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# ceramic implants

**international magazine of** ceramic implant technology

**case report**
Full-arch rehabilitation using ceramic implants in guided surgery protocol

**interview**
The long-term success rate of two-piece ceramic implants has been around 97%

**overview**
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**Dr Rodrigo Beltrão**
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# The future has arrived, and we are art and part of it

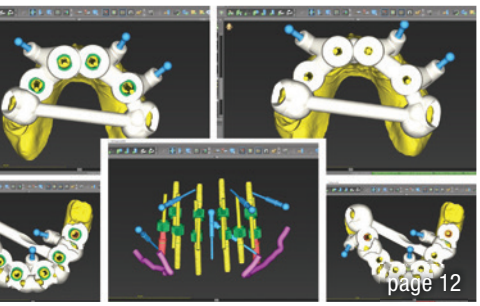
Oral implantology, whether metallic or ceramic, has undoubtedly had a global impact on the profession and on the daily lives of our patients. In the early days, implants were only placed by a few dentists, trained in specific centres, and for a few patients, who had the means to access the treatment. In recent decades, most educational institutions specialised in oral health offer training, and this is increasing not only the number of dental professionals who are considering oral implantology as a specialisation but also the number of patients, who have more access than ever to information regarding dental implants and are therefore increasingly requesting metal-free solutions for their long-term well-being.

According to major opinion leaders and media surveys, in years to come, there will be a significant conversion to ceramic implantology in dentistry. In our opinion, the training of dentists is extremely important in order to be prepared for this new era. In the South American region, the latest trends from Europe and the US are always closely watched, and today it has been almost a decade since we have introduced metal-free implantology to our daily practice. It has been a difficult road for us, because until several years ago, we did not have the necessary supplies or the training in South America. Thanks to access to international websites with medical science papers and publications such as *ceramic implants—international magazine of ceramic implant technology*, promoted worldwide, it has become a little bit easier, considering the outstanding information being made very accessible for every dentist wishing to enter the field of ceramic implantology.

Those difficulties forced us to find a plausible solution. With a group of colleagues with experience in metal-free implantology, the Sociedad Argentina de Implantología Cerámica (Argentine society of ceramic implantology; SADIC) and Academia Brasileira de Implantologia Cerâmica (Brazilian academy of ceramic implantology; ABICeram) were created with the objectives of the promotion of ceramic implantology in our region and the transmission of knowledge to other dentists. In addition, it has been of great importance for our organisations to have received intense support from the only company in South America with proprietary technology and knowledge in the development and production of ceramic implants using the ultimate technology of ceramic injection moulding that allows production of 3D native impurity-free implantable surfaces with nano-, micro- and macro-roughness.

The company donates its products to our non-profit organisations for medical and scientific purposes and, through this corporate philosophy, also helps to improve our economy, having positive social and environmental results. Without this support, it would have been impossible to develop and accelerate our missions and actions. The experience we have gained in collaboration with SADIC and ABICeram dentists has allowed us to make recommendations on one-piece and, currently, two-piece ceramic implant systems that are quickly being incorporated into the growing community of dental professionals and university curricula in our region.

There is still a long way to go, but the good thing is that we know where we want to go. We are convinced that we are on the right track, especially when we see the joy of patients who have searched for metal-free dental implant solutions and see their final result. Finally, the future has arrived, and we are proud to say that we are art and part of it.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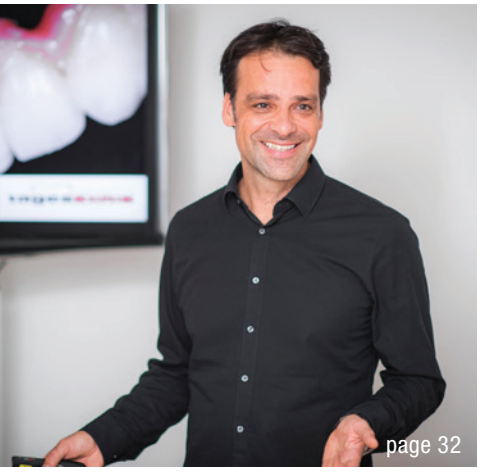
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# Two-piece zirconia implant for global metal-free restoration

Dr Riccardo Scaringi, Italy

**Zirconia in dentistry** has historically been known for its strength and biocompatibility characteristics in simple or complex prosthetic rehabilitation. Only in the last decade has it become more widely used in implantology as well. Zirconia is a mixture of composites based on zirconium dioxide. Zirconium is the metal from which the eponymous dioxide is derived. The powders used to obtain zirconia have a very high degree of purity and are obtained through complex chemical and co-precipitation procedures.[1] The crystalline structure of zirconia occurs in different geometric shapes depending on the temperature to which it is subjected and reversibly changes from a monoclinic state at room temperature to a tetragonal state up to 1,100 °C and a cubic state at around 2,400 °C. Therefore, the density of the material is determined by the shape and size of the geometric state, which determines a different final size and a different physical property, depending on the heat treatment.[2]

Sintering takes place at temperatures above 1,170 °C, determining a change of state from tetragonal to monoclinic. This causes stress that leads to fracture of the artefacts, which is why oxides were introduced to stabilise the composite and prevent fracture. In the medical field, various oxides, such as magnesium oxide, titanium dioxide, alumina, yttrium oxide and ceric oxide, are used in small percentages combined with zirconia, creating stability in various sintering processes and creating a family of zirconia-based ceramics with different chemical, physical and structural characteristics.[3]

Advancement in dental implantology occurred with the addition of yttrium oxide to zirconia, generating yttrium tetragonal zirconia polycrystals (Y-TZP). Although this achievement has only recently been translated to clinical practice, the initial studies date back to the early 1960s with ceramic materials that allowed such maturation and knowledge that today allow a degree of excellence for biomechanics and integrative biocompatibility with the hard and soft tissue of the oral cavity.[4] Zirconia does not cause systemic or local cytotoxicity, and cytocompatibility *in vivo* and *in vitro* has been reported.[5] In order to accelerate the healing time, osseointegrative properties were achieved through surface treatment by increasing hydrophilicity with different procedures.[11] Bacterial colonisation and adhesion to the implant surface are related to the material type used, Y-TZP having significant advantages over titanium.[10] *In vitro* tests have shown less accumulation of the various bacterial strains present in the oral cavity, and significant results of less adhesion on zirconia or titanium abutments has been demonstrated *in vivo*.[12–16] The absence of metal oxides allows for improved biological response of the gingival tissue, resulting in reduced bacterial formation and subsequent inflammatory onset.[18]

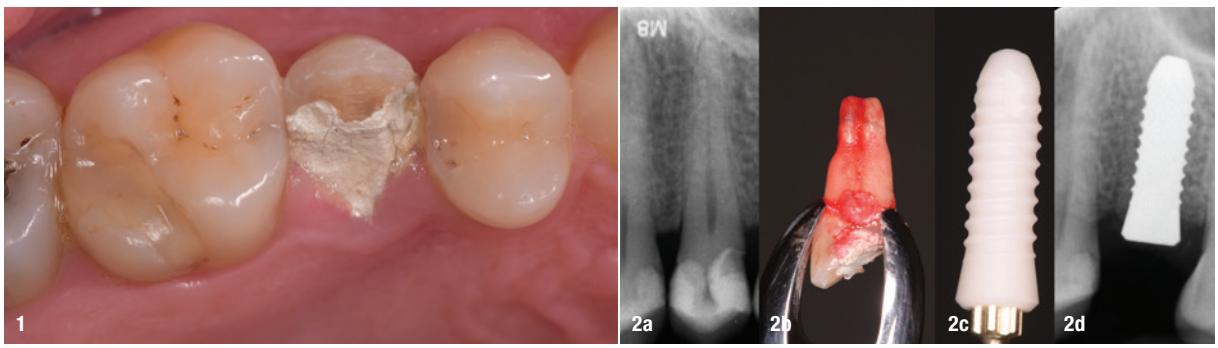


**Fig. 1:** Occlusal image of the coronal fracture of the partially medicated tooth to soothe the thermal sensitivity caused by uncovering of the pulp chamber. **Figs. 2a–d:** Initial radiographic image showing the close proximity to the floor of the maxillary sinus in addition to the viability of the tooth and the absence of periradicular infection **(a)**. Extracted root **(b)**. CERALOG Hexalobe implant **(c)**. The result of implant placement with respect to the sinus floor and the osseous and interradicular relationship **(d)**.

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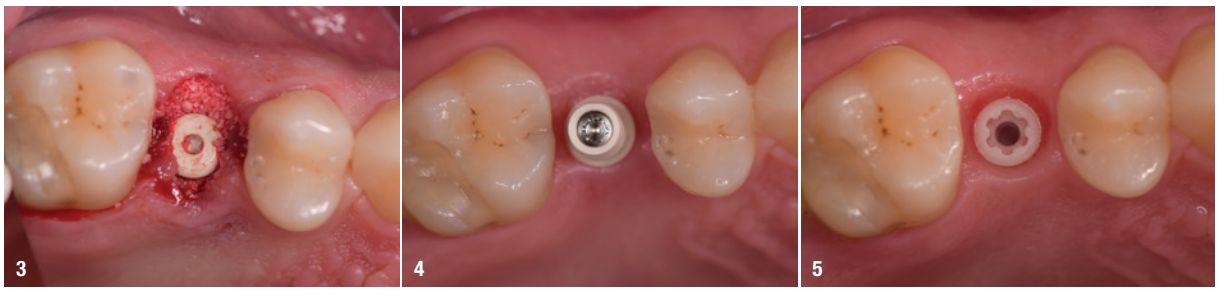

**Fig. 3:** Occlusal view of the CERALOG implant placed using a flapless technique and filling of the spaces between the bone and implant. **Fig. 4:** Provisional PEEK abutment *in situ*, to which the provisional crown produced by CAD/CAM was to be bonded. **Fig. 5:** The tissue conditioning and bone healing situation after 56 days of functional loading with the provisional crown.

The characteristic white colour of zirconia implants blends in better below the gingival tissue, especially in thin phenotypes, avoiding those unsightly grey shadows peculiar to titanium implants, especially for those implant designs with a smooth collar. Moreover, even in the case of gingival recession, no exposure of metal portions occurs.[17]

An important aspect that characterised the first generation of zirconia implants was the frequency of fracture, being about 4%, especially in the first year of loading, in cases of particular tightening of the abutments with metal screws and in two-piece implants with a diameter of less than 3.5 mm.[19] The rate has dropped below 0.5% owing to advancements in the manufacturing process, in material preparation and in implant fabrication whether by milling or isostatic pressing.[20]

As an additional fact to be noted in the knowledge of this new implant material concerns the ageing of the structure, better known as hydrothermal degradation (low-temperature degradation), that occurs at temperatures above 150 °C in an environment with the presence of water.[21] In order to fully control such degradation, ceric oxide or alumina was added to the zirconia powder composite.[22] Based on the experience gained in these 30 years of research and development, we can now consider zirconia implants a viable substitute for titanium implants, especially in highly aesthetic areas or in those patients in whom tissue quality or particular susceptibility to bacterial colonisation may require a greater guarantee of long-term outcome.[23, 24]

## Clinical case report

The male patient was a 53-year-old non-smoker in an excellent state of health, ASA I, with vertical fracture of the crown of tooth #25 associated with spontaneous pain. In the first phase of treatment, we conducted an accurate clinical and diagnostic diagnosis in which we ascertained the possible therapeutic variables aimed at coronal restoration after crown lengthening, root canal therapy and core reconstruction on which to finalise a clinical crown. The patient presented to the clinic with masticatory trauma that had caused a clear fracture of the palatal cusp of the vital tooth restored according to a direct composite technique. The fracture was extensive in depth to at least 1 mm subcrestally, in addition to uncovering the pulp chamber (Fig. 1). After careful evaluation and comparison of procedures, the patient was shown the various treatment options and opted to have the fractured tooth replaced with an implant. The choice of a ceramic implant was considered for a number of factors, including global metal-free restoration and an aesthetic outcome. We decided on a two-piece Y-TZP implant (CERALOG™, BioHorizons Camlog) made using a high-tech production process for molding (Ceramic Injection Molding–CIM).

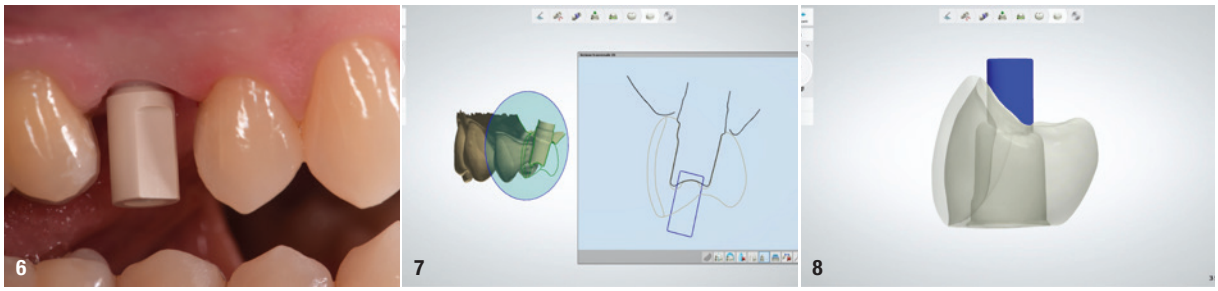

**Fig. 6:** The scan body on the implant. **Fig. 7:** The sectional design of the crown allowed for a broad evaluation. **Fig. 8:** The design showing subtraction from the vestibular aspect to accommodate the ceramic layering.

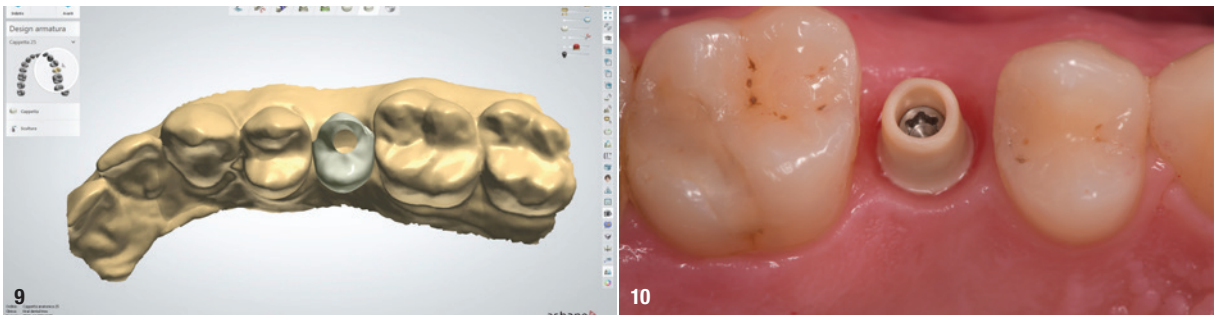

**Fig. 9:** View of the design in the context of the virtual model, showing the transition points in the adjacent contacts and the access hole in the occlusal aspect, avoiding compromise of aesthetics and of resistance to masticatory forces. **Fig. 10:** The final abutment of PEKK, a biocompatible material that is resistant to oral fluids and masticatory forces.

Root extraction was performed according to a flapless technique, avoiding injury to the cortical bone. The use of piezo-surgery allowed for facilitated removal without cortical compression (Fig. 2). Site preparation is a delicate step in implant surgery, especially for zirconia implants. In fact, ceramic implants tolerate screwing stresses poorly; therefore, the site must be carefully prepared with adequate irrigation and possible tapping of the site, especially in cases of Class D1 and D2 compact bone. In the present case, subcortical insertion was not necessary, but in the event of need, there is a countersinking fuction available in the CERALOG system, which allows placing the implant subcrestally while avoiding cortical compaction that usually induces vertical resorption.

Like with titanium implants, placement of zirconia implants requires primary stability. The difficulty is initially associated with the point of engagement of the first drill to match the centre of the implant with the inter-coronal distance. It is not always possible to use this point for implant insertion because of the variables associated with root shape and the number of roots present. The maxillary second premolar usually presents a single root or in some cases two fused roots, and therefore it lends itself more easily to a contextual replacement. The only problem is associated with the upper boundary with the cortical floor of the maxillary sinus that could limit the excursion of the pilot drill beyond the apex in search of greater primary stability (Fig. 2).

In this case, a cylindrical body zirconia two-piece implant of 12.0 mm in length and 4.1 mm diameter was used considering that the prosthetic collar had a diameter of 4.5 mm. The spaces between the bone and the implant were filled with slowly resorbing biomaterial to better preserve the alveolar bone. The implant was deliberately not restored immediately, because although the primary stability achieved was 55 ISQ, we preferred to leave the implant to heal naturally and not expose it to further occlusal trauma (Fig. 3). A healing abutment was placed on the implant.

