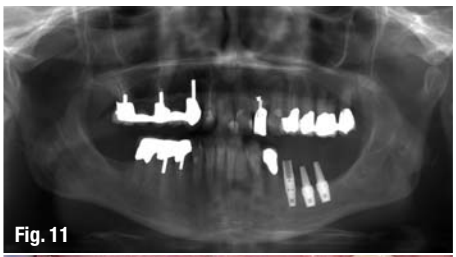


Fig. 11

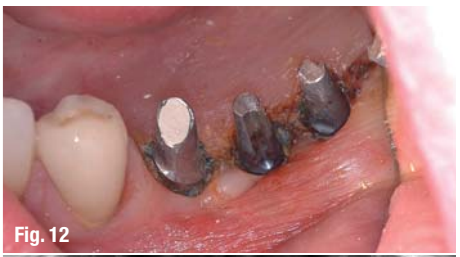


Fig. 12


Fig. 13

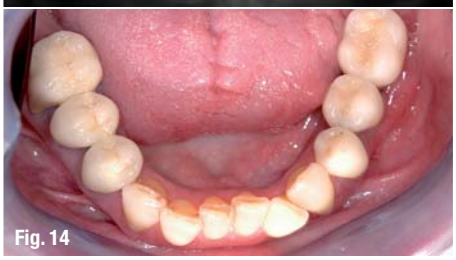


Fig. 14

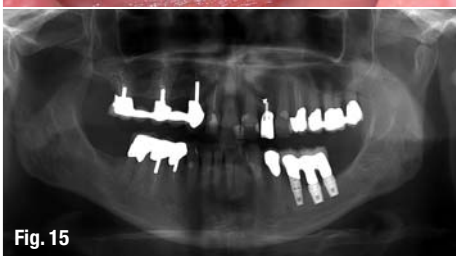


Fig. 15

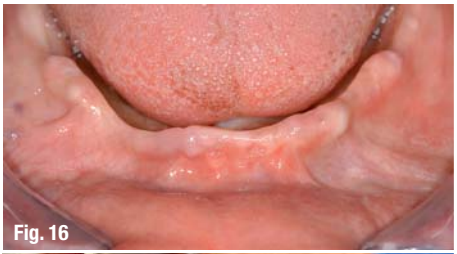


Fig. 16

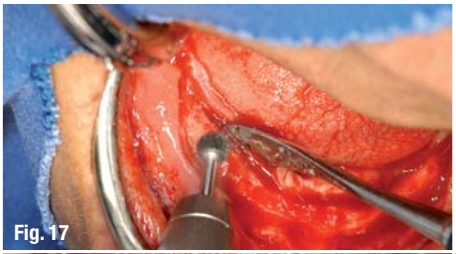


Fig. 17

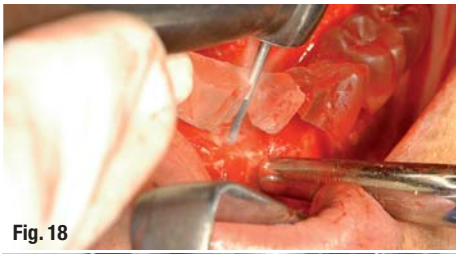


Fig. 18

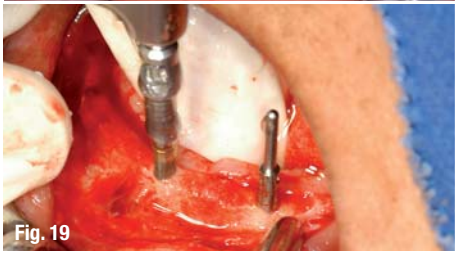


Fig. 19

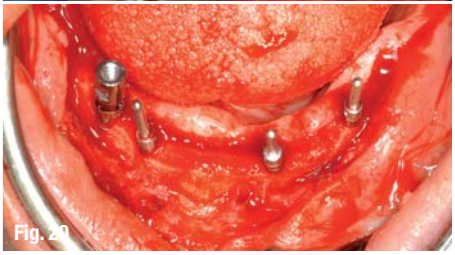


Fig. 20

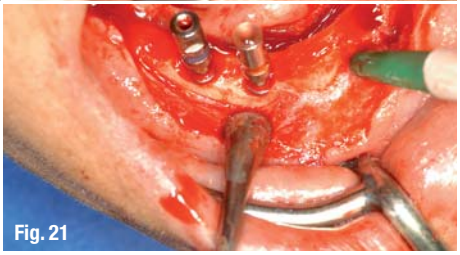


Fig. 21

Case 2

Fig. 16_ Pre-operative situation.
Fig. 17_ Preparation of the flaps and of the anchoring bone.
Fig. 18_ Determination of the implant positions.
Fig. 19_ Pilot drilling.
Fig. 20_ Direction control.
Fig. 21_ Checking the osteotomy with the parallel indicators.

tors. As soon as the predetermined depth was reached with the pilot drill, the implant site was extended with an implant drill (of the corresponding implant dimensions) (Fig. 4). The implant site was controlled with a matching Trial Fit Gage (final osteotome tips). The shoulder of the conical osteotome gage should remain slightly below the alveolar crest. The selected implants have to be removed from the sterile packing under aseptical conditions and immediately placed into the insertion site. The implants should only be in touch with the acrylic insertion aid and contact with soft tissues must absolutely be avoided. Using the punch handle, the implant is placed into the final position and the stable fit of the cover screw checked and the primary stability verified (Figs. 6–9). A healing period of minimum 18 weeks is recommended, in order to guarantee an undisturbed reorganization of the bone structure into lamellary bone.

The reentry and exposure of the implants was performed in January of 2007. At the time of insertion of the abutments, some free gingiva was transplanted in order to achieve a stable gingiva around the implants. Then the abutments were placed (Fig. 10). An X-ray control for checking the exact fit of the prosthetic abutments is recommended (Fig. 11). Six weeks later, in February of 2007, the crowns (Fig. 13) were prepared after direct trimming of the abutments (Fig. 12) and impression taking. The design of the occlusal surfaces are based mainly on theoretical considerations since pilot studies and in-vivo examinations are hardly existing in literature. It should be reasonable to displace transversal stresses which could have a negative effect on the implants, to the anterior region as far as possible. The oro-vestibular width of the occlusal surface has considerable influence on the extent of the bending point. The material used for design of the occlusal surfaces seems to have a secondary effect for the long-term success.[11] The denture should be carefully checked on correct precision fit and the design of the occlusal surfaces (Figs. 14 and Fig. 15).

The use of short implants enables an extension of the indication by the possibility to provide the patients with fixed dentures even at severe atrophy of the bone.

Fig. 22_ Implant insertion.
Fig. 23_ Final implant positioning using the punch handle
Fig. 24_ Post-operative X-ray control
Fig. 25_ Situation after soft tissue healing (gingival former).
Fig. 26_ Impression posts.
Fig. 27_ X-ray control of impression posts.

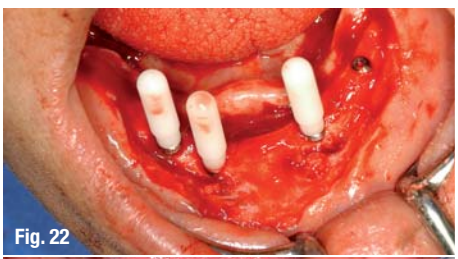
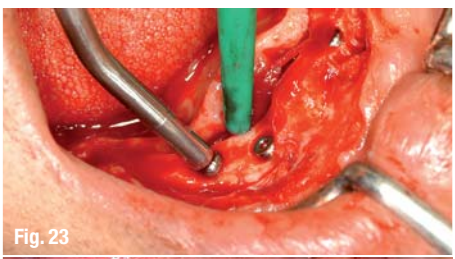


Fig. 22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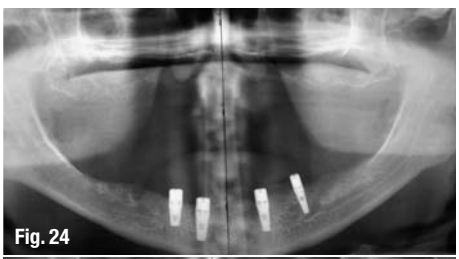
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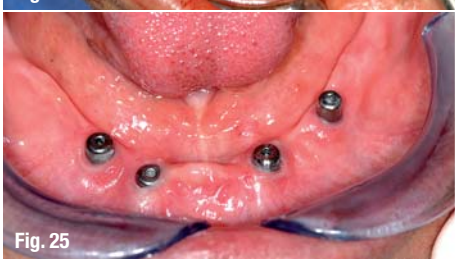
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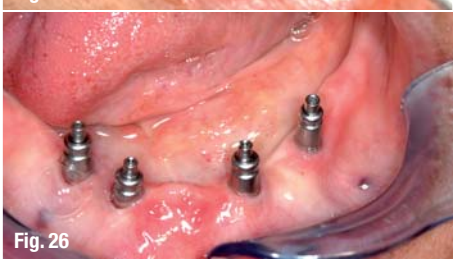
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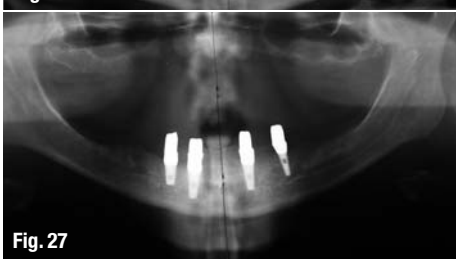
Fig. 27

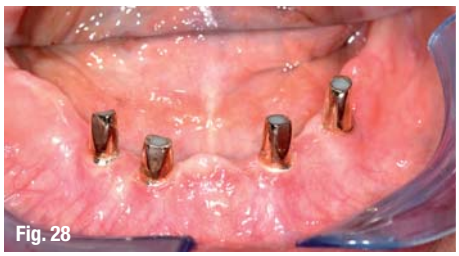
Fig. 28

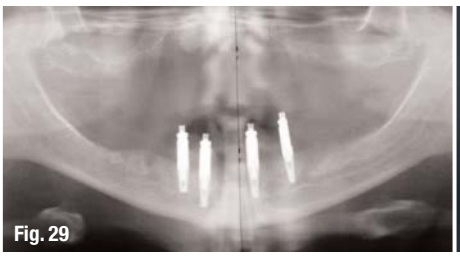
Fig. 29

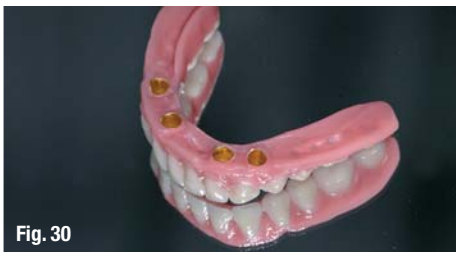
Fig. 30


Fig. 31

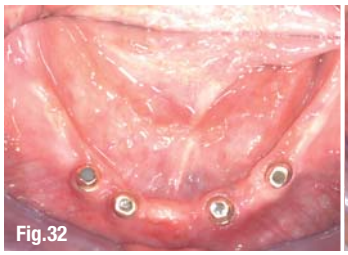
Fig.32

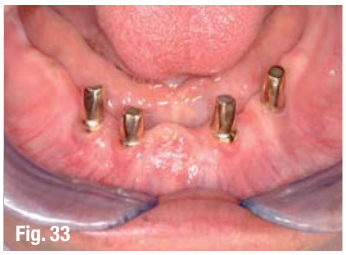
Fig. 33

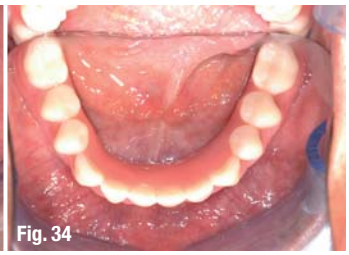
Fig. 34

Fig. 28_ Abutments inserted according to telescoping primary crowns.
Fig. 29_ X-ray control of the prosthetic elements (abutments).
Fig. 30_ Denture inserted in November 2003.
Fig. 31–35_ Situation 4 years after restoration

_Case Report of a telescopic implant-supported denture with control 4 years post-op

A female patient (52 years) with good general state of health was referred to us for implant surgery and prosthetic rehabilitation in the mandible. The patient was edentulous in the maxilla and in the mandible (Fig. 16).

