

implants

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Dr Georg Bach
President
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Dear colleagues

Oral implantology continues to advance through scientific research, clinical experience and open professional exchange. Reflecting this diversity, the current issue brings together contemporary clinical approaches, research perspectives, industry developments and opportunities for international dialogue. Its overarching aim is clear: to support informed decision-making and contribute to reliable, patient-centred care.

A particular emphasis is placed on clinical practice and the challenges encountered in modern implantology. Through case-based contributions, the issue demonstrates how treatment planning, surgical technique and the appropriate selection of instruments and procedures converge across a range of clinical scenarios.

One key topic is implant osteotomy preparation. The featured material examines relevant biomechanical principles alongside practical considerations, including progressive wear, diminished sharpness and the risk of

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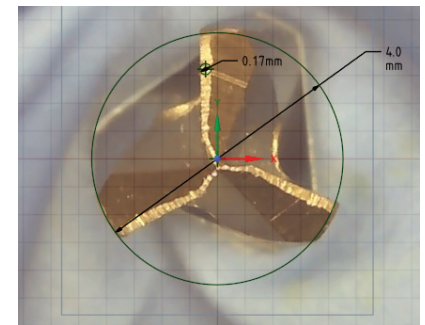
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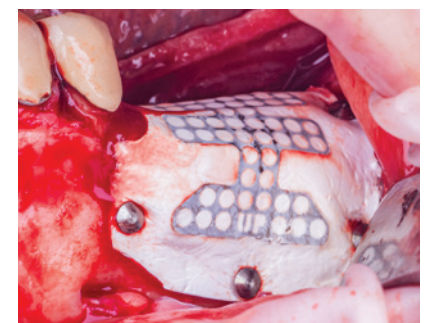
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brittleness under excessive loading. These factors highlight the importance of understanding not only the technique itself, but also the properties and limitations of the instruments involved.

Further contributions explore fully guided full-arch rehabilitation, as well as immediate implant placement combined with simultaneous guided bone regeneration in a complex patient case. Together, these reports reflect the breadth of contemporary implant treatment, from preparatory surgical procedures to comprehensive rehabilitation and combined implant and regenerative therapies.

The cases underscore the wide-ranging clinical demands of implant dentistry and provide a valuable basis for evaluating different approaches and their application in daily practice. Throughout, the central objective remains the same: the careful, individualised management of each clinical situation.

Beyond its clinical content, this issue also presents news from the dental industry and highlights opportunities for professional exchange at forthcoming international events.

I hope this edition offers valuable perspectives, encourages critical reflection and supports your daily professional practice. I wish you an informative and inspiring read.

Yours sincerely

Dr Georg Bach

President of the German Association of
Dental Implantology—DGZI



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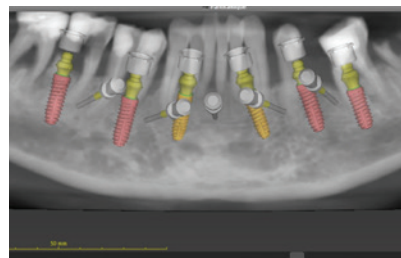


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Rethinking implant osteotomy preparation

Material science, biomechanics, and the crown down concept

Implant osteotomy preparation has remained fundamentally unchanged for more than five decades despite significant advances in implant design, surface technology, digital treatment planning, and guided surgery. Conventional sequential drilling using stainless steel drills has demonstrated excellent long-term clinical success but is associated with progressive drill wear, reduced cutting efficiency, multiple drilling steps, and increased frictional heat generation with repeated use.

Dr Gregori M. Kurtzman, USA

Solid tungsten carbide possesses exceptional hardness, wear resistance, and cutting-edge retention, making it an attractive alternative material for implant drills. However, its relatively brittle mechanical behaviour has historically limited its clinical application because conventional pilot-to-final drilling sequences expose the smallest drills to the highest torsional and bending stresses. The Crown Down concept was developed to overcome this engineering limitation by redistributing drilling forces so that the largest and mechanically strongest drill prepares the dense cortical bone before smaller drills complete the trabecular osteotomy. This review examines the scientific rationale behind this alternative osteotomy philosophy, emphasising material science, biomechanics, drill wear, thermal considerations, osteocompression, autogenous bone harvesting, and potential clinical applications. Although preliminary laboratory and clinical evidence is encouraging, additional prospective comparative studies are needed to determine whether these engineering advantages translate into superior long-term clinical outcomes.

Introduction

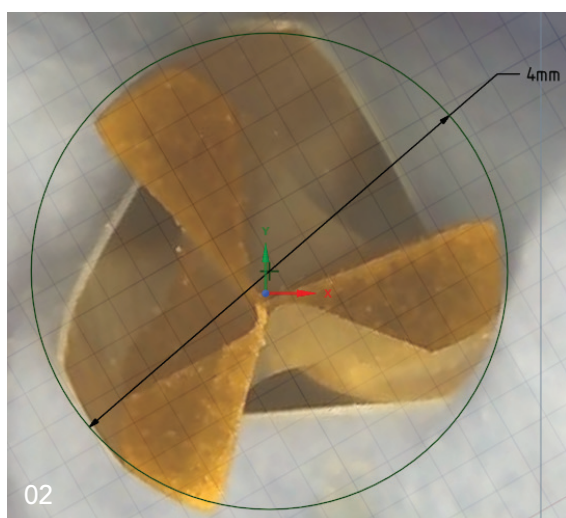
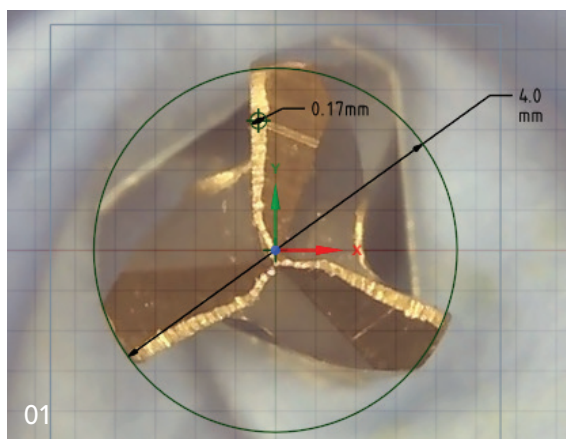
Successful implant therapy depends on precise osteotomy preparation. The implant osteotomy determines implant position and angulation while influencing primary stability, surgical efficiency, heat generation, and the biologic response of surrounding bone during healing. Although implant macrodesign, surface technology, digital treatment planning, and guided surgery have evolved considerably over the past three decades, the fundamental principles of implant site preparation have changed remarkably little.¹⁻⁴ Conventional implant osteotomies continue to be pre-

pared using sequential stainless-steel drills that progressively enlarge the osteotomy from a narrow pilot drill to the final implant diameter. This technique has demonstrated excellent long-term clinical success and remains the benchmark against which alternative osteotomy protocols should be evaluated. However, sequential drilling requires multiple drill changes and repeatedly exposes each drill to dense cortical bone, contributing to progressive drill wear, reduced cutting efficiency, increased friction, and greater thermal generation during osteotomy preparation.²⁻⁷

These limitations have stimulated interest in alternative cutting materials capable of maintaining sharp cutting edges over prolonged clinical use. Solid tungsten carbide possesses exceptional hardness, wear resistance, and cutting-edge retention, making it an attractive alternative to stainless steel.⁶⁻⁸ However, its relatively brittle mechanical behaviour has historically limited its application because conventional pilot-to-final drilling sequences expose the smallest drills to the highest torsional and bending loads while penetrating dense cortical bone. The Crown Down concept was developed to overcome this engineering limitation by reorganising osteotomy preparation according to the mechanical properties of both bone and drill material rather than simply enlarging the osteotomy sequentially. This review examines the scientific rationale, biomechanics, material science, and potential clinical applications of this alternative osteotomy philosophy.

