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CI ceramic implants

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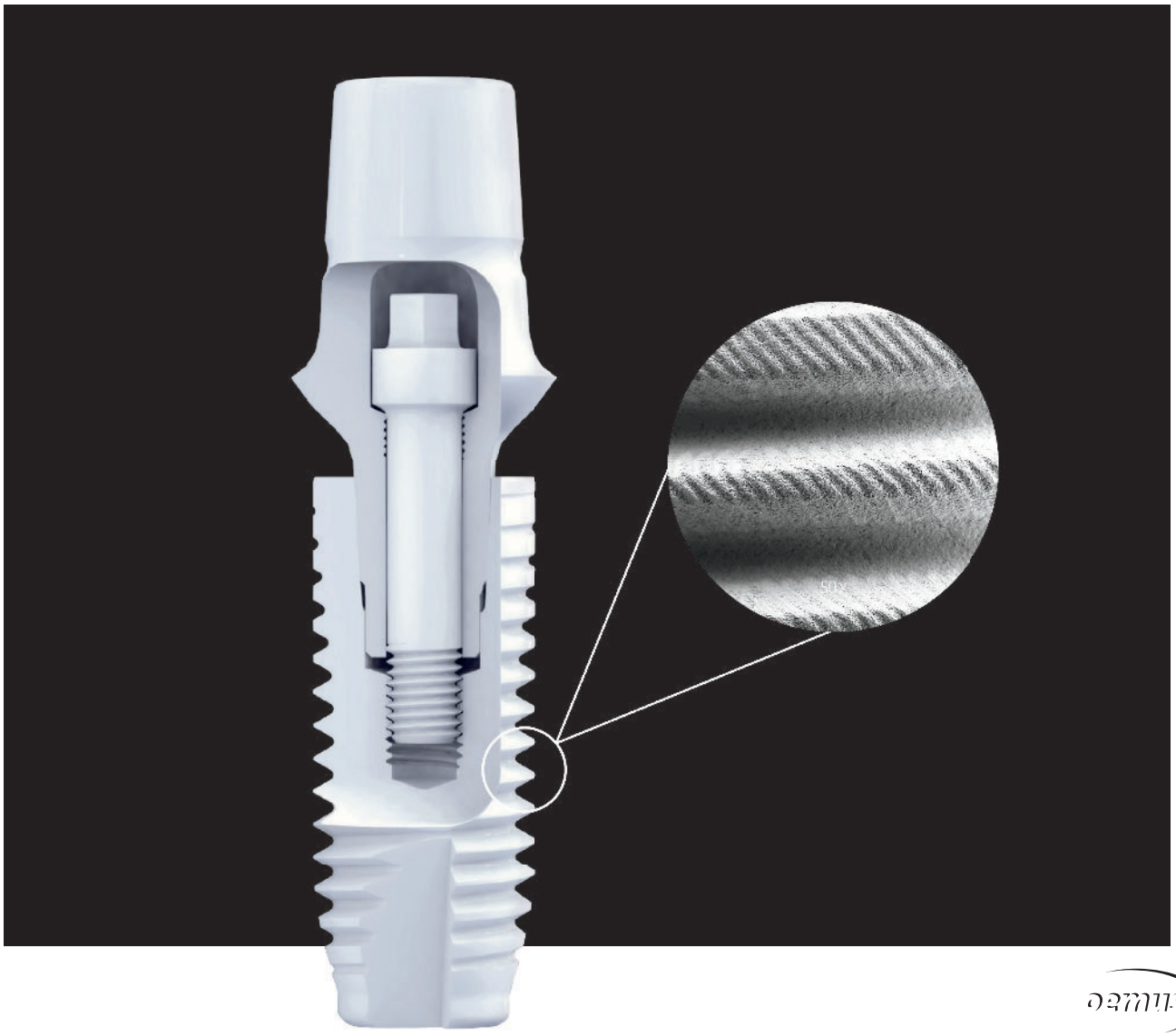

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Dr Marc Balmer
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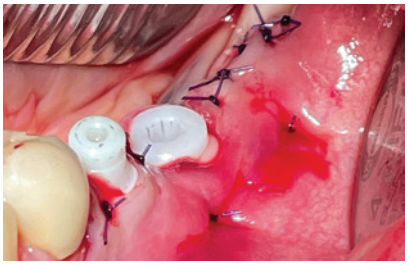
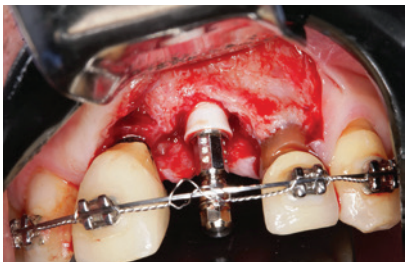
Young minds, new materials: next generation revolution

In dentistry, particularly in implantology, stagnation is not an option. The rapid development of new materials, technologies, and treatment methods requires practitioners to be flexible and committed to continuous education. The younger generation of dentists has a unique opportunity—and responsibility—to actively shape this progress. Ceramic implants are an outstanding example of how research, education, and practice can be integrated in a sustainable and forward-thinking way.

Progress in implantology is largely driven by the tireless work of research. Universities and scientific institutions play a crucial role in providing the clinical evidence for the success of ceramic implants and continuously contributing to their development. As a young researcher in this emerging field, it is essential to overcome obstacles, provide convincing evidence, and not only apply the findings in practice but also actively share them with colleagues and the next generation of professionals, thereby fostering sustainable progress.

CONTENT





▼

Those working in implantology today cannot afford to rely on outdated knowledge. Ceramic implants present specific requirements that go beyond those of titanium implants. The surgical and prosthetic specifics require focused education, workshops, and specialised programmes—ideally at renowned universities. Only through this structured learning can one systematically acquire the necessary knowledge, apply it confidently in practice, and fully unlock the potential of this innovative material. Especially the younger generation, who have a long clinical career ahead of them, should start shaping the future today.

Younger patients increasingly value sustainability, biocompatibility, and aesthetics. Ceramic implants meet all these demands and offer a future-oriented alternative to titanium implants. Their unbeatable advantage lies not only in their aesthetic inconspicuousness but also in their long-term tissue compatibility and the high-quality standard of the materials used. These qualities make them an ideal choice for modern implantology, significantly contributing to the long-term success of treatments.

– Keep growing, never stop learning! –

Yours sincerely
Dr Marc Balmer

Cover image courtesy of
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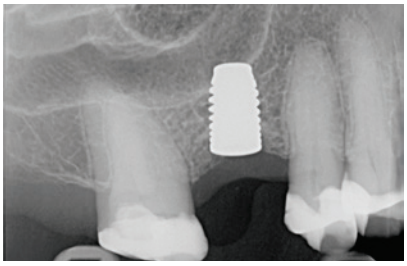
CONTENT



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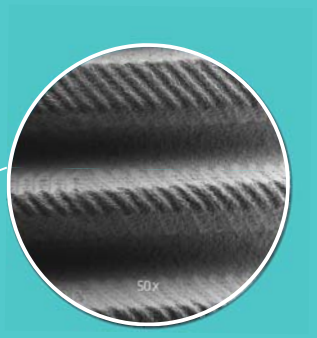

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Building up immunological firewalls

How ceramic implants can deliver immune sustainable outcomes and transform overall health

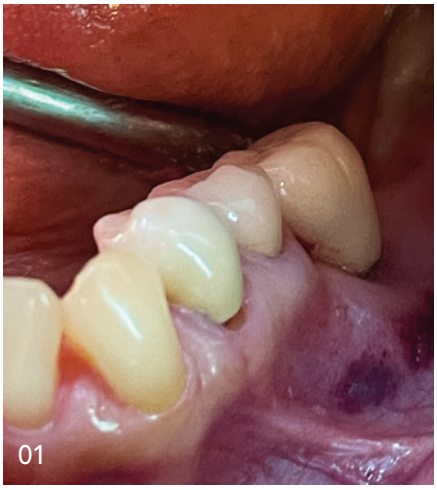
Dr Fabian Schick, Dr Dr Johann Lechner & Dr Florian Notter, Germany

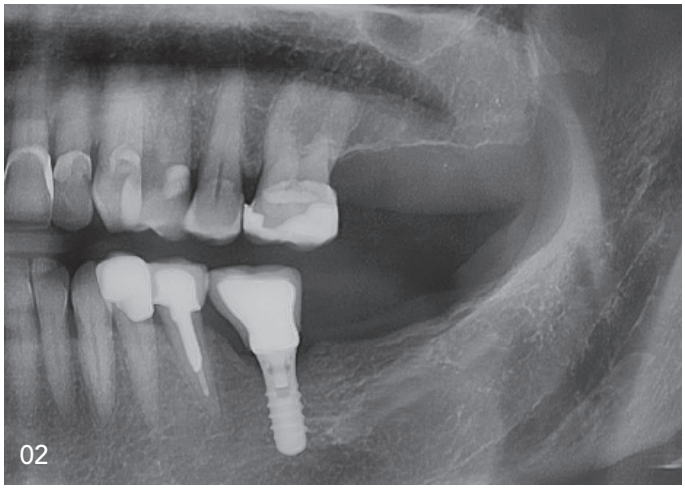
Introduction

It is well established that diseases like periodontitis and peri-implantitis can have systemic effects on general health.[1–4] A key factor may be the compromised barrier function of oral soft tissues, which can allow pathogens to penetrate deeper into the body, triggering systemic inflammatory responses. This may result in an increased concentration of aMMP-8, leading to an elevated rate of tissue degradation.[5] This phenomenon represents a localised immune overload, potentially leading to chronic systemic stress.

An analogy can be drawn to "leaky gut," where a compromised intestinal barrier is implicated in chronic autoimmune conditions and allergies.[6] Similarly, "leaky gum" highlights the role of impaired soft-tissue barriers in oral health. This connection underscores the critical role of dentistry in contributing to immune health by restoring these protective barriers and utilising biocompatible materials.

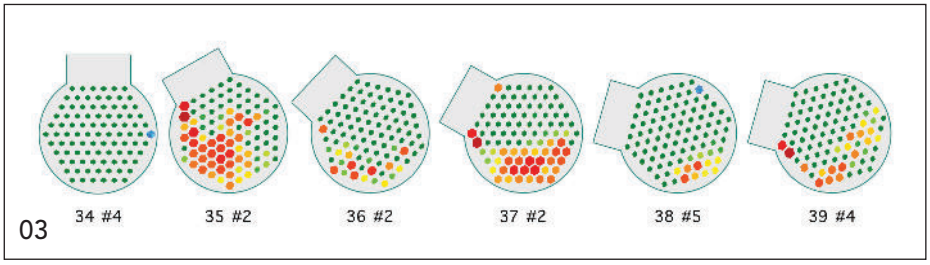
Integrative biological dentistry addresses these issues by employing strategies that support immunological relief, enhance barrier functions, optimal bone regeneration and the use of materials with high biocompatibility. Ceramic implants exemplify this approach, offering documented advantages in soft-tissue integration,[7] aesthetic outcomes, and immunological sustainability. Recent studies using transalveolar ultrasound have further revealed favourable intraosseous behaviour of ceramic materials,[8] showing reduced osteoimmunological stress and decreased cytokine loads unlike titanium, which can release





01
Clinical baseline situation showing titanium implant at position 36 with recurrent inflammatory reactions.

02
Radiographic baseline situation revealing crater-like bone loss around implant 36.



03
Transalveolar ultrasound measurement highlighting osteolytically altered bone areas in red and healthy bone structure in green.