After informing the patient on alternative possibilities of restoration, especially including vertical and horizontal augmentation, the patient decided in favour of implant surgery with short implants based on the smaller risk.

The implant surgery took place in June 2003. After anaesthesia and crestal incision from region 35 to 45, the mucoperiosteal flaps were prepared and bilaterally the mental nerve was identified and the supporting bone prepared (Fig. 17). The implant positions were determined (Fig. 18) and the pilot drillings performed (Fig. 19). The direction position of the implants was controlled by using the parallel indicators. As soon as the desired depth was reached with the pilot drill, the implant site was expanded with a final implant bur (according to the selected implant dimension) (Fig. 20). The implant site was controlled with corresponding trial fit gages (final osteotome tips). The shoulder of the conical trial fit gage should remain slightly below the alveolar crest (Fig. 21). The further surgical steps proceeded as presented in the above preceding case. By using the punch handle, the implant was tapped into the final position, and the stable fit of the cover screw and the primary stability was checked (Fig. 22, 23 and 24).

A healing period of at least 18 weeks is recommended, in order to guarantee the undisturbed transformation of structured bone to lamellary bone. The implants were exposed in September of 2003. After soft tissue conditioning, the preparation of the final restoration was started in October 2003, and in November 2003 the final denture was inserted (Figs. 25–30).

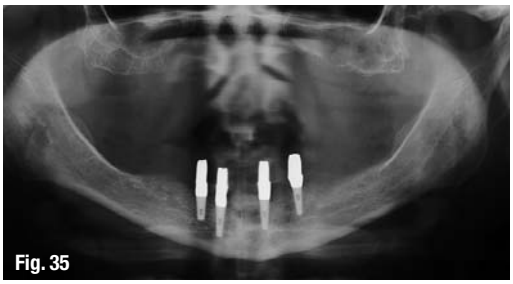
Fig. 35

The patient moved to another country for professional reasons and did not return for dental/individual prophylactic control in the meantime. She came back for control in October 2007. The restoration showed no abnormalities, neither at X-ray control nor at clinical check-up (Figs. 31–35).

_Conclusion

The use of short root-shaped implants with porous surface enables a predictable less invasive treatment method for the restoration with dental implants, even in difficult anatomical situations. The surface enlargement of the porous multi-layers of spherical titanium particles allows the ingrowth of bone into the rough surface structure and leads to a three-dimensional mechanical bond between bone and implant. The Endopore implant system allows in many cases a minimal-invasive surgical restoration.

The literature list can be requested from the editorial office.

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Restoring an aesthetic smile

Case study on planning, surgical procedure and aesthetic prosthetic anterior reconstruction

authors_ Jan Bogena and Daniela Bogena, Germany

_Targeted advertising on television and in magazines has given rise to constantly growing patient demand for best possible aesthetics. Consequently, complete restoration of both implant-based and prosthetic reconstructions is expected, and in many cases patients are even looking for the implant-prosthetic treatment to actually be a substantial improvement on their original situation.

_Case history

A 60-year-old patient presented at our practice with acute pain in the upper anterior tooth region 11 (upper right central incisor). Moderate submucosal swelling was detected by intraoral palpation. The patient's general history contained no peculiarities.

_Clinical findings

Clinical examination revealed insufficiently fixed restorations in all four quadrants, which according to the patient were at least 20 years old.

Teeth 11 and 21 (upper centrals) had previously been treated endodontically, restored with cast posts and cores and with porcelain-fused-to-metal crowns.

The periodontal findings were normal (PSI [periodontal screening index] 1–2); only in the posterior

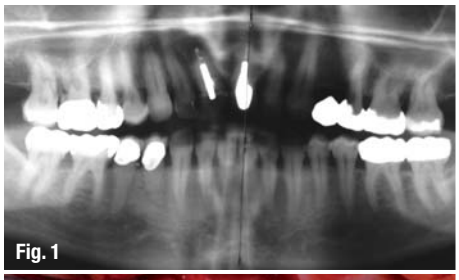
Fig. 1

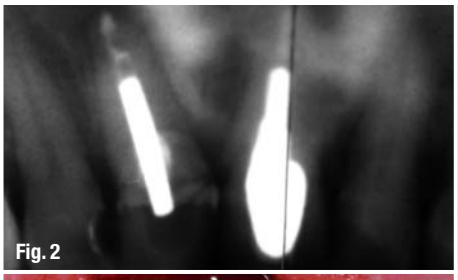
Fig. 2

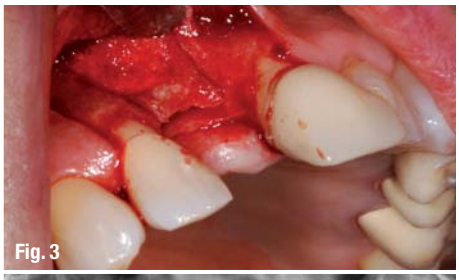
Fig. 3


Fig. 4

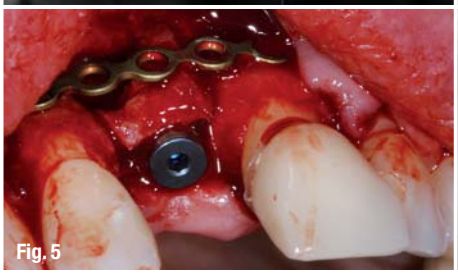
Fig. 5

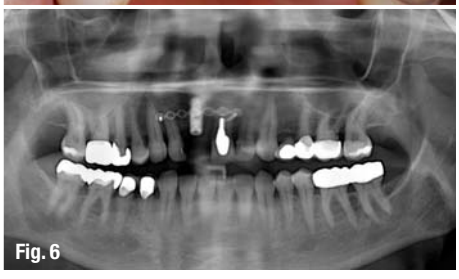
Fig. 6

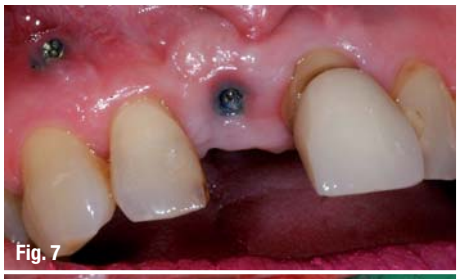
Fig. 7

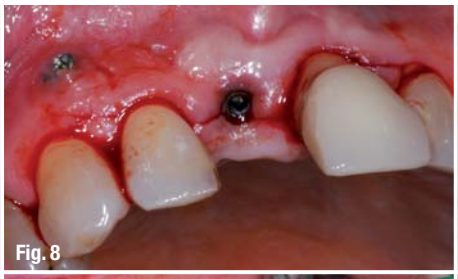
Fig. 8

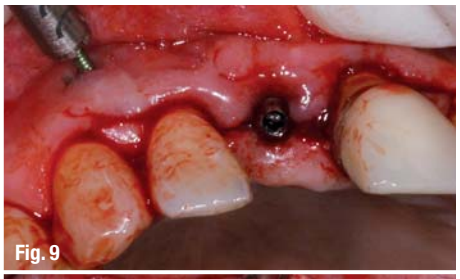
Fig. 9

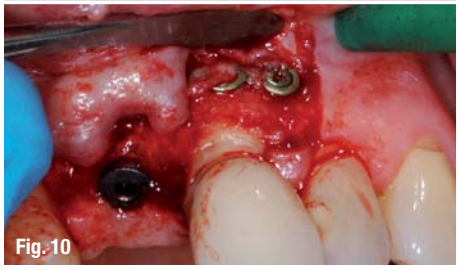
Fig. 10

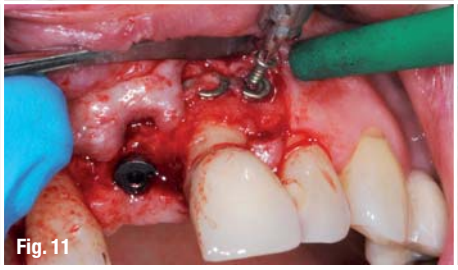
Fig. 11


Fig. 12

region were probing depths of 3 mm to 4 mm and a positive BOP recorded, which was attributable to the insufficient crown margins.

The patient's oral hygiene and compliance were exceptionally good.

_Radiographic findings

The radiographic findings obtained with an orthopantomogram showed prosthetic restorations in the posterior region (Fig. 1) and endodontically treated teeth 11 and 21. Tooth 21 (upper left central incisor) appeared normal, whereas the root filling in tooth 11 (upper right central incisor) was insufficient and an apical cystic brightening was recognisable. A prior apicectomy was visible on the image (Fig. 2).

1. Surgical planning, extraction and augmentation

First of all, the various treatment options, such as renewed apicectomy or extraction followed by implantation, were explained to the patient. The patient initially chose apicectomy, but this proved intraoperatively to be impossible due to a longitudinal fracture of the root, and consequently the tooth was extracted. Following removal of the cystic tissue, the apical vestibular defect was restored by augmentation with a mixture of NanoBone® (0.6 ml) (supplied by BEGO Implant Systems) and autogenous bone harvested from the retromolar region of the fourth (lower right) quadrant. The alveolus was covered with a non-resorbable membrane (TefGen, manufactured by Curasan), which was removed after six weeks. During this period, the patient cleaned the site of the operation with a CHX mouthwash and a soft toothbrush several times a day. Throughout the entire healing phase, the patient wore a temporary prosthesis with simple curved clips.

2. Prosthetic planning

After explaining the various possible prosthetic treatments, the patient chose a single-tooth implant in region 11 and a new restoration for tooth 21.