Why implant drills wear

A bone is an exceptionally demanding cutting substrate because cortical bone contains approximately 60 to 70 per cent mineral by weight, primarily hydroxyapatite, producing substantial abrasive forces during implant osteotomy



01
Wear noted on stainless steel drill after repeated osteotomy preparation use.

02
Lack of wear noted on tungsten carbide drill after repeated osteotomy preparation use.

preparation.³⁻⁷ As stainless-steel drills are used repeatedly, scanning electron microscopy has demonstrated progressive cutting-edge rounding, abrasion, micro-chipping, and surface deformation that reduce cutting efficiency (Fig. 1).³⁻⁵

Loss of cutting efficiency has important clinical consequences. Dull drills require greater axial pressure and longer contact time to remove bone, increasing friction at the cutting interface and generating additional heat. Eriksson and Albrektsson demonstrated that prolonged exposure of bone to temperatures above approximately 47 °C may result in irreversible thermal injury, emphasising the importance of maintaining sharp cutting instruments during implant surgery.¹ Drill longevity is also influenced by bone density, drill design, rotational speed, irrigation, surgical technique, and repeated sterilisation cycles.²⁻⁷

These observations have prompted investigation of more wear-resistant cutting materials. Solid tungsten carbide maintains a sharp cutting edge substantially longer than stainless steel and therefore has the potential to reduce friction while maintaining cutting effi-

ciency.⁶⁻⁸ In contrast to the progressive wear observed with stainless-steel drills, Figure 2 demonstrates the minimal cutting-edge wear evident in a solid tungsten carbide drill following repeated osteotomy preparation.

Material science of implant drills

The clinical performance of an implant drill depends on both its design and the properties of the material from which it is manufactured. An ideal drill should maintain a sharp cutting edge, efficiently remove bone with minimal friction, resist corrosion and repeated sterilisation, dissipate heat effectively, and tolerate the torsional and bending forces encountered during surgery.

For decades, surgical stainless steel has been the material of choice because it combines strength, toughness, corrosion resistance, ductility, and relatively low manufacturing cost. One of its greatest advantages is its ability to deform before fracturing under excessive loading, providing an important margin of clinical safety. Its primary limitation is progressive cutting-edge wear, which increases drilling resistance, friction, and thermal generation with repeated clinical use.²⁻⁷

Solid tungsten carbide offers a distinctly different combination of mechanical properties. Its exceptional hardness and abrasion resistance allow it to retain a sharp cutting edge considerably longer than stainless steel, improving cutting efficiency while potentially reducing friction and heat generation.⁶⁻⁸ However, unlike stainless steel, tungsten carbide undergoes very little plastic deformation before fracture. Consequently, successful clinical application depends not only on the drill material itself but also on a drilling sequence that minimises excessive torsional and bending stresses. The principal differences between stainless steel and solid tungsten carbide implant drills are summarized in Table 1. Comparing the relative hardness of materials commonly used for implant drill manufacture, solid tungsten carbide demonstrates substantially greater hardness than ceramic, titanium, and stainless steel (Fig. 3). This exceptional hardness allows the drill to maintain a sharp cutting edge through repeated osteotomy preparation, reducing abrasive wear and preserving cutting efficiency over a greater number of clinical procedures. However, hardness alone does not determine clinical performance. Because tungsten carbide is considerably less forgiving under excessive torsional and bending loads than stainless steel, successful clinical application requires a drilling sequence designed to minimise these stresses.

The engineering challenge

If solid tungsten carbide possesses such favourable cutting characteristics, why has it not replaced stainless steel for implant drills? The answer lies in fracture mechanics. Conventional implant osteotomy preparation begins with a narrow pilot drill that establishes implant position and angulation before progressively enlarging the osteotomy with increasingly larger drills.¹⁻⁴ Consequently, the smallest drill must penetrate dense cortical bone and is exposed to the greatest torsional and bending loads.

While stainless steel can tolerate these stresses through elastic and plastic deformation, similarly sized tungsten carbide

Property	Stainless steel	Solid tungsten carbide	Clinical significance
Hardness	Moderate	Very high	Improved resistance to cutting-edge wear
Wear resistance	Moderate	Excellent	Longer maintenance of cutting efficiency
Fracture toughness	High (ductile)	Lower (brittle)	Requires modified drilling sequence to minimise overload
Flexibility	Greater	Limited	Steel tolerates bending; carbide is less forgiving under excessive lateral stress
Cutting-edge retention	Moderate	Excellent	Reduced drilling forces over repeated use; more efficient heat transfer away from the cutting interface
Thermal conductivity	Moderate	Higher	More efficient heat transfer away from the cutting interface
Resistance to repeated sterilisation	Good	Excellent	Maintains dimensional stability with repeated clinical use
Cutting efficiency	Decreases progressively with wear	Maintained more osteotomies	May reduce friction and drilling time
Typical clinical limitation	Progressive wear and loss of sharpness	Brittleness under excessive torsional or bending loads	Forms the biomechanical basis for the Crown Down concept

Table 01
Comparison of stainless steel and solid tungsten carbide implant drills.

drills are considerably more susceptible to brittle fracture.⁶⁻⁸ Simply substituting tungsten carbide for stainless steel within a conventional ascending drilling sequence would therefore expose the smallest carbide drills to the highest mechanical loads, increasing the likelihood of fracture. The engineering limitation lies not in the material itself, but in the drilling sequence.

The Crown Down concept

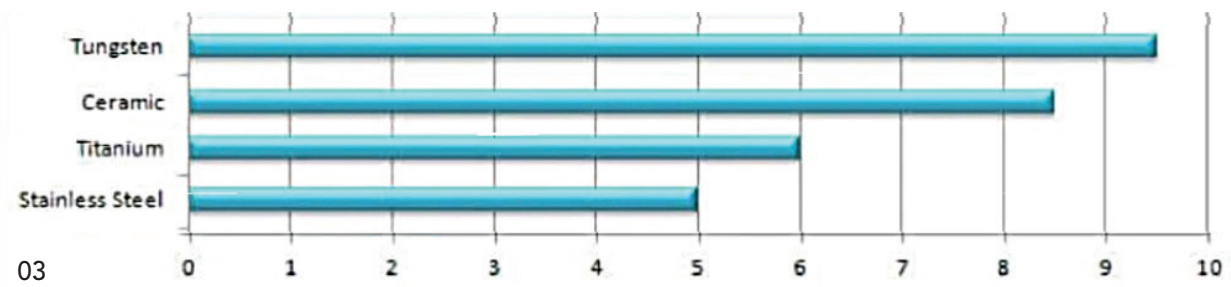
The Crown Down concept was developed by Dr Zvi Fudim to address the principal engineering limitation associated with the use of solid tungsten carbide implant drills. Rather than exposing the smallest drills to the greatest mechanical stresses, the drilling sequence is reorganised so that the largest and mechanically strongest drill encounters the highest resistance first.