After eight weeks, we removed the healing abutment and took a digital impression for the preparation of a provisional restoration placed on a PEEK temporary abutment for an additional four weeks (Fig. 4), at the end of which we removed the screw-retained provisional crown and noted the degree of peri-implant mucosal conditioning. We took a new impression with an intra-oral scanner using a scan body (Figs. 5 & 6). By using the implant system's scan body, we were able to capture the implant's specifications or the dental technician. The scan body stops at the implant connection and does not interfere with the soft tissue. The digital impression also allows for excellent reading of the conditioned tissue so that the aesthetic margins achieved can be followed. The file was sent to the dental laboratory after filling out the attached data sheet listing the implant type and model, the type of restoration desired, whether screw-retained or cemented, and the material with which it was to be finalised. The software is able to detect colour values so that an initial colour indication can be defined.

The choice of a two-piece zirconia implant allows a single restoration or possibly a multi-unit cemented restoration thanks to the design of dedicated frameworks utilising CAD/CAM and the DEDICAM CAD libraries. The data collected is supported by photographic status and spectrophotometric images. Digital data has great versatility of use and limited cost and offers great potential for use and communication effectiveness even at a distance. The dental technician was able to make a careful assessment of the implant position, the possibility of making a screw-retained prosthesis, the aesthetic margins, and the prosthetic components to be used. The dental technician is able to determine the feasibility of the restoration according to the prescription, sharing with the clinician the potential and limitations present in the specifications. It is not always possible to have an angulated screw-retained abutment allowing an access hole in a region congruous with the aesthetics and function of the implant in case the implant–abutment connection is modified by inclining the bearing surface of the implant shoulder (Fig. 7).

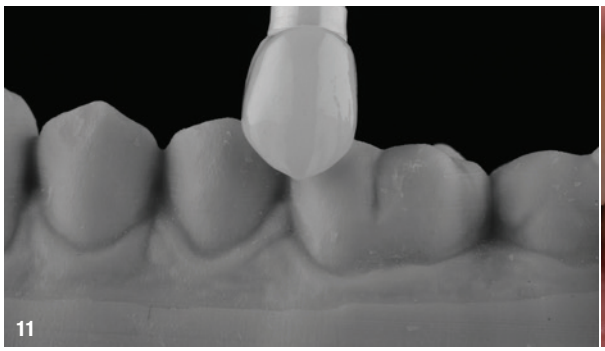



**Fig. 11:** View of the completed crown, the abutment to which it is bonded and the ceramic analogue. **Fig. 12:** Vestibular view three years after loading.

Given the special attention to the aesthetic component, we preferred to add ceramic to the coronal zirconia structure, maintaining a high-strength structure in the portion bordering the access hole and simultaneously enhancing the aesthetics with a portion characterised by ceramic layering and not simply coloured. Having established the prosthetic design and chosen the material, the design proceeded with subtraction from the vestibular aspect in the appropriate volume to accommodate the ceramic addition (Fig. 8). When deciding on a technical procedure for layering, it is crucial to have a model that can facilitate the dental technician in fabrication (Fig. 9). The abutment used for the definitive restoration is different from the one used for the provisional restoration, in material and shape. The portion of the abutment that seals the connection with the implant cannot be modified by either subtraction or addition, so the crown would be cemented in the laboratory to the abutment (Fig. 10). A removable transfer of both the implant and digital models would be housed on the model, enabling its specifications to be entered into the prosthetic design software. All this data that seems obvious in reality should be verified before taking and sending the impression to the laboratory (Fig. 11). Radiographically, the abutment appears as a space between the implant and the crown, being radiolucent.

Prosthetic placement was performed according to the manufacturer's instructions by dynamometric tightening with a Unigrip screwdriver to 15 Ncm for Holisticor screws in gold or 25 Ncm in titanium. The three-year follow-up found no signs of clinical concern, and the result was a functional implant restoration that appeared perfectly natural (Fig. 12).

## Discussion

The particular conformation of the prosthetic connection (CERALOG™ Hexalobe) firmly stabilises the abutment to the implant, preventing unscrewing, even in the long term and even if tightening was not done with a torque wrench. The PEKK abutment comparing to a standard polymer abutment in PEEK has a higher tensile strength and excellent thermoplastic performance, ensuring resistance to masticatory stress. It is possible to employ cemented or screw-retained crowns, depending on the type of rehabilitation and especially depending on the inclination of the implant and the aesthetic requirements of the prosthetic restoration.

## Conclusion

The choice of a zirconia implant is now a well-established procedure especially in cases like this one where aesthetic requirements and the desire for metal-free treatment are combined. Tissue response is always positive, and its maturation improves over time by stabilising and improving the mucosal surface. Probably poor bacterial colonisation and adhesion is a significant factor in the absence of peri-implant inflammation, and this is an ideal prerequisite for progressive and evolutionary tissue maturation. Tissue response improves over time.

## about the author

**Dr Riccardo Scaringi** teaches specialisation courses in dental implant prosthetics and digital support technologies at various universities in Italy. He is frequently invited to speak at national congresses on topics related to surgical prosthetics. He is also an active member at the most prestigious international scientific associations in the field of technological and digital surgery. Dr Scaringi is the author of various scientific texts.

## contact

**Dr Riccardo Scaringi**
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Literature

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# Full-arch rehabilitation using ceramic implants in guided surgery protocol

Dr Alexandr Bortsov, Russia

**Patients with metal** allergies and heightened allergic status represent a challenge for dental implant treatment. Nowadays, ceramic implants are emerging as a viable solution for such patients, offering the advantages of tooth-like colour, enhanced soft-tissue healing and lower affinity to plaque accumulation. However, fast and efficient treatment protocols with ceramic implants are still very demanding, particularly when it comes to full-arch restorations.

## Initial situation

A 62-year-old patient (Fig. 1) with a history of multiple metal allergies and advanced periodontal disease turned to the clinic for aesthetic fixed restoration. The patient was concerned about surgical trauma and hoped for a fast and painless procedure. Further examination revealed a heightened allergic status (increased immunoglobulin E level), painful occlusion

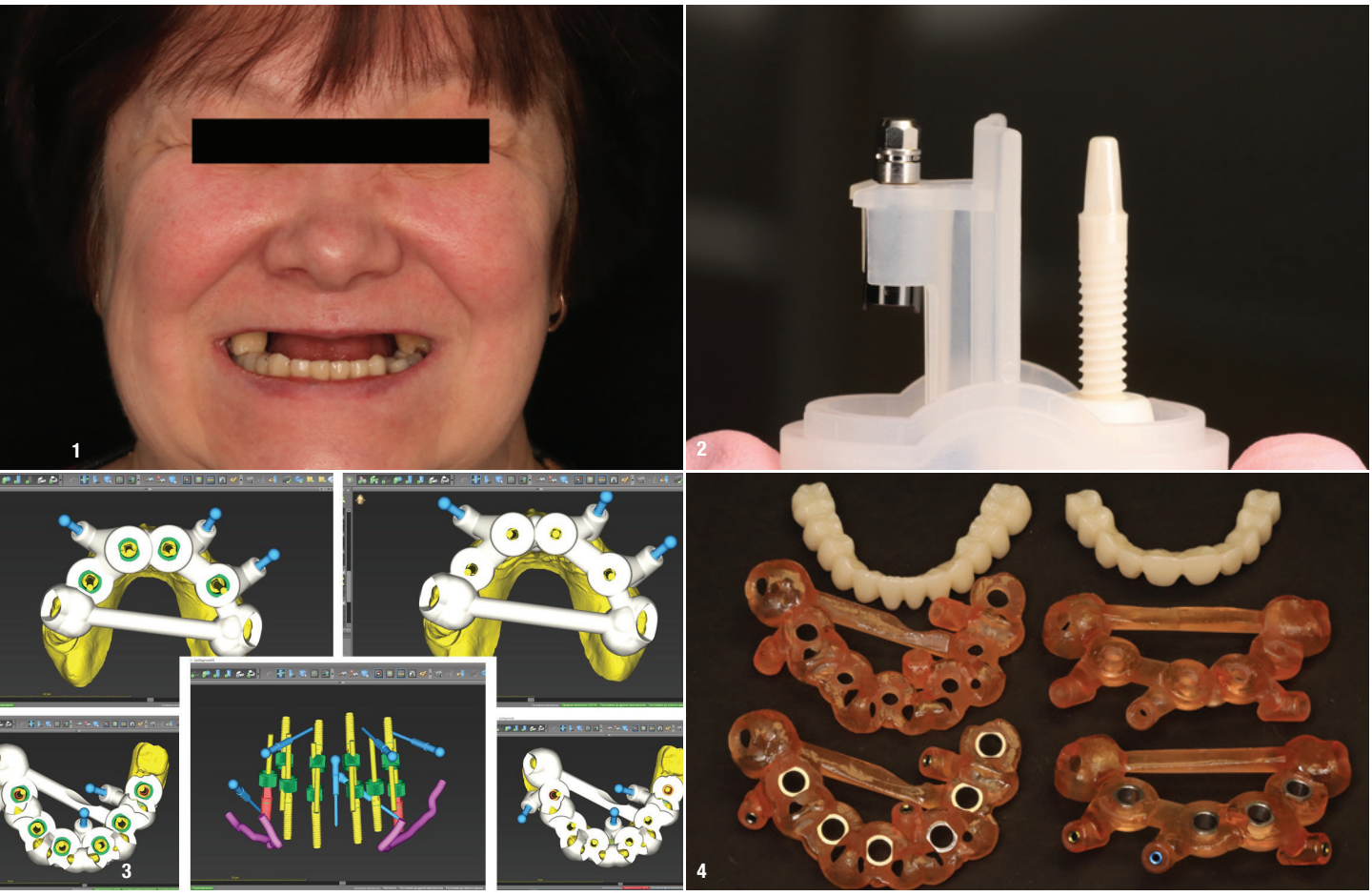

**Fig. 1:** Initial situation. **Fig. 2:** Straumann PURE monotype ceramic implant. **Fig. 3:** CoDiagnostiX planning. **Fig. 4:** Surgical guides and prefabricated provisional restorations.

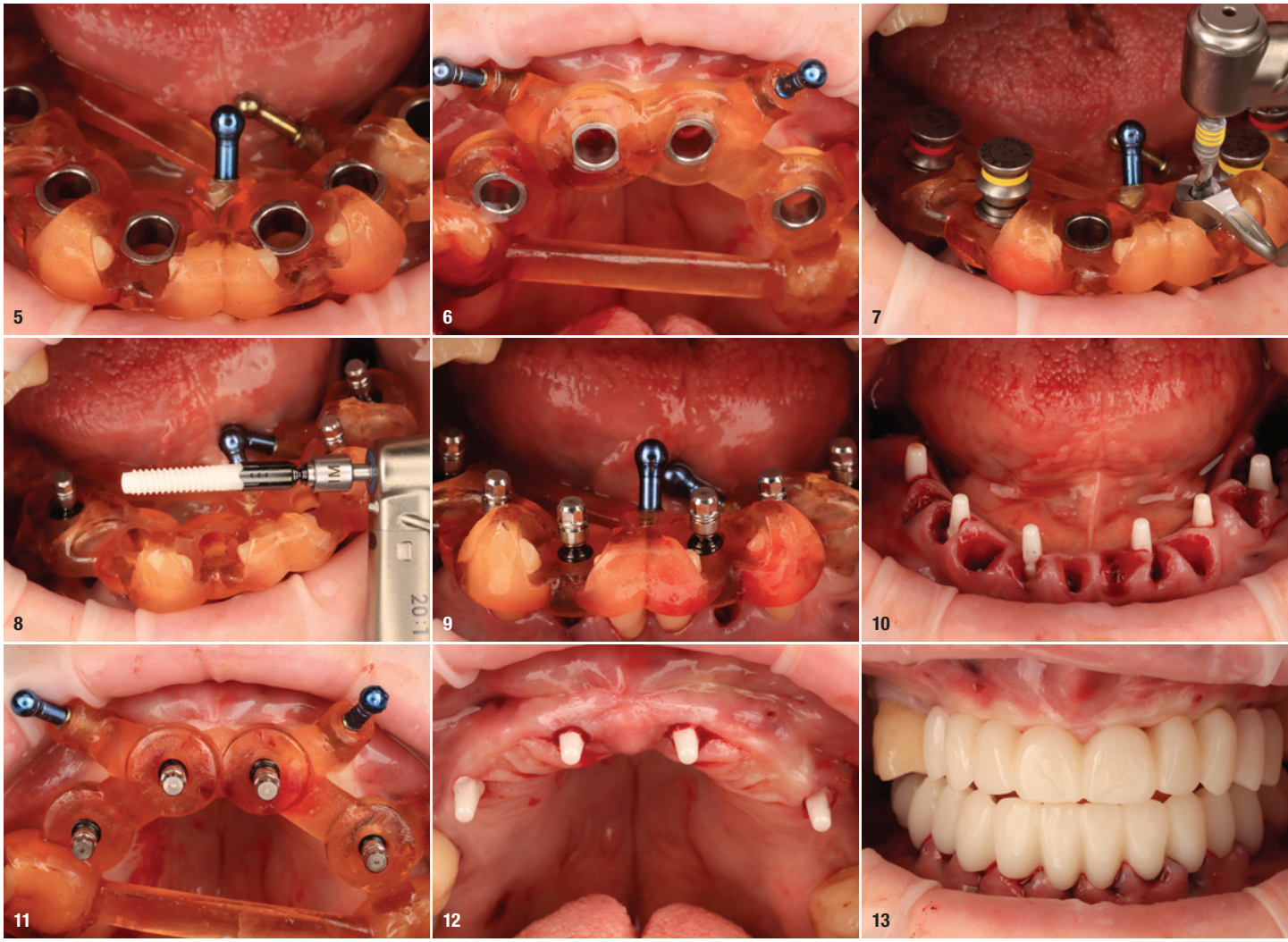


**Fig. 5:** Surgical guide fixed on the mandible. **Fig. 6:** Surgical guide fixed on the maxilla. **Fig. 7:** Guided implant bed preparation **Fig. 8:** PURE ceramic implant mounted on handpiece adaptor. **Fig. 9:** PURE ceramic implants placed via the insertion guide in the mandible. **Fig. 10:** PURE ceramic implants in place in the mandible. **Fig. 11:** PURE ceramic implants placed via the insertion guide in the maxilla. **Fig. 12:** PURE ceramic implants in place in the maxilla. **Fig. 13:** Immediate provisional restorations cemented.

with several mobile teeth and a largely hopeless dentition.

## Treatment planning

Given the patient's allergic status, Straumann PURE monotype ceramic implants (Fig. 2) were the option of choice to support full-arch restorations in the upper and lower jaws. To minimise surgical trauma and ensure precise, parallel implant placement, it was decided to use the Straumann guided surgery solution to place the implants flaplessly. To increase the precision of fit of the surgical guides, it was planned to use some of the remaining teeth for the surgical guide fixation and to extract them after implant placement. Furthermore, guided surgery based on fully digital workflows also allowed immediate provisionalisation at the end of surgery, thus facilitating patient comfort.

The patient's CBCT data, together with the data from the intra-oral scan, were imported into coDiagnostiX (Dental Wings), and virtual planning was done (Fig. 3). Based on that planning, the surgical protocol was determined and the surgical guides and the immediate provisional restorations were fabricated (Fig. 4).

## Surgical procedure

To facilitate the precision of the implant placement, two dedicated surgical guides were used: one guide for the drilling and another one for the guided insertion of the implants. The insertion guide was produced based on the dimensions of the transfer piece for the PURE ceramic implant.