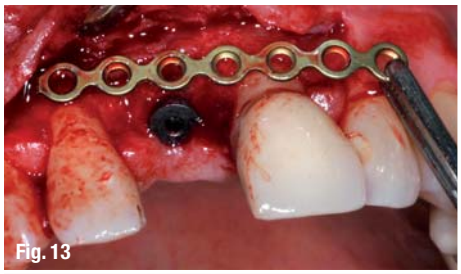
Fig. 13

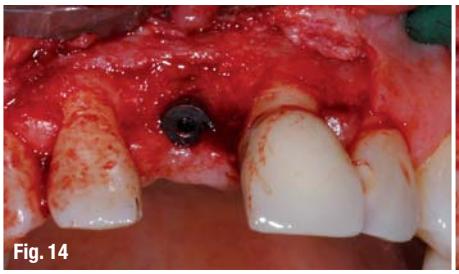
Fig. 14

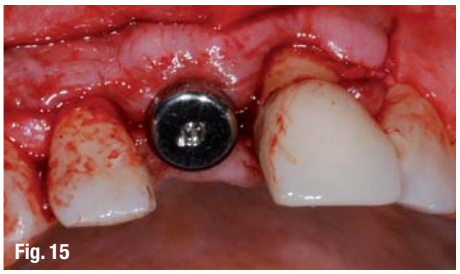
Fig. 15

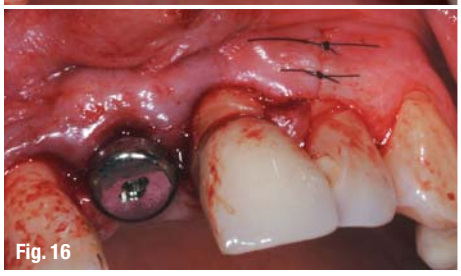
Fig. 16

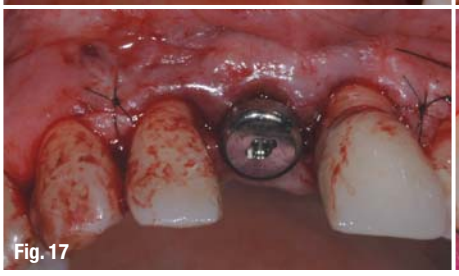
Fig. 17


Fig. 18

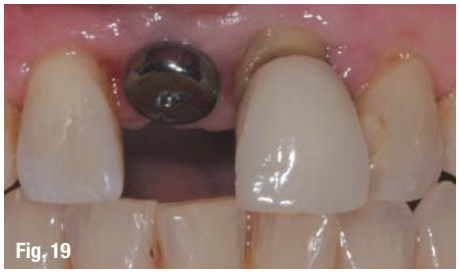
Fig. 19

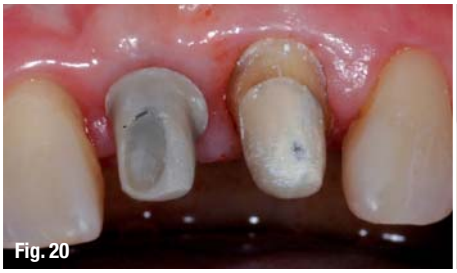
Fig. 20

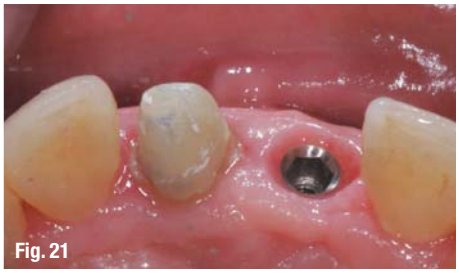
Fig. 21

In order to achieve the best possible aesthetics, the material of choice was zirconium dioxide. The operation took place six months after the consultation.

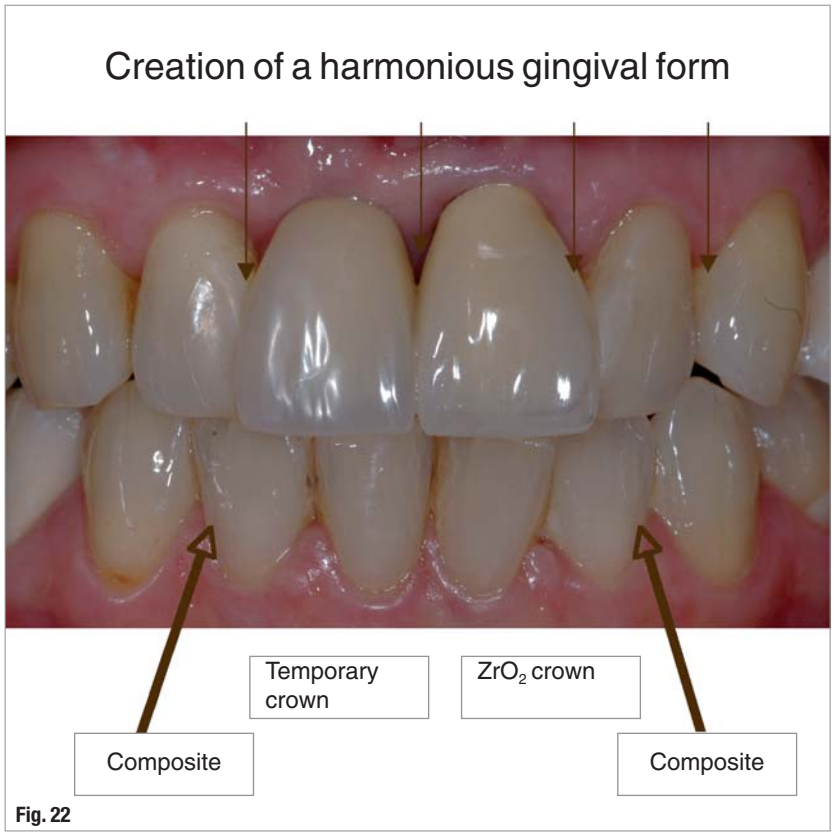

Fig. 22

3. Implant treatment planning

To ensure optimal implant positioning, a drill template with a titanium sleeve to guide the implant drills was fabricated at the laboratory. This ensured that the implant was inserted at the correct point to achieve an optimal emergence profile with the fabricated crown, and thereby optimal pink aesthetics of the soft tissue.

4. Implant insertion

A mucoperiostal flap was raised under local anaesthesia. As the orovestibular bone volume was inadequate for a highly aesthetic outcome, and also because vestibular grafting of bone substitute material is not our preferred method of treatment, we performed bone splitting (Fig. 3) before placing a BEGO Semados® S3,75 L13 implant (Fig. 4). Disposable drills are used as standard. The implant bed was prepared with a pilot drill, followed by the appropriate enlargement drills. The implant was inserted manually, following the specified protocol, with a torque spanner, applying a torque of 30 Ncm, and with adequate water cooling (isotonic saline solution). To stabilise the vestibular osseous lamella, an osteosynthesis plate was fixed with osteosynthesis screws (Fig. 5). A surgical record designed by our practice is completed for each implantation performed in order to meet all the requirements of the quality management system that we have introduced.

5. Implant exposure

After five months, the osteosynthesis plate was exposed and removed, also under local anaesthesia (Figs. 9–13). One of the screws was already showing through the mucosa (Fig. 7). Wound closure was then effected via a laterally externally crossed suture tied around the healing post and, in addition, interrupted sutures at the papillae (Fig. 8). The adequate new bone formation in the vestibular and oral region is clearly recognisable. This enlargement was achieved predictably thanks to the bone splitting performed, and it is a prerequisite for a good aesthetic result in the anterior region (Fig.


Fig. 23

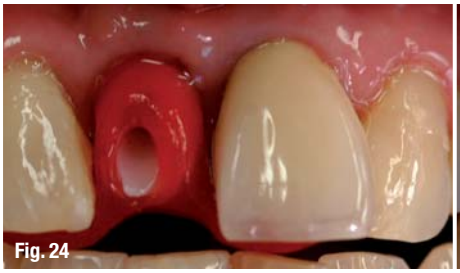
Fig. 24


Fig. 25


Fig. 26

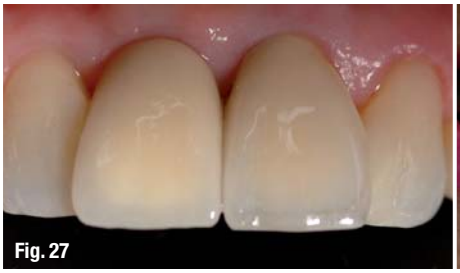
Fig. 27


Fig. 28

14). The implant cover screw was removed and the healing post with a 4.5 mm diameter was placed before closing the wound (Fig. 15). After carefully repositioning the mucoperiosteal flap, the vertical relieving incision was first of all closed with a 0.6 size suture material (Figs. 16, 17). Then a laterally externally crossed suture was tied around the healing post and, in addition, interrupted sutures at the papillae (Fig. 18). This suturing technique is used in periodontal surgery to preserve the interdental papillae.

6. Soft tissue management and temporary restoration

The patient wore her temporary prosthesis for a further two months (Fig. 19). Then the soft tissue at tooth 11 was shaped with a laboratory-made temporary crown on a temporary acrylic abutment (Fig. 20). In the following months, the restoration was modified in the cervical region by applying a flowable composite so that the desired pink aesthetics for an optimal emergence profile of the crown could be achieved (Figs. 21–23). The post abutment on tooth 21 was ground back and built up with a composite to prevent the metal from showing through later. Teeth 12 and 22 were restored using composite restorations (HFO Enamel Plus, manufactured by LOSER).

7. Prosthetic treatment

The impression is taken in the standard manner with a Sub-Dent Open tray impression (BEGO Implant Systems). The impression material of choice is a polyether (Impregum from ESPE). Immediately before taking the impression, the impression post should be customised with an acrylic resin (e.g. pattern resin) according to the soft tissue reached, in order to prevent the gingiva from collapsing.

For the final restoration, a BeCe Sub-Tec Ceramic abutment was selected. This post was fixed with a resin guide stent at each trial fitting, as it also was for final placement of the crown (Figs. 24–28). The screw channel of the abutment was sealed with a light-cured resin (Fermit from Ivoclar Vivadent). Before the final fixing, the zirconium dioxide crowns were pretreated with a silane coupling agent (Ceramic Primer, manufactured by Kuraray). The zirconium dioxide crown on implant 11 was provisionally cemented (Dentegris) and the zirconium dioxide crown on tooth 21 conventionally cemented (Panavia, manufactured by Kuraray).

8. Recall (6 months later)

As standard, all implant patients are recalled every six months and special attention is given to plaque control, freedom from soft tissue irritation and correct occlusion and articulation movements (Figs. 29–31).

Our special thanks go to our four children for understanding the amount of time we dedicate to our practice.

Furthermore, we particularly wish to thank BEGO Implant Systems for the successful collaboration._

_contact implants

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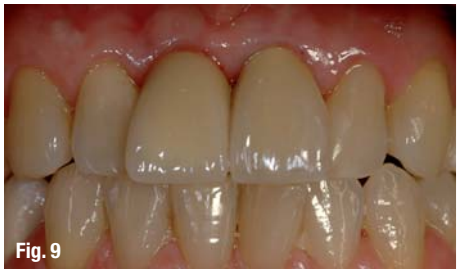
Fig. 9


Fig. 30


Fig. 31

Staging the Challenge— A Single Implant Tissue Training in the Aesthetic Zone

author_ Sanjay Sethi, United Kingdom

Modern dentistry has seen trends being constantly developed and revised, striving to accelerate treatment programmes to gain the picture perfect ending with the minimal number of stages over the shortest possible time period. This approach may be more cost effective for the practitioner and seemingly more beneficial to the patient, but to consistently achieve superior clinical aesthetic outcomes in a significant number of cases, biology teaches us a painful lesson that sometimes patience is a virtue.