Unlike conventional implant systems, the Crown Down approach does not simply reverse the traditional sequential drilling protocol. Instead, the drilling sequence is designed around the mechanical properties of tungsten carbide and the differing resistance characteristics of cortical and trabecular bone. Drill selection is determined by implant diameter and the portion of the osteotomy being prepared rather than by progressively enlarging the osteotomy from

a small pilot drill to the final diameter. The principal differences between conventional sequential drilling and the Crown Down concept are summarised in Table 2.

One commercially available implementation of this concept is the Crown Down Kit (Crown Down), which incorporates solid tungsten carbide drills organised according to this engineering philosophy. Unlike conventional implant systems that begin with a 2.0 mm pilot drill, the smallest drill in the kit is selected according to the planned implant diameter. For example, preparation of a 3.2 mm implant osteotomy utilises a 2.75 mm drill rather than a 2.0 mm pilot drill, thereby avoiding unnecessary use of extremely small tungsten carbide drills that would otherwise be exposed to high torsional stresses. The range of available Crown Down tungsten carbide drills, which are selected according to the planned implant diameter rather than by a conventional pilot-to-final sequence (Fig. 4).

For placement of a 4.8 mm implant, the sequence begins with a larger-diameter cortical drill corresponding to the planned implant diameter. Because this drill possesses substantially greater cross-sectional area and bending stiffness, it is considerably more resistant to torsional overload than smaller drills. Its primary purpose is to relieve the



03
Relative hardness comparison of materials commonly used for implant drill manufacture.

dense cortical plate, which represents the region of greatest drilling resistance. The progressive Crown Down drilling sequence (Fig. 5) demonstrates how the osteotomy is enlarged incrementally from the crestal cortex toward the final working depth while reducing cortical resistance before deeper preparation.

Once the cortical bone has been prepared, smaller tungsten carbide drills are used only within the deeper trabecular portion of the osteotomy. At this stage, the cortical resistance has already been eliminated, allowing the smaller drills to function under substantially lower mechanical loads. Consequently, they experience reduced binding, lower lateral bending forces, decreased torsional stress, and a markedly reduced likelihood of brittle fracture. The simplified two-drill Crown Down protocol is illustrated in Figure 6. A cortical drill matching the planned implant diameter enlarges only the crestal portion of the osteotomy to relieve cortical resistance (A), after which a final implant-specific drill completes the osteotomy to the planned depth and diameter (B). This approach replaces the conventional five- to eight-drill sequential protocol while reducing instrument changes and mechanical loading on the drills.

This sequence is fundamentally different from simply manufacturing conventional implant drills from tungsten carbide. If solid tungsten carbide drills were used in the traditional ascending pilot-to-final sequence, the smallest drills, particularly those measuring approximately 2.5 to 3.0 mm in diameter would be subjected to the greatest torsional and bending stresses while penetrating dense cortical bone. Because tungsten carbide exhibits limited plastic deformation prior to failure, such loading conditions would substantially increase the risk of sudden brittle fracture.

Accordingly, the innovation of the Crown Down concept lies not simply in the use of tungsten carbide as a cutting material, but in the integration of material science with drill architecture and surgical biomechanics. By matching drill diameter, drilling order, and regional bone resistance to the mechanical behaviour of solid tungsten carbide, the system enables the safe clinical application of a material that would otherwise be poorly suited to a conventional sequential drilling protocol.

Cortical bone is the real obstacle

One of the fundamental principles underlying the Crown Down concept is recognising that not all bone contributes equally to drilling resistance. Cortical bone is highly mineralised and possesses an elastic modulus several times greater than cancellous bone, accounting for most drilling torque, drill wear, and heat generation during osteotomy preparation.²⁻⁸ In contrast, trabecular bone offers substantially less resistance. Conventional sequential drilling repeatedly enlarges the cortical plate with every drill, whereas the Crown Down concept prepares the cortical bone once before completing the osteotomy within the less resistant trabecular bone. This reduces torsional stress on smaller drills, decreases cumulative friction, and

Characteristic	Conventional sequential drilling	Crown Down concept
Initial drill	2.0 mm pilot	Implant-specific cortical drill
Smallest drill used	2.0 mm	Implant diameter dependent (e.g. 2.75 mm for a 3.2 mm implant)
Cortical preparation	Repeated with every drill	Performed once by the largest drill
Region of highest mechanical stress	Smallest drill	Largest drill
Drill material	Stainless steel	Solid tungsten carbide
Typical number of drills	4 or more	2
Primary engineering objective	Sequential enlargement	Mechanical load redistribution
Risk of brittle carbide fracture	High if carbide substituted directly	Reduced by Crown Down architecture

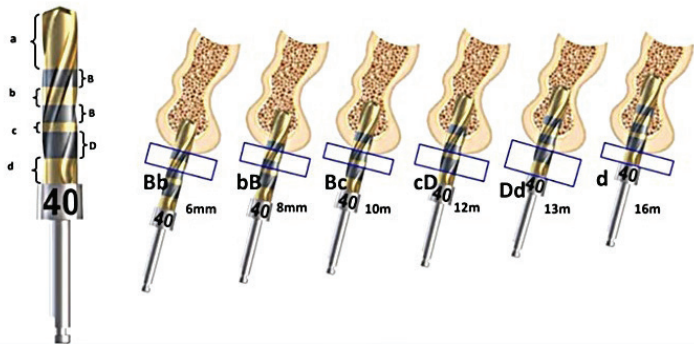
Table 02
Conventional sequential drilling versus the crown down concept.



04

04
The diameters available for the tungsten carbide Crown Down drills.

05
Crown Down osteotomy preparation using a 4.0 mm drill, with sequential advancement progressively enlarging the osteotomy from the crestal cortex to the final depth, reducing drilling torque and heat generation.



05

improves drilling efficiency. The innovation is not simply the use of tungsten carbide, but the integration of drill material, drill diameter, and drilling sequence with the biomechanics of cortical and trabecular bone.

Osteocompression and primary stability

Primary implant stability is essential for predictable osseointegration, particularly when immediate placement or immediate loading protocols are used. Although implant stability depends on implant design, bone density, and surgical technique, osteotomy preparation remains a major determinant of the mechanical relationship between the implant and surrounding bone.¹⁵

Conventional undersized osteotomies achieve stability by compressing both cortical and trabecular bone. While cortical engagement contributes to insertion torque, excessive cortical resistance may increase crestal stresses without proportionally improving stability. In dense bone, excessive insertion torque may contribute to incomplete implant seating or the clinical phenomenon commonly referred to as a “spinner.”