Patent

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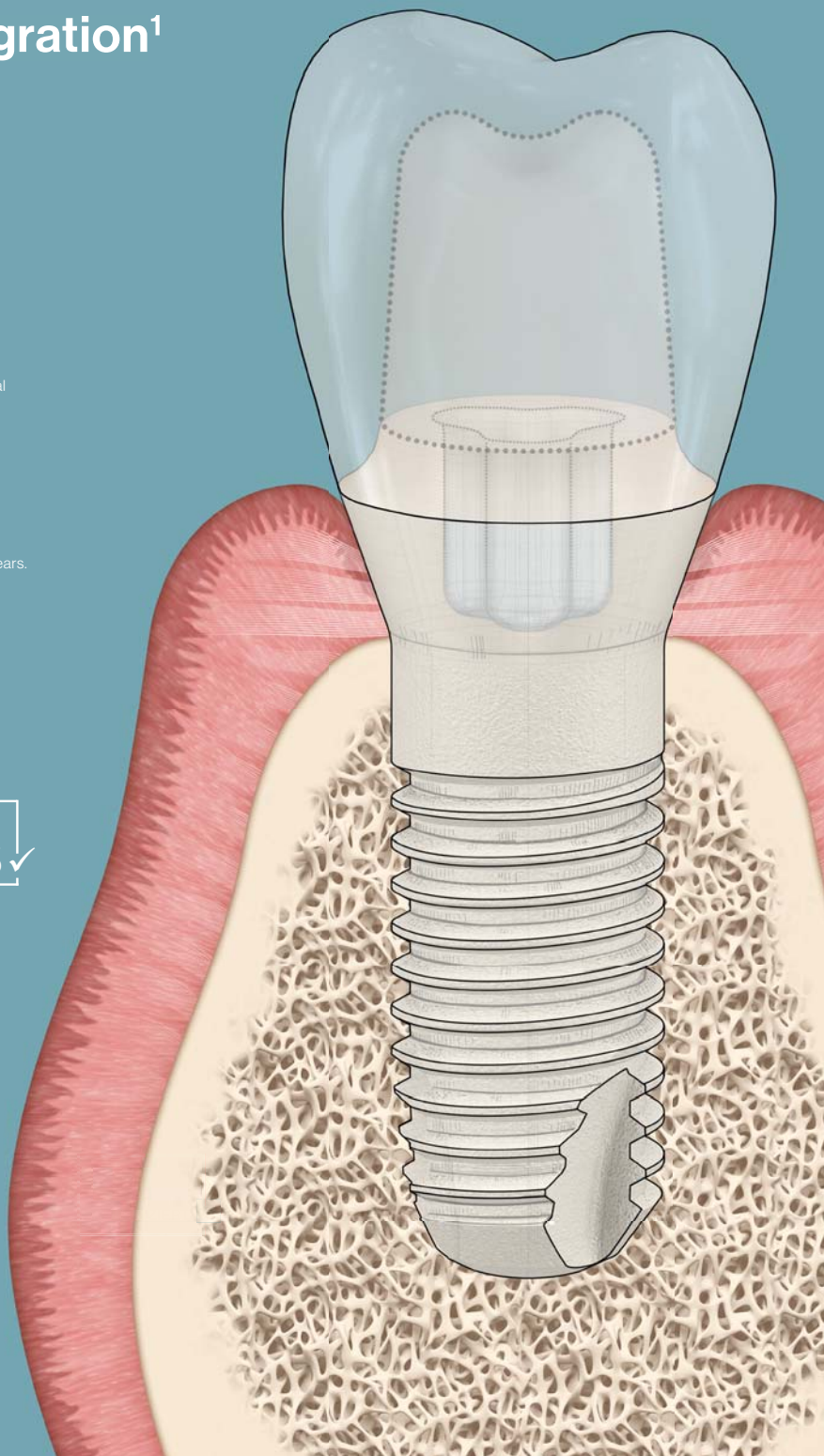

1. **Glauser R, Schupbach P.** Early bone formation around immediately placed two-piece tissue-level zirconia implants with a modified surface: an experimental study in the miniature pig mandible. Int J Implant Dent. 2022 Sep 14;8(1):37. doi: 10.1186/s40729-022-00437-z. PMID: 36103094; PMCID: PMC9474793.
2. **Brunello G, Rauch N, Becker K, Hakimi AR, Schwarz F, Becker J.** Two-piece zirconia implants in the posterior mandible and maxilla: a cohort study with a follow-up period of 9 years. Clin Oral Implants Res. 2022 Dec;33(12):1233–44. doi: 10.1111/clr.14005. PMID: 36184914.
3. **Karapataki S, Vegh D, Payer M, Fahrenholz H, Antonoglou GN.** Clinical performance of two-piece zirconia dental implants after 5 and up to 12 years. Int J Oral Maxillofac Implants 2023;38:1105–1114. doi: 10.11607/jomi.10284

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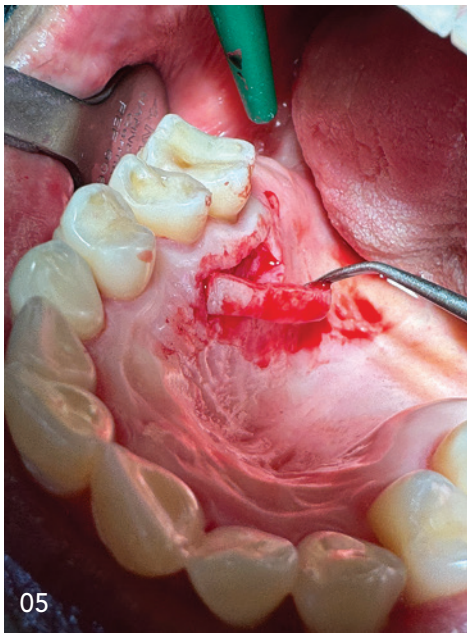
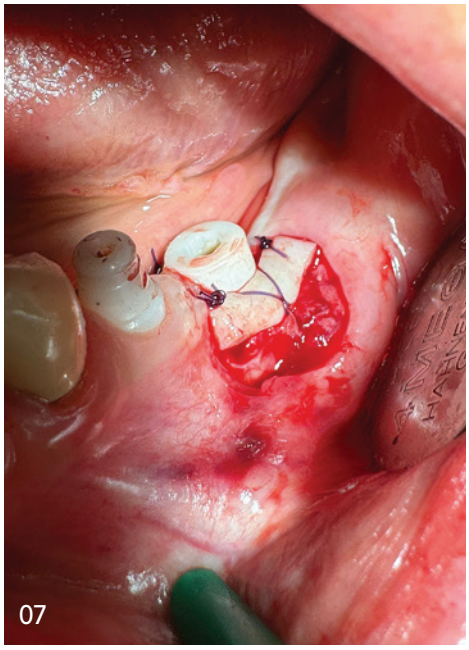
04
Postoperative clinical situation after immediate implantation at positions 35 and 36.



05
Harvesting of the free gingival graft from the palate.

06
Wound management of the donor site using A-PRF membranes and suturing technique.

07
Transplantation of the free gingival graft to the recipient site.



metal particles into bone, that could cause osteoimmunological stress.[8–10]

These findings reinforce the notion that reducing immunological stress in the oral and maxillofacial region can positively influence overall health.[11]

This case report demonstrates how targeted surgical techniques, and the use of biocompatible ceramics can simultaneously achieve immunological relief and aesthetically sustainable outcomes.

Materials and methods

Patient case and diagnosis

A 45-year-old female patient is presented with a chronically inflamed and painful titanium implant at tooth position 36. Clinical examination revealed a lack of keratinised mucosa, and radiological imaging showed crater-like bone loss around the implant. (Fig. 1). Previous disinfection treatments had failed to achieve stable conditions. The patient sought a long-term, inflammation-free, and aesthetically satisfactory solution.

Transalveolar ultrasound imaging identified osteolytic and degenerated areas with elevated cytokine activity of RANTES/CCL5[12] around both the titanium implant and an insufficiently treated root canal at tooth 35 (Figs. 2 & 3). These findings indicated potential contributors to systemic immunological stress and localised tissue degradation.

Surgical reconstruction

In the first stage of treatment, the peri-implantitis-affected titanium implant and the insufficiently treated tooth were removed. Inflammatory tissue was meticulously debrided using metal-free

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08
Healed, inflammation-free situation prior to prosthetic restoration.

09
Clinical condition following the placement of all-ceramic prosthetic restorations.

10
Radiographic condition after completion of all-ceramic prosthetic restorations.

rotating instruments, followed by disinfection with ozone gas[13] and water. Subsequently, two ceramic implants[14] (Fig. 4) with advantageous geometries for optimal integration were placed, achieving a primary stability of 45–50 Ncm. Bone defects and gaps were filled with autologous platelet-rich fibrin (A-PRF) membranes to provide high concentrations of growth factors, facilitating regeneration in hard and soft tissues. Injectable PRF (I-PRF) further enhanced the regenerative potential in the surrounding tissues.[15–17]

To restore the keratinised mucosa, a second procedure was performed eight weeks later, involving a free gingival graft (FGG) harvested from the palatal region[18] (Fig. 5). A split flap was created at the recipient site, and mobile mucosal tissues were removed before graft placement with minimal invasive suturing (Fig. 6). A-PRF membranes and I-PRF were used at both donor and recipient sites to enhance healing (Fig. 7). The surgical site healed without complications, and sutures were removed after 14 days.

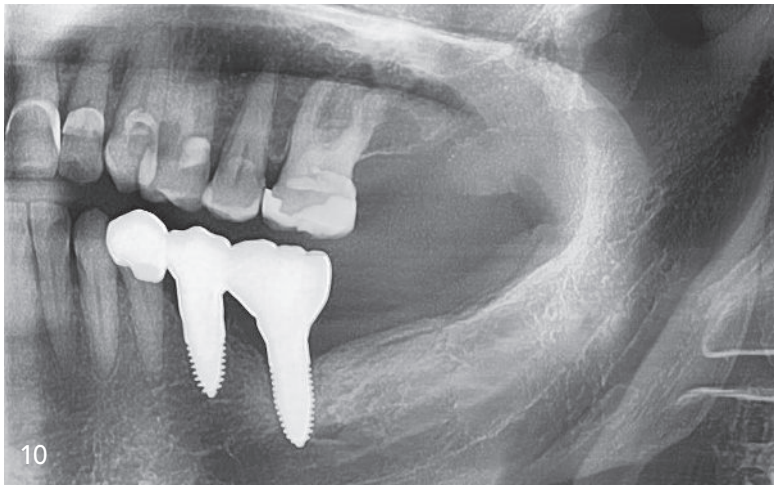
The final prosthetic restoration with fully ceramic crowns was completed after eight weeks under inflammation-free conditions (Figs. 8–10). By this stage, the patient reported complete pain relief, and the chronic inflammation was resolved, leading to high satisfaction even prior to prosthetic placement.

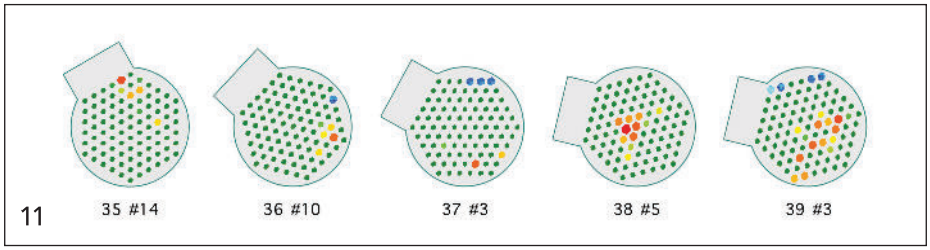
Results

The use of biocompatible ceramic implants and the restoration of stable biological conditions resulted in multiple significant outcomes:

1. **Immunological relief:** Transalveolar ultrasound measurements after nine months of treatment showed increased bone density (Fig. 11) and therefore, reduced osteoimmunological cytokine levels (RANTES/CCL5), confirming the effectiveness of bone regeneration concepts and the "immunological firewall" created by ceramic materials and special soft-tissue transplantation techniques.
2. **Sustainability:** The re-establishment of keratinised mucosa provided an effective soft-tissue barrier against pathogens, contributing to long-term implant stability.
3. **Aesthetic excellence:** The treatment fulfilled high aesthetic standards, achieving a natural appearance and ensuring patient satisfaction.

These results underscore the importance of combining advanced diagnostics with regenerative and biocompatible approaches to achieve sustainable outcomes in both functional and aesthetic dentistry.





11
Follow-up transalveolar ultrasound measurement showing complete bone healing and remineralisation after nine months.

"This case highlights how integrative biological dentistry can address both immunological and aesthetic challenges through advanced diagnostics and innovative surgical techniques."

Discussion

This case highlights how integrative biological dentistry can address both immunological and aesthetic challenges through advanced diagnostics and innovative surgical techniques. Chronic stress and systemic inflammatory responses, often originating from subclinical and clinical lesions in the oral cavity, can be effectively mitigated through the implementation of bone regeneration concepts and sealing immunological barriers.

The use of ceramic implants is particularly advantageous. Compared to titanium, ceramic materials exhibit superior biocompatibility, fostering better soft-tissue integration and minimising osteoimmunological stress. These minimally invasive procedures not only protect systemic health but also achieve high aesthetic standards, representing a whole-body approach to patient care.

The mouth-body connection emphasises the interplay between oral and systemic health. Chronic inflammation in the oral cavity, such as peri-implantitis, can exacerbate systemic conditions by perpetuating a state of low-grade immune activation. Studies have linked oral infections to increased risks of cardiovascular disease,[1,2,19] diabetes,[20] and autoimmune diseases like atopic dermatitis.[4] Conversely, resolving oral inflammation can have far-reaching health benefits, including improved metabolic function and reduced systemic inflammatory markers.

Ceramic implants are particularly suited for this integrative approach due to their unique properties. Unlike titanium, ceramics are bioinert, minimising the release of particles or ions that could trigger an immune response. Their excellent soft-tissue compatibility fosters a tight mucosal seal, which acts as a physical and immunological barrier against microbial invasion.

Conclusion

This case exemplifies how the strategic use of high-technology diagnostics and targeted surgical techniques can lead to immunologically sustainable and aesthetically excellent treatment outcomes. By creating an "immunological firewall," ceramic implants effectively combine functional and aesthetic benefits while contributing to overall health optimisation.

The integrative biological dentistry approach should not be viewed as conflicting with established concepts but as a natural progression and enhancement of traditional therapeutic philosophies. Ceramic implants emerge as the preferred choice for immunologically and aesthetically demanding treatment protocols.