_Introduction

Time does not heal all! Planning and meticulous execution are always the fundamental basis of treatment success. Combine this with the merits of each case, whilst aiming for realistic goals, then the final result is already starting to take shape in the distance.

Some cases can be treated very efficiently indeed, with the end result mimicking natural harmony. Generally speaking, such cases have already met the prerequisites for aesthetic success, such as favourable:

_ surrounding bone levels
_ soft tissue height, contour and type
_ absence of acute infections
_ occlusion
_ lip line position, ie low to medium lip/smile line
_ general health.

These criteria have been documented many times, with differing variables within a similar equation.[1-3] On the other hand, demands for "perfection" are constantly on the rise, and the standards to be achieved are getting higher and higher. Osseointegration is no longer the principal concern for the long-term outcome of implant therapy. The soft tissues and emergence profiles must now also mirror the adjacent teeth as closely as possible, and stability over time should be without question. To presume this to be a formality in the anterior aesthetic zone would be naive to say the least. Achieving predictable outcomes requires an understanding of limiting factors. With biology being the biggest of them

Fig. 14_ Final portrait view.

Fig. 14

all. Without accounting for biology, the door is opened to a multitude of hard and soft tissue healing problems, not to mention the minutiae that separates excellence from good.

Taking time to stage certain cases and watch them develop gives time to evaluate each phase before the next step is carried forward. This in turn gives time for the body's biology to harmonise, and with this, stability will come hand-in-hand. Whilst waiting for maturation of grafted tissues, good provisional restorations can often take the impulse from the patient and the clinician to finish the case as quickly as possible, thereby buying more time for nature to take its course. The following case illustrates the need, in the author's opinion, for staging treatment to face the challenges of high aesthetic demands.

_Case Study

A 28 year old female patient was referred to the author's practice with a failing upper right central incisor. She presented with:

_ Skeletal class II
_ Facial thirds in approximate proportion
_ High lip line and gummy smile with more than 3mm gingival display
_ Class II anterior open bite occlusion with an over jet of 3mm
_ Negative smile curve
_ Occlusal guidance was all posterior group function with non working side
interferences
_ No TMJ symptoms
_ No problems with eating
_ Maximum opening 48 mm
_ Clear medical history.

The patient's complaints were the aesthetics of both central incisors and their respective differing gum levels. Tooth 11 was occasionally tender to bite on but getting increasingly more mobile and at presentation had a buccal sinus (Fig. 1, X-ray 1). After the initial consultation the patient stressed that she did not wish to undergo any orthodontic treatment, especially with the possibility of orthognathic surgery and crown lengthening to correct the skeletal, occlusal discrepancies and to reduce or eliminate the excess gingival display, whilst also looking to balance the gingival levels. All options should be presented to each patient before embarking on a case, thereby giving a fully balanced opinion from which the patient can see the differing pathways available to achieve their desired end result. The patient requested that she would like individual teeth with an implant to replace tooth 11. She did not want to have any fixed bridge work, regardless of design or type.

At further clinical examination, the rest of the teeth were all clinically and periodontally sound, except tooth 11, which had a mid facial pocket of 8 mm and large apical amalgam tattoo. Fortunately, the amalgam tattoo was hidden under the patient's upper lip, even with her excessive gingival display during a full smile. Both upper central incisors had been restored with porcelain fused to metal crowns. Tooth 21 was vital, whereas tooth 11 had been apicected and root-filled as previously mentioned. The patient was already well informed of treatment options from her referring dentist when she attended the author's practice. She was even made a metal ceramic rochette bridge by her referring dentist, which was ready to replace tooth 11 when it was extracted.

_Treatment Plan

_ To extract tooth 11 and wait 6–8 weeks and fit the rochette provisional
_ Graft the area and possibly place the implant simultaneously
_ May need further grafting of soft or hard tissue or a combination
_ Provisionalise teeth 11 and 21 and evaluate
_ Final restorations.

Each phase was to have healing periods to evaluate success before the next phase. Meanwhile, the patient's routine dental care was undertaken by the referring dentist.

Radiographs

1_ Pre-operative.
2_Six weeks after extraction.
3_Implant in position with graft. packed level with short healing abutment.
4_Fit day of the Zirconia abutment and provisional crowns.
5_Eleven implant been placed for two years.

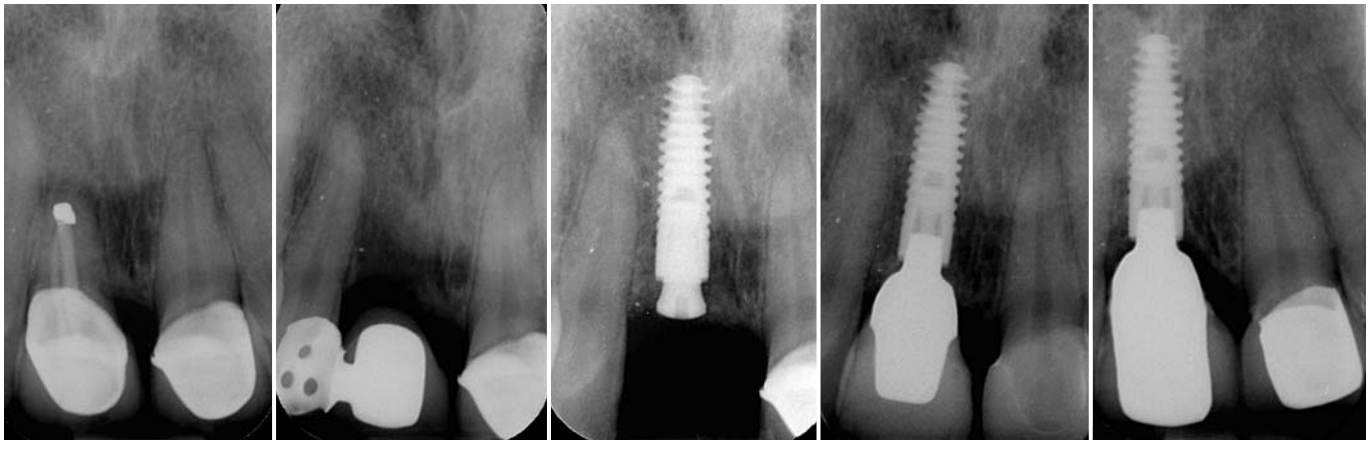


Fig. 13

Fig. 1_ Pre-operative view.
Fig. 2_ View of rochette in situ six weeks after extraction of tooth 11.
Fig. 3_ View of surgical site at exposure.
Fig. 4_ Directional indicator used as a positioning guide for implant placement.
Fig. 5_ ANKYLOS implant in place with short healing abutment exposed threads covered with autogenus chips.
Fig. 6_ Bioss granules adapted prior to membrane coverage.
Fig. 7_ One year after implant graft placement with rochette in situ.
Fig. 8_ Chair side cantilever bridge from 21 adapting the pontic over the healing abutment.
Fig. 9_ Zirconia abutment torqued in place.
Fig. 10_ Laboratory made composite provisionals after one year in situ.
Fig. 11_ Note gingival topography after tissue training.
Fig. 12_ Final close up view at three months.
Fig. 13_ Lateral view.

_Stage 1—Extraction

Tooth 11 was extracted as atraumatically as possible, the socket was thoroughly curetted and flushed through with sterile saline. The socket was carefully examined and almost the entire labial plate of bone up to the apex of 11 had been lost, this was 8 mm from the gingival margin. Thus the decision was made to just place a collagen plug into the socket and allow for complete tissue healing and then to revisit the site six to eight weeks later for a bone graft. The rochette bridge was cemented to replace the missing tooth (Fig. 2, X-ray 2).

_Stage 2—Bone Graft

A full mucoperosteal flap was raised to fully expose the surgical site and the extent of the bone dehiscence. At the exposure, it was assessed that due to the fact that tooth 11 had a shortened root, it was possible to position a 3.5 mm x 11 mm Ankylos implant (Dentsply Friadent) and obtain excellent primary stability due the presence of apical bone. The only surface of the implant that was not fully submerged into bone was the labial 3–4 mm. Local autogenous bone chips and scrapings were collected from the nasal spine and used to cover the exposed implant threads immediately. The cover screw was next removed and a short narrow healing abutment was placed into the implant. This was not to be transmucosal, but would remain under the flap and act as a tent for the slowly resorbing membrane (Ossix, *3i*) under which inorganic bovine bone mineral (Bio-Oss granules, Geistlicht) was carefully adapted.[4] The whole flap was then periosteally relieved, a frenectomy was simultaneously performed and the flap was passively closed to achieve primary closure (Fig. 3–6, X-ray 3). The principle of placing the implant and


Fig. 1


Fig. 7


Fig. 2


Fig. 8


Fig. 3


Fig. 9


Fig. 4


Fig. 10


Fig. 5


Fig. 11


Fig. 6


Fig. 12

grafting at the same visit was utilised to provide excellent primary stability. The ANKYLOS implant was chosen because of its protocols that allow for subcrestal placement, which does not affect the final tissue level to any great extent. But also because of the absence of a micro gap at the abutment interface, which in conjunction with a platform switch promotes stability in bone and gingival tissue levels coronal to the fixture head position. Once the tissues were sutured tension free, the rochette pontic was apically reduced to ensure a passive fit over the sutured flap and only then recemented.

_Healing period

A minimum healing period of nine months was to be observed. In actual fact, after suture removal, the patient did not return for one year. At this review appointment the tissue level of tooth site 11 was more coronal than that of 21. The grey shine through was coming from the healing abutment (Fig. 7). The next phase was to uncover the implant and place a larger modified two-piece healing abutment. The two-piece healing abutment was used to start the process of creating the correct emergence profile. This is part of the "tissue training" stages (the healing abutment is now transmucosal and the rochette can be adjusted and recemented once again). After waiting six weeks for tissue maturation, tooth 21 was prepared for a full coverage crown and a chair-side provisional cantilever bridge was made. This was carefully refaced with composite to create natural form and an increase in length for both 11 and 21 (Fig. 8). The pontic was carefully adapted to the healing abutment and aesthetic form and emergence profiles reassessed. An "A"-silicone impression could now be taken to accurately translate the information to the laboratory technician. The purpose of this was to establish, as closely as possible, the correct form and length of the desired final restorations. From here, the technician who was sent photographs to accompany the impressions could fabricate composite provisionals and also select a zirconia abutment (Cercon, Dentsply Friadent) from the transfer impression.