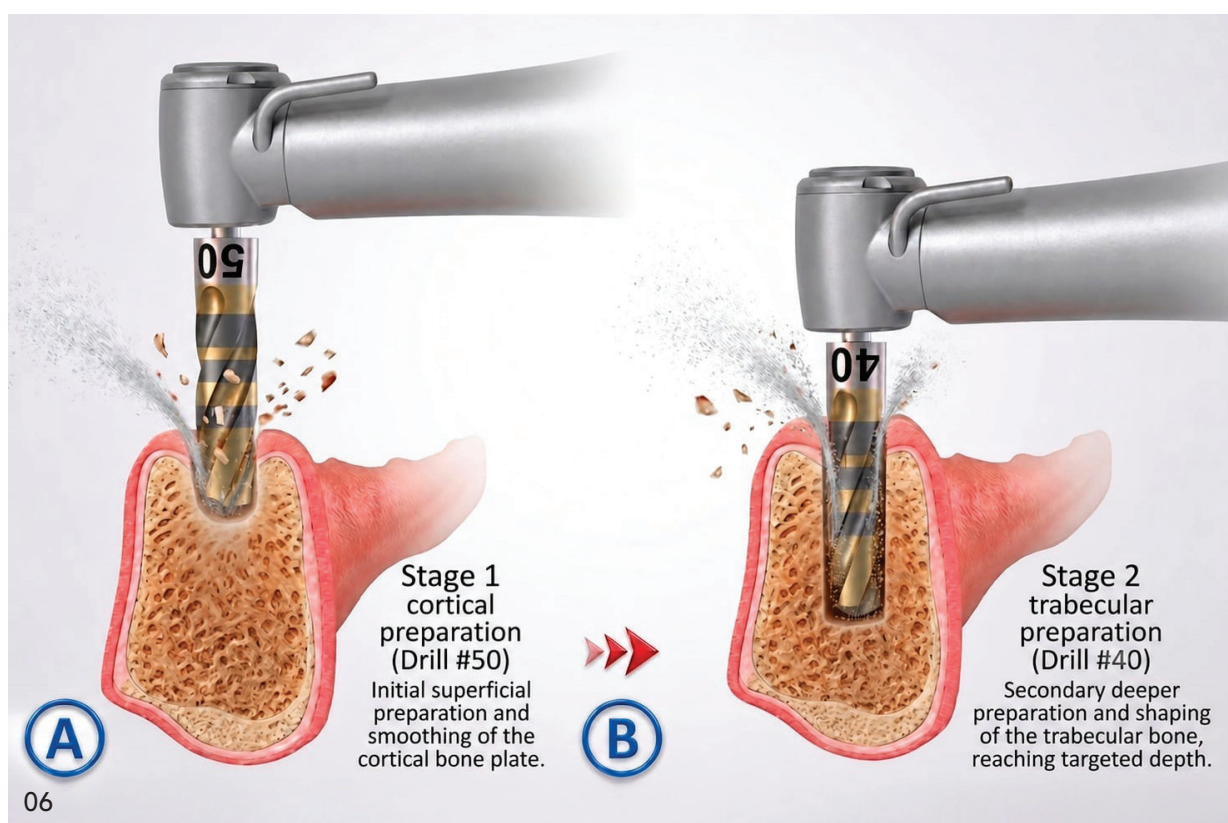
The Crown Down concept approaches stability differently. Because the cortical bone has already been prepared to the planned implant diameter, implant insertion relies primarily on controlled compression of the more elastic trabecular bone while minimising unnecessary cortical binding. Although clinical confirmation is still needed, this

approach is biomechanically consistent with current concepts of implant stability.¹⁵ Recent systematic reviews have shown that osteotomy techniques capable of modifying bone condensation can significantly influence primary implant stability, although long-term effects on marginal bone levels and implant survival continue to be investigated.¹⁶

Low-speed drilling and thermal management

Conventional implant osteotomy preparation relies on copious irrigation to control frictional heat. The Crown Down concept instead focuses on maintaining cutting efficiency, thereby reducing the friction responsible for heat generation. Because solid tungsten carbide maintains a sharp cutting edge substantially longer than stainless steel, efficient cutting can often be achieved at lower rotational speeds.⁶⁻⁹

Current evidence indicates that low-speed osteotomy preparation without irrigation can be performed safely when appropriate instrumentation and surgical technique are used.⁹ Reduced rotational speed, sustained cutting efficiency, and lower friction may decrease heat generation while maintaining bone viability. Because thermal production remains influenced by multiple factors, including bone density, drill geometry, drilling pressure, cutting efficiency, drilling time, and surgical technique with low-speed drilling should be viewed as one component of a comprehensive thermal management strategy rather than a replacement for sound surgical technique.¹⁻⁹



06

Two-drill Crown Down osteotomy protocol utilises a cortical drill that matches the planned implant diameter enlarging only the crestal portion of the osteotomy relieving cortical resistance at the planned implant site (A), then a final implant-specific drill (4.0 mm shown; B) completes the osteotomy to the planned depth and diameter. This two-drill Crown Down protocol replaces the conventional 4 or more drill sequential osteotomy technique while reducing drilling time, instrument changes, and mechanical stress on the drills.

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References:

- 1 Data on File, Usability Test (Geistlich Pharma AG, Wolhusen, Switzerland).
- 2 Dewilde F, et al.: J Clin Implant Dent Relat Res 2024; 26(3): 545–53. Epub ahead of print. (clinical study)
- 3 IFU Geistlich Bio-Gide® Forte

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Potential advantage	Current supporting evidence	Level of evidence	Future research needed
Improved drill wear resistance	Laboratory studies demonstrate superior wear resistance of tungsten carbide compared with stainless steel.	Strong laboratory evidence	Prospective clinical studies evaluating drill longevity
Maintenance of cutting efficiency	Material science and laboratory investigations support prolonged cutting-edge retention.	Strong laboratory evidence	Clinical evaluation after repeated osteotomies
Reduced friction during drilling	Expected from maintained sharpness and lower cutting forces.	Engineering rationale with laboratory support	Comparative clinical studies
Reduced heat generation	Laboratory studies demonstrate drill sharpness significantly influences thermal generation.	Moderate evidence	Randomised clinical trials comparing osteotomy temperatures
Simplified surgical workflow	Fewer drilling steps reduce instrument exchanges.	Clinical observation	Time-and-motion clinical studies
Improved surgical efficiency	Reduced drilling sequence may shorten operative time.	Clinical observation	Prospective workflow studies
Low-speed drilling without irrigation	Supported by randomised clinical trials demonstrating safe osteotomy preparation and preservation of harvested bone.	High clinical evidence	Long-term multicentre studies
Recovery of viable autogenous bone	Randomised clinical trials demonstrate excellent cellular viability and osteogenic potential.	High clinical evidence	Histologic and long-term regenerative outcome studies
Improved guided surgery workflow	Fewer drills and reduced irrigation requirements may simplify guided procedures.	Engineering rationale	Comparative guided surgery trials
Controlled trabecular osteocompression	Supported by biomechanical principles of cortical relief and cancellous bone compression.	Engineering rationale	Clinical studies evaluating insertion torque, ISQ, and marginal bone stability
Reduced cortical binding during implant insertion	Logical consequence of cortical relief before implant placement.	Engineering rationale	Prospective comparative studies
Improved long-term implant outcomes	Currently unknown.	Insufficient evidence	Randomised controlled clinical trials with long-term follow-up

Table 03

Potential clinical advantages of the Crown Down concept: Current evidence and future research needs.