To further control potential deviations, the implant bed preparations were done starting from the distal sections

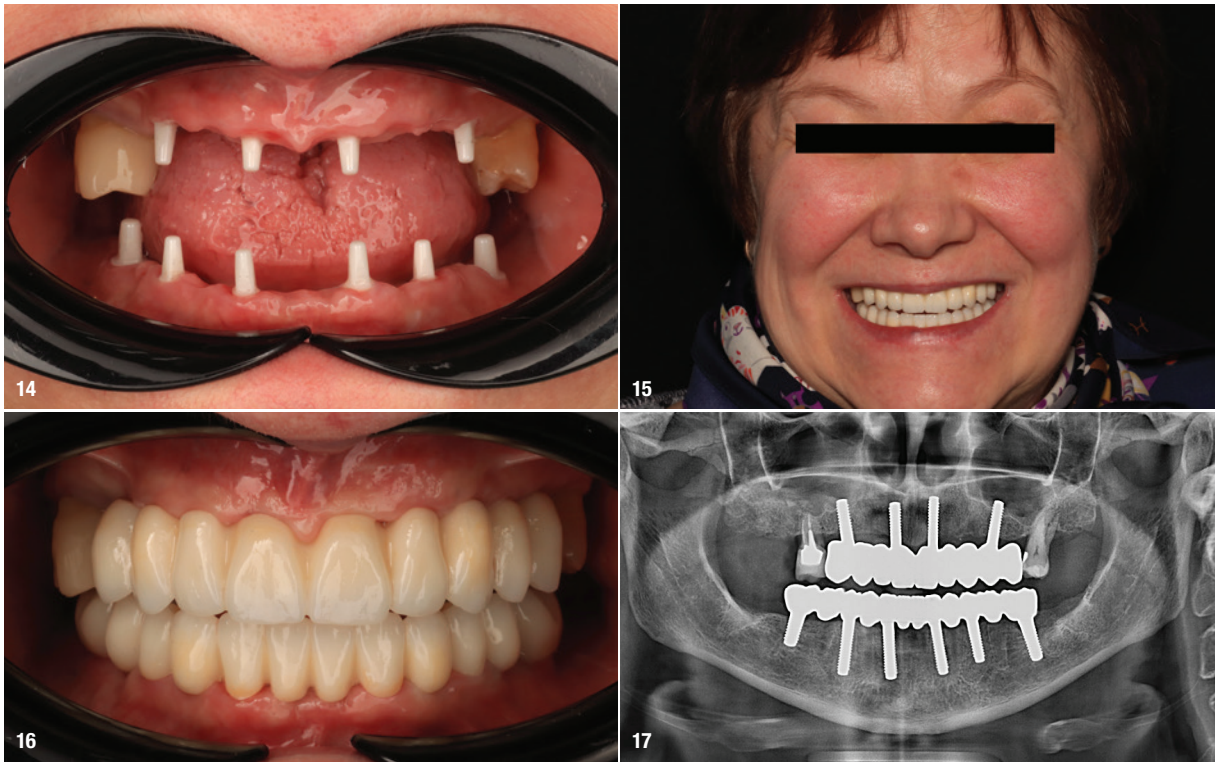

**Fig. 14:** Soft-tissue healing at the two-month follow-up. **Fig. 15:** Result and smile line. **Fig. 16:** Definitive restorations cemented. **Fig. 17:** Dental panoramic tomogram at the one-year follow-up.

and moving mesially while fixing every prepared osteotomy with the additional fixation pins (Figs. 5–7). The insertion guide was then fixed, and the fully guided implant placement was carried out (Figs. 8–12). Finally, the prefabricated provisional restorations were cemented and the patient could leave the office (Fig. 13).

## Prosthetic procedure

At the two-month follow-up visit, the clinical examination showed good soft-tissue healing (Fig. 14). Conventional closed-tray impressions were taken. It was decided to leave the distal teeth in the maxilla to provide better proprioception. At the final appointment, the definitive full-arch zirconia restorations were cemented (Figs. 15 & 16). The patient was satisfied with the functional and aesthetic outcomes. The dental panoramic tomogram at the one-year follow-up showed stable results (Fig. 17).

## Conclusion

This clinical case illustrates a successful full-arch rehabilitation using Straumann PURE ceramic implants in a digital protocol. The Straumann guided surgery system helped to manage several clinical challenges: digital tooth extraction, prefabrication of immediate provisional restorations and post-extraction placement of multiple PURE monotype implants precisely parallel to each other—all in an efficient and minimally invasive protocol.

## about the author

**Dr Alexandr Bortsov** graduated with a DDS from South Ural State University in Chelyabinsk in Russia. As a surgeon, his focus areas are implantology and guided surgery, aesthetic dentistry and digital dentistry. Dr Bortsov is the director of the Dental Art clinic in Chelyabinsk and of the International Team for Implantology study club in Chelyabinsk. He is the head of surgery and prosthodontics at the Central Dentistry clinic in Russia.

## contact

**Dr Alexandr Bortsov**
+7 905 839850
89058398504@mail.ru

Author details

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# Immediate implantation with platelet-rich fibrin and immediate loading

Prof. Belir Atalay & Dr Beril Atalay, Turkey

**Since Brånemark first described** dental implantology many years ago, the waiting time for implantation and loading has changed owing to material and implant surface characteristics. After osseointegration was defined, different implant materials were produced. Today, titanium is the most preferred material, but mixed materials of titanium and zirconia have been developed for dental implantology in addition to titanium, and zirconia implants with metal-free content are available. After much clinical feedback, some authors have pointed out that adverse immune reactions to titanium oxide can occur and cause biological complications after many years.[1] Titanium implant components may also be visible and cause discoloration of the gingiva as a result of bone resorption and recession of the peri-implant soft tissue.[2] Zirconia ceramics have been proposed as an alternative material for dental implants. The reasons for zirconia preference as an implant material are especially its high biocompatibility and aesthetic white colour. Mechanical features such as a low modulus of elasticity and thermal conductivity have made zirconia ceramics an alternative as well.[3] Animal studies have proved that osseointegration can be achieved with this material.[1] Both *in vitro* and *in vivo* studies have proved that there is better soft-tissue healing and integration around zirconia implants compared with titanium implants. In addition, zirconia has a low surface energy, which allows less bacterial colonisation on its surface, and thus less peri-implant infection occurs.[4] A meta-analysis of studies conducted between 2004 and 2017 showed that zirconia implant survival rates had significantly increased and that the fracture incidence of zirconia oral implants had significantly reduced from 3.4% to 0.2%.[5] Regarding commercially available zirconia implants, clinical data up to and after five years of functional loading has reported survival rates of 95%.[6–10]

Zirconia plays an important role in implant dentistry, not only as the preferred crown material but also as the material of choice for fabricating healthy dental implants.[11] Owing to the aforementioned advantages and the increasing demand for aesthetic and metal-free material in implant dentistry, research on the clinical use of zirconia implants is currently increasing.[4] This paper presents the surgical and prosthetic steps for an immediately placed anterior zirconia implant.

## Case report

The 30-year-old female patient was referred to our clinic owing to the discoloured gingiva around her right central incisor. The tooth had undergone root canal therapy and been restored with a crown. Previous local chronic infection had caused a small defect in the buccal wall bone (Fig. 1). The patient had a high smile line, and because of the bone loss and thin gingiva, a titanium abut-

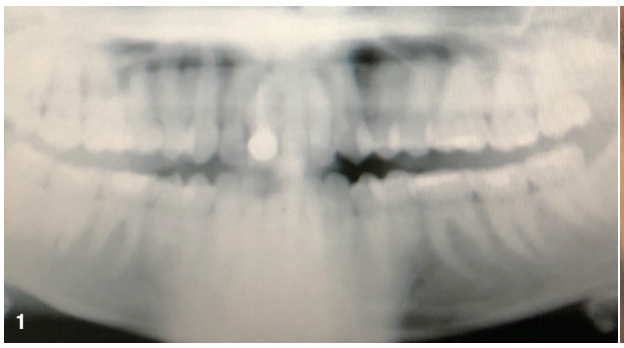
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**Fig. 1:** Pre-op radiograph of the patient. **Fig. 2:** Intra-oral view of the patient before extraction.

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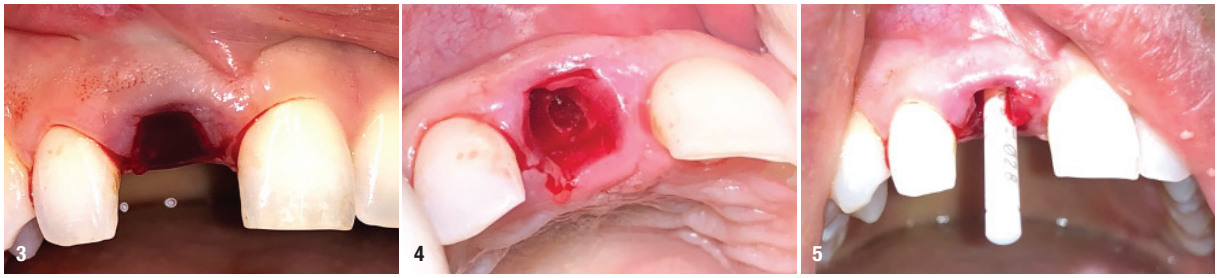


**Figs. 3–5:** Atraumatic socket preparation with a combination of zirconia drills.

ment and implant may have reflected through the gingiva, causing aesthetic complaint (Fig. 2). A zirconia implant was therefore suggested to the patient for its biological, aesthetic and physical properties. For better, faster and infection-free healing, the use of platelet-rich fibrin (PRF) was also suggested, and blood was collected from the patient's forearm into vacuum blood collection tubes. Under local anaesthesia, tooth #11 was extracted atraumatically, the cavity was curetted and the implant socket was prepared with zirconia drills (Figs. 3–5). The vacuum blood collection tubes were centrifuged horizontally for 8 minutes at 2,300 rpm and leucocyte- and platelet-rich fibrin (L-PRF) collected (Figs. 6 & 7). The extraction socket was then disinfected with ozone application for 1 minute (Fig. 8). A Zeramex XT two-piece zirconia implant of 4.2 mm in diameter and 12.0 mm in length (Dentalpoint) was then placed immediately (Figs. 9 & 10). To provide bone–implant contact, the gap left in the socket was filled with L-PRF (Fig. 11). No sutures were used. A provisional crown was prepared with the patient's old crown, and it was cemented temporarily (Figs. 12–14) in order to preserve the socket.

Antibiotics (twice a day), analgesics and an oral rinse containing 0.2% chlorhexidine were prescribed. Also, postoperative care was explained to the patient. A panoramic radiograph was taken to evaluate the implant placement (Fig. 15).

After two months of healing, the need for gingivectomy arose (Fig. 16). The gingivectomy was performed with a diode laser, taking the zenith of the symmetrical central incisor as a reference. An impression was taken to prepare a second provisional crown for better soft-tissue adaption and healing.

After ten weeks of healing, the stability of implant was measured, and an implant stability quotient value of 72 was found. This was sufficient for definitive restoration, and thus an impression was taken. After checking of colour, gingival adaptation and occlusal forces, a definitive IPS e.max crown (Ivoclar Vivadent) with a zirconia abutment was cemented (Figs. 17–19). A last check after cementation was done radiographically (Fig. 20). Soft-tissue healing was close to perfect, and the patient was satisfied with the aesthetic result (Fig. 21).

## Discussion

Since the dental titanium implant has been used as a treatment for partial or total edentulism, various biological and technical complications have been reported. These are calculated as 7% for soft-tissue complications after five years, 5% for bone loss over 2 mm and 7% for aesthetic complication.[1] Thus, the need for a better material which can solve these complications has emerged over decades. The first ceramic material used for dental implants was alumina. It showed good osseointegration, but the mechanical properties of this material are insufficient in the long term.[2] Zirconia ceramic was then proposed as an alternative. Zirconium is a mined grey-white metal, and zirconia is a ceramic that is an oxide of zirconium.[4] *In vitro* studies have shown good biological responses to zirconia and no adverse reactions.[1] Besides its biological advantages, zirconia implant has good mechanical properties (a high flexural strength of

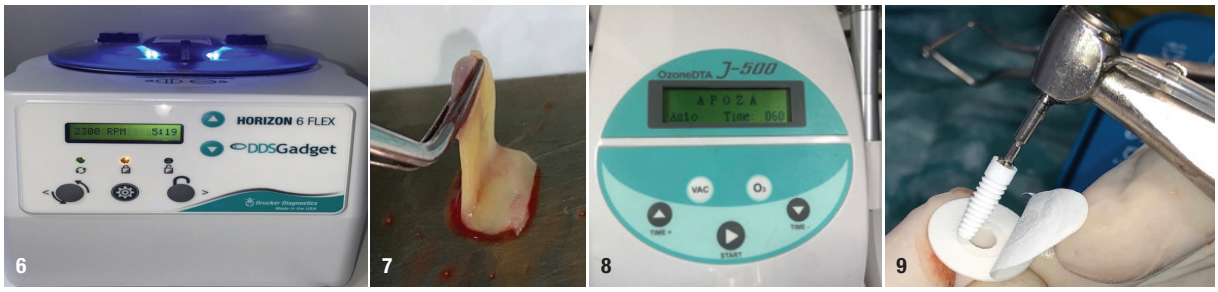



**Fig. 6:** Horizontal centrifuge machine. **Fig. 7:** Platelet-rich fibrin collection. **Fig. 8:** OZONE DTA J-500 machine (APOZA). **Fig. 9:** Zeramex XT implant.

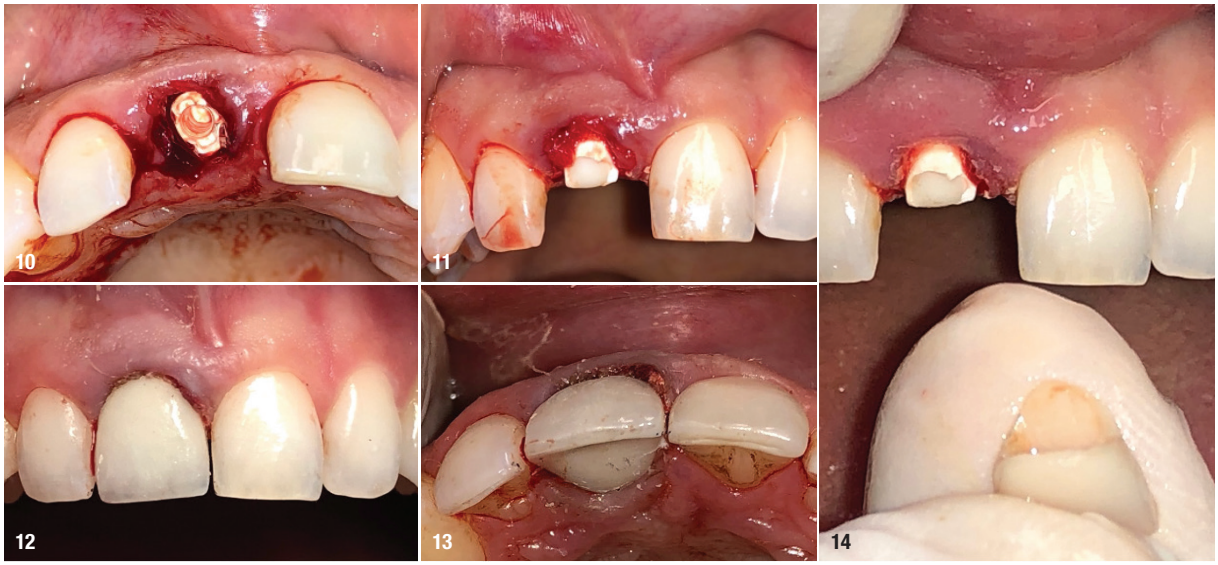


**Fig. 10:** Implant *in situ*. **Fig. 11:** Gaps between the bone walls and implant filled with platelet-rich fibrin. **Figs. 12–14:** Provisional crown cementation.