A zirconia abutment was selected to optimise soft tissue aesthetics, as well as the other well documented advantages that this very strong metal alternative displays.[5] (Fig. 9) The zirconia abutment was torqued to 15 Ncm and the two provisional crowns were temporarily cemented and left in situ for final tissue maturation. The patient was now happy to leave the current situation for a further year until she was ready to complete the case (Fig. 10, X-ray 4). The final restorations were Lava crowns (3M ESPE), which were definitively cemented. The final post-operative picture shows the final crowns at three months after fit, but note that the provisionals had been in place one year prior to this and the bone graft had been placed one year prior to the provisionals.[6–7] (Fig. 11–14, X-ray 5.)

_Summary

By staging the challenges faced, the author was able to progress to each following step with added assurance. Therefore, by the time the final restorations were definitively fitted, the stability of the graft and tissues had already taken place. Although this goes against current trends in modern implant therapy, the destination reached was met with the warmest gratitude from the patient. As clinicians it is our duty to appreciate that each case must be approached on its merit, and that one must cater for the individual patient. In this case, the time involved not only placed biology on the clinician's side but also helped the patient to spread her cost. This is just one more factor that can all too often be taken for granted.

The author is indebted to his technicians and friends, Eva Forst and Richard O'Brien, for their technical teamwork involved with this case._

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_contact implants

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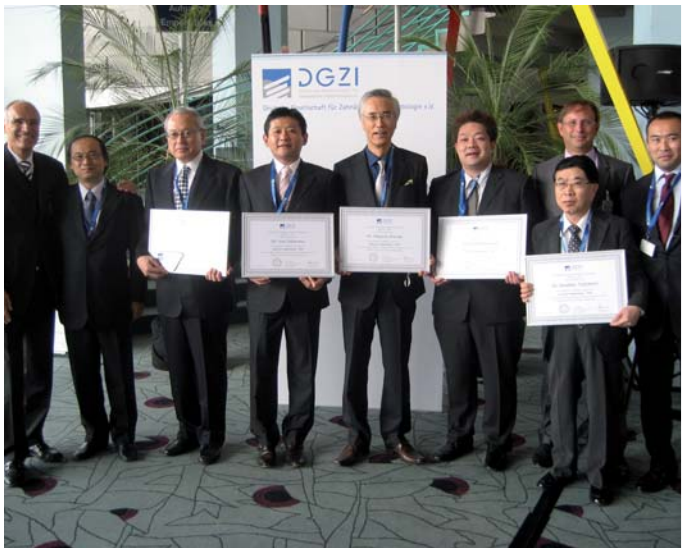
More than 500 participants— The DGZI Annual Congress in Bremen was a complete success

_ **"Interdisciplinary concepts** for implantological rehabilitation" was in the thick of things of the 38th DGZI International Annual Congress. The extraordinary versatile scientific program and the many special sessions made the most significant DGZI event become an outstanding advanced training event, which was certainly also due to the absolute successful soiree. On the occasion of the congress in Bremen it became once more clear that DGZI e.V. (German Association for Dental Implantology plays an important role in mediating between university and dental practice and in exchanging know-how on national and international level. The main issue was: How can I give a positive long-term prog-

nosis to an implant supported prosthesis, and which important factors have to be considered?

In spite of all progresses in design, surfaces, materials of implants and computer-supported diagnosis as well as planning methods, the implantological know-how of the dentist is the crucial factor for success in implantology. Though constructive aspects of implants (micro gap) have been in the center of discussion, as far as the efforts to improve bone-implant interfaces are concerned, the influencing factors for the long-term success of implants are much more complex than generally described. In Bremen, DGZI succeeded in setting new courses thanks to the selected interdisciplinary issues and their consequent contentional realization. As previously announced, the two hour lasting session "High resorbed residual ridge in the posterior maxilla" was certainly one of the congress highlights. The oral and maxillofacial surgeon Dr Dr Frank Palm (Konstanz/Germany) did an excellent job in moderating this session. Six experts presented their therapy concepts using different sinus lifting techniques for treating a specific clinical case (the patient had to meet the required conditions) and discussed the case afterwards with the participants. The interaction with the audience was facilitated by the voting system TED, a technical innovation which made it possible to participate actively in the discussion and vote for the personally favored treatment. This was truly a novelty for participants and lecturers as well. At this point, it has to be underlined that once again DGZI could gather renowned national and international expert lecturers like Prof Dr Murat Yildirim/Germany, Prof Dr Dr Wilfried H. Engelke/Germany, Prof Dr Jürgen Setz/Germany, Prof Dr Klaus-Ulrich Benner/Germany, Prof Stephen L. Wheeler/USA, Prof Dr Dr Dirk Nolte/Germany, Dr Achim W. Schmidt/Germany, Prof Dr Nabil Jean



Barakat/Lebanon and Dr Ronald Cardoso/USA. On the previous day of the DGZI Annual Congress, the international examination for specialists and experts in implantology was carried out for the first time by the German Board of Oral Implantology (GBOI). Forty implantologists successfully took their exams that were conducted by an independent international team of experts. In addition to the main scientific program of the Annual Congress many interesting concurrent sessions, workshops and a broad program for staff also took place.

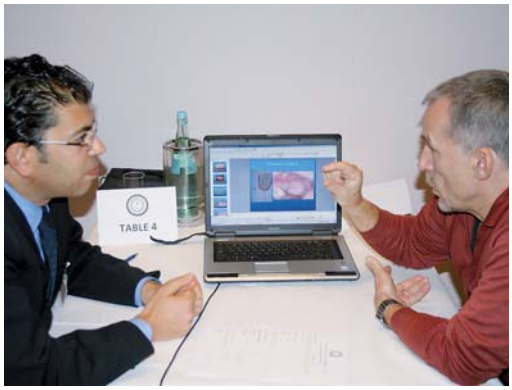
More than 300 participants attended the traditional evening event in the Ratskeller, a restaurant in the basement of the old city hall of the Free Hanseatic City of Bremen. Typical dishes and a cheerful atmosphere with dancing and entertainment were characteristic for this soiree. Prof Hans L. Grafelmann, the founding president and implantology pioneer, was welcomed as our special guest. He congratulated his successors of the executive board to the many successful congresses held in Germany and abroad and the number of prestigious national and international lecturers.

He pointed out their success in keeping DGZI on an approved level and the ability to attract many new dentists from abroad to become members, which also fosters the international efforts of implantology science.

Grafelmann continued his speech saying: "It is a great pleasure for me to see how our attempts are still carried on even after 38 years and I appreciate that many conncections to implantology associations in other countries could be established, especially with regard to the exchange of know-how and experiences. In the meantime many social and personal friendships have also been formed."

The 39th DGZI Annual Congress will take place in Munich (October 9–10, 2009)._

First international examination conducted by GBOI in Bremen— A complete success!



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_The medical and especially the dental medical market is increasingly becoming more global. Many German dentists are already working abroad, they have partners all over the world, and they are successfully engaged internationally. For a considerable time, we have also been observing that there is growing interest of patients coming from abroad to be competently treated by experienced colleagues in Germany. Especially those patients coming from Arabian countries and the former GUS states certainly appreciate quality and know-how "made in Germany" and use their stay in Germany for sophisticated dental treatment. This is the reason, why the DGZI, which is the oldest European association for dentists specialized in oral implantology, provides the possibility to obtain the internationally accredited certificate of the German Board of Oral Implantology "SPECIALIST IN ORAL IMPLANTOLOGY DGZI" and "EXPERT IN ORAL IMPLANTOLOGY DGZI" respectively. The precondition is that you either have already successfully passed DGZI examination for implantology specialists or you fulfill the conditions required for implantology according to the Concensus Conference.

This additional examination provides an international certificate, which at the same time serves as a proof for your qualified expert knowledge in English. On the occasion of the 38th DGZI Annual Congress in Bremen (October 10–11, 2008) more than 35 examinees took the corresponding examination on October 9, 2008. After a challenging written examination, according to American university standards, all participants had to present themselves before an international board of examiners for the oral examination. The organizers succeeded in gathering an independent international team of experts, all of them professors of highly renowned universities. After having passed their written and oral exams, the certificates were solemnly handed over to all participants. The participants résumé was: Challenging and not at all easy, but this examination has been a great experience and a forward-looking qualification within a global world.

The next international examination will take place on the occasion of DGZI 39th International Annual Congress in Munich in October 2009. For more information, please refer to the DGZI office in Düsseldorf/Germany._

_Independent International Board of Examiners

implants

Prof Dr Werner Goetz, M.D., Ph.D.

_Born in 1957
_1980–1987 studies of medicine, physical anthropology and prehistorical sciences at the Universities of Tuebingen and Goettingen, Germany
_1986–1987 Internship at the University Hospital Goettingen
_1987 M.D., 1989 Ph.D.
_1987–2001 Dept. of Histology at the Center of Anatomy of the University of Goettingen, Germany
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_Since 2004 speaker and instructor of the Deutsche Gesellschaft für Zahnärztliche Implantologie (DGZI)

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_ Consultant Prosthodontist, Saad Specialist Hospital, Kobar, KSA, 2006
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_ Senior Lecturer, Post Graduate Program in Prosthodontics, Lebanese University
_ Senior Lecturer, Post Graduate Program in Restorative, Lebanese University
_ Senior Lecturer, Post Graduate Program, The Dental College, Lebanon
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_ International Speaker for BIOMET *3i*®
_ International Speaker for 3M ESPE®
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_ Member of the scientific comity of the journal "Le Monde Medical"
_ Ex Member of the Health Controllers Comity (Health Ministry)
_ Member of the oral comity of the "Colloquium" Sept.1992

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_ Former Chairman, Department of Oral and Maxillo-Facial Surgery Dental School, Lebanese University
_ President of the Lebanese Association of Osseointegration
_ President of the East Mediterranean Association of Osseointegration
_ Past President of The International College of Dentists

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_1982–1986 Instructor in Oral Medicine and Periodontology Cairo University/Egypt
_1986–1990 Assistant Lecturer Cairo University/Egypt
_1990–1998 Lecturer Cairo University/ Egypt
_1998–2003 Assistant Professor Cairo University/Egypt
_Since 2003 Professor in Oral Radiology Department Cairo University/Egypt
_Since 2006: Comprehensive Oral Implantology Course Director, Cairo University/Egypt
_Since 2007 Director of Continuing Education Unit Faculty of Oral and Dental Medicine, Cairo University/Egypt
_Since 2005 Certification: Expert Implantology–DGZI/Germany
_Since 2005 Certification: Specialist Implantology–DGZI/Germany
_Since 1996 Membership of the International Congress of Oral Implantology USA
_Since 2001 Membership of the Prosthetic Section of the International Congress of Oral Implantology USA
_Since 2001 Honorary Membership of WHO is WHO Historical Society for the Professional Educators Section USA
_Since 2002 Active membership of the German Association of Dental Implantologists Germany
_Since 2002 Diplomate and fellowship with medal of honor ICOI International Congress of Oral Implantology, USA
_Since 2005 Representative of the German Association for Oral Implantology Egypt
_1991–2008 Publishing of more than 14 researches/supervising more than 10 Master thesis and 5 PhD thesis: General Dentistry and Implantology
_Co-Inventor of Implant Simulator S/W and TARIM Implants template milling machine, 2002
_Since 1996 International Gold Star Award for Excellence in Corporate Image and Quality to Maadi Dental Center Madrid, Spain

Dr Suheil M. Boutros

_1996 dental degree from the University of Detroit Mercy, Master of Science and Certificate in Periodontics from the University of Minnesota, USA
_Diplomate of the American Board of Periodontology
_Practice limited to periodontics and dental implants
_Member of the American Academy of Periodontology, American Dental Association, and Michigan Dental Association

4th Arab-German Implantology Meeting of DGZI

Selection of Abstracts

Immediate Implant at the Molar Site

_ Dr Khalid Saleh Al-Hamdan, Saudi Arabia

Dr Khalid Saleh Al-Hamdan

_Abstract

The progressive involution of the alveolar bone begins following tooth loss, and it is accompanied by a reduction in both the quality and quantity of hard and soft tissues. Experimental animal researches and clinical studies demonstrated that the immediate implant placing reduces alveolar resorption. Moreover, this surgical procedure also allows a better final rehabilitation because it facilitates both morphological ridge contour preservation and accurate prosthetic implant installation, maintaining the natural tooth angle. There are also important benefits because the treatment time is reduced. Indeed, alveolar wound healing coincides with implant osseointegration and the patient can achieve the reinstatement of his edentulousness swiftly and by means of a single surgical exposure.