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drfabischick@outlook.de
www.dr-lechner.de

Dr Fabian Schick

Literature

Full-arch rehabilitation of the mandible: eight years of follow-up

Stable hard and soft tissue and no peri-implantitis in a compromised patient

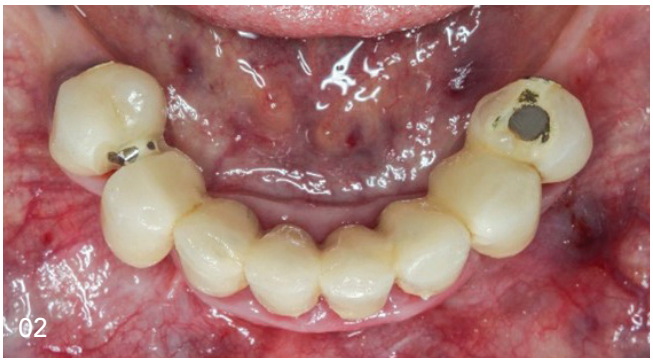
Dr Harald Fahrenholz, Austria

Initial situation, diagnosis and treatment planning

A 70-year-old female patient presented requesting general restoration of her mandibular teeth. She had a more than 20-year-old bridge from tooth #34 to tooth #44, teeth #33 and 43 being pontics (Figs. 1 & 2). The patient exhibited failing dentition due to periodontitis marginalis profunda.

The CBCT scan showed sufficient bone volume in regions #32, 34, 41 and 44 for implant placement (Fig. 3). The treatment plan proposed to the patient was extraction of all the remaining mandibular teeth and immediate placement of two-piece implants in these regions to support a full-arch restoration. After healing, these implants would support a bar-retained removable overdenture, offering advantages in handling and cleaning for both the dentist and patient.

The challenge with this case was to use an implant system able to osseointegrate and function without biological complications despite the active periodontitis. A system was selected which has been demonstrated in a recent long-term study to achieve precisely that.[1]



01 Frontal view of the initial clinical situation with the 20-year-old bridge *in situ*.

02 Occlusal view of the initial clinical situation with the 20-year-old bridge *in situ*.

03 Radiograph before tooth extraction.

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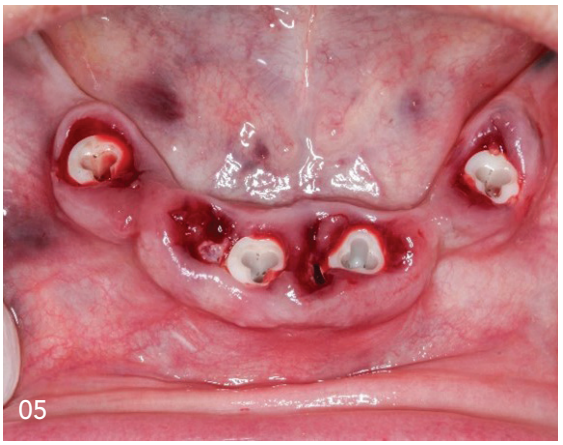
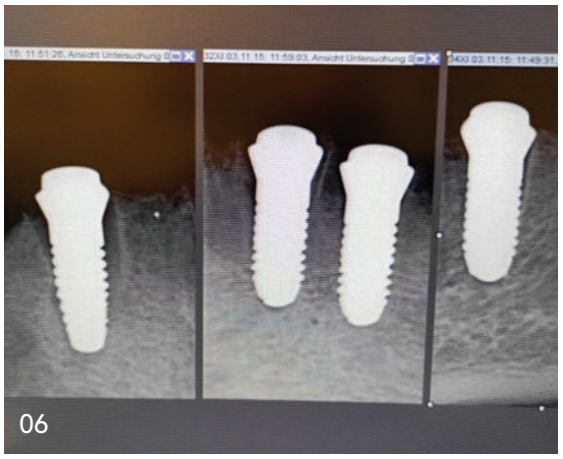
04
Clinical situation after removal of the bridge and tooth extraction.

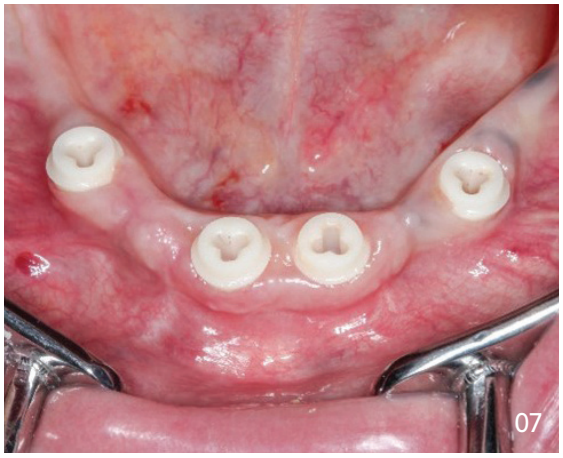


05
Clinical situation after placement of the implants.



06
Radiographs immediately after implant placement. Evident gap between the extraction socket wall and implant #44 (left).

08
Conventional impression of the full arch, including the shoulders and internal connections of the implants.



07
Clinical situation after three months of healing.

09
Prepared glass fiber posts on the 3D model.

Pretreatment and surgical procedure

To improve the soft-tissue condition ahead of surgery, a three-month prophylaxis treatment was performed, reducing the bacterial load. The bridge was cut into four pieces and removed, followed by the extraction of the mandibular teeth (Fig. 4). The bone quality around the extraction sites was evaluated, and four implants (4.5 mm in diameter, 11.0 mm in length; Patent™ Dental Implant System) were inserted without incision to a final torque of 25 Ncm, according to the surgical protocol of the manufacturer (Figs. 5 & 6). A provisional denture was prefabricated based on a conventional impression taken before surgery and was relined before seating to avoid any interference with the implants during healing.

Prosthetic restoration

After three months of healing, osseointegration of the implants was confirmed using the Periotest (Medizintechnik Gulden; Fig. 7). A conventional full-arch impression of the mandible, capturing the implant shoulders and internal connections, was taken and a stone model was cast in the dental laboratory. On this model, the glass fiber posts, serving as prosthetic retention elements of the used implant system, were prepared to be parallel (Figs. 8 & 9). The correct fit of the prepared posts in the implants' internal connections was verified intra-orally before fabricating the bar (Fig. 10). The fit of the bar was also checked intra-orally (Fig. 11). Thereafter, the overdenture was produced, and a PEEK matrix was integrated as a secondary retention element inside the prosthesis (Fig. 12). The glass fiber posts, and the bar were adhesively cemented using a dual-polymerising cement (RelyX Unicem 2, 3M; Fig. 13), and the overdenture fitted to restore function and aesthetics (Fig. 14).

Result after five and eight years

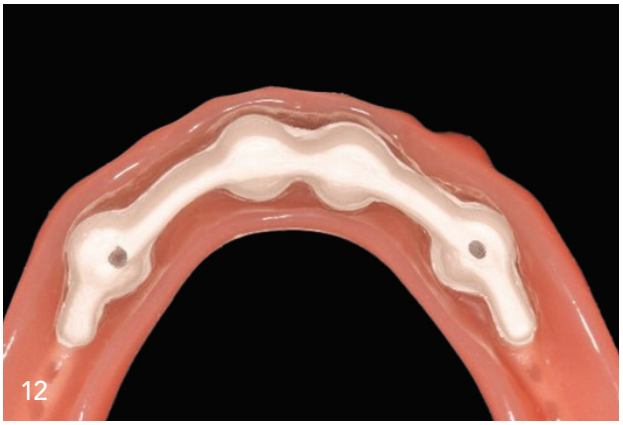
Five years postoperatively, stable marginal bone levels around the implants were observed (Figs. 15 & 16). The gap between the extraction socket wall and implant #44 present immediately after placement had been completely filled with bone by the five-year follow-up.

Eight years postoperatively, the bone levels were still stable (Figs. 17–20), and healthy soft tissue comparable to the baseline three months after implant placement was noted. At the eight-year follow-up, even an increase in the volume of keratinised gingiva around implants #32 and 44 was observed (Figs. 21 & 22).

“The challenge with this case was to use an implant system able to osseointegrate and function without biological complications despite the active periodontitis.”

10
Clinical situation at try-in of the prepared glass fiber posts.

11
Clinical situation at try-in of the bar.



12
Secondary retentive element fabricated from PEEK integrated in the overdenture.

13
Clinical situation after cementation of the glass fiber posts and the bar.

14
Clinical situation after seating of the overdenture.

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Discussion

In my dental office, I frequently encounter patients with compromised health, often suffering from systemic disease or chronic inflammation, such as the present case of terminal periodontitis. To help these high-risk patients with impaired healing capacity, I need an implant system that osseointegrates quickly and predictably and has minimal impact on the immune system. Being able to provide long-term aesthetics and function without biological complications for these compromised patients is incredibly rewarding.

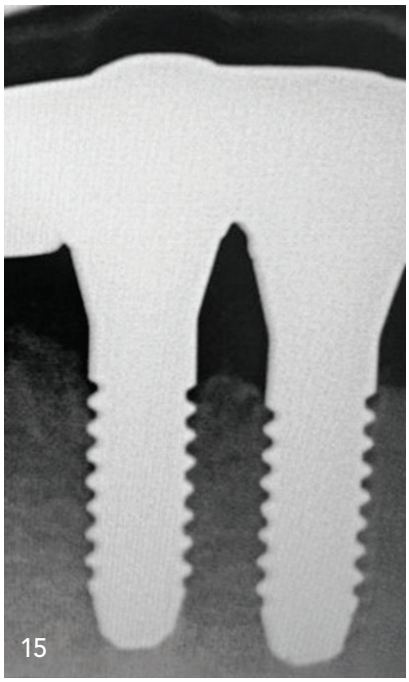
In a recently published long-term study I conducted in collaboration with Dr Sofia Karapataki and the Medical University of Graz, we intentionally included such everyday patients. The long-term clinical performance of the two-piece implant system used in this case was confirmed, corroborating the findings of another such study on this system.[1, 2] The most significant finding was that no peri-implantitis was reported after the maximum follow-up period of 12 years. This is consistent with my observations from over 15 years of daily use of this system.

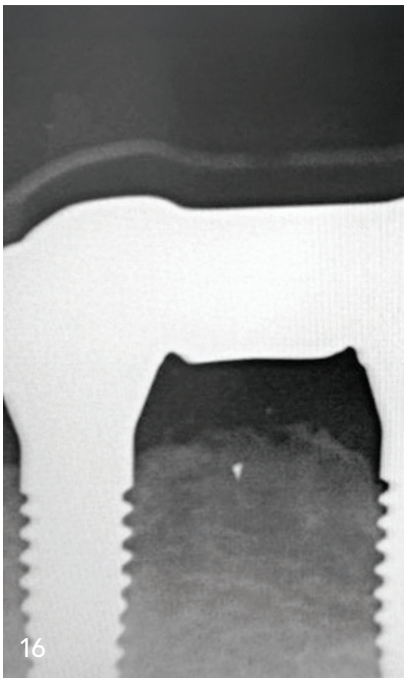
Conclusion

Characterised by stable marginal bone levels, healthy soft tissue and an absence of peri-implantitis, the treatment outcome achieved in this case remained satisfactory over the extensive follow-up period. This reflects what independent long-term studies have reported on the clinical performance of this implant system and underscores its viability as a reliable treatment option, even for complex cases involving patients with compromised health.

15 Radiograph of region #41 after five years showing stable bone levels.

16 Radiograph of region #42 after five years showing stable bone levels.

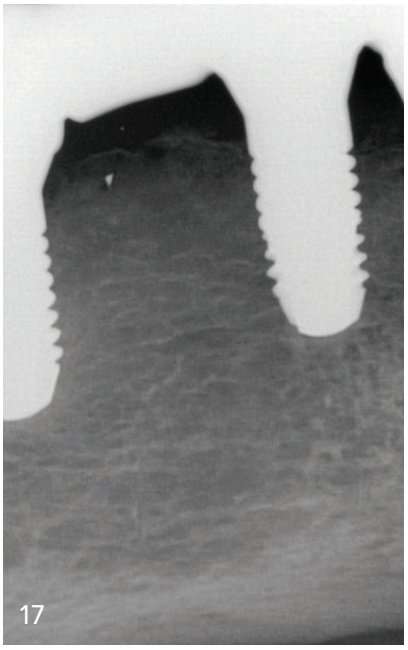


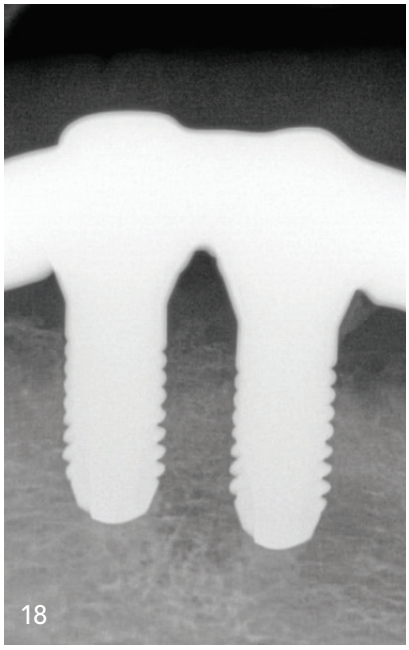


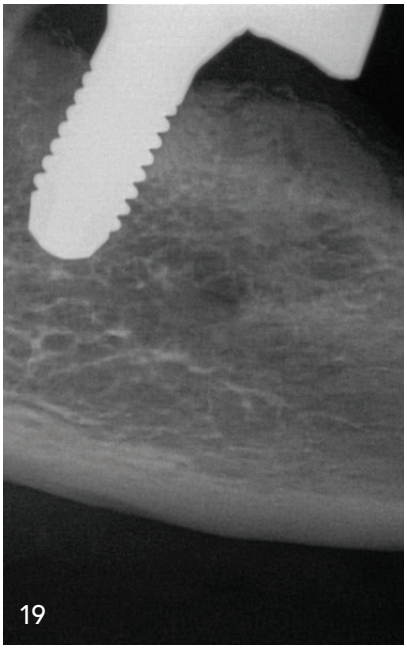
17 Radiograph of region #42 after eight years showing stable bone levels.