Clinical take-home points

- Conventional sequential drilling remains a predictable and well-documented technique.
- Progressive drill wear contributes to reduced cutting efficiency and increased friction.
- Cortical bone accounts for most drilling resistance, drill wear, and thermal generation.
- Solid tungsten carbide offers substantially greater wear resistance than stainless steel.
- Tungsten carbide's brittleness requires a modified drilling sequence.
- The Crown Down concept distributes mechanical loading according to drill strength rather than drill diameter.
- Low-speed drilling facilitates recovery of viable autogenous bone.
- Simplified drilling may improve surgical efficiency and guided surgery workflows.
- Additional prospective clinical studies are needed before definitive conclusions regarding long-term clinical superiority can be drawn.

Autogenous bone harvesting

An additional advantage of low-speed drilling without continuous irrigation is efficient collection of autogenous bone. Autogenous bone remains the benchmark grafting material because it provides osteogenic cells, osteoinductive growth factors, and an osteoconductive scaffold.^{10,11} During conventional drilling, irrigation rapidly washes much of the particulate bone into the suction system, limiting recovery.

With low-speed preparation, bone chips remain attached to the drill flutes and can be transferred directly to the surgical site. The larger cortical drill frequently yields sufficient particulate bone to repair small peri-implant dehiscence defects, extraction socket deficiencies, or localised contour defects without requiring a secondary donor site. Randomised clinical studies have demonstrated excellent cellular viability and osteogenic potential of bone harvested during low-speed drilling without irrigation.⁹ Although larger grafting procedures still require additional graft materials, recovery of biologically active autogenous bone represents a valuable secondary benefit of the Crown Down approach.

Guided surgery applications

Digital implant planning and guided surgery have become integral components of contemporary implant therapy. Although guided surgery improves implant positioning and prosthetically driven treatment planning, guide sleeves may partially restrict coolant access to the drill tip and require multiple drill exchanges during osteotomy preparation.¹³

Because the Crown Down concept emphasises efficient cutting at low rotational speeds while reducing the number of drilling steps, dependence on continuous irrigation may be reduced, improving visualisation and simplifying surgical workflow. Fewer instrument exchanges may also improve efficiency during both single-tooth and full-arch guided implant procedures. Although comparative clinical evidence remains limited, the combination of simplified drilling, efficient cutting, and low-speed preparation appears well suited for digital implant workflows.

Clinical perspective

The Crown Down concept should be viewed not simply as another implant drilling protocol but as an engineering-based approach that aligns drill material, drill sequence, and bone biomechanics to optimise osteotomy preparation. While its biomechanical rationale is supported by laboratory evidence and early clinical experience, prospective comparative clinical studies are needed to determine whether these theoretical advantages translate into improved long-term clinical outcomes.

Discussion

Although conventional sequential drilling remains the benchmark for implant osteotomy preparation, the protocol was developed before many of today's advances in implant design, digital treatment planning, guided surgery, and regenerative techniques.¹⁻⁸ The Crown Down concept reexamines osteotomy preparation by shifting the emphasis from sequential enlargement of the osteotomy to management of mechanical loading.

Rather than repeatedly enlarging the cortical plate with progressively larger drills, the Crown Down approach prepares the dense cortical bone first using the largest and mechanically strongest drill, allowing subsequent preparation of the trabecular bone under substantially lower torsional and bending stresses. This drilling architecture, rather than the use of tungsten carbide alone, represents the principal innovation of the concept. By matching drill material, drill diameter, drilling sequence, and regional bone resistance to the mechanical behaviour of solid tungsten carbide, the system enables safe clinical use of a material that would be poorly suited to a conventional ascending drilling sequence.

The concept also recognises that cortical bone, rather than trabecular bone, is responsible for most drilling resistance, drill wear, and frictional heat generation. Preparing the cortical plate once before completing the trabecular osteotomy may reduce cumulative friction, simplify the drilling sequence, and improve surgical efficiency. In addition, low-speed drilling without continuous irrigation facilitates recovery of viable autogenous bone for management of small peri-implant defects while avoiding a secondary donor site.⁹⁻¹¹

Although the biomechanical rationale is well supported by material science and laboratory investigations, prospective comparative clinical studies are still needed to determine whether these engineering advantages translate into improved implant stability, reduced complications, or superior long-term clinical outcomes. Table 3 summarises the proposed clinical advantages of the Crown Down concept, distinguishing those supported by current laboratory or clinical evidence from those that remain based primarily on engineering principles and require prospective clinical validation.

Conclusion

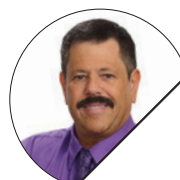
Sequential implant osteotomy preparation has remained remarkably consistent for more than five decades because it is predictable, reproducible, and supported by extensive clinical evidence. Nevertheless, advances in material science provide opportunities to reconsider how implant osteotomies are prepared.

The Crown Down concept represents an engineering-based approach that aligns drill material, drill sequence, and bone biomechanics rather than simply enlarging the osteotomy sequentially. By allowing the strongest drill to prepare the region of greatest mechanical resistance, the concept addresses one of the principal limitations that has historically prevented the widespread use of solid tungsten carbide in implant surgery.

Potential benefits include improved wear resistance, maintenance of cutting efficiency, simplified workflow, efficient autogenous bone harvesting, and reduced dependence on continuous irrigation. While these advantages are supported by sound engineering principles and encouraging early evidence, prospective comparative clinical studies remain necessary to determine whether they translate into superior long-term clinical outcomes.

Rather than simply introducing another implant drill system, the Crown Down concept encourages clinicians to reconsider the biomechanics of implant osteotomy preparation. If future research confirms its theoretical and laboratory advantages, it may represent an important evolution in surgical implant instrumentation.

The true innovation of the Crown Down concept is not simply the substitution of solid tungsten carbide for stainless steel, but the redesign of implant osteotomy preparation to match drill material, drill diameter, and drilling sequence with the biomechanical resistance of cortical and trabecular bone. This integration of material science and surgical biomechanics provides the engineering foundation for the safe clinical application of solid tungsten carbide implant drills.



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About the author



Peri-implantitis: could the risk begin before surgery?

When we think of peri-implantitis, we tend to think of biofilm, patient-related factors, surgical and prosthetic factors, or maintenance and follow-up strategies. But could part of the problem begin much earlier—before the implant even leaves its packaging?

Dr Dirk Duddeck, Germany

A new White Paper from the CleanImplant Foundation focuses on a risk factor that has received comparatively little attention in discussions of peri-implantitis: manufacturing- and packaging-related contamination on new, sterile-packaged dental implants.

The starting point is surprisingly simple: An implant can be sterile and still be contaminated. Sterility describes the absence of viable microorganisms. It does not necessarily mean the implant surface is free of plastic particles, foreign metals, or other residues from manufacturing and packaging processes.

This is precisely where the 16-page White Paper *The Missing Variable in Peri-implantitis* begins. Looking at the issue from four perspectives—science, manufacturers, clinicians, and patients—it raises a central question: Have we underestimated a variable in our search for peri-implantitis risk factors?