900–1,200 MPa, hardness of 1,200 Vickers and a Weibull modulus of 10–12), making it the best alternative. In most animal studies, bone–implant contact was found to be more than 60% and osseointegration was as successful as with titanium counterparts. One study even found that bone healing was better with zirconia. Bacterial adhesion was lower with zirconia implants. This is important because it is the first stage of peri-implant mucositis and peri-implantitis. Zirconia also promotes early formation of the biological width and mucosal seal, which prevents infection and thus early marginal bone loss.[2, 3] It also definitely shows better interaction with gingival soft tissue than metal alloys do. Zirconia prosthetic components and zirconia implants offer superior aesthetics compared with other materials.[4]

As zirconia ceramics were introduced, fracture resistance was a concern. Therefore, to avoid this, one-piece implants were manufactured. However, it has been found that one-piece zirconia implants have a high early fracture rate. This could be a consequence of healing under loading and the immediate occlusal forces acting on a one-piece implant. Abutment options may also be inadequate. To overcome these problems, two-piece zirconia implants were introduced to the market.[3]

As zirconia implants have continued to improve and micro-roughened surfaces of zirconia implants have been manufactured, reliable fracture toughness and strength have been shown, as well as better osseointegration and, of course, better survival rates, similar to those of conventionally used titanium implants.[5, 6, 8] Recent experimental studies have shown that the latest generation of zirconia implants with micro-roughened surfaces have very similar osseointegration values compared with titanium implants. In a 2016 paper, the survival rate for zirconia implants after one year of function was 92% for single crowns. For titanium implants, this

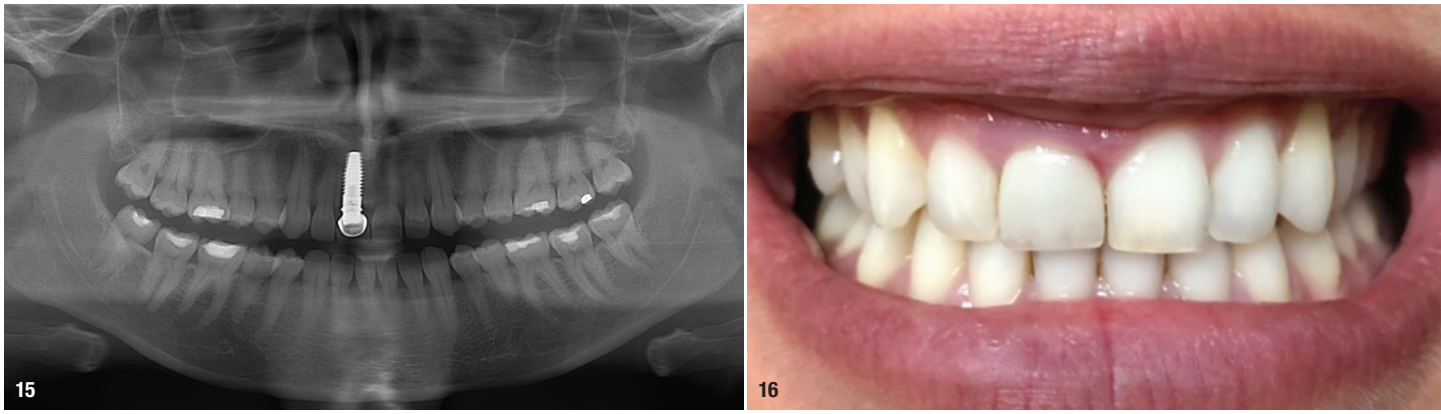
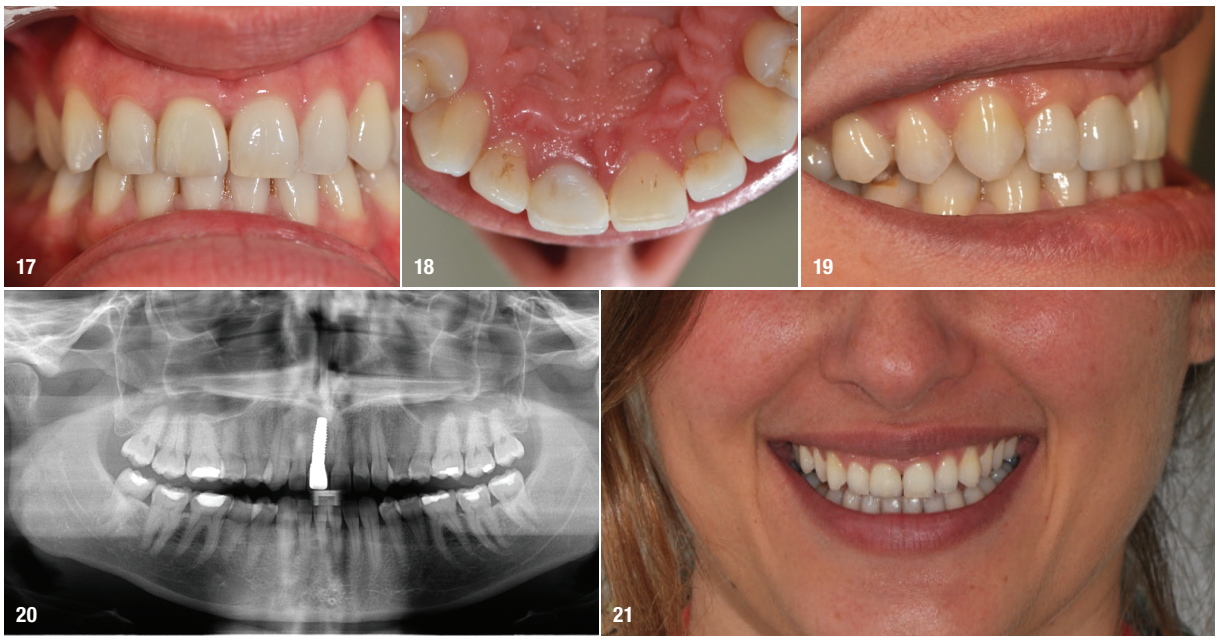


**Fig. 15:** Panoramic radiograph after zirconia implant and provisional crown placement. **Fig. 16:** After two months of soft-tissue healing, the need for gingivectomy was observed.




**Figs. 17–19:** Definitive IPS e.max crown and surrounding healthy gingiva. **Fig. 20:** Control panoramic radiograph. **Fig. 21:** The satisfied patient with the aesthetic result.

rate was 97.2% after five years and 95.2% after ten years.[3] One-piece compared with two-piece zirconia implants had no effect on survival rates, and two-year survival rates were reported to be 97.2%.[5, 12–16]

## Conclusion

Owing to the demand for aesthetic and metal-free materials, the preference for zirconia ceramics has increased. Better soft-tissue healing, osseointegration ability, low bacterial adhesion, high mechanical properties and a colour close to the natural tooth colour are advantages of this material. Although the results of rehabilitation with zirconia implants are successful, further prospective clinical studies and long-term follow-up are needed. Owing to unexpected complications and the lack of information on long-term clinical outcomes and for economic reasons, most clinicians still do not recommend zirconia implants to their patients. In the next decades, the use of titanium or other metals will greatly decrease, and thanks to developing technology, zirconia could be the new gold standard.

Prof. Belir Atalay

Dr Beril Atalay

Literature

## about the authors

**Prof. Belir Atalay** received his PhD in oral surgery in 2006 from Istanbul University in Turkey. He is a professor in the Department of Oral and Maxillofacial Surgery of the Faculty of Dentistry at the same university. In recent years, he has focused on ceramic implants, tissue regenerative techniques and immediate implant treatment in his own clinic and the faculty clinic.

**Dr Beril Atalay** received her PhD in oral surgery in 2014 from Istanbul University in Turkey. She is in private practice in Istanbul. As the first member of the International Academy of Oral Medicine and Toxicology in Turkey, she approaches oral care from a holistic perspective and is experienced in ceramic implantology, mercury filling removal and regenerative treatments. She is also a member of the European Academy of Ceramic Implantology.

## contact

**Prof. Belir Atalay**
+90 545 5964654
www.beliratalay.com

**Dr Beril Atalay**
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# Immediate implant placement and function in the aesthetic zone

## Single-tooth restoration with a narrow-diameter two-piece implant

Dr Roland Glauser, Switzerland


**Figs. 1a & b:** Frontal clinical view **(a)** and radiograph of the initial situation **(b)**.

**Recent years** have seen a continuous increase in the demand for zirconia dental implants as a result of growing public health awareness and a surge in material sensitivity cases. For one thing, zirconia implants elicit little inflammatory reaction from the peri-implant tissue and provide a particularly high degree of epithelial attachment. In addition, zirconia implants have a rather natural appearance owing to their white, almost tooth-like colour, facilitating highly aesthetic treatment outcomes. For these reasons, among others, zirconia implants pose a viable treatment option for restoration of missing teeth or the replacement of failing restorations in the anterior region. However, implant placement in the aesthetic zone can pose significant clinical challenges. In cases with atrophic changes to the alveolar crest or limited space (especially in the anterior mandible), narrow-diameter implants might be indicated. In the following, Zurich-based dental implant specialist and researcher Dr Roland Glauser presents a clinical case in which a failing post and core restoration in the anterior mandible had to be removed and restored using a narrow-diameter zirconia implant (Patent™ Dental Implant System, Zircon Medical Management) and a crown. The manufacturer of the implant system used offers the possibility of designing dental implants individually using proprietary software, allowing Dr Glauser to tailor the planned implant to the anatomical conditions of the patient.

### Initial situation

The 45-year-old male patient was referred to my practice. He presented for initial consultation complaining about a crown on his endodontically treated tooth #41 that had become loose. The patient had an accident in his youth which resulted in the traumatic facture of the mandibular right central incisor. As a result, the tooth had to be endodontically treated and was restored with a gold post and core and a veneered ceramic crown (Fig. 1). The crown had been *in situ* without complications for 22 years. Upon removing the failing crown

**Figs. 2a & b:** Occlusal clinical view **(a)** and radiograph after removal of the insufficient crown and post in region #41 **(b)**.

and the post, a vertical root fracture was discovered (Fig. 2). Therefore, the remaining root was deemed unsalvageable.

## Treatment planning

Treatment would involve the extraction of root #41, and the restoration of this area with an immediate implant with immediate function using a provisional crown. Before the surgery, the dental laboratory conducted a spatial analysis on a study model. Additionally, the tooth to be extracted was ground off the stone model, and an implant analogue was placed in the ideal position. Thereafter, the glass fiber post was prepared on the model, and a shell provisional prosthesis was fabricated (Fig. 3). It incorporated wings to be placed on the neighbouring teeth to allow its correct positioning.

## Surgical procedure

After local anaesthesia had been administered, a rubber dam was placed for isolation and optimum control of the operative site. Root #41 was then extracted, and the extraction socket was carefully curetted to remove any fibrous tissue and examined (Fig. 4). The osteotomy for the immediate implant was prepared according to the drilling protocol of the implant manufacturer (Fig. 5). An individual two-piece narrow-diameter zirconia implant of 3.5 mm in diameter and 13.0 mm in length (Patent™ Dental Implant System, Zircon Medical Management), which was designed ahead of surgery, was inserted into the prepared osteotomy to a final torque of 28 Ncm, achieving adequate primary stability to proceed with the provisional prosthesis and immediate function (Fig. 6).

## Provisional prosthesis and soft-tissue augmentation

Immediately after implant placement, the glass fiber post, which was prepared in advance by the dental laboratory, was inserted into the 3C connection of the implant and cemented in place using RelyX™ Unicem dental cement (3M; Fig. 7). Afterwards, a guided bone regeneration procedure was performed using Bio-Oss Collagen® and a resorbable Bio-Gide® membrane (Geistlich Pharma) to fill the gap between the wall of the extraction socket and the implant (Figs. 8 & 9). A circular hole was punched in the membrane to allow it to be placed over the grafted site with the implant penetrating through, enabling provisionalisation. The post was then isolated to avoid any chemical reaction between the glass fiber post and the composite. The provisional prosthesis was relined on the post with flowable composite (Fig. 10). The wings were subsequently cut off, and the crown was polished. The crown was cemented using a temporary cement (Temp-Bond™, Kerr Dental), and a lingual vent hole allowed for excess cement to be evacuated. A connective tissue graft was placed labially to bulk up the soft tissue and increase volume (Fig. 11). The grafted site was finally sutured closed (Fig. 12).

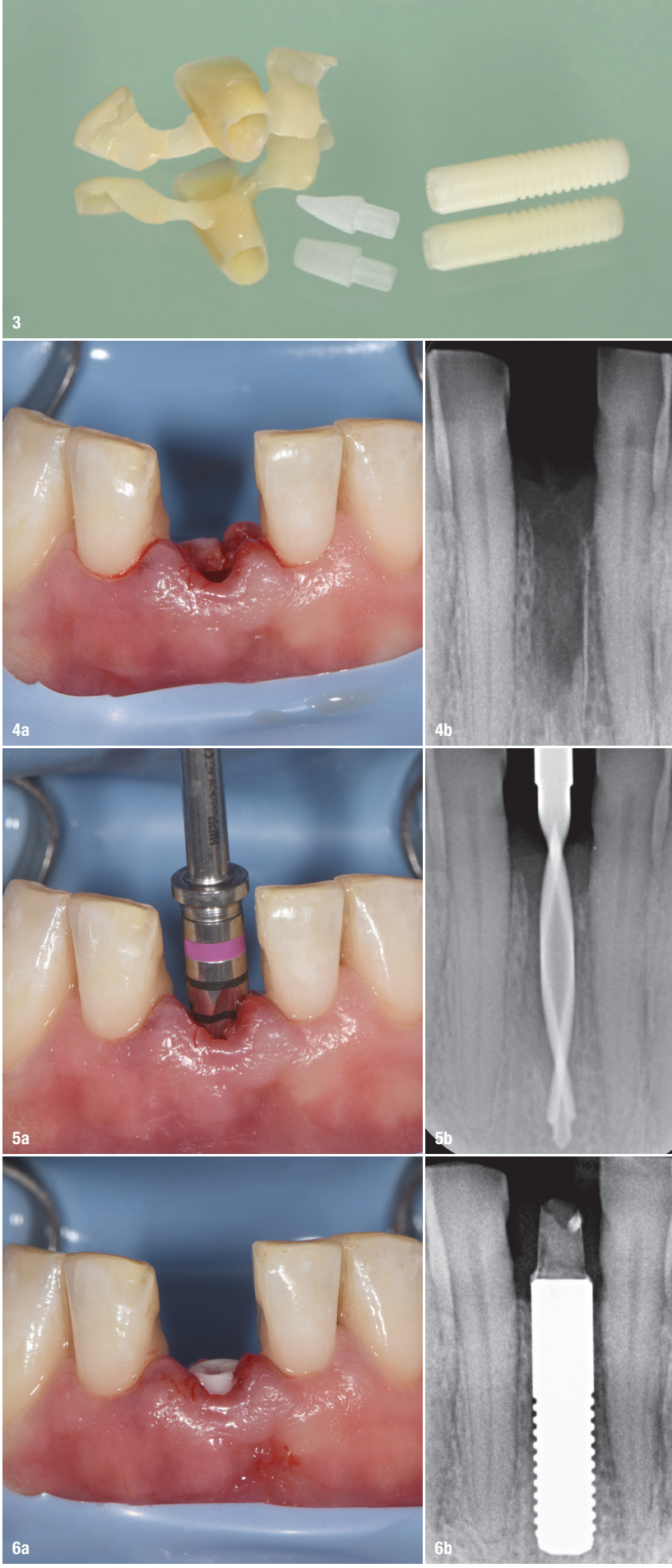



**Fig. 3:** From left: The shell provisional prosthesis with wings to be supported on the neighbouring teeth, the glass fiber post prepared in advance, and the individual narrow-diameter implant. **Figs. 4a & b:** Frontal clinical view **(a)** and radiograph after root extraction **(b)**. **Figs. 5a & b:** Frontal clinical view **(a)** and radiograph of the osteotomy preparation **(b)**. **Figs. 6a & b:** Frontal clinical view **(a)** and radiograph after immediate implant placement **(b)**.

## Healing and definitive restoration

At the three-week follow-up, healing was considered uneventful (Fig. 13). At the nine-month follow-up (Fig. 14), a conventional full-arch impression was taken, which served as the basis for the fabrication of the master model and the definitive crown by the dental laboratory (Figs. 15 & 16). At the ten-month follow-up, the definitive prosthesis was delivered (Fig. 17). At the 12-month follow-up, the definitive prosthesis was considered highly aesthetic, and the peri-implant soft-tissue conditions were stable and healthy (Fig. 18).

## Discussion

Restoring mandibular incisors with dental implants is a surgical and prosthetic challenge owing to the lack of space. Treatment planning with the final prosthetic outcome in mind is critical. The procedure described here employs a guided approach based on the crown position. Surgically, immediate placement requires a more lingual position of the implant, leaving some space between the implant and buccal plate, hence the guided bone regeneration procedure, in which some bone substitute was placed in the gap to support the buccal plate and maintain volume. To further enhance aesthetics and volume, a fibrous tissue graft was placed just under the cervical part of the crown. Moreover, the implant used incorporates a true soft-tissue-level design and is placed at the equigingival level. This means that its crown margin is clearly visible and accessible during the entirety of the prosthetic proce-

**Fig. 7:** Frontal clinical view of the glass fiber post cemented in place. **Fig. 8:** Occlusal clinical view prior to guided bone regeneration. **Fig. 9:** Bio-Oss Collagen®, resorbable Bio-Gide® membrane, and connective tissue graft. **Figs. 10a & b:** Frontal **(a)** and occlusal clinical views of the cemented provisional crown **(b)**. **Fig. 11:** Frontal clinical view of the connective tissue graft *in situ*. **Figs. 12a & b:** Frontal **(a)** and occlusal clinical views of the sutured grafted site **(b)**. **Fig. 13:** Frontal clinical view three weeks post-op. **Figs. 14a & b:** Frontal **(a)** and occlusal clinical views at the nine-month follow-up, before final impression taking **(b)**.