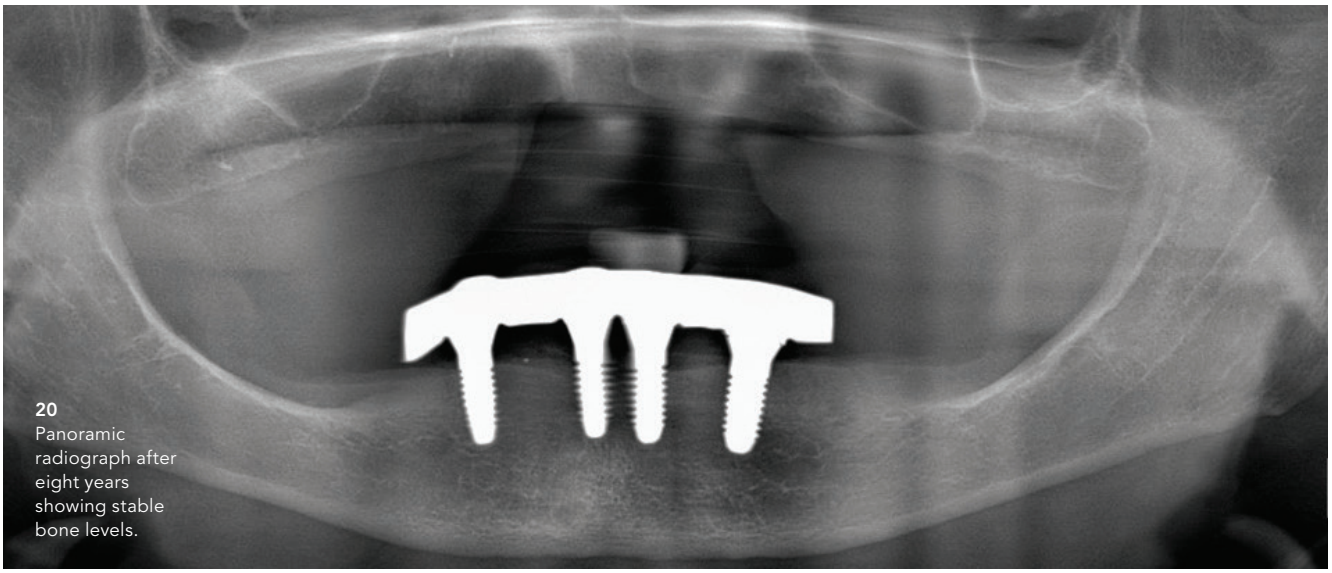
18 Radiograph of region #41 after eight years showing stable bone levels.

19 Radiograph of region #34 after eight years showing stable bone levels.









20
Panoramic radiograph after eight years showing stable bone levels.

21
Left lateral view of the clinical situation after eight years showing healthy and stable soft tissue.

22
Right lateral view of the clinical situation after eight years showing healthy and stable soft tissue.

"[...] I frequently encounter patients with compromised health, often suffering from systemic disease or chronic inflammation, such as the present case of terminal periodontitis."

References:
[1] Karapataki S, Vegh D, Payer M, Fahrenholz H, Antonoglou GN. Clinical performance of two-piece zirconia dental implants after 5 and up to 12 years. Int J Oral Maxillofac Implants. 2023 Dec 12;38(6):1105–114. doi: 10.11607/jomi.10284. PMID: 38085741.
[2] Brunello G, Rauch N, Becker K, Hakimi AR, Schwarz F, Becker J. Two-piece zirconia implants in the posterior mandible and maxilla: a cohort study with a follow-up period of 9 years. Clin Oral Implants Res. 2022 Dec;33(12):1233–44. doi: 10.1111/clr.14005. PMID: 36184914.

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Four-year clinical and radiographic follow-up: ceramic vs titanium implant in the aesthetic area

Jaques Luiz, Julia Helena Luiz & Flávia Sukekava, Brazil

01
Panoramic image of the patient wearing orthodontic braces and the provisional resin-bonded crown in the position of tooth #21.

Abstract

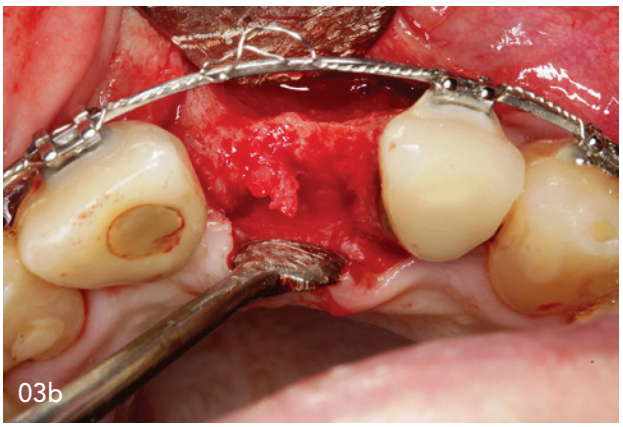
This study reports a four-year clinical and radiographic follow-up of a single patient treated with screw-retained implant restorations in the aesthetic zone. Eleven years after receiving a titanium implant for the maxillary right central incisor, a two-piece ceramic implant replaced the left central incisor. Follow-up assessments (initial at six months, then yearly) from 2019 to 2023 demonstrated successful outcomes for both implants, with good peri-implant tissue stability. These findings suggest ceramic implants may be a viable long-term alternative for patients seeking restorations free of potential metal toxicity concerns.

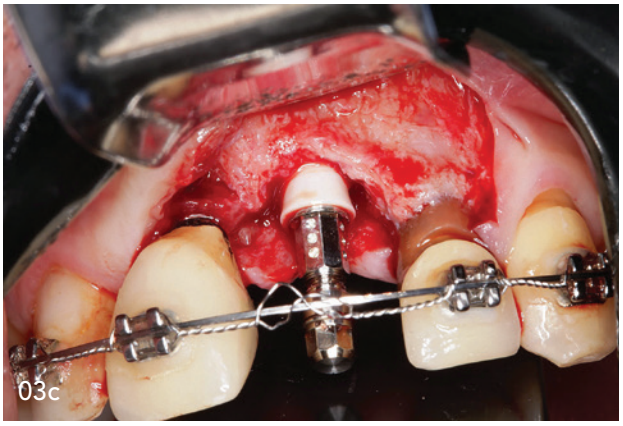
Introduction

Since the advent of osseointegration, the rehabilitation of partially or totally edentulous spaces with the use of dental implants has been in constant advancement. Widely accepted concepts such as "osseointegration" are now being challenged. It has been recently suggested that rather than a bone repair process, osseointegration is in fact an osteoimmune defense reaction,[1] which would lead the body to form new bone to encapsulate and isolate the endosseous implant from the oral tissues. Within this scenario, titanium implants should be seen as osteoimmunomodulatory elements rather than a bioinert biomaterial, as previously thought.[2] Thus,

02
Initial periapical radiographic showing the missing tooth #21 and a resorbed alveolar ridge; the titanium implant in tooth #11.

03a–c
Occlusal view showing a resorbed alveolar bone **(a)**; flap elevation **(b)**; and ceramic implant manually installed in the alveolar ridge **(c)**.





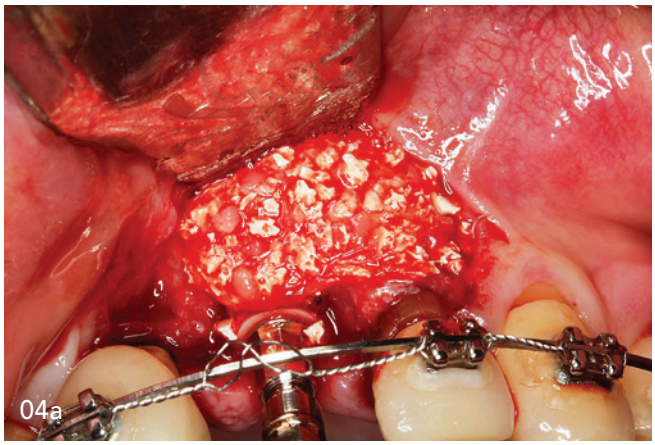
marginal bone loss (MBL) may be understood as a result of osteoimmunological mechanisms that react to titanium ions and particles released into the oral tissue due to corrosion and wear, while bacterial challenge should be seen as a secondary condition.[1] Moreover, the accumulation of titanium ions and particles in the body may also result in tissue discoloration; toxic reactions and hypersensitiveness to metals.[3,4]

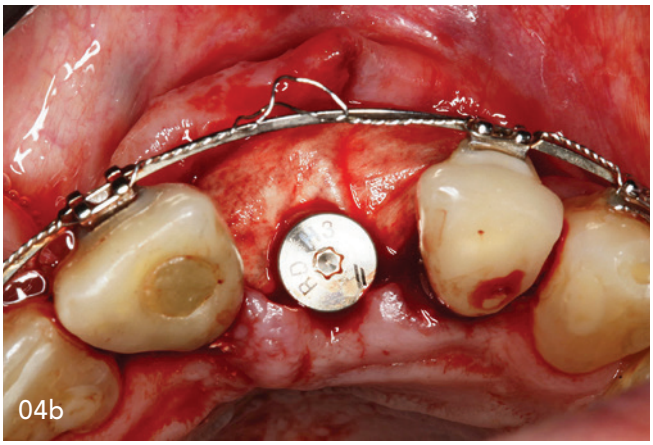
Due to concerns being raised regarding the use of titanium implants, zirconia ceramic implants have emerged as an alternative, not only due to their aesthetic benefits, but also the biocompatibility and biomechanical properties,[5] peri-implant soft-tissue response,[6] bacterial adhesion,[7] and plaque formation,[8] which have been shown to be at least similar, if not better than titanium. Furthermore, differently from titanium implants, zirconia implants also seem to be bioinert for human tissues.[9]

However, there is a lack of long-term data comparing ceramic implants with titanium implants, especially when placed in the same patient. Therefore, the aim of this article is to report on the results of a four-year clinical and radiographic follow-up of a patient rehabilitated with screw-retained single restorations supported by a ceramic and a titanium implant in the aesthetic area.

Clinical case

In the beginning of 2019, a systemically healthy 41-year-old, non-smoker, male patient was referred to a specialised private clinic in the city of Curitiba, Brazil for the replacement of a lost maxillary left central incisor (#21). Eleven years previously, at the age of 30, the patient reported being in an accident that resulted in the traumatisation of his maxillary anterior teeth and the loss of his upper right central incisor (#11) and the breakage of his upper





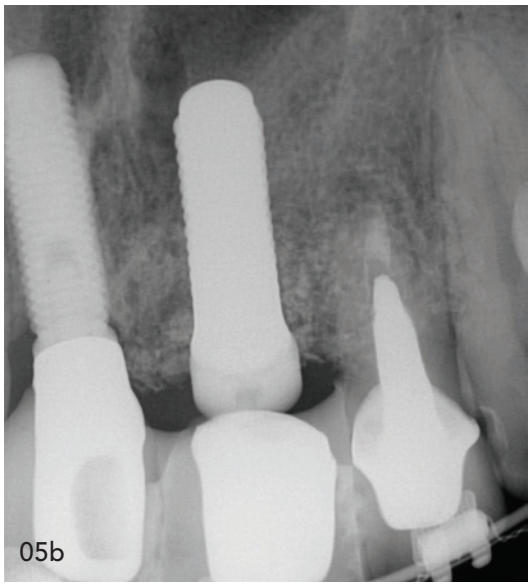
04a + b
Implant defect covered with xenogeneic bone substitute **(a)**; and collagen membrane placed to cover all the graft material and around the healing cap **(b)**.

left central (#21) and lateral incisor (#22; Fig. 1). Teeth #21 and #22 underwent endodontic treatment and were rehabilitated with individual conventional prostheses. Tooth #11 was rehabilitated with a screw-retained metal-ceramic crown connected to an external hexagon titanium implant. All the procedures were conducted by another clinician, which prevented access to treatment details.

During the initial clinical-radiographic examination, the patient, who had initiated orthodontic treatment three months before, was presented with tooth #21 restored with a resin-bonded restoration (Fig. 1). According to the patient, tooth #21 was highly mobile and extracted by the orthodontist. The periapical radiograph showed a resorbed marginal alveolar bone, indicating that no ridge preservation procedures had been conducted at the time of extraction (Fig. 2). A CBCT scan was requested to better assess the area and assist in treatment planning.