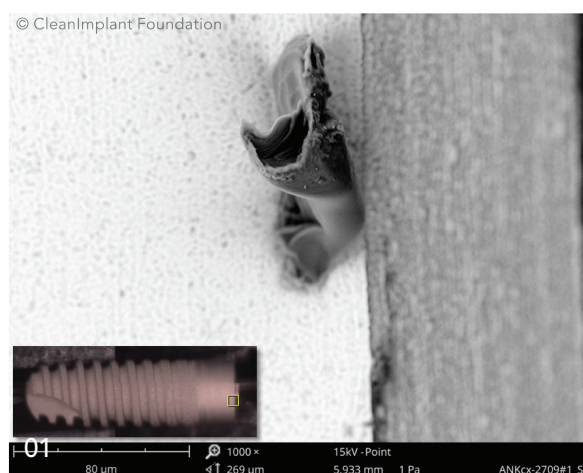
What can be found on new implants?

For years, the CleanImplant Foundation has been examining factory-new, sterile-packaged implants using scanning electron microscopy and elemental analysis. Most recently, an international quality assessment study analysed 80 implants from 55 manufacturers in independent, accredited testing laboratories.

Researchers found significant contamination on one in four implants examined. In these cases, more than 50 organic, i.e. carbonaceous particles were detected on one third of the analysed surface.

The range of substances identified is remarkable. Findings included polyoxymethylene and polysiloxanes, halogenated plastic particles, as well as residues containing tungsten, iron-chromium-nickel, or copper-tin compounds. Film-like contaminants were also detected, including erucamide lubricants, quaternary ammonium compounds, and dodecylbenzenesulfonic acid (DBSA).

This does not mean that a single particle will inevitably cause peri-implantitis. The white paper explicitly avoids suggesting such a monocausal relationship. The more relevant question is: What



01
SEM image (1,000x) of plastic material at the implant shoulder.

02
Same implant, different location, significant contamination: SEM image (1,000x) of plastic residues at an exposed implant thread. Additional chemical analysis identified synthetic polymers (plastic residue, polysiloxane), residues of dodecylbenzene sulfonate (a cell-toxic surfactant), aromatic and aliphatic hydrocarbons.



For those interested in exploring the data, scientific background, and different perspectives in greater depth, the White Paper *The Missing Variable in Peri-implantitis* is available at: whitepaper.cleanimplant.com

Or simply scan the QR code to read more.



foreign particles on an implant surface may trigger a biological response—particularly during the early phase of healing?

When the body responds to foreign particles

Research has shown that particles within certain size ranges can trigger macrophage-mediated foreign-body reactions. Pro-inflammatory cytokines may promote osteoclast activity, while matrix metalloproteinases can contribute to soft-tissue degradation. Once a rough implant thread becomes exposed, bacterial colonisation may lead to peri-implant mucositis. Without timely intervention, progression to peri-implantitis and potentially implant loss cannot be ruled out.

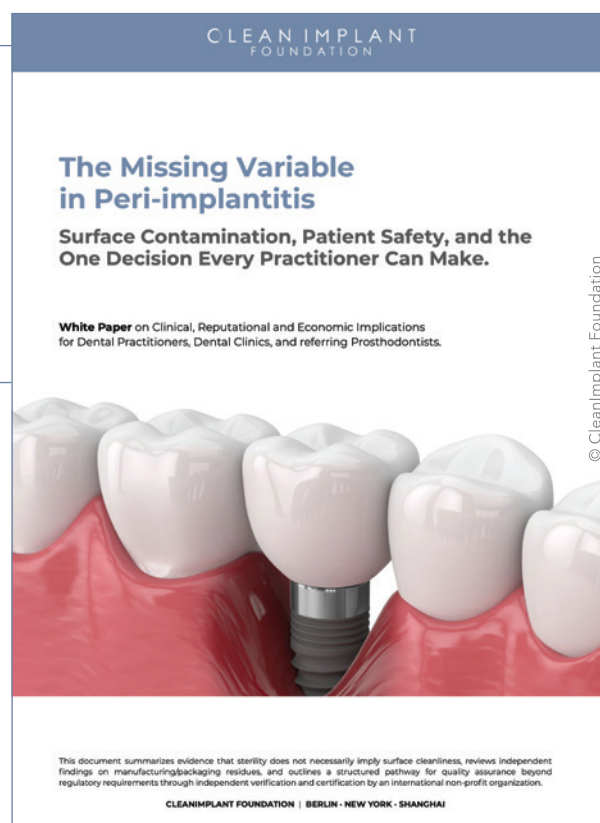
This is particularly relevant during the sensitive phase of osseointegration, when a technically manufactured implant surface comes into direct contact with biological tissue. Particulate and film-like contaminants could interfere with this delicate balance. For some substances, the concern is evident: DBSA, for example, has direct cytotoxic effects.

The potential relevance of plastic materials originating from implant packaging is currently being investigated in an *in-vitro* study at the University of Zurich, where corresponding contamination effects are being systematically reproduced and analysed.

The good news is that these residues are not unavoidable in modern dental implants. With controlled manufacturing, cleaning, and packaging processes, the contaminants described can, in principle, be technically avoided—consistently across production batches.

A risk factor clinicians can influence

Many factors affecting the long-term success of implant therapy can only be influenced to a limited extent. General health, genetic predisposition, and patient compliance are obvious examples. The choice of implant system, however, is actively made before surgery. Surface quality should therefore also be considered an integral part of quality assurance in clinical practice.



The CleanImplant Foundation awards its “Trusted Quality” seal to implant systems that demonstrate consistent surface cleanliness across production batches and beyond minimum regulatory requirements. The assessment is based on clinical data, independent analyses conducted by accredited testing laboratories, and a peer-review process that must be repeated every two years to maintain the award.

This raises a fundamental question for every implant dentist: What objective evidence of surface cleanliness is available for the implant system I use in my practice? Selection criteria, procurement decisions, and patient communication should be documented transparently—not least in view of potential medico-legal implications.

The White Paper does not offer a simplistic equation of “contamination causes peri-implantitis.” Instead, it draws attention to a surprisingly rarely asked question: What is actually present on an implant when the sterile packaging is opened?

Discuss with the CleanImplant project experts at the EAO Congress in Lisbon. Meet us at booth F25.