The most addressed topic at the implant' related conferences is the immediate implant placement at the aesthetic zone. However, first molars are the first permanent teeth to erupt and usually the first to be lost due to caries. Therefore, the objectives of this presentation were to present the guidelines in the atraumatic extraction of the first molar teeth, socket management and immediate implant placement after extrac-

tion. In addition, indications and contraindications and alternative options will be addressed.

Bio-engineering in implantology

_ Dr Hans van der Elst, Germany

Dr Hans van der Elst

_Abstract

Comparison between the use of different artificial bone material and autologous bone as well as the use of PRF in various grafting procedures. The use of biomaterials in implantology today is a standard procedure and almost every surgeon is using it daily. How can the use of these materials be more predictable and the symptoms after surgery be diminished? Can the use of PRF in these cases be a solution? PRF is gained out of the own blood of the patient and is very easy to get. Is PRF a activator of the biomaterial or can it be used as a biomaterial as a solo product? Showing cases with a standard operation protocol with the use of PRF.

The Treatment of the Difficult Maxilla and the Prosthetic Reconstruction

_ Dr Dr Werner Stermann, Germany

Dr Dr Werner Stermann

_Abstract

The autor evaluates the question of why the treatment of the maxilla with implants is more difficult than of the lower jaw. He indicates the different parameters which are significance for a minimum invasive procedure. The aim is to choose the optimal implant system according to the available bone and the indication class. As a rule, in the upper lateral region a sinus lift procedure is required. If the available bone above the sinus is very shallow, a sinus implant stabilizer is indicated. Finally, the different prosthetic modalities will be demonstrated.

Mini implants in orthodontics

_ Dr Walid Odeh, Jordan

_Abstract

Mini implants can be used in Epithesis and orthodontics. In orthodontics, they have many advantages like immediate load application, minimal anatomic limitation and ease of placement and removal... etc. They have many kinds and types like regular, tapered, small head type, fixation head type and others, with each one has a specific location and function. Methods of surgical procedures can be divided according to head exposure (open method and closed method) and path of mini implant insertion (Diagonal and perpendicular) and there are two types of driving mini implants (self-tapping and self drilling). Longer mini implants in maxilla than mandible and choosing the longest mini implant without damaging adjacent tissues are some of the general rules in choosing mini implants. They can be positioned in many sites in maxilla and mandible. Finally, successful mini implant depends on clinicians' skill, site selection and others. And they can present a great advantage to orthodontists by helping in acting of all types of orthodontic movement._



Selected Events 2008/2009

NOVEMBER 2008

November 28–December 3	*GNYDM Greater New York Dental Meeting*	New York, USA	Web: www.gnydm.com

FEBRUARY 2009

February 13–14	*Unnaer Days of Implantology*	Unna, Germany	Phone: +49-3 41/4 84 74-3 08 Fax: +49-3 41/4 84 74-2 90 Web: www.oemus.com
February 26–28	*Academy of Osseointegration–Annual Meeting*	San Diego, California	E-mail: academy@osseo.org Web: www.osseo.org

MARCH 2009

March 10–12	*UAE International Dental Conference & Arab Dental Exhibitions*	Dubai, UAE	E-mail: office@dgzi-info.de Web: www.aeedc.com
March 24–28	*33rd IDS – International Dental Show*	Cologne, Germany	Web: www.koelnmesse.de

APRIL 2009

April 8–10	*5th Arab-German Implantology Meeting of DGZI & 1st Joint Syrian-German Implantology Meeting*	Damascus, Syria	E-mail: alkubaissy@hotmail.com (for Syria) E-mail: drtamimi@dgzi-international.com (for other countries) Web: www.dgzi-international.com Web: www.drtamimi.com

JUNE 2009

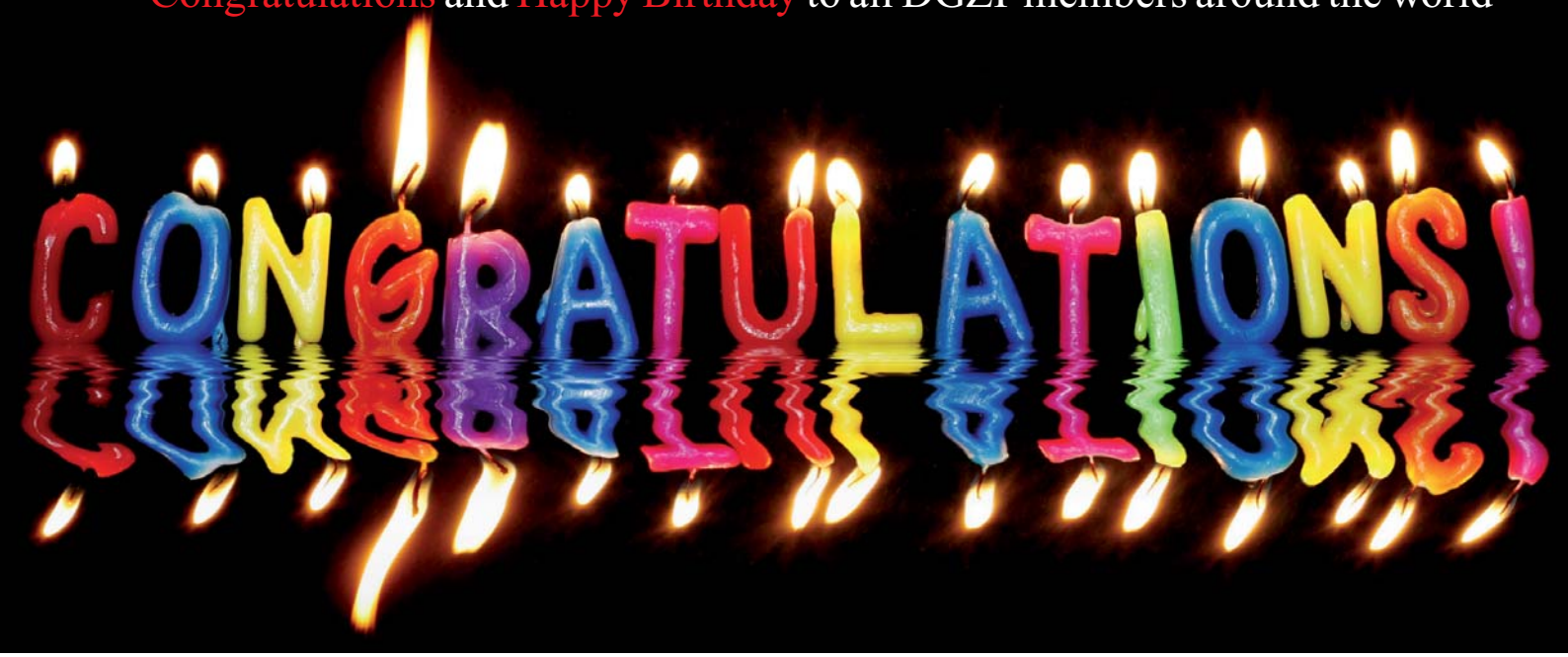
June 25–27	*8th SimPlant Acadamy World Conference*	Monterey, Canada	Web: www.simplantacademy.org

NOVEMBER 2009

November 4–7	*AOS 7th Biennial Conference*	Queensland, Australia	Web: www.aos.org.au



Congratulations and Happy Birthday to all DGZI-members around the world



OCTOBER 2008

65th Birthday
Klaus Jürgen Rühlmann (30.10.)

60th Birthday
Dr Michael Mautner (09.10.)
Dr Karl-Josef Dörr (14.10.)
Dr Hubert Stieve (16.10.)
ZA Wilhelm Enger (18.10.)
Dr Heinrich Schünadel (27.10.)
Dr Jochen Walter (28.10.)

55th Birthday
Dr Joachim Feldmann (15.10.)
Dr Klaus Winter (15.10.)
Dr Kurt Strauss (16.10.)
Dr Damian Lawnik (23.10.)

50th Birthday
Dr Jürgen Zitzen (05.10.)
Dr Uwe Joachim Drews (10.10.)
Dr Wim van Thoor (17.10.)
Dr Roger Nikolaus Neissen (22.10.)
Dr Andreas Lintel-Höping (25.10.)
Dr Friedrich Josef Lingemann (28.10.)

45th Birthday
Dr Wolfgang Fruh (01.10.)
ZA Frank Saxler (04.10.)
Dr Frank Bidenharn (09.10.)
Uwe Storch (09.10.)
Dr Jürgen Veeser (18.10.)
Dr Rainer Stock (22.10.)

40th Birthday
Dr Volker Segelke (06.10.)
Dr Detlef Holzmann (11.10.)
Dr Ehud Teperovich (11.10.)
Kalman Rohlfs (11.10.)
Dr Jürgen Barth (30.10.)

NOVEMBER 2008

65th Birthday
Dr Suzuki Nobuaki (28.11.)

60th Birthday
Dr Hans-Joachim Buss (15.11.)
Dr Hans Joachim Kleform (18.11.)
Dr Ari Rosenblatt (25.11.)
Dr Ralph Hübner (29.11.)

55th Birthday
Dr Erich Pelz (24.11.)
ZA Goy Joly (27.11.)

50th Birthday
Dr Erwin Breckner (01.11.)
Dr Peter Schwedler (01.11.)
Dr Albert Vogel (03.11.)
ZA Ralf Kohring (11.11.)

45th Birthday
Dr Hans-Martin Zydeck (06.11.)
Dr Brigitte Jansen (14.11.)
Dr Joachim Goebbels (15.11.)
Dr Thilo Reith (17.11.)
Dr Alexander Jahn (23.11.)
Dr Robert Zipplies (27.11.)
Antonia Scheck (28.11.)

40th Birthday
Dr Christian Eis (03.11.)
Dr Frank Weßling (05.11.)
Dr Basem Shakhatreh (07.11.)
Dr Stephan Eckrich (17.11.)
Dr Richard J. Meissen (17.11.)
Dr Christian Kohler (22.11.)
Nasser Kabak (29.11.)