Based on the CBTC scan, a treatment plan was defined, and the patient was presented with the possibility to be restored with another conventional titanium implant or with a new ceramic implant. After considering the benefits and possible drawbacks of each treatment alternative, the patient opted for the ceramic implant. Due to the implantation position required, a two-piece Ø4.1 mm x 11 mm ceramic implant (PURE Ceramic®, Straumann) was chosen. After the bonded restoration was removed (Fig. 3a), a periosteal flap was elevated to grant access to the alveolar ridge (Fig. 3b). The ceramic implant was manually installed in a completely healed ridge by an experienced clinician (JL) to an initial insertion torque of 35 Ncm, as recommended by the implant manufacturer (Fig. 3c). The remaining buccal wall defect was completely covered by a xenogeneic bone substitute (Cerabone, botiss biomaterials; Fig. 4a), and then covered by a collagen membrane (Jason® membrane, botiss biomaterials). A healing cap was placed over

05a + b
Clinical view showing the non-resorbable sutures and the provisional resin-bonded crown in position, fixed to the orthodontic braces **(a)**; and periapical radiographic, showing the ceramic implant with the healing cap **(b)**.



Year	BOP*		Mob*		Sup*		PPD (mm)	
	TP 11	TP 21	TP 11	TP 21	TP 11	TP 21	TP 11	TP 21
2019	1	0.75	0	0	0	0	2.25	1.75
2020	1	0.75	0	0	0	0	2	1.75
2021	0.75	0.75	0	0	0	0	2	1.5
2022	0.5	0.75	0	0	0	0	2	1.5
2023	0	0	0	0	0	0	2	1.5

TP: tooth position; BOP: Bleeding on Probing; Mob: Mobility; Sup: Suppuration; PPD: Peri-implant Pocket Depth.

* Mean of findings (0 absent; and 1 present) at four peri-implant sites (mesial, proximal, buccal and palatal).

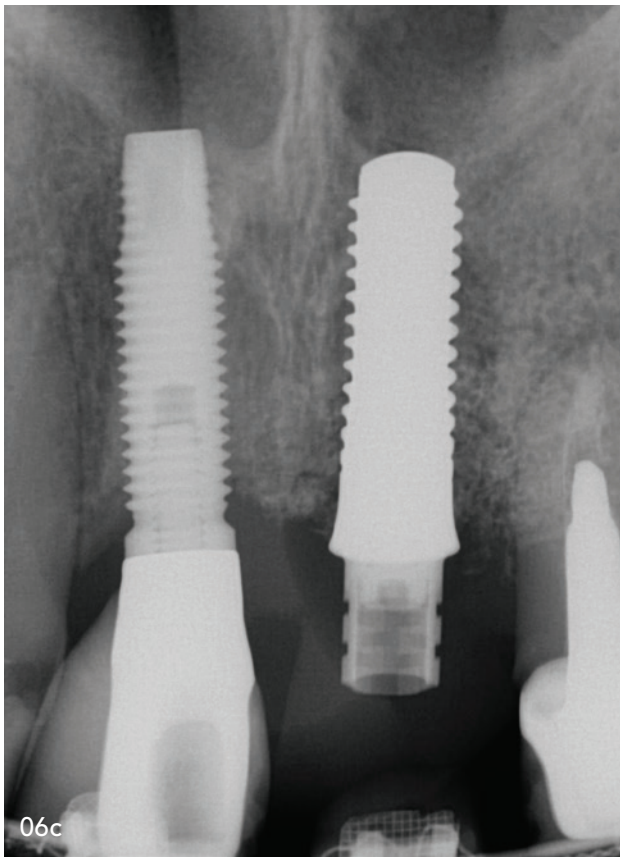
Table 01
Mean values for the clinical variables measured around the ceramic implant (tooth #21) and the titanium implant (tooth #11) during the follow-up visits.

the implant (Fig. 4b), which allowed for a semi-submerged implant healing (Fig. 5a), while a provisional resin-bonded crown was placed over the implant (Fig. 5b).

After three months of healing, the clinical (Fig. 6a) and radiographic examination (Fig. 6b) showed the presence of a well-healed soft tissue and alveolar bone all around the implant. The implant was then loaded with a provisional screwed-retained crown that was kept in place until the completion of the orthodontic treatment. Three years after implant placement, the definitive ceramic crowns for both teeth #11 and #21 were delivered. All the prosthetic procedures were performed following the analogue flux.

The patient was included in a regular maintenance programme. The first clinical-radiographic examination was conducted six months after provisional crown loading in 2019, and yearly, from then on until 2023. At each visit, both implant #11 and #21 were clinically assessed with a manual periodontal probe (PUNC, Hu-Friedy) at four sites around each implant (mesial, distal, buccal, and palatal). The following parameters were recorded at each visit: Bleeding on Probing (BOP) and Peri-implant Pocket Depth (PPD), presented in mm as a mean of the four measured sites. Suppuration (Sup) and Mobility (Mob) as present (1) or absent (0); Sup as a mean of the four measured sites and Mob for each fixture. All the clinical data was collected at every visit by the same experienced clinician (FS). Periapical radiographs were also taken at each visit to check the integrity of the alveolar bone and for the presence of marginal bone loss.

Over the follow-up period, both implant-rehabilitated crowns presented similar behaviour and characteristics (Table 1). BOP was present around both implants at all initial measurements but absent at the final assessment after the completion of the dental rehabilitation treatment. Mob and Sup were absent at all visits (Table 1). In 2023, an occlusal view of the implant sites permitted us to observe a dark shadow in the mucosa around the titanium implant, but not around the ceramic implant (Fig. 7c). Radiographically, the marginal bone level around both implants were stable over the follow-up period (Fig. 7c). At the completion of the treatment, the patient presented a pleasant aesthetic result in the anterior area of the mouth.

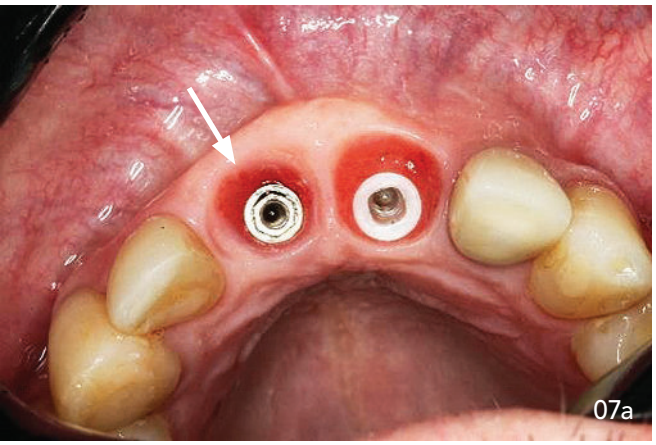


06a–c
Six months postoperative: occlusal view showing the ceramic implant healing cap surrounded by a healthy mucosa **(a)**; provisional crown installed over the ceramic implant **(b)**; and periapical radiographic showing the ceramic implant in healed bone **(c)**.

Discussion

To the best of our knowledge, this is the first case report to follow-up the behaviour of a conventional titanium implant in comparison with a ceramic implant installed next to each other in the anterior maxilla in the same patient. That was possible because the titanium implant was inserted 11 years before the ceramic implant. The clinical and radiographic data collected over the four-year period is quite unequivocal concerning the success of both implants. These findings were expected as previous studies have already indicated that ceramic implants can perform as successfully when compared to published findings on titanium implants.[10] Even when we considered the metallic implant prosthetic connection installed so many years before the metal free implant.

Differences found for BOP over the follow-up period may be attributed to the presence of more plaque accumulation around the titanium implants than on ceramic implants. Animal models[8,11,12] have already shown that the amount and thickness of dental plaque around zirconia specimens was reduced when compared with titanium specimens. Furthermore, the sulcular epithelium around zirconia implants appeared to be shorter, in some ways closer to dental sulcular epithelium dimensions.[11] A review study on different abutment connections also indicated that, similar to titanium, hemidesmosomes bind to zirconia, although epithelial adhesion seems to be improved around zirconia components.[9] That might explain the lower PPD levels observed around the ceramic implant despite similar bone levels. The higher BOP scores observed at both implants in the first visits can be explained by the fact that the patient was under orthodontic treatment, which impeded proper access to oral hygiene and using provisional crown over the implants. Nonetheless, the combination of regular maintenance and a thick soft-tissue biotype ensured the stability of the peri-implant tissues. It's noteworthy, however, that the fact the dark shadow observed in the mucosa around the titanium implant, but not around the ceramic implant, may



Literature

07a–c
Three years post-operative: occlusal view showing the peri-implant mucosa around a metallic implant. Note the difference in colour (arrow) of the mucosa around the titanium implant (left) and the ceramic implant (right) **(a)**; note the aspect of the definitive ceramic crowns over the implants **(b)**; and periapical radiograph showing both implants and crowns **(c)**.

be indicative of the dissolution of titanium ions and particles into the soft tissue. While that might not be sufficient to activate the osteoimmunological mechanisms to initiate MBL, metal toxicity has become a concern among many patients.[3,4]

Mob and Sup were completely absent over the follow-up period for both the ceramic and titanium implants, indicating hard-tissue stability, as observed in another case series presented previous.[14] That can be observed in the radiographic follow-up, which showed no significant bone changes. The hot-isostatic pressed tetragonal zirconia polycrystal used in the implant selected in this case received a surface treatment to improve hard-tissue adhesion.[9] Moreover, a preclinical pilot study showed that in the presence of a stable peri-implant soft tissue in association with an adequate initial implant–bone contact, no statistically significant differences in MBL were observed between metallic and ceramic implants.[11]

Conclusion

The findings of this case report have suggested that both titanium and ceramic implants have similar behaviour in the long term and can be successfully used for treating edentulous spaces. However, ceramic implants can be an important alternative for patients who do not feel comfortable with installing metal implants for fear of toxicity accumulation over time.

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Impact of periodontitis on systemic health and on implants—Part 2

Part 1

Profs Curd Bollen, Germany, Paul Tipton, UK & Prof. Gagik Hakobyan, Armenia

As stated in the first article: mouth and health go hand in hand. The oral cavity is the ingress to our entire body. Nutrition enters there, and our teeth masticate the food so that all the alimentary components we need can be released to our complete body.

Infections in the oral cavity therefore have a huge impact on general health. After all, chewing forces push intra-oral periodontal bacteria into our bloodstream. This process can cause severe collateral damage. In the first part of our article, we discussed the impact of periodontal pathogens on cardiovascular diseases, diabetes, respiratory diseases, pregnancy, rheumatoid arthritis and chronic kidney disease.

In this second article we will highlight six other key points about the relationship between periodontitis (i.e. periodontal pathogens) and systemic diseases.

7. Alzheimer's disease

Alzheimer's disease is a progressive neurodegenerative disorder characterised by cognitive decline, memory loss, and changes in behaviour. Three key aspects play a role: accumulation of amyloid-beta peptides, aggregation of hyperphosphorylated tau protein and chronic neuroinflammations in the brain.[1]

Periodontitis increases the risk of Alzheimer's because periodontopathogens increase the production of the amyloid beta peptides, which occurs in the brain damage in Alzheimer's patients. Moreover, both Alzheimer's and periodontitis are associated with increased oxidative stress, which can damage tissues and cells.[2]

The impact of periodontitis on Alzheimer's disease is based on three mechanisms:

1. **Bacterial translocation:** periodontal pathogens, such as *P. gingivalis*, can enter the bloodstream and reach the brain, potentially contributing to the formation of amyloid plaques and neurofibrillary tangles.
2. **Inflammatory mediators:** cytokines and other inflammatory mediators produced in response to periodontal infection can cross the blood–brain barrier, promoting neuroinflammation.[3]
3. **Immune response:** chronic periodontal infection can lead to a systemic immune response that affects the central nervous system.

Recent studies have shown a higher prevalence of periodontitis in individuals with Alzheimer's disease compared to those without. Some trials indicate that treating periodontitis can reduce systemic inflammation and potentially slow cognitive decline in Alzheimer's patients.[4]

Therefore, screening and diagnosis for Alzheimer's patients is important to manage and prevent periodontitis. Screening and diagnosis for periodontitis patients could be combined with monitoring cognitive functions and evaluating for signs of cognitive decline.

8. Erectile problems

Erectile dysfunction (ED) is the inability of a man to achieve or maintain an erection sufficient for satisfactory sexual performance.

It can result from various factors, such as physical causes (cardiovascular disease, diabetes, or hormonal imbalances), psychological causes (stress, anxiety, and depression) or lifestyle factors (smoking, excessive alcohol consumption, and lack of physical activity).[5]

The relationship between erectile dysfunction and periodontitis is an emerging area of research, with growing evidence suggesting that periodontal health may influence sexual health.[6]

There are four shared mechanisms between both problems:

1. **Chronic inflammation:** ED and periodontitis involve chronic inflammation. Periodontal inflammation can contribute to systemic inflammation, which may affect erectile function. Periodontal infections increase levels of systemic inflammatory markers such as C-reactive protein (CRP) and interleukins.

2. **Endothelial dysfunction:** inflammation from periodontitis can lead to endothelial dysfunction, impairing blood vessel function and potentially contributing to ED. Chronic inflammation and oxidative stress from periodontitis can impair endothelial function, affecting blood flow to the penis and leading to ED.
3. **Cardiovascular health:** both conditions are linked to cardiovascular health. Periodontitis can exacerbate cardiovascular diseases, which are known risk factors for ED.[7]
4. **Bacterial translocation:** oral bacteria from periodontitis can enter the bloodstream and potentially affect vascular health, which is crucial for maintaining erectile function.