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About the foundation



Vertical ridge augmentation in the atrophic posterior region of the mandible

A 3D guided bone regeneration approach

Guided bone regeneration (GBR) has a strong scientific evidence base. It is a predictable, effective and widely documented technique for vertical and horizontal bone augmentation in implantology,¹⁻⁶ and compared with other techniques, it is the most reliable and stable in the long term, demonstrating less resorption, a low complication rate and low morbidity.⁷ The biological principles that determine the predictability of bone formation using GBR techniques have been established by various authors.^{1, 2, 8}

Dr Javier Mayor Arenal, Spain

These principles are based on the placement of a membrane that acts as a barrier, selectively excluding unwanted tissue (epithelial cells and fibroblasts) and creating a closed space that can be populated by osteogenic cells, allowing bone formation within the defect. For this process to be successful, primary wound closure must be achieved after regenerative surgery, ensuring adequate vascularisation and maintenance of the regenerative space, as well as optimal mechanical stability of the bone graft and the wound during healing.⁹ Horizontal GBR with resorbable membranes and vertical GBR with titanium-reinforced non-resorbable PTFE membranes allow substantial bone gain, achieving an average gain of 5.68 ± 1.42 mm for horizontal augmentation¹⁰ and 5.02 ± 2.03 mm for vertical augmentation using e-PTFE¹¹ and 5.45 ± 1.93 mm using d-PTFE.¹²

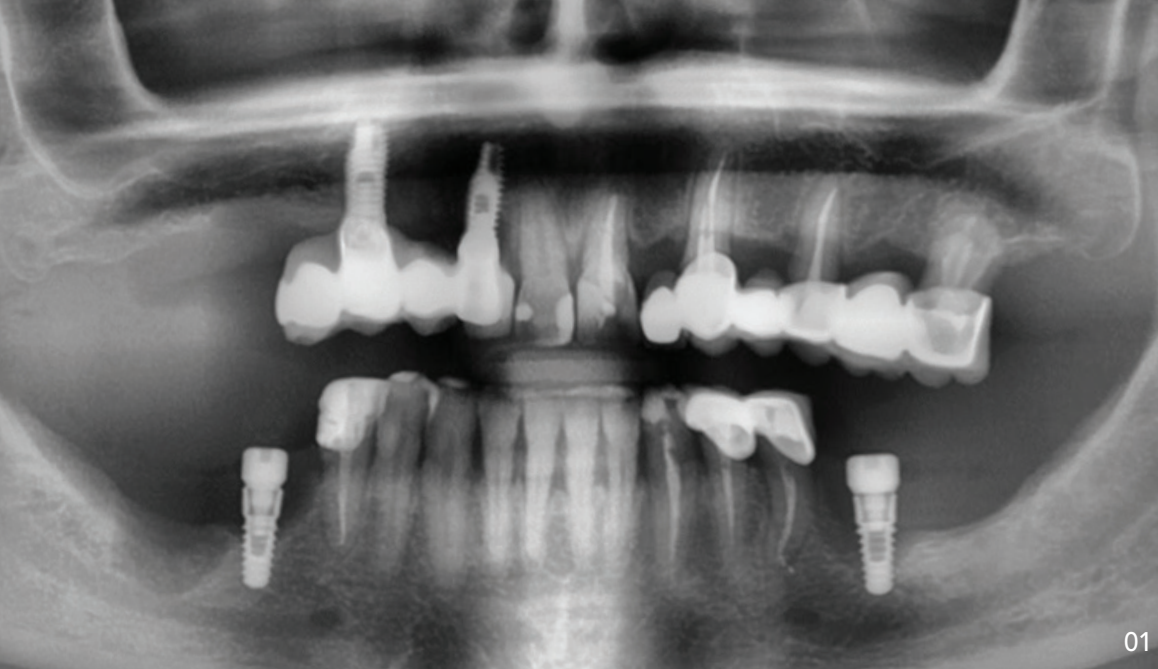
Vertical ridge augmentation is supported by a substantial body of clinical and scientific evidence spanning more than 30 years.^{5, 6, 11, 13-16} It is particularly demanding from a biological and technical point of view because vertical defects have a more limited supply of osteogenic cells and less vascularisation than other defects.^{17, 18} In this type of procedure, the use of membranes capable of maintaining the space throughout the healing time (nine to 12 months) is essential so that the space can be occupied by newly formed bone.^{18, 19} Autogenous bone is considered essential as a grafting material, either alone or mixed with allograft or anorganic xenogeneic bone mineral. When a mixture is used, it should contain at least 50% autogenous bone to obtain reliable bone gain and an adequate amount of vital bone at re-entry, which is considered indicative of treatment success. The therapeutic objective of these techniques is to regenerate hard and soft tissue at the defect

site, enabling implant placement and subsequent provision of a fixed implant-supported prosthesis so that the patient can regain function and aesthetics.

The case reported in this article involved vertical ridge augmentation in the atrophic left posterior region of the mandible. In addition to the challenges posed by the complexity of soft-tissue management in this area, there is limited surgical access and reduced blood supply.¹⁴ In this area, it is very important to have a clear understanding of the position of the relevant anatomical structures, such as the mental nerve, inferior alveolar nerve, sublingual space, sublingual artery, lingual nerve and Wharton's ducts.²⁴ Inadequate surgical management of these structures can result in adverse events or intra-operative complications. In presenting this case, I will discuss the critical factors of this technique in the atrophic posterior region of the mandible and how to perform adequate soft-tissue management while protecting the adjacent anatomical structures, using appropriate techniques to manage the lingual and buccal flaps and ensure passive, tension-free closure for a successful regenerative procedure.

Case presentation

The 55-year-old patient, with no relevant medical history, presented with peri-implantitis affecting implants #36 and #46—only implant #36 is addressed in this report—as well as pain and suppuration in the area (Fig. 1). The patient requested a definitive solution and was advised to undergo explantation, followed by regeneration of the resulting defect in order to place a new implant, surrounded by bone, and finally restore function and aesthetics with a fixed implant-supported prosthesis.



01
Initial panoramic radiograph of implant #36.

02a–c
Initial panoramic radiograph (a).
Close-up of the affected implant and surrounding bone (b). Bone healing after explantation (c).

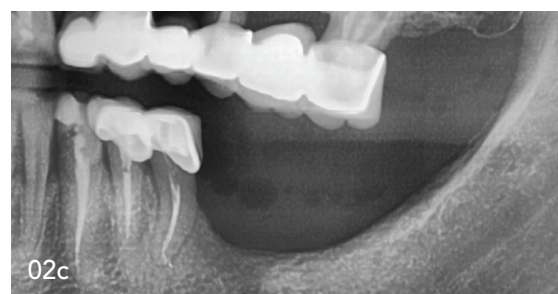
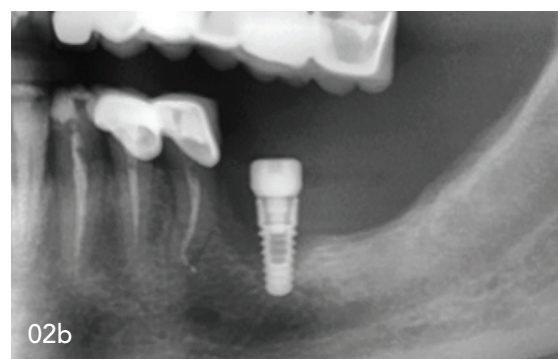
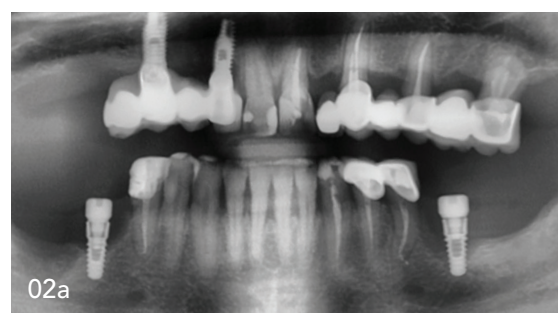
03
Clinical situation after explantation.