DECEMBER 2008

65th Birthday
Dr Hans-Peter Kroker (01.12.)
ZA Jochen Tribulowski (04.12.)
Dr Rüdiger Dinse (22.12.)
Dr Manfred Claßen (30.12.)

60th Birthday
Dr Michael Thiele (02.12.)
Dr Dr Michael Brockerhoff (09.12.)
Dr Michael Passow (15.12.)
Dr Bernhard Buchwald (22.12.)
Dr Christian Hieronymus Fried (23.12.)

55th Birthday
Dr Thomas Spielau (05.12.)
Liethsien Oei-Yosy (13.12.)
Dr Uwe Sommer (26.12.)

50th Birthday
Dr Leendert van Heyningen (09.12.)
Dr Klaus Suchanka (11.12.)
Dr Helmut Gottsauner (11.12.)
Dr Klaus Aichmüller (15.12.)
Dr Jens Walters (24.12.)
Dr Mathias Stirkat (26.12.)

45th Birthday
Dr Karsten Kowallik (02.12.)
Dr Dr. Thomas Koty (04.12.)
Dr Thomas Jehle (05.12.)
Dr Petra Krauss (10.12.)
ZA Kai Lüdemann (13.12.)
Dr Stefan Wegener (15.12.)
Dr Wafaa Kaddoura (23.12.)
Dr Stefan Mauß (25.12.)
Dr Stephan Künzle (26.12.)

40th Birthday
Dr Sven Hangert (03.12.)

Manufacturer News

W&H

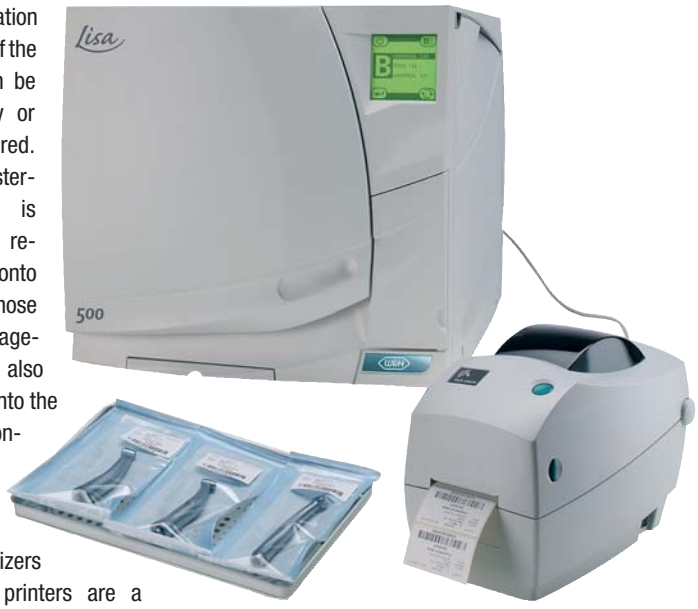
Simply reliable documentation: Lisa and LisaSafe

Complete documentation during the preparation of medical products is required by law, and is also the order of the day for the protection of patients, dentists and staff. An important requirement during the preparation of critical medical products is the labelling of sterile goods with the information relevant for sterilisation.

W&H offers a reliable solution to this task which is independent of the PC with the documentation concept of the "Lisa 300/500 sterilizer + LisaSafe label printer".

You can rely on Lisa! Lisa sterilizers work with an "intelligent" software which guarantees safe sterilization of any load exclusively in "Class B" cycles and which documents the relevant data on a memory card. When, and only when, sterilization has been successfully completed, LisaSafe is authorised to print labels. These labels give information about the number of the sterilizer, the batch number, the date of sterilization and the storage time of the sterile item. This can be carried out manually or automatically as required. Before treatment, the sterile item packaging is opened, the label is removed and then stuck onto the patient card. Those who use practice management software can also feed the information into the patient file using a conventional 128 bit bar code reader.

It couldn't be easier. Lisa 300/500 sterilizers and LisaSafe label printers are a patented partnership which provide guaranteed safe sterilization and simple documentation that still meets all legal requirements. LisaSafe is simple to install using the "Plug & Play" system and is operated without any additional software and with no need for training.



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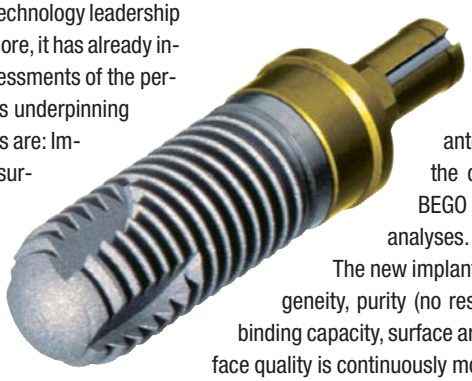
BEGO Implant Systems

BEGO Implant Systems leads the way in implant technology

Bremen-based BEGO Implant Systems has laid claim to technology leadership with its newly expanded implant system range. Furthermore, it has already invested heavily in independent technical and clinical assessments of the performance of BEGO Semados® implants. The three pillars underpinning our claim to technology leadership in the field of implants are: Implant design, Implant-abutment connection and Implant surface. In all three key areas, BEGO Implantology is unsurpassed. In terms of implant contour design, the outer contour of the BEGO Semados® RI implant, in particular, has undergone a unique process of optimisation with a bionic approach (i.e., mimicking nature) to achieve outstanding implant stability and strength in clinical use, as demonstrated in elaborate simulations. Previously unavoidable grooves, which engineers regard as the fatal weak points in any component, have been eliminated from the design. This means that BEGO has produced a system which meets the most stringent demands for functional, high-performance implants.

In the design of the implant shoulder, gene expression analyses and histological examinations of the gingival emergence profile were conducted at the University of Jena and provide proof of the technical perfection of these BEGO implants. On the basis of the results from the working group headed by Prof Dr Dr S. Schultze-Mosgau, which are soon to be published, BEGO will continue with its policy of polishing the upper end of the implant. With regard to the implant-abutment connection, striking evidence has been produced by the Institute of Materials Science at Koblenz University of Applied Sciences to demonstrate that the 45° taper with its impressively narrow manufacturing tolerances and the anti-rotation protection provided by a deep hex together guarantee perfect functionality. Long-term studies into the crestal bone situation following placement of BEGO Semados® implants confirm the engineers' analyses.



The new implant surface TiPurePlus® offers remarkable homogeneity, purity (no residues from chemical etching agents), protein binding capacity, surface area and a superior bone coverage rate. The surface quality is continuously monitored by the highly respected Fraunhofer Institute for Applied Materials Research

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EMS

Air-Flow Perio: biofilm removal to the base of the pocket

With the Air-Flow handy Perio EMS is penetrating into the subgingival area. According to the manufacturer, the new Air-Flow handy Perio is the first and only portable Perio device which enables effective removal of subgingival biofilm. Based on the Air-Flow handy 2+ series and the Air-Flow Master, which was awarded an innovation prize, this handpiece provides the dentist with an ergonomic masterpiece which EMS says is ideal for treating patients and enables the complete removal of biofilm. The transparent dome and the power chamber are pink. This combination lends the white handy a genuinely attractive design. Together with the Air-Flow powder Perio, the single-use Perio nozzle reaches down to the base of the parodontal pocket. What EMS has in mind is to mount an attack on damaging biofilm as part of subgingival prophylaxis treatment with an application summed up in the words "Air-Flow kills biofilm". Using this method dentists can also effectively treat the continuously growing number of cases of peri-implantitis among implant patients and counter the impending loss of implants.

The Air-Flow handy Perio by EMS reaches deep into the pockets.

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camlog foundation

The camlog foundation Research Award 2008/2009

During the International CAMLOG Congress held in May 2008 in Basel, the President of the camlog foundation, Prof Rolf Ewers, Vienna, announced and invited entries for the camlog foundation Research Award 2008/2009, which offers prizes of CHF 10,000 for the winner, CHF 6,000 for the runner up and CHF 4,000 for the third place. Entries are invited from committed specialists aged under 45 years working in universities, hospitals and surgeries. Participants will have from the middle of 2008 to the end of 2009 to prepare their research papers, which are to be submitted to the camlog foundation after their publication in a recognized scientific journal.

The research underlying the expected exceptional scientific papers must have been conducted in one of the countries in which CAMLOG Biotechnologies AG, Basel, is represented by its products and services. The papers may be written in either English or German.

The papers to be submitted are to relate to one of the following three areas:

_ Conceptual approaches for sustainable results in implant dentistry
_ Concepts for optimum red-white esthetics
_ Convinving long-term results.

The papers will be judged and assessed by the scientific jury, consisting of five members of the Foundation Board and the Scientific Board of the camlog foundation.

The winner of the camlog foundation Research Award 2008/2009 will have the opportunity of presenting his or her paper to a larger audience at the International CAMLOG Congress 2010, where entries will also be invited for the camlog foundation Research Award 2010/2011.

Conditions of entry and the entry form on which entries must be made can be downloaded from http://www.camlogfoundation.org/

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Nobel Biocare

Nobel Biocare reinforces leading market position in Asia by establishing own subsidiary in Taiwan

Nobel Biocare (NOBN) today announced that it signed an agreement to take over the operations of its Taiwanese distributor, Implant Master, in order to establish a new, wholly owned Nobel Biocare subsidiary in Taipei. Nobel Biocare and Implant Master have achieved a leading market position of approximately 30 per cent market share in Taiwan.

Taiwan: An attractive market with strong prospects

The Taiwanese dental market comprises over 10,000 dentists and 2,000 labs, serving a population of 23 million people. Approximately 15% (>3 million) of the Taiwanese population is estimated to be missing one or more teeth. Less than 5% of them have been treated with implants so far. Current implant market volume is estimated at ~USD 50 million. Taiwan is considered one of the most attractive dental markets in Asia.

Continued investments in market growth initiatives in Asia

The Taiwanese subsidiary marks another milestone in Nobel Biocare's continued investment into the promising Asia region and is a further step towards increasing the company's global reach, and strengthening its leading position in Asia. With the strongest regional presence in the industry, Nobel Biocare is well positioned to capitalize on the growth drivers of this attractive region. During the past two years, Nobel Biocare has successfully opened subsidiaries in key Asian markets, including China and India. In 2007, the company also inaugurated the first Asian Procera production facility for individualized full-ceramic prosthetics in Tokyo.

In parallel with the inauguration, an esthetic and restorative dental conference was held, at which more than 2,000 Japanese dental professionals were in attendance. Nobel Biocare holds a 32% market share in Japan, the largest Asian market. The company reinforces its market growth initiatives in Asia by investing in training and education initiatives, such as World Tour conferences and strategic university partnerships. In April and May 2008, the company hosted two successful World Tour conferences in Shanghai (China) and Mumbai (India). In addition, two major World Tour conferences are scheduled for the end of June in Singapore, and in September in Taiwan.