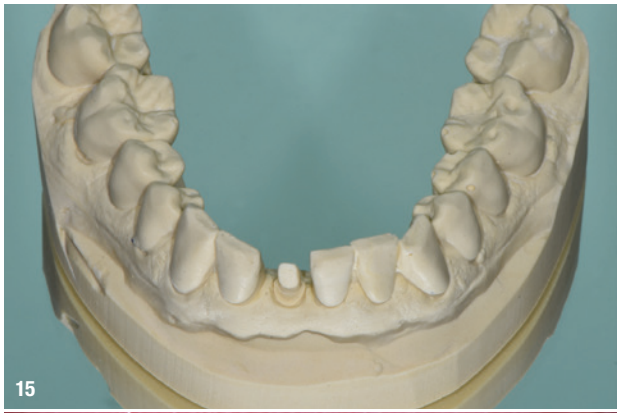







**Fig. 15:** The master model. **Fig. 16:** The definitive crown. **Figs. 17a & b:** Frontal **(a)** and occlusal clinical views ten months post-op **(b)**, immediately after cementation of the definitive crown. **Fig. 18:** Frontal clinical view of the final result at 12 months, two months after cementation of the definitive crown.

Author details

dure. For the same reason, excess cement can be easily and completely removed after cementation of the glass fiber post. Designing the provisional prosthesis with a vent hole allows any excess cement to be evacuated lingually instead of being pushed down into the sulcus. As a result, the risk of cementitis due to subgingival cement remnants is virtually non-existent.

## Conclusion

For implant-supported restorations in the aesthetic zone, especially in the anterior mandible, where there might be limited space, the narrow-diameter zirconia implant used in the case described presents a viable treatment option. One year after surgery, the treatment outcome was considered functional and highly aesthetic thanks to the beneficial soft-tissue integration of the implant, and an increase of keratinised gingiva could even be observed. Another factor decisive for the excellent treatment outcome was that I was able to design the implant individually in advance using the proprietary design software of the implant manufacturer and, by doing so, tailor it to the unique anatomical conditions of the patient.

## contact

**Dr Roland Glauser**
Cosmodent AG
am Bahnhofplatz
Bahnhofplatz 9
8001 Zurich
Switzerland
+41 44 266 1111
www.cosmodent.ch

# Tricortical stabilisation in severely atrophic buccal bone

## A technique for immediate anterior aesthetic zirconia implant restoration

Drs Leon Chen & Jennifer Cha, USA

**A goal of implant placement** is the provision of an osseointegrated fixture to support an aesthetic and functional restoration.[1] Imperative to the success of this treatment modality is ensuring optimal bone between the implant and periapical bone, bone–implant contact at the most coronal level and the least amount of buccal bone and soft-tissue recession or atrophy.[1]

However, a prolonged period of edentulism may result in extreme atrophy and resorption that compromise and complicate implant placement and restoration, particularly in the anterior maxilla.[2] A severely atrophied and resorbed maxilla may not present the requisite bone volume for achieving primary stability when conventional implant surgical techniques are undertaken.[2–4] As a result, conventional implant surgery techniques anterior to or below the sinuses are often contra-indicated because of insufficient bone mass.[2, 4]

Additionally, deficient buccal bone anatomy negatively affects aesthetics and is a significant causative factor of aesthetic implant complications and failures.[5] Inadequate buccal bone volume may cause a concavity in relation to

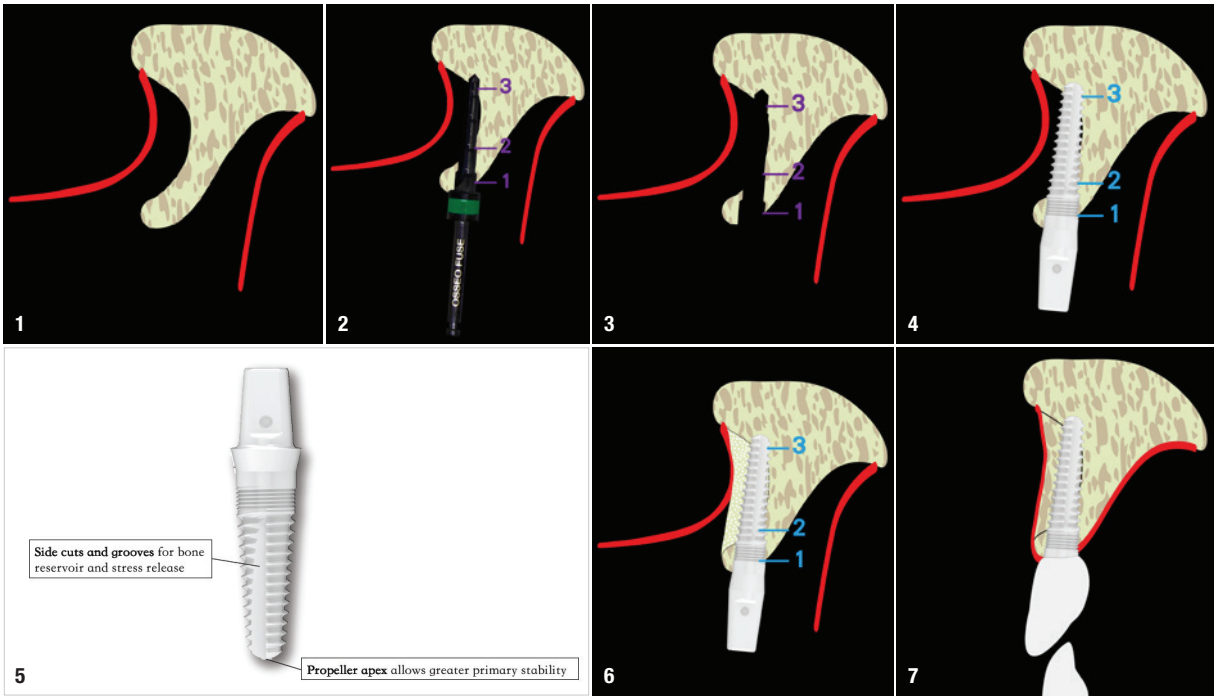



**Fig. 1:** Sagittal view illustration of a severe buccal plate undercut. **Fig. 2:** Sagittal view illustration of how an ideal osteotomy is made by first entering from the crestal plate, perforating the buccal plate and continuing into the apical portion of the buccal plate. **Fig. 3:** Sagittal view illustration of an osteotomy created with the tricortical stabilisation technique. **Fig. 4:** Sagittal view illustration of the placement and locking into position of the one-piece zirconia implant through three cortical plates (i.e. tricortical stabilisation). **Fig. 5:** The OsseoFuse® Z-40 (COHO Biomedical Technology) one-piece zirconia implant. **Fig. 6:** Sagittal view illustration of the implant placed with the tricortical stabilisation technique and placement of bone grafting material. **Fig. 7:** Sagittal view illustration of the anticipated definitive restoration results after six to eight months.

adjacent tissue levels, resulting in a dark shadow.[6] Furthermore, extraction procedures produce a gap between the buccal socket wall and implant, requiring pre-prosthetic grafting to maintain crestal bone levels and gingival crestal position.[5]

## Conventional preservation techniques

Therefore, preservation and augmentation of the buccal plate are essential both to maintain gingival tissue position to prevent aesthetic compromises and to facilitate proper implant positioning and placement and, most importantly, primary implant stability and long-term osseointegration.[5] In cases with severe buccal resorption in the anterior region, this typically is accomplished by harvesting chin or ramus bone blocks, which are subsequently placed and stabilised with pins.[7, 8] Gaps remaining between the bone block and native bone are then filled with bone particulate and covered with a membrane. The goal in augmenting the buccal plate is to preserve the socket until maturation in order to facilitate implant stability and restoration aesthetics.[9]

Unfortunately, such conventional procedures require an eight- to 12-month healing period, after which an implant can be placed, providing all the bone has successfully matured. Ironically, creating the osteotomy requires drilling out approximately 50% of the grafted bone to house and stabilise the implant. Subsequently, an additional three to six months of healing is then required for osseointegration, after which yet another surgery is required to expose the implant and place an abutment.[5]

However, such currently accepted procedures are not immune to challenges. Harvesting autogenous bone through surgery at a donor site depends upon the presence of sufficient bone for harvesting, subsequent grafts are prone to resorption and the multiple surgeries required contribute to patient discomfort.[10, 11] The membrane may also be exposed, which could lead to membrane removal, incomplete bone growth and eventual treatment failure.[6] Additionally, failure of the bone block grafting technique can result from dehiscence, bone exposure and soft-tissue collapse owing to slow revascularisation.[6, 12, 13]

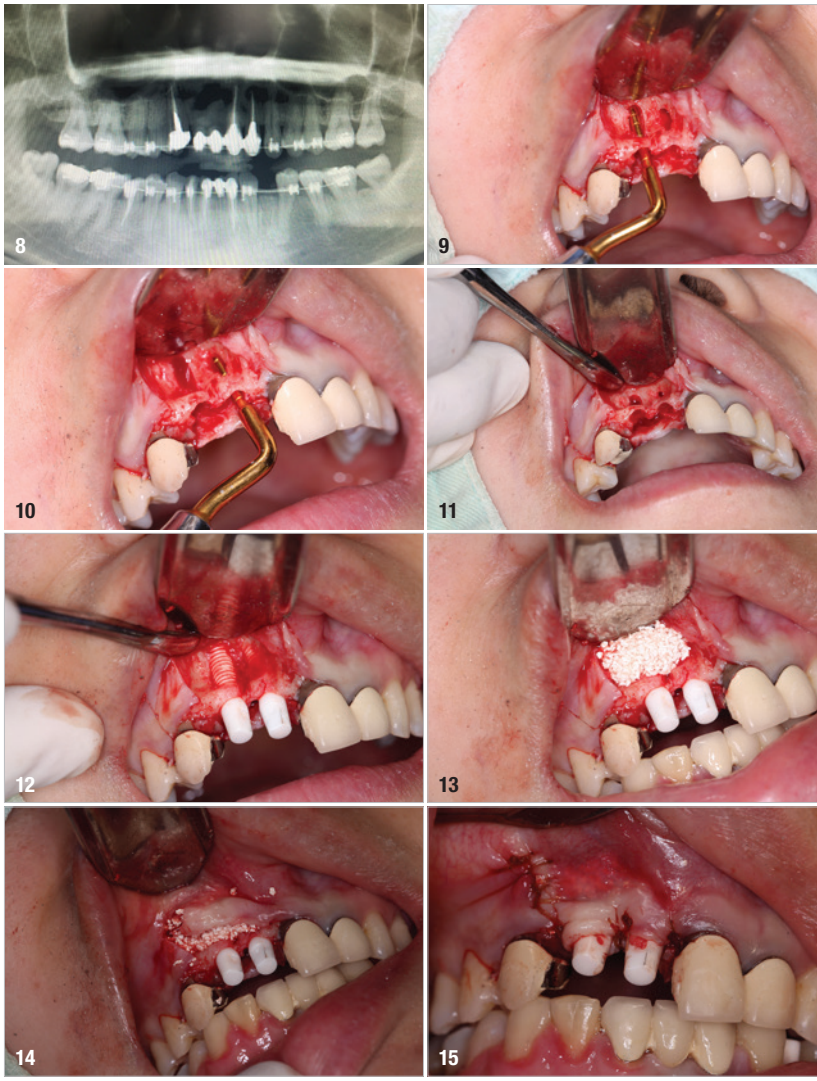


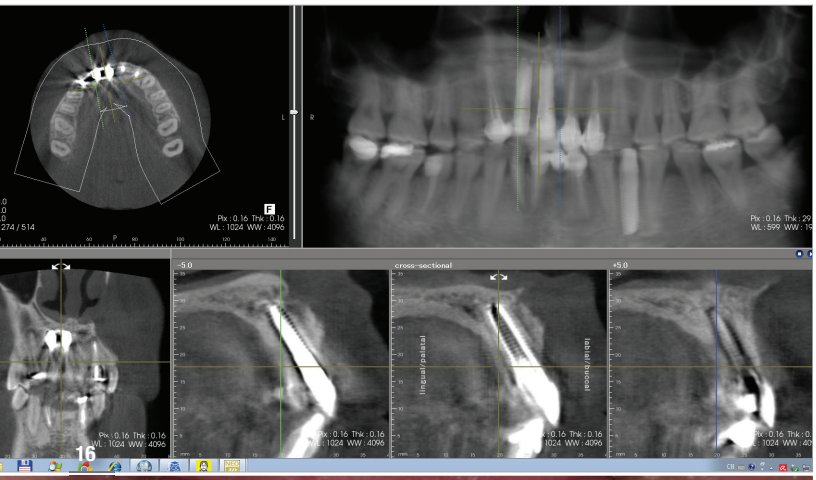

**Fig. 8:** Preoperative radiograph of the female patient whose maxillary right lateral and central incisors had been lost because of trauma 20 years earlier. **Fig. 9:** Buccal bone anatomy assessment using a condenser, revealing severe buccal undercuts at site #12. **Fig. 10:** Buccal bone anatomy assessment using a condenser, revealing severe buccal undercuts at site #11. **Fig. 11:** Osteotomy created with a preset drill according to the tricortical stabilisation technique. **Fig. 12:** Two implants placed. **Fig. 13:** Minimal bone grafting material filling the recessed buccal sites. **Fig. 14:** The buccal flap passively repositioned to cover the bone grafting material. **Fig. 15:** Primary closure.

## Current advancements

Considering the time required for conventional implant treatment procedures, materials and techniques have been incorporated over the years to optimise bone augmentation, implant placement immediately after extraction (or when sites demonstrate severe resorption and atrophy), and implant osseointegration.[3, 5] These have included materials for bone replacement (e.g. osteoconductive xenograft materials and osteoinductive synthetic materials) for scaffolding, as well as cell migration, adhesion, proliferation and differentiation.[5–7, 14–16] Although these options have eliminated the need for some surgical procedures (e.g. harvesting from donor sites and separate surgery for implant placement after bone remodelling) and demonstrate varying degrees of success, they are not completely predictable or efficient for patients and dentists for implant restoration of the anterior maxilla that presents with severe buccal atrophy and resorption.[6, 7, 14–16]

## Tricortical stabilisation technique

The tricortical stabilisation technique represents a clinically efficient and predictable means to place implants,



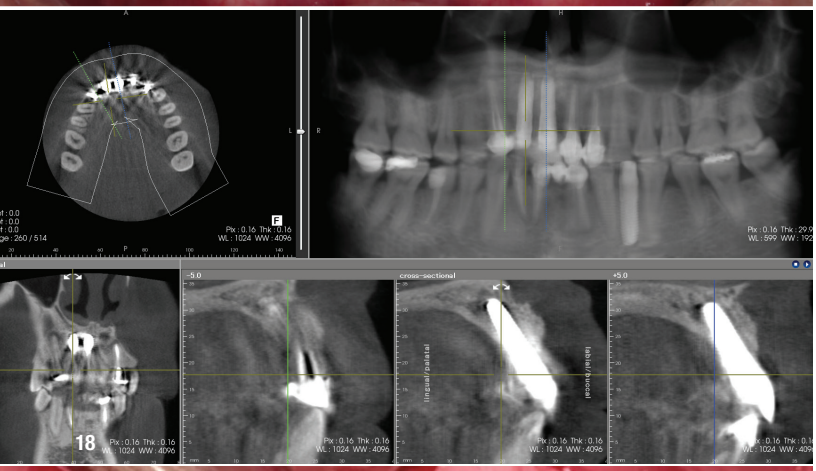


**Fig. 16:** Immediate postoperative panographic radiograph of the implants and bone grafting at sites #12 and 11. **Fig. 17:** Retracted view of the immediately placed provisional restorations on implants #12 and 11. **Fig. 18:** Four-month CT scan confirming buccal bone graft and implant integration at sites #12 and 11.

bone grafting material and provisional restorations at anterior sites demonstrating severe buccal plate undercuts and recessed and exposed buccal bone in one surgical appointment (Fig. 1). The cornerstone of the technique is the establishing of primary implant stability through three cortical plates (i.e. crestal plate, buccal plate and apical portion of the buccal plate) and filling remaining recessed buccal areas with bone grafting material at the time of implant placement.

After buccal plate recession and atrophy have been confirmed radiographically, a buccal flap is made (i.e. crestal incision and vertical incisions) to expose recessed areas, and a condenser is then used to evaluate buccal bone quality, paying special attention to determining the presence of severe buccal undercuts. A preset drill (OsseoFuse® One Drill® implant system) is used to create the ideal osteotomy by entering the site from the crestal plate, perforating the buccal plate and continuing into the apical portion of the buccal plate (Figs. 2 & 3).