Studies have shown an association between periodontitis and an increased prevalence of erectile dysfunction. Men with periodontitis may be at higher risk for developing ED. Some trials even suggest that treating periodontitis can lead to improvements in markers of systemic inflammation and potentially improve erectile function.[8]

The same clinical recommendations are again applicable here: good oral hygiene, regular dental check-ups, interprofessional dental–medical collaboration and early screening. Also, lifestyle modifications are encouraged: healthy lifestyle changes, such as a balanced diet, regular exercise, and smoking cessation, to improve both oral and sexual health.

9. Cancer

Cancer encompasses a range of diseases characterised by uncontrolled cell growth and the ability to invade or spread to other parts of the body. Various types of cancer can affect different organs and systems.

Specific periodontitis bacteria are also associated with certain types of cancer, such as pancreatic cancer and especially colon cancer.[9] As risk factors, genetic predisposition, environmental exposures (e.g. smoking, radiation), and lifestyle factors (e.g. diet, physical activity) are indicated. Furthermore, chronic inflammation as in chronic periodontitis is a known risk factor for the development and progression of many cancers. The persistent inflammation and immune system activation in periodontitis may influence cancer development and progression by their elevated levels of inflammatory cytokines and biomarkers. Increased oxidative stress is associated with both periodontitis and cancer. Oxidative stress can damage DNA and contribute to carcinogenesis.[10]

Certain periodontitis-associated bacteria, such as *P. gingivalis*, have been linked to the development of some cancers, potentially through these mechanisms of chronic inflammation and bacterial toxins.

Specific cancer types and evidence:

1. **Oral cancer:** there is evidence suggesting that periodontitis may be a risk factor for oral cancers. The chronic inflammatory environment in periodontitis may promote carcinogenic processes in oral tissues.[11]
2. **Head and neck cancer:** studies have shown associations between periodontitis and an increased risk of head and neck cancer. Chronic inflammation and bacterial infection in periodontitis may contribute to these types of cancer.[12]
3. **Other types:** some research suggests associations between periodontitis and increased risk of other cancers, such as pancreatic cancer, though the evidence is less established.

Cancer, however, can also have an impact on periodontitis. Treatments such as chemotherapy and radiation therapy can adversely affect oral health, leading to conditions like dry mouth, mucositis, and increased susceptibility to infections, including periodontitis. Furthermore, cancer and its treatments can impair the immune system, making individuals more susceptible to periodontal infections. Finally, cancer and its treatments can affect nutritional intake and oral hygiene practices, potentially exacerbating periodontal disease.

10. Metabolic syndrome

Periodontitis and metabolic syndrome are interconnected through pathways involving inflammation, insulin resistance, and microbiome alterations. Metabolic syndrome is a cluster of conditions that increase the risk of heart disease, stroke, and type 2 diabetes. It includes several components: central obesity (excessive fat around the abdomen), hypertension (high blood pressure), dyslipidemia (abnormal cholesterol or triglyceride levels), insulin resistance (reduced ability of cells to respond to insulin, leading to high blood sugar levels) and a pro-inflammatory state (elevated levels of inflammatory markers like C-reactive protein [CRP]).[13]

There are several links between periodontitis and metabolic syndrome:

1. **Chronic inflammation:** periodontitis causes systemic inflammation, characterised by elevated inflammatory markers such as CRP and cytokines (e.g. TNF-α, IL-6). This chronic inflammation is a key feature of metabolic syndrome, contributing to insulin resistance and endothelial dysfunction.
2. **Insulin resistance:** periodontitis-induced inflammation can exacerbate insulin resistance, a core component of metabolic syndrome. Moreover, the inflammatory cytokines from periodontitis can interfere with insulin signaling pathways.
3. **Microbiome dysbiosis:** both conditions are associated with microbial imbalances. Periodontitis involves pathogenic oral bacteria, while metabolic syndrome is linked to gut microbiome dysbiosis. The oral bacteria from periodontitis can enter the bloodstream and potentially affect the gut microbiome, contributing to metabolic disturbances.[14]
4. **Adipose tissue inflammation:** in metabolic syndrome, excess adipose tissue releases pro-inflammatory cytokines. These cytokines can worsen periodontitis by enhancing the inflammatory response in periodontal tissues.[15]
5. **Oxidative stress:** both conditions are associated with increased oxidative stress, which contributes to tissue damage and inflammation. Oxidative stress from metabolic syndrome can exacerbate periodontal tissue destruction.

Integrated care by addressing periodontitis may help reduce systemic inflammation and improve insulin sensitivity, positively impacting metabolic syndrome management.

Lifestyle modifications are however of utmost importance: a balanced diet rich in anti-inflammatory foods (e.g. fruits, vegetables, whole grains) can benefit both conditions and regular exercise improves insulin sensitivity and reduces inflammation, aiding in the management of both periodontitis and metabolic syndrome.

Finally, anti-inflammatory medications and treatments for insulin resistance can benefit both conditions. Probiotics and prebiotics may help restore microbial balance and reduce inflammation.[16]

11. Gut dysbiosis

Periodontitis and gut dysbiosis are linked through the complex interplay between oral and gut microbiomes, systemic inflammation, and the immune response. Gut dysbiosis refers to an imbalance in the gut microbiota (overgrowth of harmful bacteria, fungi, or viruses, and a decrease in beneficial bacteria), the community of microorganisms living in the intestines. This imbalance can disrupt normal digestive functions, the immune system, and even overall health.[17]

Dysbiosis can cause chronic inflammation in the gut, which can spread systemically. Conditions like inflammatory bowel disease, irritable bowel syndrome, and metabolic disorders can be linked to gut dysbiosis.[18]

Again, there is a clear link with periodontitis:

1. **Systemic inflammation:** periodontitis leads to systemic inflammation, which can affect gut health. Similarly, gut dysbiosis can lead to systemic inflammation that affects oral health.
2. **Microbial translocation:** bacteria from the oral cavity can enter the bloodstream and potentially influence the gut microbiota. For instance, *P. gingivalis*, a major pathogen in periodontitis, has been found in the gut and can contribute to dysbiosis.[19]
3. **Immune system:** both conditions involve the immune system's response to microbial imbalance and inflammation. Chronic inflammation in one site can influence inflammation in another, creating a bidirectional relationship.
4. **Shared risk factors:** conditions like diabetes, poor diet, and smoking can contribute to both periodontitis and gut dysbiosis. Additionally, the use of antibiotics can impact both oral and gut microbiomes.

Treating periodontitis may improve gut health and vice versa.[20] A comprehensive approach to managing both conditions can involve improving oral hygiene, dietary changes, probiotics, and anti-inflammatory treatments. Furthermore, a diet rich in fiber, prebiotics, and probiotics can support a healthy gut microbiome and potentially reduce inflammation associated with periodontitis.

12. Peri-implant mucositis and peri-implantitis

Periodontitis can have a significant influence on the development and progression of peri-implant mucositis and/or peri-implantitis.[21] These conditions are primarily driven by bacterial infections. Individuals with a history of periodontitis may have a higher microbial load and increased bacterial diversity, which can contribute to the development of peri-implant mucositis and/or peri-implantitis if implants are placed. In addition, chronic inflammation from periodontitis can affect systemic health and immune response, potentially making patients more susceptible to peri-implant mucositis and/or peri-implantitis.

Individuals with a history of periodontitis may struggle with plaque control, which is crucial for the health of both natural teeth and implants. Poor plaque control around implants can increase the risk of peri-implant mucositis and/or peri-implantitis.[22]

Literature

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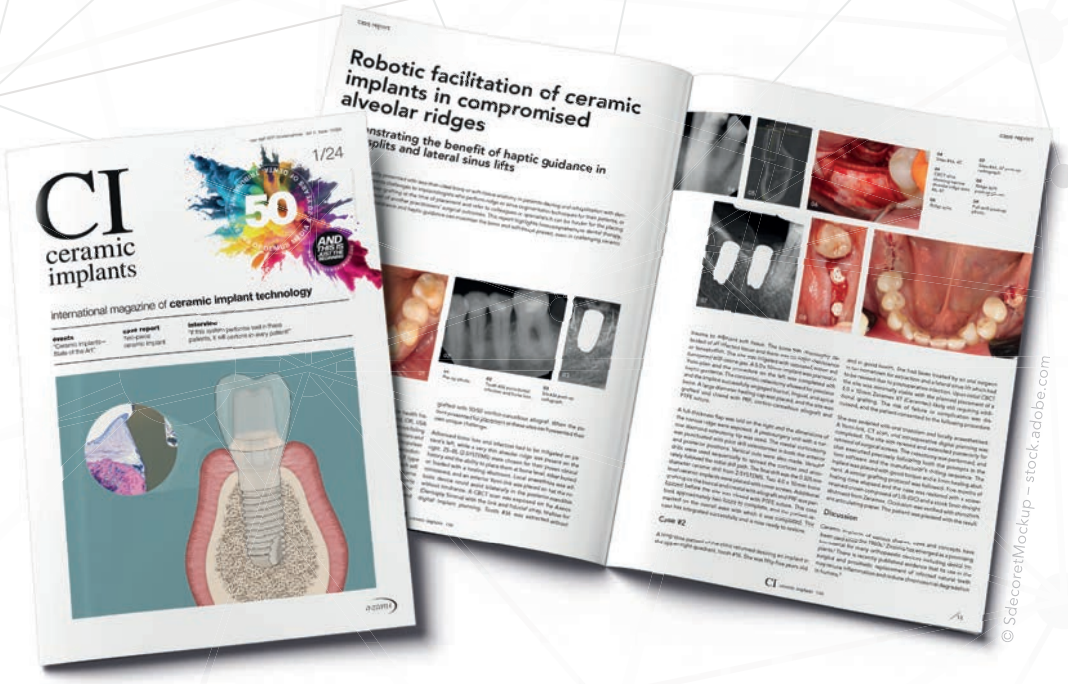

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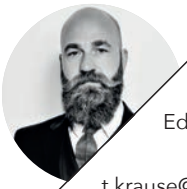

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Pure ceramic rehabilitations: when excellence meets the fundamentals

Dr Gábor Róza & Dr, MSc, PhD Mariane Sordi, Switzerland


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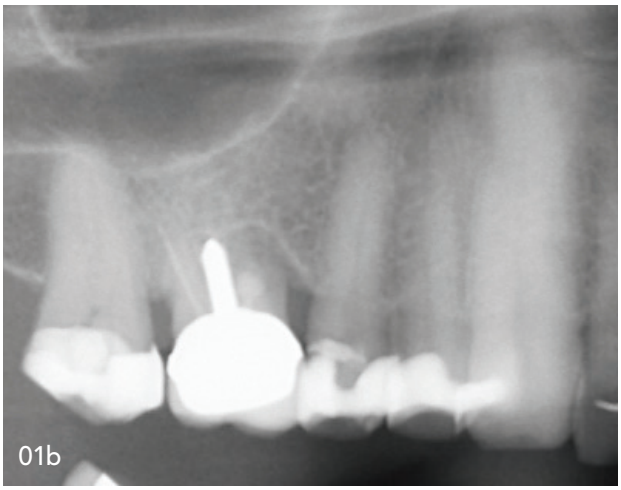
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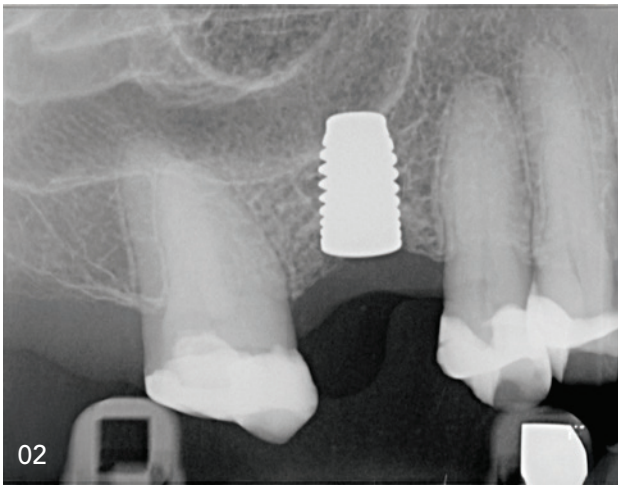
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In dentistry, the foundation of successful outcomes lies in mastering the fundamentals. When combined with pioneering materials like ceramics, even the simplest treatments can achieve good results. Conversely, complex clinical cases often captivate clinicians with the challenge they present. Therefore, simple cases are sometimes underestimated, leading to undesired outcomes.

Outstanding clinicians excel by addressing every case with diligence, combining surgical and prosthetic precision. Alongside clinical skills, high-quality biomaterials and workflow-friendly systems are essential.