Largest geographical presence

With its Taiwanese subsidiary, Nobel Biocare has expanded its global reach to 37 company-owned organizations, and its products and services are available in 70 countries. The company maintains the largest geographical foothold in the industry, and its global reach comprises a direct presence and leading positions in key emerging markets in Asia, Latin America and Eastern Europe. Currently, Asia contributes 15% to Nobel Biocare's sales and should become an increasingly important driver for growth in the future.

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Implant Direct

Launch of new abutment lines

Europe's leading online provider for dental implants (www.implantdirect.eu) has launched a new complete line of abutments for the Spectra System and leading implant lines of Nobel Biocare, Straumann and Zimmer Dental.

Within its increasing demand by customers, Implant Direct has extended the available abutment portfolio for the proprietory Spectra System and compatible lines to Nobel Biocare, Straumann and Zimmer Dental with up to 70% lower prices:

_ Locator Abutments in 4 different heights (1–4 mm) at 85 Euro
_ Temporary Abutments (titanium/plastic) at 45 Euro
_ 15° & 30° degree screw-receiving abutments for "All-on-Four" cases
_ Gold/plastic abutments at 75 Euro
_ Straight/contoured titanium abutments for 65 Euro.
_ 15°Angled cementable abutments at 65 Euro
_ Ball anchor abutments at 65 Euro
_ Full Contour abutments at 65 Euro

All abutments have been developed integrating the latest state-of-the-art production technology and precision, based on the 25 years of experience of Dr

Gerald Niznick as developer and holder of more than 23 patents. Abutments can be ordered in the Online Shop of Implant Direct www.implantdirect.eu. A tollfree infoline has been established: 00800-4030 4030.

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J.Morita

3D Accuitomo 80 continues to grow: new large image formats with the 170 version

J. Morita's 3D Accuitomo demonstrates its technological market leadership. With 80 µm voxel the successor model "170" enables image formats of 100 x 100 and 170 x 120 mm. The requirements of ENT medicine were one reason for the realization of the new version. The new landscape format is suitable for diagnoses involving the whole head and neck region. Enhanced image dynamics enable greater precision in the visualization of hard and soft tissue. The central component is the FPD (flat panel detector), which produces a subtle spread of contrast. Specifically, these images can be used for examinations of apical lesions, TMJ problems, and impactions, as well as in implant therapy, endodontics, restorative dentistry and surgery. The 40 x 40 mm field of view is adequate for 90 per cent of all cases. In all image areas patients are only exposed to a low but effective dose of radiation. A high priority has been given to providing the operator with a choice between image areas without having to sacrifice high resolution.

3D Accuitomo 170: high resolution from 40 x 40 mm to 170 x 120 mm.

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Omnia

Basic Implant Set by Omnia

The sterile Basic Implant Set by Omnia was designed for implant surgery, where a suitable level of sterility and safety for both surgeon and patient is required. It is indicated for small surgery, packaged in double sterile wrapping and consists of one operator gown SMS size L, one assistant gown, two operator caps, one patient cap, one drape 2-layers 50 x 75 cm with adhesive size, one patient drape 2-layers 75 x 90 cm with adhesive U-shape, tubing sleeves 120 cm Omnisleeve, and one waste bag

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Clinical House Dental

Dental implants: 10 years reassurance free of charge

Ten years reassurance and no extra costs: On account of its technological and medical advantages, the manufacturer and insurer are providing a dental implant with an implant protection policy. At no extra charge it guarantees patients 10-year fully comprehensive insurance on implant replacement and covers standard treatment costs. "Today no patient has to accept dental implants without a protection policy", asserts the medical technology manufacturer Dirk-Rolf Gieselmann, Zürich.
Implant protection policies are available from all dentists working in implantology who treat their patients with the fully comprehensive implant PerioType X-Pert from Clinical House Europe. As a recent Forsa study shows, 71 per cent of all Germans are in favour of a guarantee on medical work lasting several years. Every other patient would even change their practitioner for a guarantee undertaking.

Fully comprehensive at no extra cost
The protection policy means the implant patient has documented entitlement to implant replacement at no charge for ten years. The protection also covers the necessary implant components required for fabricating the replacement crown or bridge. Furthermore, the treatment costs for standard insertion of the replacement implant are also covered. The insurance is already included in the implant price and is therefore free of charge for the dentist and the patient. The protection policy is secured by the Gothaer/AMG insurance company in association with the 'Mensch und Medizin' foundation.

As hard as diamond
The guarantee in the form of an implant protection policy was made possible by a completely revolutionary, diamond-hard coating technology making dental implants even more stable and durable. It was developed in collaboration with the Fraunhofer-Institute for Surface Engineering and Thin Films (IST) in Braunschweig, Germany.

Breakthrough in the battle against periimplantitis
Despite their high healing rates, conventional implants also have their weaknesses. Current investigations at the University of Genf indicate that every fourth implant is threatened by periimplantitis—inflammation of the region around the implant—due to inadequate aftercare. With the fully comprehensive implant it's different.
Current study results from the University of Düsseldorf show a breakthrough in the battle against implant loss: Even the most intensive oral hygiene, a basic prerequisite for maintaining the long-term health of dental implants, cannot damage the new surface of the fully comprehensive implant. It also promotes deposition of healthy tissue and therefore long-term stability. An enormous step forward for implantology, according to Prof Dr Jürgen Becker, head of the Düsseldorf study. All information availalable from: the fully comprehensive implant hotline +49-180/5 22 55 07 and on the Internet at www.dasvollkaskoimplantat.de.

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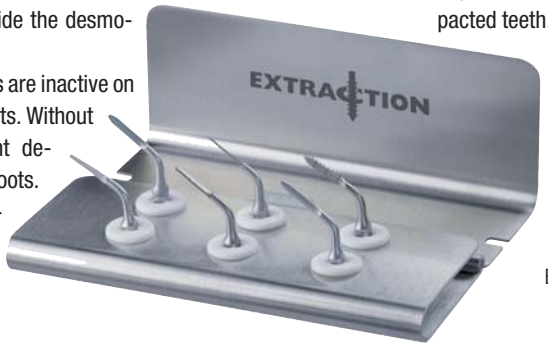
Acteon

Extraction Kit by Satelec®

The Extraction Kit is the latest addition to the range of ultrasonic surgical tips from Satelec®. Compatible with Piezotome™ and ImplantCenter™ power generators, this new kit of six tips has been especially developed for extractions (total or partial): avulsions, hemisections and root amputations.
The Extraction Kit presents unarguable clinical advantages for the practitioner:
_ ease and speed: the slimness of these tips associated with ultrasonic technology facilitates their access inside the desmodontal space;
_ surgical safety: thanks to the selective cut, tips are inactive on soft tissue and sensitive anatomical components. Without any inertia, the regular to-and-fro movement decreases the risk of lesions on adjacent teeth and roots.
The use of this kit will also provide benefit to patients who will experience:
_ swift and less traumatic treatment that respects the alveolar plate;
_ less post operative pain.



This kit, which is directed mainly towards general practitioners and stomatologists, consists of:
_ Five LC tips intended for syndesmotomies and periradicular osteotomies. With differing shapes and orientations, they address the morphological constraints without damaging neighbouring tissue and anatomical elements. Combined with the action of ultrasonic micro-oscillations, they achieve, with just a simple sweeping movement around the tooth, detachment of the periodontal ligament in order to facilitate avulsion of the tooth outside the alveolus.
_ One Ninja™ tip, with double saw-tooth edges, developed especially for hemisections and root amputations, this tip is also recommended for sectioning impacted teeth. The Ninja's selective and accurate cut allows the practitioner to achieve faster and less invasive surgery.

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Straumann

Straumann presents Roxolid™

At the17th EAO, Straumann presented a new material that could make dental implants smaller and stronger. The new material, which is called Roxolid™, is an alloy of titanium and zirconium and is the first material to be designed specifically for dental implants. Roxolid™ is 50% stronger than pure titanium[1], the current material of choice for implants. Exciting preclinical study results presented in Warsaw showed that Roxolid integrated with bone better than pure titanium.[2] The combination of enhanced strength and osseointegration could open the door for a new generation of smaller, safer implants, which would be particularly advantageous in situations where there is limited space between teeth. A further potential advantage could be the use in thin bone (narrow bone ridge), where wider implants would necessitate bone augmentation/grafting procedures. Engineered and developed by Straumann, Roxolid is currently undergoing clinical trials in six countries. Preliminary (6–12 month) observations from the first clinical trial were also presented at the EAO[3] showing very promising survival rates. Pending regulatory approvals and further positive findings from the broad clinical program, Roxolid implants are expected to become available in initial markets in the course of 2009.

The quest for high performance materials

According to published research[4], titanium and zirconium are the only two metals commonly used in implantology that do not inhibit the growth of osteoblasts, the bone forming cells that are essential for osseointegration. In addition to this attribute, Roxolid can be combined with Straumann's third-generation SLActive surface technology, unlike other alloys such as TAV, which cannot accommodate the sophisticated mircostructuring processes required.

SLActive outperforms main competitor

In addition to material, surface is a key factor in successful implant therapy. In 2005, Straumann introduced its third generation implant surface technology SLActive, which cut implant healing times in half from 6–8 to 3–4 weeks.[5] In a preclinical head-to-head study presented at the EAO, the osseointegration of titanium-SLActive was compared to a leading competitor surface (TiUnite®[6]) at three time points (10 days, 3 and 6 weeks) after implant placement.[2] At each time, SLActive demonstrated higher mean shear strength values (indicative of surface osseointegration), which were statistically significant at both 3 and 6 weeks.
The investigators concluded that SLActive was more effective in enhancing interfacial shear strength. This adds to the large body of data and experience supporting SLActive on titanium implants as the benchmark.

A new level of osseointegration indicated

One of the most remarkable findings presented at the EAO was the observation that Roxolid enhanced osseointegration beyond the current SLActive gold standard. In a preclinical study, titanium-SLActive implants were compared with Roxolid-SLActive equivalents at four weeks after placement. Histomorphometry revealed significantly more bone growth around the Roxolid implant. The removal torque values for the new material were significantly higher, leading to the conclusion that Roxolid improved osseointegration performance.[2]

Initial results from large clinical program

In a prospective pilot clinical trial, which is still ongoing, small diameter (3.3 mm) Roxolid implants were placed in 22 patients. Preliminary data (6–12 months) were presented at the EAO showing very promising survival rates. This is the first of a number of clinical studies evaluating the new material.

References

[1] Based on internal specifications and ASTM F67.
[2] Gottlow J et al. Preclinical data presented at the 23rd Annual meeting of the Academy of Osseointegration (AO), Boston, February 2008, and at the 17th Annual Scientific Meeting of the European Association for Osseointegration (EAO), Warsaw, September 2008.
[3] Barter S et al. Clinical data presented at the 17th Annual Scientific Meeting of the European Association for Osseointegration (EAO), Warsaw, September 2008.
[4] Steinemann S. Peridontol 2000 1998;17:7–21.
[5] Oates TW et al. Int J Oral Maxillofax Implants 2007;22:755–760.
[6] Registered trademark of Nobel Biocare.

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implants
international magazine of oral implantology