To simultaneously promote primary stabilisation and contribute to procedural efficiency, the tricortical stabilisation technique then employs the one-piece zirconia implant OsseoFuse® Z-40 (COHO Biomedical Technology), which is placed and locked into position through the three cortical plates (Fig. 4). The one-piece zirconia implant is ideal for the tricortical stabilisation technique because it requires less maintenance and fewer procedural steps; it also effectively and tightly engages the tricortical bone to achieve the desired primary stability (Fig. 5).[17] Once primary stability has been



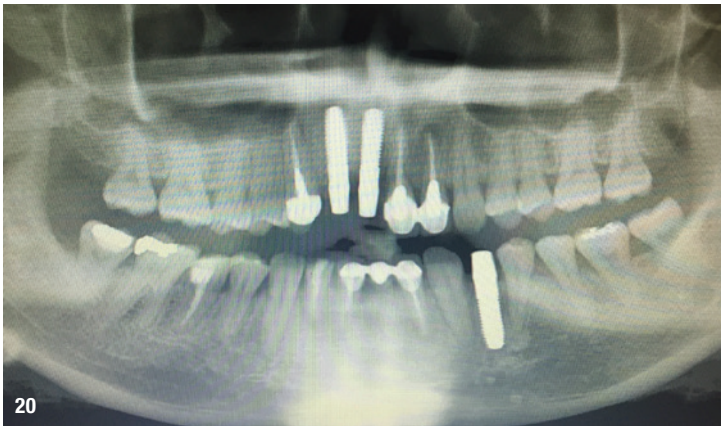


**Fig. 19:** Re-entry after 12 months, revealing completely intact and hardened bone grafting material. **Fig. 20:** Panographic radiograph after 12 months, confirming implant and buccal plate stability at sites #12 and 11.

achieved, only a minimal amount of bone grafting material is required, since it need only fill remaining recessed buccal areas not occupied by the implant (Fig. 6).

The main benefits of implementing the tricortical stabilisation technique include a single-stage surgical appointment, during which both implant placement and bone grafting material are placed; simultaneous fixed provisional restoration placement; and elimination of the need for bone block grafting, stabilisation pins and membranes, since the implant achieves optimal primary stability by locking into the three cortical areas. Additionally, because 50% of the recessed space is occupied by the implant itself, less bone grafting material is required. Overall, patients are relieved from undergoing multiple surgeries that typically span 18–24 months, as well as from wearing an uncomfortable removable provisional restoration. With the tricortical stabilisation technique, a definitive implant-supported restoration can be placed between six and eight months after the single surgical appointment (Fig. 7).

## Case presentation

A 28-year-old female patient presented with a fixed partial denture replacing teeth #12 and #11 that had been placed 20 years earlier. These teeth were lost as a result of trauma incurred during a bicycle accident. She was interested in a more aesthetic, stable and permanent replacement for these teeth and specifically enquired about dental implants.

Thorough oral and medical histories were taken, and intra-oral and radiographic examinations were performed (Fig. 8). Although nothing was found to contraindicate implant restorations at these sites, atrophy at sites #12 and #11 had resulted in severe buccal undercuts and buccal plate recession that could have presented challenges when establishing primary and long-term implant stability, as well as for anterior aesthetics. After discussions with the patient about the advantages and disadvantages of multiple-stage implant surgeries and restoration procedures, it was determined that the tricortical stabilisation technique would be undertaken for this patient. Both sites #12 and #11 would be restored with 3.75 × 13.00 mm one-piece zirconia OsseoFuse® Z-40 implants and immediate fixed provisional restorations.

## Clinical protocol

After the patient had been anaesthetized, a full-thickness buccal flap was created and elevated. A condenser was then used to assess the buccal bone anatomy, revealing severe buccal undercuts at sites #12 and #11 (Figs. 9 & 10).

Owing to the severe buccal plate recession at these areas, the osteotomies were performed using a preset drill (OsseoFuse® One Drill®) according to the tricortical stabilisation technique, using copious cold saline irrigation to minimise heat generation.[5] The drill first entered the crestal bone, continued through the exposed buccal plate and re-entered into the apical portion of the buccal plate (Fig. 11).

Two implants were then immediately placed into the tricortical osteotomies at sites #12 and #11 and achieved primary stability (Fig. 12). In this case, the selected implants were ideal because they enabled an efficient, minimally traumatic protocol, which subsequently contributed to patient comfort.[17]

Because the anatomy of the zirconia implants occupied most of the recessed areas and primary tricortical stabilisation had been achieved, only a minimal amount of an anorganic bovine bone grafting material (Geistlich Bio-Oss, Geistlich Pharma) was necessary to fill the remaining recessed buccal plate areas (Fig. 13). No barrier membrane was needed. The buccal flap was passively repositioned to cover the bone grafting material, and primary closure was achieved with #4/0 nylon suture thread (Figs. 14 & 15). An immediate postoperative radiograph was taken to confirm implant angulation and position (Fig. 16), after which fixed provisional restorations were placed on each implant (Fig. 17).

The patient returned four months later, after uneventful healing, at which time a CT scan confirmed maturation of the buccal bone graft, filling of the recessed and atrophied areas, and implant integration (Fig. 18). Excellent buccal volume and absence of inflammation around the implants were noted. Upon re-entry after 12 months, completely intact and hardened bone grafting material was observed (Fig. 19), and implant and buccal plate stability were evident radiographically (Fig. 20).

## Conclusion

The tricortical stabilisation technique represents a clinically efficient and predictable method for placing implants, bone grafting material and provisional restorations in one surgical appointment at anterior sites demonstrating severe buccal plate undercuts and recessed and exposed buccal bone. The technique enables dentists to provide patients with a single-surgery treatment that demonstrates stability, functionality and aesthetics, rather than requiring them to undergo multiple procedures or endure discomfort for an extended time.[18, 19] By strictly following the protocol presented in this case report, an implant can be immediately placed and provisionally restored at atrophic and recessed buccal sites resulting from prolonged edentulism. Although future clinical studies are necessary to confirm the long-term validity of this approach, previous research suggests that such a technique will support buccal bone regeneration.[18, 19]

Literature

## contact

**Dr Leon Chen**
+1 702 220-5000
drleonchen@gmail.com

Author details

**Dr Jennifer Cha**
+1 702 220-5000
drjennifercha@gmail.com

Author details

**Dr Niq Chen**
+1 702 220-5000
onedrillusa@gmail.com

Author details

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# “Patients come to us because they know we focus heavily on their health and well-being”

An interview with Dr Holger Scholz, Germany

**Dr Holger Scholz** is owner and manager of the Dental Clinic Konstanz private practice in Germany, specialising in metal-free and digital dentistry, and a consultant dentist at the Swiss Mountain Clinic in Castaneda in Switzerland. From the moment he used a metal-free implant made of zirconia, he was enthusiastic about the new possibilities offered by this material and recognised its potential. Dr Scholz deals intensively with holistic health concepts for a sustainably successful life, especially with the connections between nutrition, exercise, mental attitude and success. In the following interview, Dr Scholz talks about his experiences with the new generation of the whiteSKY ceramic implant system (bredent medical). The whiteSKY implant system has been proved clinically and scientifically since its introduction in 2006. Scientifically sound published long-term results of over ten years speak to its success, demonstrating that comparable results can be achieved with the whiteSKY zirconia implants to those achieved with titanium implants.

**Dr Scholz, when did you start using ceramic implants?**

I have been placing dental implants since 1996, and like most of my peers, I started with titanium implants. The year 2006 marks my first ceramic implant placement, and that moment was pivotal for me. I immediately realised the huge value and potential of ceramic implants, so much so that in the same year, I bought a new clinic and made it exclusively metal-free. Over two years ago, the German company bredent medical introduced me to its new-generation whiteSKY implant system, the Tissue Line and the Alveo Line. The R&D team at bredent asked my opinion about the new design, and from then onwards, I switched entirely to the whiteSKY dental implant.

**What initially convinced you of the whiteSKY concept?**

The quality of the material and the new design of the whiteSKY implant were the main reasons. The company

really impressed me with its quality management, and the extent to which it focuses on this was not something I had experienced with any other company. It is reassuring to know that the implants I am placing are the most stable and safest I could possibly use. Our figures show how confident we are about the system: 85% of our entire patient base has been treated with the whiteSKY dental implant and that equates to about 400 cases so far. I am particularly pleased with the fact that the Tissue Line allows the gingiva to have more growing space and therefore a healthier and more stable gingiva in the long term compared with other one-piece systems we have used. Using the whiteSKY metal-free dental implant fits perfectly with our clinic ethos, and our success is testament to this. Patients come to us because they know we focus heavily on their health and well-being.

**How important is a sound scientific basis to your decision?**
Many so-called metal-free implants actually have some level of metal within their production process. The bredent implants perform very well in relation to metallic contamination, that is, they do not contain nickel, which has been found in other ceramic implants. We also find that some metal-free systems contain a percentage of radioactive substances. A study published in 2020 highlighted that bredent medical implants do not contain any radioactive elements such as uranium or thorium. Our patients desire healthy solutions, and that is the reason why we are very happy with the Tissue Line and Alveo Line whiteSKY systems from bredent.

**What are the improvements with the new generation of the whiteSKY Tissue Line and the Alveo Line?**
I initially focused a lot on the Alveo Line whiteSKY dental implant because I was used to this kind of system. I found it had the ideal design for immediate implant placement. The wide implant shoulder is essential for immediate implantation: it offers the gingiva the opportunity to grow and protects the underlying bone during the healing phase. The wide shoulders are also very helpful for aesthetically and functionally great prostheses, especially in the posterior region. Almost 80% of the implants I placed were immediate restorations. Today, however in 70% of cases, I use the Tissue Line, the design of which is exciting for a wide number of clinical options. In my view, the quality and aesthetics of the gingiva are enhanced, far more so than with wide-platform implants. The Tissue Line however calls for more skill, as it is more difficult to place than the Alveo Line. The Tissue Line offers the perfect solution for me, but the Alveo Line is great too and allows a lot more variability.

We have very high-quality standards for the implants placed in our clinic. A modern ceramic implant must offer maximum safety on the one hand and an up-to-date design on the other. The new whiteSKY Tissue Line im-

plants fulfil both these requirements in a unique way. Whether immediate implantation or late implantation, in addition to the reliable osseointegration, I am particularly struck by the aesthetically pleasing, excellent gingival condition achieved within just a few weeks.

The first generation of the whiteSKY implant is one of the best-documented zirconia implant systems. Clinical and scientific evaluations have been carried out from the very beginning. Histological investigations confirmed the good osseointegration of the implants. These results have also been confirmed clinically. The long-term survival rate is on par with that of titanium implants. The bone level is stable in the long term, and the red–white aesthetics are outstanding. For the second-generation whiteSKY Tissue Line, the proven success factors were retained and customer-requested improvements introduced.

## about the interviewee

Dr Holger Scholz is the owner and manager of the Dental Clinic Konstanz, specialised in metal-free and digital dentistry and a consultant dentist at the Swiss Mountain Clinic in Switzerland. In 2006, Dr Scholz inserted his first metal-free implant made of zirconium oxide. From the first moment he was enthusiastic about the new possibilities offered by this material and recognised the huge potential.
Dr Scholz is a speaker and author on topics from the fields of digital and metal-free dentistry and (co-) author of various books. He is also a successful Peak Performance Coach (certified NLP master and coach) and deals intensively with sustainably successful life concepts, especially with the connections between nutrition, sport, inner attitude and success.

## contact

**Dr Holger Scholz**
Germany
info@tagesklinik-konstanz.de
www.tagesklinik-konstanz.de
www.bredent-implants.com

bredent



# The long-term success rate of two-piece ceramic implants has been around 97%.

An interview with Dr Elisabeth Jacobi-Gresser, Germany

**She was already** critically concerned with the material titanium when it was still considered biocompatible and inert. Dr Elisabeth Jacobi-Gresser is a practising oral surgeon specialised in implantology, who is also a founding member of the German Society for Environmental Dentistry (DEGUZ e.V.) and former director of the Integrative Dentistry curriculum of the Dental Association of Rhineland-Palatinate (Landeszahnärztkammer Rheinland-Pfalz). As a board member of the DGZI, she is engaged to implementing ceramic implantology to certified modular education and explains in the following interview with *ceramic implants—international magazine of ceramic implant technology*, what modern two-piece ceramic implant systems can and must achieve today.

**Dr Jacobi-Gresser, let's begin with one of the most important questions for dentists who insert implants: You have accomplished follow-ups in patients with ceramic implant for many years. What long-term observations have you made over a period of more than a decade?**

My experience with ceramic implants now extends back over 15 years. In the initial years, only one-piece implants of Y-TZP ceramic were available. The application was limited for known reasons. In strictly selected cases, specifically when treating a bounded edentulous space with optimal splinting during the healing phase, the long-term experience is extremely good. Over a period of 11 years, I have yet to see any late implant loss. Expanding the indication to include free end situations, I observed many early implant failures in the very early stage of ceramic implant development, so I very quickly ruled out this indication. Even today, I consider the early healing phase after insertion of a ceramic implant to be the "sensitive" phase. Retrospectively analysed, the long-term suc-

cess rate of two-piece ceramic implants has been around 97% over all, with a very low incidence (approximately 8%) of peri-implantitis.

**You use two-piece screw-retained ceramic implants. What is the percentage of these implants in your practice?**

There was an initial transition phase following the introduction of the two-piece ceramic implants in 2009. The abutment implant connection initially was still cemented/glued, but since 2017, the year of introduction of the reversible screw-retained ATZ implants into the market, I have switched over entirely to these ceramic implants. In particular, this is due to my expertise in environmental oral medicine and the more comprehensive view of the immunological condition of the patient or compelled to the patient's demand and expectation.

**What experiences have you had with two-piece metal-free implants?**

With the implementation of two-piece systems in 2009, my experience primarily has been focused on the ATZ implant system, which I retrospectively evaluate as very encouraging. After 30 years of experience with titanium implants before, I am especially excited about the excellent tissue reaction around the ceramic body, even in a long-term follow-up.

**Many implantologists are especially focused on the topic of healing. Is there a difference in ceramic implantology?**

The conditions for good healing are essentially comparable with titanium implant systems, as we know from pre-clinical osseointegration studies. However, the lower inflammatory reactivity of the immune system towards zirconia appeals for a more differentiated approach in planning the insertion of ceramic implants. As a result of the lower immunological reaction in terms of a less strong immune response to the foreign material, the osseointegration mechanism can be compromised, since the healing mechanism depends on adequate immune activity. The material itself requires a more "sensitive" approach: thread cutting is essential to minimise friction during the screwing procedure to avoid bone damage by heat. An adequate immune reaction is required during the healing phase for the osseointegration. Of importance is the patient's specific immune competence, too. The conditions for bone healing must be established based on a comprehensive patient history with information on medical restrictions as well as an analysis of key laboratory parameters. In addition to

"An implant approach considering knowledge in **clinical environmental medicine** helps to meet requirements, patients with risk profiles afford."

assessing the patient's general inflammatory predisposition, that is a thorough clinical history, and to record the status with regard to micronutrients such as various minerals, vitamin D3, etc. I believe the importance of these aspects increases especially in times when our immune systems are under heavy assault as for example in a pandemic.

**The grinding of ceramic implants is still a topic of discussion among implantologists. In your view, is it recommendable to grind ceramic implants in the mouth?**
Studies give proof of increased particle load of the peri-implant soft and hard tissue after grinding of ceramic implants, which can cause a tissue reaction similar to the pro-inflammatory immune activation caused by titanium particles, although less severe. This probably could be one of the potential causes of reported tissue degradation processes associated with ceramic implants approved for grinding. In an animal model, our research group examined ceramic test objects that were externally cut and plasma-cleaned and compared them with test objects that were subjected to a final "finishing" of the surface as for a commercial ATZ ceramic implant surface. It was shown that the cut surfaces released significantly more zirconium and aluminium into the tissue. Further comparative studies in human tissue samples are required.

**Various zirconium oxides are used for dental implants: ATZ, TZP and Y-TZP. How do they differ, and what are their advantages?**
I consider them differing in terms of physical and chemical properties in relation to corrosion resistance and stability, subsequently resulting in different effects with respect to corrosion debris in biological tissue. An implant fracture due to mechanical overload unfortunately implies a total failure due to material break down. Extensive comparative study results exist for screw-retained ATZ ceramic systems regarding stability under load and surface ageing compared with titanium. With regard to particle-induced toxic effects on tissue cells, comparative data are available for Y-TZP and titanium implants in animal models.