In terms of implant systems, the advantages of using metal-free zirconia implants are well-documented. The key benefits include low biofilm formation, absence of metallic particle release and enhanced soft-tissue attachment to implants and abutments, establishing zirconia implants as a valuable clinical recommendation.[1,2]

The present case demonstrates the placement of a Z-Systems Z5-BL zirconia implant in the upper right first molar region (Figs. 1a & b). Due to maxillary sinus pneumatisation, a bone level 5x8mm implant was selected (Fig. 2). After achieving

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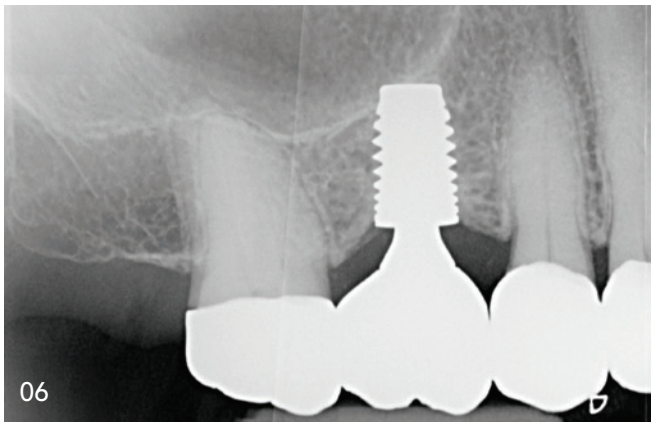

osseointegration, the implant was reopened (Fig. 3), and a zirconia abutment was selected for crown fabrication. The abutment was secured in place by the exclusive internal conical connection of Z-Systems' two-piece implants, which is activated by a zirconia screw (Fig. 4). The neighbouring teeth were also rehabilitated with full ceramic crowns (Fig. 5), and the case was finalised by restoring health, function, and aesthetics to the highest standard (Figs. 6 & 7).

References:

[1] Chen L, Tong Z, Luo H, Qu Y, Gu X, Si M. Titanium particles in peri-implantitis: distribution, pathogenesis and prospects. Int J Oral Sci. 23 Nov 2023; 15(1):49.

[2] Roehling S, Gahlert M, Janner S, Meng B, Woelfler H, Cochran DL. Ligature-induced peri-implant bone loss around loaded zirconia and titanium implants. Int J Oral Maxillofac Implants. March/April 2019; 34(2):357–365.

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Implants without peri-implantitis: "My search has come to an end!"

Patent

According to research, every fifth implant patient develops peri-implantitis.[1, 2] In this interview, Dr Fabrice Baudot, who is a specialist in minimally invasive surgery based in France and a founding member of the European Academy of Ceramic Implantology—EACim, talks about how his search for a peri-implantitis-free implant system led him to Patent™. Patent™ is the only two-piece implant system worldwide that has been demonstrated in independent studies to prevent peri-implantitis in the long term.

Interview with Dr Fabrice Baudot, France

Dr Baudot, how significant is the problem of peri-implantitis in dental practice today?
Peri-implantitis is a major concern. Research by Derks and Tomasi in 2015 found that 22 per cent of implant patients experience this condition, while peri-implant mucositis, its precursor, affects nearly double that number. These findings are consistent with the S3 guideline published by the European Federation of Periodontology in 2023.[3] Adding these numbers, we find that over 60 per cent of implant patients are biologically compromised, each presenting a problem for treating clinicians.

Is existing peri-implantitis a problem that can be solved?
This is what's concerning. There is still no successful long-term treatment option for peri-implantitis. We can only temporarily eliminate the chronic inflammation—by removing biofilm and granulation tissue, using a laser or an air polisher, an ultrasonic scaler or a curette. Additionally, we now know that complete re-osseointegration over the initially exposed implant surface cannot be achieved with today's peri-implantitis therapies.[4, 5]

If peri-implantitis cannot be treated with lasting success, what options do dental professionals have?
Prevention is key. Renvert and Polyzois's conclusion from their 2015 research remains as relevant as ever: "As with every disease, prevention is the best form of treatment, and peri-implantitis is no exception."[6]

Speaking of peri-implantitis prevention, how do you achieve this in daily implant practice?
Preventing peri-implantitis for me is part of a comprehensive approach that begins with proper and skilful execution of the treatment plan and masterful management of the soft and hard tissue, requiring a lot of education and experience. Together with my referring partners, I strive to achieve this every day in my practice.

Despite this, however, I encountered an increasing number of peri-implantitis cases over the past years, often referred to me for treatment. During my search for an implant system able to prevent this disease from developing in the first place, I discovered the Patent™ system, which claims to achieve this through its Zero Peri-Implantitis Concept.

Does Patent™ live up to that promise?
Initially, I was sceptical. After evaluating this system, however, it became apparent to me that it could work. Patent™ has a transmucosal design without a submucosal microgap, a sealed implant–crown connection, and a mucophilic surface that promotes strong soft-tissue adhesion. These features work together to prevent bacterial invasion and colonisation. Long-term stud-

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ies at two leading universities have confirmed the effectiveness of this concept, reporting no peri-implantitis around Patent™ implants, even in high-risk patients.[7, 8]

As an advocate for zirconia dental implants, you've used various systems in the past. What makes Patent™ stand out for you?
In my practice, I'm always on the lookout for less invasive, more natural products and protocols to improve my patients' quality of life. Patent™ aligns with this philosophy as a full zirconia implant that is biomimetic, mimicking the natural tooth with its design and prosthetic concept. Its patented manufacturing process produces a Y-TZP zirconia material that can be safely prepared by grinding without compromising fracture resistance. This represents a paradigm shift in implantology, opening up a wide range of clinical applications and allowing practitioners to express their creativity. These factors, together with the aforementioned long-term evidence, give me and my patients confidence in the therapeutic quality of this system.

You are a founding member and the scientific director of the European Academy of Ceramic Implantology (EACim). What is the academy's mission?
The EACim has grown rapidly since its founding in 2018, expanding its reach in Europe and into regions such as Africa and the Middle East. To date, we have organised three international congresses, held biennially, and are now preparing for our fourth congress, which will take place in Madrid. Our core mission, in collaboration with our partners in the sector, is to promote education and communication around ceramic implantology. We aim to educate dental professionals across disciplines on the latest clinical approaches with zirconia implants and the unique opportunities they provide. To this end, we are also focussing our efforts to be present at the congresses of other associations, such as the EAO, with seminars and workshops. Additionally, we've expanded our outreach efforts to include patients directly, leveraging social media, television, and radio to raise awareness about the benefits of ceramic dental implants. We are actively working to achieve greater public engagement with this topic.

What's your conclusion?
With Patent™, my search for a peri-implantitis-free implant solution has come to an end. It's not just another option in my toolkit—it's my first choice. I can confidently offer my patients a solution that I know will remain healthy and functional for the long term.

More information is available at www.mypatent.com.

Literature

About the interview partner

Dr Fabrice Baudot is a French dentist specialised in periodontics and implantology. He currently leads a practice that focuses on laser-assisted microsurgery. His therapeutic approach is always based on minimally invasive surgery. Dr Baudot is frequently invited to speak at international dental conferences, and he is the author of numerous scientific publications. In addition, he is the scientific leader and one of the founding members of the European Academy of Ceramic Implantology.

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Explore the future of ceramic implantology

Save the date for the 3rd European Congress for Ceramic Implant Dentistry

Under the theme "Facts of Ceramic Implants Part III", the European Society for Ceramic Implantology (ESCI) invites dental professionals, implantologists, and researchers to join the 3rd European Congress for Ceramic Implant Dentistry, taking place from 25 to 27 September 2025, in Zurich, Switzerland. This event will showcase the latest advancements in ceramic implantology, combining cutting-edge science, practical insights, and networking opportunities in an inspiring setting.

Learn from leading experts

The congress will feature 25 renowned speakers who will share their expertise, presenting innovative research, advanced techniques, and practical applications. Topics will range from the fundamentals of ceramic implantology to complex surgical procedures and interdisciplinary approaches. Whether you're an experienced professional or new to the field, the programme offers valuable insights to enhance your practice.

Hands-on workshops

Participate in interactive workshops led by industry leaders to refine your skills in ceramic implantology. These sessions will cover state-of-the-art surgical techniques, innovative materials, and integration strategies, providing practical tools to elevate your clinical practice.

Networking and social highlights

The congress also offers opportunities to connect with peers and experts in a relaxed environment. A welcome reception will kick off the event, fostering professional connections and idea exchanges.

The gala dinner, hosted at the picturesque Landgut Bocken on lake Zurich, will be a cultural highlight. Attendees will enjoy Swiss hospitality, fine dining, and entertainment in a stunning setting.

A blend of science and Swiss excellence

Set in Zurich, a global center of innovation, this congress combines academic rigor with warm hospitality. Attendees can enjoy the city's cultural richness and modern amenities, making it an ideal backdrop for this prestigious gathering.

Shape the future of ceramic implantology

The 3rd European Congress for Ceramic Implant Dentistry offers a unique platform to explore advancements in the field, connect with like-minded professionals, and contribute to the future of ceramic implantology.

Mark your calendar! Join this transformative event from 25 to 27 September 2025, in Zurich. Details on registration and the programme will be available soon at www.esci-online.com. For a glimpse of the 2022 congress highlights, visit https://esci-online.com/en/highlights-2022.

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ESCI

Zeramex XT—an outlook for 2025: market growth, further clinical studies and popular event formats

The demand for zirconia implants is increasing year on year—as is the interest in the two-piece zirconia implant system Zeramex XT. CeramTec Schweiz GmbH anticipates market growth and continues to invest in the expansion of production capacities, clinical studies and training programmes.

The year 2025 will see even more scientific evidence for the Zeramex XT two-piece ATZ zirconia implant system as well as more exciting event formats that are very popular with Zeramex users. In addition to several retrospective studies on Zeramex XT led by Dr Dr Thomas Mehnert, Dr Elisabeth Jacobi-Gresser, and Dr Thomas Franke and to be published in 2025, several dates for the "Zeramex Meet & Learn" event series at the company's site in Spreitenbach (Switzerland) are also being planned.

Referral events with presentations and case studies on Zeramex XT including surgery, prosthetics and dental technology will be also continued in 2025.

The 3rd European Congress for Ceramic Implantology of the European Society for Ceramic Implantology (ESCI) supported by CeramTec Switzerland (Company Partner), will be the further highlight of the year in the field of ceramic implantology. Pre-registration for the congress is already open and can be made via e-mail to info@esci-online.com. Please find more details about the products, workshops, and events at www.zeramex.com.

CeramTec Schweiz GmbH
Switzerland
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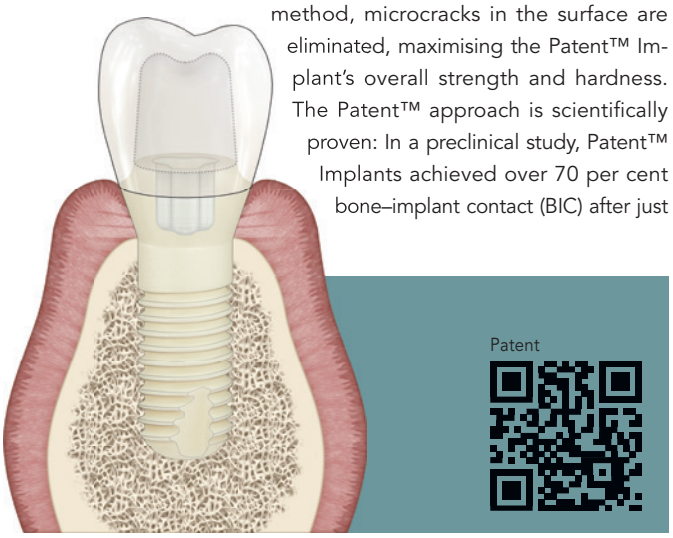
The only two-piece zirconia implant with long-term studies

Minimum risk of fracture and predictable osseointegration—the Patent™ Dental Implant System has solved the challenges of conventional zirconia implants. Only its patented production process creates the surface roughness needed for fast and predictable osseointegration. In the last step of this revolutionary manufacturing method, microcracks in the surface are eliminated, maximising the Patent™ Implant's overall strength and hardness. The Patent™ approach is scientifically proven: In a preclinical study, Patent™ Implants achieved over 70 per cent bone–implant contact (BIC) after just four weeks of healing, outperforming all other dental implants investigated in similar studies in terms of bone healing speed and success.[1] Furthermore, long-term studies conducted by leading universities in Germany and Austria evaluated the performance of Patent™ over nine and up to 12 years, finding no instances of implant fractures or peri-implantitis—even in compromised patients with risk factors such as systemic disease and/or chronic inflammations as well as smoking.[2,3] Learn more at www.mypatent.com.



Patent™ Dental Implant System
Switzerland
+41 44 5528454
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Literature

1. Glauser R, Schupbach P. Early bone formation around immediately placed two-piece tissue-level zirconia implants with a modified surface: an experimental study in the miniature pig mandible. Int J Implant Dent. 2022;8(1). doi:10.1186/s40729-022-00437-z
2. Brunello G, Rauch N, Becker K, Hakimi AR, Schwarz F, Becker J. Two-piece zirconia implants in the posterior mandible and maxilla: A cohort study with a follow-up period of 9 years. Clin Oral Implants Res. 2022;33(12):1233–1244. doi:10.1111/clr.14005
3. Karapataki S, Vegh D, Payer M, Fahrenholz H, Antonoglou GN. Clinical performance of two-piece zirconia dental implants after 5 and up to 12 years. Int J Oral Maxillofac Implants. 2023;38(6):1105–1114. doi:10.11607/jomi.10284

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ZiBone zirconia medical device: revolutionising dental implants for straight smiles

With our state-of-the-art products, we aim to equip dentists with the tools they need to create beautiful, natural-looking smiles for their patients. We will delve into the key features and benefits of our products, and how they can enhance your practice and patient outcomes.