**You mentioned the patient's immunological response. Does everyone respond the same?**
In scientific studies it has been shown that both the genetic predisposition for increased inflammatory response as well as the individual immunological hyperreactivity to foreign substances like particles can trigger pro-inflammatory effects in humans. We should therefore pay attention to the patient's individual susceptibility. An individual risk assessment should be included in the planning process of an implant approach to minimise the risk of impairing the patient's health and to maximise the implant success in a long-term period.

**Which values matter here?**
In addition to evidence of a chronic "career of health deficiency" of the patient, appropriate laboratory analyses are also available for determining the individual genetic inflammatory predisposition. Laboratory blood assays are performed in specialised immunological laboratories for various implant materials. There have been functional tests available for years and innovative ones are currently under development, which have to be confirmed in clinical studies. An implant approach that considers knowledge in clinical environmental medicine helps to meet the needs of patients with risk profiles. We are able to select a better-tolerated implant material. The genetic predisposition is a given, but we can diminish the burden of harming epigenetic phenomena by avoiding invasive pro-inflammatory triggers.

**What do you think of the new German S3 guidelines for two-piece ceramic implants?**
The new S3 guidelines on ceramic implants consented to in September 2021 confirm the applicability and long-term success of one-piece implants, and two-piece ceramic implants are at least regarded as an option. The new guidelines will give support to the implantologists in conflict with private insurance companies, that still refer to the old guidelines from the year 2017. Only a few of them still refuse to refund the costs. The official publication of all new S3 guidelines in implantology is expected in the very near future.

## contact

**Dr Elisabeth Jacobi-Gresser**
Mainz, Germany
mail@jacobi-gresser.de
www.jacobi-gresser.de

Dentalpoint AG

Dr Elisabeth Jacobi-Gresser

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ISMI e.V. Office Leipzig
Holbeinstraße 29 | 04229 Leipzig | Germany
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# For the benefit of patients

## An overview of the ceramic implant societies around the globe

Janine Conzato, Germany

**Around the world**, a strong community of scientifically recognised and renowned specialists, of interested and motivated members of dental practices and universities, of strong and quality-oriented company partners, and of professional societies are all committed to one goal: the scientific production and dissemination of evidence-based and well-founded knowledge about dental ceramic implants for the benefit of patients. Dental implant treatment with ceramic implants is currently one of the fastest growing, most research-intensive and most innovative areas in dentistry. There continues to be a great deal of development in the market of ceramic implantology, and the need for evidence-based research remains high. These activities have to be carried out and accompanied by the dental profession within the framework of a non-profit professional society. The major ceramic societies are establishing curricula and intensifying their worldwide cooperation, and new professional societies are joining. The following provides an overview of the majority of current scientific societies for ceramic implantology operating all over the world. And more is yet to come, stay tuned for updates in our upcoming issues.

### Sociedad Argentina de Implantología Cerámica (SADIC)

**info@implantesceramicos.com.ar | www.implantesceramicos.com.ar**

In mid-2018, the Argentine society of ceramic implantology was created with the objective of promoting ceramic implantology in Argentina and the region by transmitting the experience acquired by its founders after almost a decade of practice and training. In an editorial in this issue, SADIC's president, Dr Enrique Reinprecht, explains the extremely difficult beginnings of the clinical practice of ceramic implantology in South America, owing to the lack of supplies and training. Undoubtedly, access to information has changed in recent years, allowing a large number of dental professionals to access the latest trends quickly. At the same time, an agreement of mutual aid and advice was reached with a company with a global reach, MABB (Z7 Zirconia Implant System), which, being the only one in South America, provides the necessary materials to achieve the founding objective. Surely other companies will follow this path, understanding the change required by the users of these technologies.

During its years of existence, SADIC has presented informative and training events throughout the country. It is in the process of engaging with various educational institutions (among them the University of Buenos Aires and the Asociación Odontológica Argentina, the Argentine dental association) in order to motivate dental professionals and students of these institutions to immerse themselves in ceramic implantology and learn about its benefits.

The work in South America is enhanced by SADIC's close relationship with the Brazilian academy of ceramic implantology, with whom its members share problems and solutions and pursue the same objectives. It is hoped that the actions to come will make other institutional relationships possible. Long-standing entities such as the International Society of Metal Free Implantology, International Academy of Ceramic Implantology, European Society for Ceramic Implantology and European Academy of Ceramic Implantology are references for SADIC and examples to follow.

### Academia Brasileira de Implantologia Cerâmica (ABICeram)

**www.instagram.com/abiceram/ | +55 51 991230174**

Before 2016, there was no ceramic implant brand in Brazil registered with the Brazilian Health Regulatory Agency, and it was only a few pioneering dentists with links to Europe and the US

who had any clinical or research experience with ceramic implants. These pioneers imported implants and used them for specific cases or research in Brazil or abroad. The registration of the first ceramic implant brand in Brazil in 2016 made it suddenly much easier for clinicians to gain and share experiences. As zirconia implants were a hot topic at that time, lectures and meetings started to take place all over the country. In 2018, with the support of the International Academy of Ceramic Implantology (IAOCI), the first South America Ceramic Implant Symposium was organised by Drs Rodrigo Beltrão and Sammy Noumbissi in Pôrto Alegre in Brazil and was attended by national and international speakers. The event was successful and a great opportunity for those from South America and Brazil in particular to meet and share experiences. In 2019, Drs Beltrão and Noumbissi, together with Dr Rogério Salinas, organised the second South America Implant Symposium in São Paulo in Brazil, and that was the moment when they decided to create the Brazilian academy of ceramic implantology, ABICeram. Because of the pandemic, the association is still in the embryonic stage. In the meantime, ABICeram organises meetings online and is in the process of legally establishing it and linking up with the IAOCI and European Society for Ceramic Implantology as supporters.

## European Academy of Ceramic Implantology (EACim)

**eacim-ceramic-implantology.com**

More than ever, the EACim is joining the efforts of its partners to build the future and to convey information on this approach to implantology to the greatest number of dentists in all of Europe. On 23 April in Belgium, three founding members of the EACim, Drs Pascal Eppe, Philippe Duchatelard and Giancarlo Bianca, brilliantly represented the academy in lectures on zirconia implantology in partnership with the Belgian dental society Société de Médecine Dentaire. On 2 June, Drs Simon Tordjman and Eppe were in Paris in France to give a presentation on the advantages of PEEK on zirconia implants. On 9 June, the EACim hosted an event in Brussels in Belgium, gathering about 50 participants, in which Drs Tolomeo Boioli and Eppe discussed the topic of zirconia implantology and biological dentistry.

The next major EACim event is planned for 15 October in Brussels, during which workshops will be presented by two of the EACim's international ambassadors: Dr Marcel Wainwright from Germany and Dr Norbert Cionca from Switzerland. Participants will have the opportunity to spend a whole day with them dedicated to the use of piezo-surgery and mucogingival surgery in ceramic implantology. The EACim's next major international congress is scheduled for 10 June 2023 in Paris and will offer a scientific programme of international speakers and experts in ceramic implantology.

The EACim shines through the communications of its members and ambassadors. Its mission is to transmit the academy's passion for advancing implantology by integrating zirconia implantology into dentists' therapeutic tools.

## International Society of Metal Free Implantology (ISMI)

**office@ismi.me | www.ismi.me**

In January 2014, the ISMI, International Society of Metal Free Implantology, was founded in Constance, Germany. The founding president is the implantologist and pioneer in the field of ceramic implants, Dr Karl Ulrich Volz. The other founders include well-known implantologists from Germany and abroad. The aim of the professional society, founded on the initiative of specialists in ceramic implants, is to promote metal-free implantology as an innovative and particularly forward-looking direction within implantology. In addition, ISMI is committed to the comprehensive establishment of metal-free implant treatment concepts in its public relations work in specialist circles and in patient communication. In addition to patient promotion and public relations, the international society offers its members a number of benefits, such as an individual profile page for each active member of the society, an online specialist archive and chat function on the topic of metal-free implantology, interesting continuing education offers and a regularly published newsletter as well as free subscription to the magazine *ceramic implants*, which is published three times a year in English. The current president of ISMI is Dr Dominik Nischwitz from Tübingen, a specialist in biological dentistry and ceramic implants.

# 51ST INTERNATIONAL ANNUAL CONGRESS OF DGZI

30 September–1 October 2022
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## Programme for dentists and dental technicians

### FRIDAY, 30 SEPTEMBER 2022

**FUTURE PODIUM—Young Generation DGZI**

09:00 – 09:15 **Dr Georg Bach/GER—DGZI President**
Opening ceremony

09:15 – 09:55 **Dr Jochen Tunkel/GER**
Social media—a must-have for the implantological practice?

09:55 – 10:35 **Priv.-Doz. Dr Dr Eik Schiegnitz/GER**
Update on augmentation and soft-tissue management

10:35 – 11:15 **Prof. Dr Sigmar Schnutenhaus/GER**
Interface aligner implantology

11:15 – 11:45 **Speaker and podium discussion**
The speakers and the scientific leader/host discuss the relevance of the presented developments for the daily clinical practice of implantologists.
Participants have the opportunity to actively take part in the discussion.

11:45 – 12:30 **Break/Dental exhibition**

**OP-TUTORIALS**

12:30 – 13:30 **OP-Tutorial ❶** straumanngroup
**Priv.-Doz. Dr Puria Parvini/GER**
Immediate implant placement and immediate restoration in the aesthetic zone

13:30 – 14:30 **OP-Tutorial ❷** bicon
**Prof. Dr Mauro Marincola/ITA**
Minimally invasive implantology with greatly reduced bone volume

**TABLE CLINICS (TC)—Visions in Implantology**

15:15 – 16:00 **Session 1, TC table 1–20**
16:00 – 16:15 Change of table
16:15 – 17:00 **Session 2, TC table 1–20**
17:00 – 17:15 Change of table
17:15 – 18:00 **Session 3, TC table 1–20**

More information: www.dgzi-jahreskongress.de

18:00 – 20:00 **Get-together at the congress/exhibition area**

### SATURDAY, 1 OCTOBER 2022

**SCIENTIFIC PRESENTATIONS**

09:00 – 09:10 **Dr Georg Bach—DGZI President**
Welcome and introduction of the speakers and scientific programme

09:10 – 09:40 **Prof. Dr Dr Peer Kämmerer/GER**
News from the bone!

09:40 – 10:10 **Priv.-Doz. Dr Dr Keyvan Sagheb/GER**
Minimally invasive versus augmentation—"The Mainz Concept"

10:10 – 10:40 **Prof. Dr Dr Florian Stelzle/GER**
The box technique as a basis for successful bone augmentation

10:40 – 11:00 **Speaker and podium discussion**

11:00 – 11:45 **Break/Dental exhibition**

11:45 – 12:15 **Priv.-Doz. Dr Peter Gehrke/GER**
Maximum safety with minimum effort: How much implant prosthetics is really necessary?

12:15 – 13:00 **Dr Kay Vietor/GER**
**MDT Björn Roland/GER**
Implant prosthetic high-end: Digital emergence profiling—The new gold standard?

13:00 – 13:30 **Dr Georg Bach/GER**
**MDT Christian Müller/GER**
Implant prosthetic troubleshooting

13:30 – 13:45 **Speaker and podium discussion**

13:45 – 14:30 **Break/Dental exhibition**

14:30 – 15:00 **Priv.-Doz. Dr Dr Stefan Röhling/GER**
Ceramic implants in the mouth—does everything really run smoothly?

15:00 – 15:30 **Prof. Dr Jürgen Becker/GER**
**Nicole Rauch/GER**
Ceramic implants—scientific facts and long-term experience in clinical use

15:30 – 16:00 **Dr Elisabeth Jacobi-Gresser/GER**
Immunological effects of titanium and zirconium oxide implants

16:00 – 16:15 **Speaker and final discussion**

## Organisational matters

### CONGRESS FEES

**Friday, 30 September and Saturday, 1 October 2022**

| | |
|---|---|
| Dentist/dental technician DGZI member | €295* |
| Dentist/dental technician non-member | €345* |
| Medical assistant (with proof) DGZI member | €120* |
| Medical assistant (with proof) non-member | €135* |
| Student (with proof) | only conference fee |
| Conference fee** | €118 excl. VAT |

### TEAM FEES

**Friday, 30 September and Saturday, 1 October 2022**

| | |
|---|---|
| Dentist + dental technician DGZI member | €395* |
| Dentist + dental technician non-member | €475* |
| Dentist + assistant DGZI member | €375* |
| Dentist + assistant non-member | €400* |
| Conference fee** per person | €118 excl. VAT |

* The reservation is made on behalf of and on the account of DGZI e.V. incl. 7% VAT.

** Incl. coffee breaks, drinks and lunch. The conference flat rate has to be paid by every participant.

**Online registration: www.dgzi-jahreskongress.de**

### ORGANISER

**DGZI e.V.**
Paulusstraße 1 | 40237 Düsseldorf | Germany
Phone: +49 211 16970-77
Fax: +49 211 16970-66
sekretariat@dgzi-info.de
www.dgzi.de

### ORGANISATION | REGISTRATION

**OEMUS MEDIA AG**
Holbeinstraße 29 | 04229 Leipzig | Germany
Phone: +49 341 48474-308
Fax: +49 341 48474-290
event@oemus-media.de
www.oemus.com

### VENUE

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## 51ST INTERNATIONAL ANNUAL CONGRESS OF DGZI

Registration form via Fax to
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04229 Leipzig
Germany

I would like to register the following persons bindingly for the 51st International Annual Congress of DGZI on 30 September and 1 October 2022 in Berlin, Germany (Please mark accordingly):

**Online registration: www.dgzi-jahreskongress.de**

❑ yes ❑ no | ❑ Friday ❑ Saturday | ❶___ ❷___ ❸___ (of chosen table clinics)

Academic titel, last name, first name, profession — DGZI member — Participation

❑ yes ❑ no | ❑ Friday ❑ Saturday | ❶___ ❷___ ❸___ (of chosen table clinics)

Academic titel, last name, first name, profession — DGZI member — Participation

Evening event on Friday, 30 September 2022 ____ (# of persons)

Stamp

I am hereby agreeing to the general terms and conditions of the 51st International Annual Congress of DGZI.

Date, Signature

E-mail address (Please declare, you will receive the invoice and certificate via e-mail.)

Zircon Medical Management

## Master of zirconia: The Patent™ Dental Implant System

While other ceramic implant manufacturers struggle with early osseointegration failure and high fracture rates, Zircon Medical Management, the manufacturer of the Patent™ Dental Implant System, together with leading scientists and a team of highly experienced material experts, has succeeded in mastering the complex process of manufacturing zirconia implants in a unique way—employing a process that has been protected by 14 patents. All surface-machining steps are carried out prior to sintering. Through the proprietary manufacturing process, a surface roughness is achieved (6 µm) that is up to five times rougher than conventional zirconia implant surfaces. In the subsequent sintering stage, potential process-related microcracks are eliminated. Moreover, the design of the Patent™ Dental Implant System does not merely mimic the design of titanium implants. Rather, its design was purposefully engineered to perfectly complement the material characteristics of zirconia. The result is a true tissue-level zirconia implant that is unparalleled in terms of fracture resistance, osseointegration and long-term stability. In addition, the entire manufacturing process—from raw material assembly to milling and final packaging—takes place exclusively at two proprietary production sites in Germany. Therefore, Zircon Medical Management is able to guarantee Patent™ users absolute quality control. Choose long-term stability. Choose reliable osseointegration. Choose Patent™ Implants from Zircon Medical Management, the master of zirconia.

The two-piece Patent™ Dental Implant System is entirely metal-free. It consists of the implant itself and an incredibly strong yet flexible glass fibre abutment, which, having dentine-like properties, attenuates the masticatory forces within the context of definitive restoration.

**Zircon Medical Management AG, Switzerland**
**+41 78 8597333**
**www.mypatent.com**

Zeramex XT

## Unique implant–abutment connection

The material of the future, zirconium dioxide, the two-piece design of the implant, the unique implant–abutment connection, the conventional and digital workflow, the outstanding clinical results and the know-how from 17 years of research and development are what make the Zeramex XT ceramic implant system so successful.
The heart of the implant–abutment connection is the VICARBO® screw made of carbon fibre-reinforced high-performance PEEK. The principle: the implant made of zirconium dioxide absorbs the compressive forces, while the VICARBO screw counteracts tensile and bending forces. The design of the external thread ensures high primary stability and the microstructured and hydrophilic Zerafil surface demonstrates convincing osseointegration with a success rate of 98%.[1]
Recent studies show several advantages of zirconium dioxide over other materials: it has lower plaque accumulation as well as lower bacterial adhesion and contributes to better blood circulation in the soft tissue.

**Dentalpoint AG, Switzerland**
**+41 44 38883636**
**info@zeramex.com**

ClaroNav

## Introducing Navident 4: Why do I need one?

Are you constantly looking for ways to elevate and differentiate your practice from mainstream dental providers? We know the challenges you face when you are aiming for the highest levels of performance and results—both functionally and aesthetically.

Navident provides breakthrough surgical navigation with advanced function and form. From more efficient single implant replacements to a fully edentulous rehabilitation workflow, Navident is poised to revolutionise and differentiate your practice: Conduct high-precision implant treatments quickly and confidently. Reliably detect important anatomical structures. Locate root canals and other fine anatomical structures with precision and efficiency. High-precision navigation of your piezotome enables accurate assessment and predictable outcomes.

The new Navident system is equipped not only with next-generation, 3X resolution camera technology, but also provides everything from ergonomic design to reimagined touchscreen interface, and is created to provide smooth workflow integration for clinicians at every stage of their career. Precision dentistry for the precision dentist.

Navident 4 comes in cart-based or new wall or ceiling mount configurations for ultimate versatility. Navident 4 is now available at a special pre-order price and shall be showcased at the EAO Congress in Geneva (booth G10).

**ClaroNav, Canada**
**+1 647 951-1525**
**anna@claronav.com, www.claronav.com**

Z-SYSTEMS

## Z-SYSTEMS Ceramic Implants—100% Ceramic, 100% Swiss

Ceramic implants have been at the cutting-edge of dental implant technology for over a decade, and are becoming increasingly popular with patients and practitioners worldwide. As a market leader, Z-SYSTEMS has taken another leap forward with its innovative Z5-BL (Bone Level) and soon-to-be-released Z5-TL (Tissue Level): the world's first two-part, screw-retained implants made entirely of ceramic. For the first time, completely submerged healing is now also possible with ceramic implants. The Z5-BL's advantages are evident in its beautiful bone level design and a unique variety of abutments. A high-precision, extremely stable conical connection between the abutment and the implant makes it possible to use this material even for the occlusal screw. Many practitioners also like to work with tissue level implants—especially in biological dentistry. In recognising these clinical demands, Z-SYSTEMS is rapidly following the release of the Z5-BL with an equally-revolutionary Z5-TL. These latest releases build on the proven platform of Z-SYSTEMS heritage line: the Z5m, Z5m(t) and Z5c. Each Z-SYSTEMS product features the technology's unique, patented laser surface for outstanding osseointegration. The company's proprietary manufacturing process has produced a top-quality implant family renowned for its great durability. In addition to fixed restorations, removable locator-like abutments are also possible on all two-piece Z-SYSTEMS implants. Available lengths are 8, 10 and 12 mm and diameters are 3.6, 4.0 and 5.0 mm.

**Z-SYSTEMS Ceramic Implants**
**Switzerland**
**contact@zsystems.com (for USA/Americans & UK/MEA)**
**support@zsystems.com (for EU costumers)**
**www.zsystems.com**

CleanImplant Foundation

# Last call for current quality assessment study and education on implant impurities ex-factory at the EAO Congress in Geneva


CleanImplant Foundation experts continue the global awareness campaign concerning production-related contamination on new, sterile-packaged implants. CleanImplant Managing Director and Head of Research, Dr. Dirk U. Duddeck (left), will give insights and information about the latest study results to all interested colleagues at booth F50. *(© CleanImplant Foundation)*

The non-profit CleanImplant Foundation will attend the 29th Scientific Congress of the European Association for Osseointegration (EAO) from 29 September to 1 October 2022 with its information booth at F 50. In the setting of the European congress, the Foundation continues its global awareness campaign concerning production-related contamination on new, sterile-packaged implants. On the same occasion, Dr Dirk U. Duddeck, Managing Director and Head of Research at CleanImplant, aims to advance the implant procurement for the Foundation's current and fifth overall scientific study on the quality of dental implants. The presence of numerous implant manufacturers is sought to conclude the collection process, initiating the next iteration of the large-scale quality assessment study conducted in collaboration with internationally renowned universities such as the Charité–University Medicine in Berlin, Germany.

In what has become the most extensive overview of surface cleanliness performances across the entire industry, the surfaces of commercially available implant systems are examined for concerning remnants from the production processes using complex, state-of-the-art SEM analyses. To ensure a comprehensive overview of the manufacturing quality of the implants available for sale on the market, the implant types to be tested were, in advance, selected by the Foundation's scientific advisory board. All implant manufacturers with implants examined in the study are invited to participate in this study.

Results of the previous year's studies are alarming: Over a third of all sterile-packaged and "ready-to-use" implant types exhibited significant levels of foreign particles and concerning residues on their surfaces. However, there is an easy way to avoid purchasing untested, risky implants. At the information booth in Geneva, CleanImplant experts will inform about these contaminants' impacts and advise on selecting the best implant systems: With the "Trusted Quality"-seal, CleanImplant creates transparency and awards implant systems with a high-quality surface. To date, selected implant types carrying the coveted seal are from manufacturers such as Biotech Dental, bredent medical, BTI, CAMLOG, Global D, medentis medical, MegaGen, NucleOSS, Sweden&Martina, Zircon Medical, and SDS. The quality seal is valid for two years. Other implant systems are currently undergoing the testing process.

**CleanImplant Foundation**
**+49 30 200030190 · www.cleanimplant.com**

ISMI

# State-of-the-Art—The 6th Annual Meeting of ISMI

Under the motto "Ceramic Implants – State of the Art", the International Society of Metal Free Implantology e.V. (ISMI) invited participants to its 6th Annual Meeting at the Dorint Kurfürstendamm Hotel in Berlin on 24 and 25 June 2022. Renowned experts and users from Germany and abroad shared their knowledge with the interested participants. Practical application examples, current trends in the use of ceramic implants and biological aspects of metal-free implantology were the focus of diverse discussions. Satisfied participants, happy speakers and a full industrial exhibition—a truly successful 6th Annual Meeting, which was attended not only by dentists and implantologists, but also by some master dental technicians.

Two workshops and ten lectures provided a varied update programme on metal-free implantology for interested participants. Prof. Dr Dr Dr Shahram Ghanaati kicked off the event with the pre-congress symposium. Dynamically and at eye level, he spoke to the numerous participants in the mectron workshop about the scientific use of blood concentrates to support the patient's own regeneration and about regenerative-supportive measures to preserve the tooth. He also presented the new S3 guideline on the use of platelet rich fibrin (PRF) in dental implantology, which will come into force in September. In the second pre-congress workshop, the dentist Prof. Dr Marcel Wainwright, who works in Luxembourg, presented, together with the company Zircon Medical Management, a selection of clinical cases that were restored with Patent™ implants, taking holistic aspects into account. Prof. Wainwright focused on the problem of increasing material intolerance and the growing health awareness of patients—this also has a direct influence on the dental and implantological treatment of patients.

The highlight of the first day of the congress was the ISMI White Night on the MS Poseidon. Together with the speakers, the participants were able to float through the centre of Berlin on the Spree in a relaxed atmosphere. An exclusive menu, drinks and the magnificent view under the open sky brought the day to a successful close—even a small rain shower could not dampen the exuberant mood.

The second day of the congress, chaired and moderated by Dr Dominik Nischwitz and Dr Alexander Sobiegalla, was all about science. The international top speakers and audience included implantology-savvy dentists as well as medical experts who, in addition to focusing on ceramic implants, also discussed general health optimisation according to basic biological principles. In the industrial exhibition, company representatives and participants alike had the opportunity to exchange information about new products and already proven materials. An all-round service was also offered for the participants during the breaks: Lunch invited to a collegial exchange at the table.

1

**Fig. 1:** Dr Dominik Nischwitz– Vice President of ISMI and scientific drector of the congress.
**Fig. 2:** View of the podium at the 6th ISMI meeting in Berlin.

**OEMUS MEDIA AG**
**www.ismi-meeting.com**


2

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## Save the date:

Join us for the
7th Annual Meeting of ISMI
on **5 and 6 May 2023**
in Munich.

ESCI

# 2nd European Congress on Ceramic Implantology


ESCI Board of Directors: Dr Frank Maier, Dr Stefan Röhling (Vice President), Dr Jens Tartsch (President), Prof. André Chen, Member of Scientific Advisory Board: Prof. Ralf Kohal



**PART II FACTS of CERAMIC Implants**
**20.-22.Oct. 2022**
**Zurich-Switzerland**

Ceramic implants have developed from a marginal phenomenon to a serious factor in implantology. It is currently one of the fastest growing, most research-intensive and most innovative areas of dentistry. This makes a practice-oriented, but also scientific and evidence-based approach to the subject all the more important — only the facts count!

"Facts of Ceramic Implants, Part II" is the motto of the "2nd European Congress for Ceramic Implant Dentistry", which will take place on 20 and 21 October 2022 in Zurich, Switzerland.

Twenty-one internationally renowned speakers such as Prof. Ronald Jung, Prof. Tomas Albrektsson, Prof. Ralf Kohal, Dr Josef Choukroun or Prof. Bilal Al Nawas will present all backgrounds of ceramic dental implants with exciting lectures. The organisers of the ESCI promise a unique programme in the field of dental implantology with ceramic implants. The event will provide both the interested beginner and the experienced user with valuable new insights for the successful application of ceramic implants as a complementary and reliable therapy option to titanium implants. From the possibilities and limitations of the material zirconium dioxide to the biological background, to the professional clinical use, all relevant facts will be highlighted.

The ESCI is a hub for outstanding scientific research and for clinical and practical experience in dental implantology with ceramic implants. Thus, the "2nd European Congress for Ceramic Implant Dentistry" will also have some special features: "Facts of Ceramic Implants" offers young researchers and all ESCI members the opportunity to present their research results and their clinical cases during the "short lecture sessions". The best presentation in its category will be awarded with the "ESCI Award". The pre-congress workshops, which are free of charge for congress participants, offer the opportunity to familiarise themselves with the various systems.

The venue was also chosen with care. Just ten minutes from Zurich — located directly on Lake Zurich — the Bocken Congress Centre in the middle of the countryside not only offers an inspiring environment for serious congress content, but also enables an escape from everyday life, a common exchange and intensive networking. Thus, in addition to the scientific programme, the location, the social framework of the congress as well as the ESCI Gala Dinner will be something very special.

**European Society for Ceramic Implantology**
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100 years of IDS

## High number of exhibitors confirms the international leader status of the most important, global dental show


IDS, the International Dental Show in Cologne is demonstrating all of its strengths: At the coming event from 14 to 18 March 2023, almost all of the relevant key players have already confirmed their participation. In total, IDS is currently recording well over 1,000 exhibitors as well as 11 country participations with over 400 companies represented. “The global appeal of IDS as the most important industry platform is the driving force for both a successful present and future of the international dental family. 100 years of IDS stands for innovation and constant performance at the highest level and is thus also a synonym for the strength of the dental industry. And together we will position IDS as the leading international dental trade fair over the next decades,” Mark Stephen Pace, Chairman of the Association of German Dental Manufacturers (VDDI), and Oliver Frese, Chief Operating Officer of Koelnmesse, emphasised in a joint statement. Once again, IDS will cover the comprehensive spectrum of the dental world–from the dental and dental technology section, infection protection and maintenance, through to services, information, communication and organisation systems as well as organisation tools.

**Source: IDS Cologne**

Leadership and caries prevention

## Study finds clinic leadership has direct impact on level of preventive care


Based on data on more than 5,300 patients and information on the work environment of 75 public dental clinics, the authors of a recent study concerning dental clinic leadership in Malmö, Sweden, found that patients were more likely to receive necessary preventive care if the clinic was run under a high quality of leadership, as assessed by the opinions of the clinical staff. High-quality leadership also fostered a collaborative work climate and allowed for clear role expectations and low staff burnout.

In Sweden, more than half of the adult patients who receive treatment for dental caries are diagnosed with new caries within two years, despite diligence in attending follow-up appointments, indicating that providing evidence-based preventive care is complicated. In their study, the authors found that less than 10 per cent of the patients evaluated actually received preventive care along with their restorative treatment. The authors emphasised the importance of good clinic leadership for helping staff to build a better focus on prevention and the need for clinic leadership to create a work climate that reduces barriers for patients to voice their opinions and that enhances staff priority to provide preventive care.

The study also found that, statistically, caries prevention was more likely to be provided to patients who were younger, were male, had a lower level of education and were born outside of Scandinavia. Income had no effect. These findings support that groups at highest risk tend to receive the most prevention independent of income, thus counteracting social inequality in health as intended by Swedish healthcare legislation.

**Source: Dental Tribune International**


Global oral health action plan

## FDI leads consultation with its stakeholders on WHO's draft

FDI World Dental Federation led a consultation with its stakeholders on WHO's draft global oral health action plan so that a comprehensive and consolidated response could be provided. Developments on the global oral health agenda have been very promising in the last few years. It was therefore of utmost importance that FDI provided input to the public consultation on WHO's draft global oral health action plan. To ensure all views were reflected, FDI led a consultation with its stakeholders, including its members, Council, Committees, Task Teams, partners, and other organisations to ensure a comprehensive and consolidated response could be submitted. The joint response to the public consultation of the global oral health strategy, which was supported by 65 organisations, made an impact on the final language included. The resolution on oral health requested WHO to translate the Global Strategy on Oral Health into an action plan for public oral health by 2023, including a framework for tracking progress with clear measurable targets of oral health to be achieved by 2030.

It is important to make your voice heard as it has been seen that it can influence outcomes and ultimately it will be everyone's responsibility to help implement the action plan so that it can be ensured "oral health for all" in line with FDI's Vision 2030.

**Source: FDI World Dental Federation**

Needle-free dental anaesthesia

## Successful pilot trial of needle-free dental anaesthesia

Researchers are literally taking the pain out of visits to the dentist after the successful creation and pilot trial of a needle-free device for dental anaesthesia for teeth extractions.

A collaboration between the University of Otago, University of Auckland, and Auckland University of Technology, the device differs from other needle-free dental jet injectors in that it is driven by a silent motor and is specifically designed for dental work.

Eight patients who all needed removal of top teeth as part of their treatment plan were included in the trial. All participants received both the traditional needle and the needle-free injection device.

The needle-free anaesthesia was the preferred technique by all of the participants at all stages, and six of the eight reported a pain-free extraction with the needle-free delivery. In two cases further anaesthetic was required by the traditional needle technique. Of the eight participants in the study, five were not considered to have dental anxiety, two had mild dental anxiety and one was classified as having high dental anxiety. The patients were followed for seven days. In all cases healing was "uneventful" irrespective of the technique used.

"Even though this was just a proof-of-concept trial, this device certainly could reduce or eliminate anxiety due to needle phobia," Professor Paul Brunton says. While the results of this study are encouraging, a larger clinical trial is the next step to validate the technique and to investigate whether it can be used for other dental treatments that require local anaesthesia.

**Source: University of Otago, New Zealand**

# Congresses, courses and symposia


**51st International Annual Congress of DGZI**

30 September–1 October 2022
Berlin, Germany
www.dgzi-jahreskongress.de

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**2nd Joint Congress for Ceramic Implantology**

14–15 October 2022
Kreuzlingen, Switzerland
www.joint-congress.com

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**2nd European Congress Ceramic Implant Dentistry**

20–22 October 2022
Zurich, Switzerland
www.esci-online.de

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**IDS – International Dental Show 2023**

14–18 March 2023
Cologne, Germany
www.ids-cologne.de

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ceramic implants

**international magazine of** ceramic implant technology

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*oemus@oemus-media.de*

**CEO**
Ingolf Döbbecke
*doebbecke@oemus-media.de*

**Member of the Board**
Lutz V. Hiller
*hiller@oemus-media.de*

**Chairman Science & BD**
Jürgen Isbaner
*isbaner@oemus-media.de*

**Editorial Council**
Dr Michael Gahlert (Germany)
Dr Sofia Karapataki (Greece)
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**Editorial Management**
Janine Conzato
*j.conzato@oemus-media.de*

**Executive Producer**
Gernot Meyer
*meyer@oemus-media.de*

**Product Manager**
Timo Krause
*t.krause@oemus-media.de*

**Art Director**
Alexander Jahn
*a.jahn@oemus-media.de*

**Designer**
Nora Sommer-Zernechel
*n.sommer@oemus-media.de*

Stephan Krause
*s.krause@oemus-media.de*

**Customer Service**
Marius Mezger
*m.mezger@oemus-media.de*

**Published by**
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Holbeinstraße 29
04229 Leipzig, Germany
Tel.: +49 341 48474-0
Fax: +49 341 48474-290
*kontakt@oemus-media.de*

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