ZiBone zirconia implants represent the pinnacle of dental implant technology. Crafted with precision and passion, our implants boast superior biocompatibility, promoting seamless integration with the jawbone. The aesthetic appeal of zirconia perfectly complements the natural dentition, creating a lifelike appearance that leaves patients with renewed confidence in their smiles. ZiBone zirconia implants are engineered to offer outstanding mechanical properties, ensuring lasting durability and stability, setting new standards for implant success rates.

Biocompatibility: Zirconia's biocompatibility reduces the risk of allergic reactions and inflammation, fostering a healthy healing process.

Optimal osseointegration: The advanced design of ZiBone zirconia implants with Ra 0.6 µm surface treatment, facilitates reliable osseointegration, promoting stable and successful implant placements.

Versatility: Our products cater to a wide range of dental cases, enabling you to provide personalised solutions for each patient's unique needs. Implant dimension 3.6, 4.0, 5.0 with different length 8, 10, 11.5, 13, 14.5.

Join us in revolutionising dental implantology—together, we create smiles that inspire confidence!

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BAYERNS BEST 50—bredent receives an award for best performance

bredent GmbH & Co. KG was honoured by the Bavarian State Ministry of Economic Affairs, Regional Development and Energy as one of the fastest-growing medium-sized companies in Bavaria. As part of the "BAYERNS BEST 50" event, the company and 49 other winners received the award, which stands for outstanding entrepreneurial growth, employee growth and sales growth. The award was handed over by Hubert Aiwanger, Bavarian State Minister for Economic Affairs, Regional Development and Energy.

"The award is a confirmation of our continuous corporate development and our commitment to our employees and the region," explains Peter Brehm, founder and owner of bredent. "With our innovative approach and a strong focus on quality and training, we have not only created jobs, but also actively contributed to the creation of a high standard of living in Bavaria."

The "BAYERNS BEST 50" award recognises companies that have achieved superior growth in recent years. Important selection criteria are the economic success of the company and the active role of the company management in the business.

bredent GmbH & Co. KG will showcase its innovative products at upcoming IDS International Dental Show from 25 to 29 March 2025, in Cologne. Find bredent GmbH & Co. KG in Hall 4.2, booth H68/69.

bredent medical GmbH & Co. KG
Germany
www.bredent-medical.com

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Neodent® Zi Ceramic Implant System: performance with outstanding aesthetic result

The Neodent® Zi Ceramic Implant System combines the notions of aesthetic, stability, and flexibility. This solution allows clinicians to immediately treat patients due to the modern naturally-tapered design and wide prosthetic portfolio, achieving high-end aesthetic results.

Treatment flexibility

Designed to provide several treatment solutions and a wide range of prosthetic possibilities through a two-piece connection, Zi offers solutions from conventional to digital workflow, able to treat bone types I to IV.

Tapered design and connection for stability

The Ceramic Implant System exhibits a modern tapered geometry designed for predictable immediate load. This feature is designed to mimic the tapered shape of a natural tooth root, achieving high primary stability.
Additionally, Zi has the exclusive ZiLock® internal ceramic connection, a user-friendly system designed with a longer screw which provides a secure engagement between the ceramic implant and the ceramic abutment. This design improves the performance by optimising the force distribution along the internal connection.

Ceramic prosthetic portfolio

The Ceramic prosthetic portfolio allows conventional or immediate protocols.
In addition, both conventional and digital workflows can be applied, resulting in a natural-looking restoration.

Neodent at IDS 2025

Neodent, the largest dental implant company in Brazil and the second-largest implant company in the world by volume, will showcase the Zi Ceramic Implant System at IDS 2025 in Cologne from 25 to 29 March. Already a success in the aesthetics segment and the German market, Zi invites visitors to discover its exceptional performance at Hall 4.2, booth G080/J089.

Neodent—A Straumann Group Brand
Switzerland
www.neodent.com

Z-SYSTEMS reaches 20-year milestone in advanced dentistry, pioneering zirconia implants

Z-SYSTEMS Ceramic Implants is proud to celebrate the continued success of our bone-level and tissue-level ceramic implants—the world's first and only 100 per cent ceramic dental implants with a screw-retained conical connection. These groundbreaking implants have set a new standard in implantology, offering unmatched strength, biocompatibility, and aesthetic excellence.
With 20 years of dedicated research and clinical expertise, Z-SYSTEMS has revolutionised the field of implants and their commitment to innovation has propelled the company to the forefront of dental implant technology. The advanced design of the 100 per cent ceramic implants provides patients with a metal-free solution that promotes optimal long-term outcomes, ensuring stability, natural appearance, and improved oral health.

Key features and benefits:

1. **Superior aesthetics:** The tooth-coloured zirconia material closely resembles natural teeth, allowing for seamless and lifelike restorations.
2. **Enhanced biocompatibility:** Our zirconia implants feature biocompatible materials with excellent tissue acceptance, promoting healthy osseointegration and long-term implant success.
3. **Two-piece conical connection:** This unique connection ensures a precise fit and stability while minimising the risk of bacterial penetration, contributing to lasting implant success.
4. **Outstanding durability:** Zirconia's exceptional strength and fracture resistance make our implants highly durable and suitable for a wide range of clinical cases.

Join us as we celebrate 20 years of pioneering excellence, as the world leader in zirconia implants, and discover how Z-SYSTEMS' bone-level and tissue-level implants can grow your practice and improve patient outcomes. For more information, visit www.zsystems.com.

Z-SYSTEMS Ceramic Implants is a leading dental implant manufacturer specialising in advanced ceramic implant solutions. With a focus on innovation, precision, and patient-centric outcomes, Z-SYSTEMS has set a new standard in implant dentistry. The company's commitment to excellence is rooted in a passion for enhancing smiles and improving the lives of patients worldwide.

Z-SYSTEMS AG
Switzerland
www.zsystems.com

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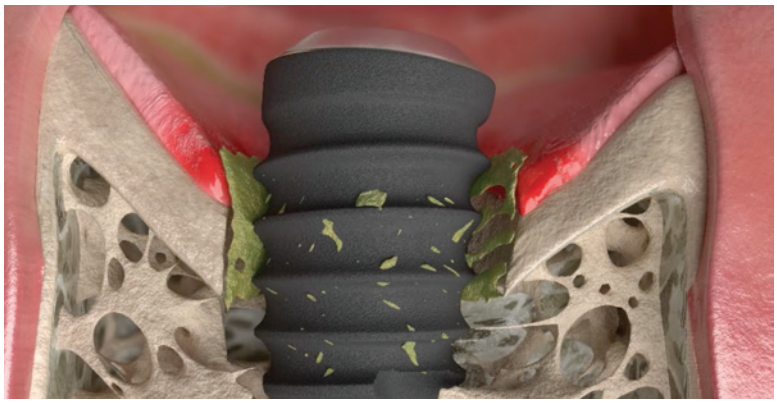
New photorealistic animation on the pathophysiology of particle-induced peri-implantitis

A widely understated risk factor for peri-implantitis that needs better understanding has increasingly become a focus in dental implantology: thin-film cell-toxic residues and particulate plastic material. These contaminants are often found in quality assessment studies on new, sterile-packaged dental implants. They originate from machining, remain after insufficient cleaning processes, or can result from faulty handling and packaging during the complex production chain of implant manufacturing.



In collaboration with Manolis Babatsikos and the team at 3D Medical Animations, the CleanImplant Foundation has created a photorealistic animation on the pathophysiology and pathobiology of peri-implantitis caused by contaminants on new dental implants. The animation clearly illustrates in an impressive way how impurities left on the implant surface can initiate an immune reaction in the patient via a foreign body reaction. During that foreign body response, pro-inflammatory cytokines promote osteoclastic activity, leading to bone loss at the osseous interface with the implant. Early bone loss and soft-tissue degradation are often described as the beginning of a bad ending as bacterial plaque accommodates on implant threads exposed to the oral cavity.

The three-minute photorealistic video can be seen on the completely redesigned website of the non-profit initiative (www.cleanimplant.org). The CleanImplant website relaunch shows a comprehensive reimagining of the history and vision, far beyond a simple update. Visitors can explore pivotal developments and features that highlight the CleanImplant initiative. The video is available for download and is free for use in lectures and dental education. The download link for a high-resolution version of the 3D animation is available on request.

CleanImplant Foundation · Germany
www.cleanimplant.org

News | ceramic-implants.info

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EACim 2025—shaping the future of ceramic implantology in Madrid

The European Academy for Ceramic Implantology (EACim) proudly announces its annual congress 2025, set to take place in the vibrant city of Madrid on 13 and 14 June 2025. For the fourth time, EACim will once again bring together pioneers, innovators, and leading voices in advanced ceramic implantology for two days of cutting-edge science, inspiration, and collaboration.

Renowned international experts and speakers will take the stage to share their expertise on the future of metal-free implantology. The programme promises a widespread mix of latest findings and up-to-date knowledge from the constantly growing field of ceramic implantology.

But the EACim Congress 2025 offers far more than knowledge transfer: it is a platform for dynamic exchange, sparking conversations that will shape tomorrow's patient care. Hands-on workshops, interactive demonstrations, and discussions with top professionals will immerse participants in practical solutions for clinical challenges. From groundbreaking research to visionary ideas, this is where the future of implant dentistry takes form.

Madrid, with its unique blend of tradition and innovation, provides the perfect setting. Between sessions, delegates can explore the city's rich history, world-renowned art, and gastronomic treasures, ensuring a congress experience that is as inspiring as it is unforgettable.

Join the EACim 2025 Madrid congress to connect, learn, and lead. Don't miss the opportunity to be part of the movement that is driving the evolution of ceramic implantology. Together, we will redefine standards, inspire progress, and elevate patient outcomes across Europe and beyond.

Save the date and join the 4th annual congress of EACim in Madrid—where the future begins. Visit www.eacim-ceramic-implantology.com for registration and updates.

EACim

EACim—European Academy of Ceramic Implantology
www.eacim-ceramic-implantology.com

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Save the date: joint annual scientific conferences of ISMI and DGKZ 2025

The International Society of Metal Free Implantology (ISMI) and the German Society for Cosmetic Dentistry (DGKZ) are delighted to announce their upcoming joint annual conferences, which will take place on 9 and 10 May 2025 at the prestigious Dorint Kurfürstendamm in Berlin, Germany.

This highly anticipated event will serve as a significant platform for advancing the field of metal-free and ceramic implantology, offering participants the opportunity to engage with the latest scientific research, innovative clinical techniques, and cutting-edge technological developments. A comprehensive programme is being curated to include keynote lectures, interactive sessions, panel discussions, and case presentations led by renowned experts and pioneers in the field. The interactivity of the congress will once more find a highlight in the well-appreciated table clinic sessions embedded in the programme.

In the joint congress, the DGKZ will focus on the fusion of both topics—ceramic implantology and aesthetics. It represents a modern approach to dentistry—it shows the combination of function and aesthetics.

The joint conferences aim to foster meaningful dialogue and collaboration between clinicians, researchers, academics, and industry professionals who share a commitment to advancing biocompatible and sustainable implant solutions. By attending, participants will gain invaluable insights into current trends and future directions while expanding their professional networks within a global community of specialists.

Attendees are encouraged to save the date and secure their participation early by registering via event@oemus-media.de.

For additional information or inquiries, please contact: ISMI – International Society of Metal Free Implantology, Bücklestraße 5a, 78467 Konstanz, Germany. Further information is also available at the ISMI website www.ismi.me.

We look forward to welcoming you to Berlin for this pivotal event in the field of implantology!

International Society for Metal Free Implantology e.V.
www.ismi.me

ISMI

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4th EACim CONGRESS

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SAVE THE DATE

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IN CERAMIC IMPLANTOLOGY

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Dr Adina LANDSCHOOF \ The beauty of soft tissue around ceramic implants \
Dr Regeane KANIAK \ Lecture title to be consulted on our site \
Dr Asaf WILLENSKY \ Zirconia or titanium dental implants ? Lessons from the mouse model \
Dr Markus et Mathias SPERLICH \ Preserving biology to through immediate digital treatment with two-part ceramic implant \
Dr Saurabh GUPTA \ Lecture title to be consulted on our site \
Dr Olivier HENRY-SAVAJOL \ Lecture title to be consulted on our site \
And two other "surprise guests" \ Names and lecture titles to be consulted on our site

CLOSING COCKTAIL \ The conference day will end with a dinner cocktail

madrid 4th EACim CONGRESS

CONGRESS LOCATION

HOTEL NH COLLECTION
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Chamartín, 28036 Madrid

INFORMATION & REGISTRATION

eacim-ceramic-implantology.com

DO YOU TRULY KNOW YOUR IMPLANT SYSTEM?

sterile + clean

sterile + dirty

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whiteSKY – **BREDENT MEDICAL**
Kontact W – **BIOTECH DENTAL**
BlueDiamond – **MEGAGEN**
s-Clean SQ-SL – **DENTIS**
ZENEX – **IZEN IMPLANT**
AnyRidge – **MEGAGEN**
SuperLine – **DENTIUM**
T6 torQ – **NUCLEOSS**
In-Kone – **GLOBAL D**
T6 – **NUCLEOSS**
UnicCa – **BTI**

*) Scanning electron microscope images (BSE mode) of new implants after unboxing – Both implants were sterile packaged, FDA labeled and ready for clinical use.

Sterile does not mean clean. Far too many implant systems have concerning residual surface contaminants.

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