Treatment would involve vertical and horizontal GBR in the defect area, using a dual-texture e-PTFE membrane and a combination of 80–90% particulate autogenous bone and 10–20% anorganic porcine bone mineral. After the maturation of the bone graft, we would place a replacement implant at site #36, surrounded by bone. Once the patient had accepted the proposed treatment, implant #36 was explanted, and we waited for three months before performing surgery because the site presented with inflammation, erythema and bacterial contamination associated with the peri-implantitis (Figs. 2a–c). In such a case, it is more prudent to wait a few months (at least three) before surgery to allow the soft tissue to heal sufficiently for proper management during the regenerative procedure.

Surgical management

We began the procedure (Fig. 3) by making a full-thickness incision along the centre of the ridge, within the keratinised mucosa, using a No. 15 scalpel blade. The crestal incision ended distally 2 mm from the retromolar pad, and from there, we made a distal oblique vertical incision, keeping the scalpel blade in firm contact with the bone, towards the ramus of the mandible. Anteriorly, we made a vertical incision at the mesiobuccal line angle. This is ideally done two teeth beyond the surgical site,^{14, 20, 24, 25} but in this case, we extended this to three teeth (avoiding vertical releasing incisions adjacent to crowned teeth). The extension also allowed local autogenous bone harvesting and tunnelled access towards the chin using special disposable scrapers. On the lingual side, we made a scalloped incision from tooth #35 to tooth #41, without vertical releasing incisions. Next, we refined the incision line with a 4R/4L curette to ensure ideal full-thickness flap elevation down to the bone, allowing us to properly and completely detach the periosteum from the incision line. For this elevation, we used a Molt-type periosteal elevator for both the buccal and lingual flaps.

We raised the lingual flap to the mylohyoid line, where the mylohyoid muscle attaches to the mandible. Anteriorly, generally from the canine, the mylohyoid attachment is located more apically, so in this area, we raised a full-thickness flap, since the anterior position of the mylohyoid does not interfere with flap management. Posteriorly, as the mylohyoid attachment is more coronal, we raised a full-thickness flap in the retromolar area. Lingually, we advanced approximately 3–4 mm by tunnelling, taking care to protect the lingual nerve because of its close proximity to the ridge crest in this region (Fig. 4).





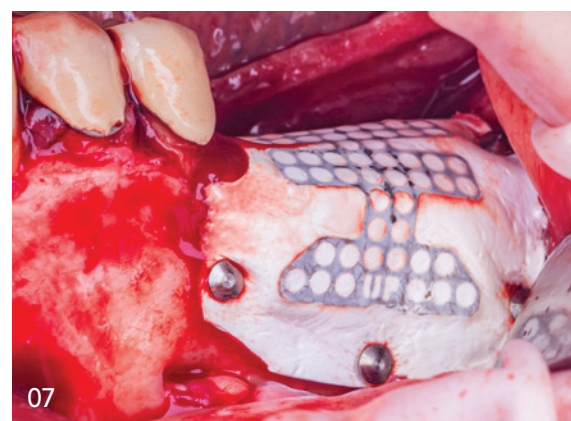
04
Bone defect after raising the full-thickness flap.

05
Cortical perforations performed to promote vascularisation and osteogenesis in the bone graft.



06
Stabilisation of the NeoGen membrane, beginning with lingual fixation and incorporation of autogenous bone graft into the defect.

07
Lingual and buccal fixation of the membrane, achieving adequate stability over the bone defect.



Buccally, we raised a full-thickness flap while protecting the mental nerve at its point of emergence and removed any remaining attached soft tissue with a back-action instrument. Regarding the management of the lingual flap, to achieve tension-free primary wound closure, different techniques can be used.^{23, 26} In this case, we applied Urban's coronal advancement technique for the lingual flap, which involves the intentional preservation of the mylohyoid muscle attachment to the mandible.²⁴ This release was performed in three zones: Zone I (posterior), where we tunnelled and detached the retromolar pad, adequate release of which facilitates advancement of Zone II (middle), where we gently performed a blunt dissection of the superficial fibres of the mylohyoid muscle; and finally Zone III, the area with the highest complication rate,^{14, 25, 27} where we took particular care to perform a shallow periosteal releasing incision using a slightly angled No. 15 scalpel blade, extending from approximately the level of the canine (where the presence of the periosteum is evident) to the position of the most anterior tooth involved in the flap, allowing sufficient and uniform release along the entire length of the flap and achieving passive primary closure. Regarding the advancement of the buccal flap, there are also different techniques,^{14, 15, 28, 29} but in this case, we predominantly used the

technique described by Ronda in 2015,³⁰ in which a periosteal releasing incision is made from anterior to posterior, along the buccal flap, combined with a brushing technique using a No. 15 scalpel blade in an angled position on the periosteal fibres, trying to dissect and separate the superficial part from the deeper part of the flap, thereby achieving effective and predictable coronal advancement.

Subsequently, we collected autogenous bone from the external oblique line and mandibular ramus using a curved disposable bone scraper (SAFESCRAPER TWIST, META Technologies). Using a trephine, we also harvested bone cylinders, which we ground together with the scraped bone to improve compaction of the grafting material, combining autogenous bone flakes with medium to large particles.^{17, 18, 31} We used a mixture of 80–90% autogenous bone and 10–20% anorganic porcine bone mineral (THE Graft, Purgo Biologics).^{12, 14, 21, 32}

Recipient site preparation

We prepared the recipient bone bed by decortication with a disposable bone scraper and by creating multiple cortical perforations with a 1.4 mm diameter round tungsten carbide bur in a handpiece, particularly in the crestal area, to

a depth of approximately 3–4 mm (Fig. 5), sufficient to reach the medullary bone and thus promote bleeding and increase angiogenic and osteogenic potential at the grafted site.^{23, 33, 34}

Membrane adaptation and regeneration execution

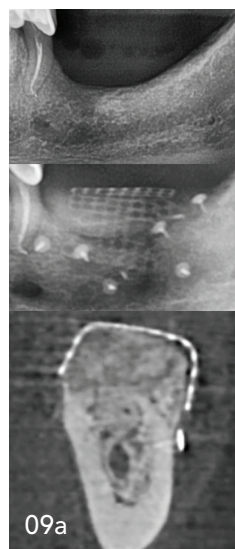
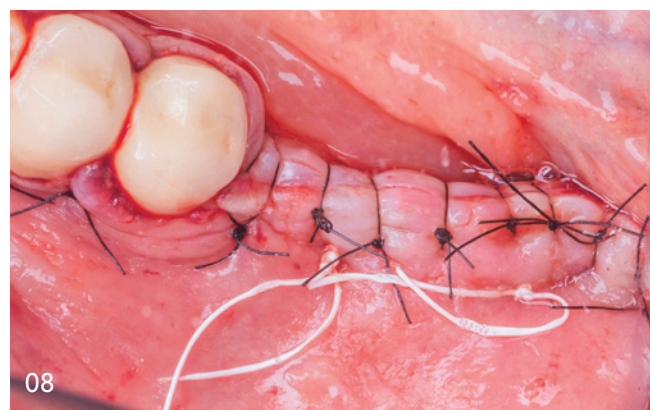
A titanium-reinforced, dual-texture e-PTFE membrane (NeoGen, Neoss) of the appropriate size was selected to overlap the adjacent bone by at least 2 mm and was trimmed to completely cover the graft volume while maintaining at least 1.5 mm of separation from the adjacent tooth.^{14, 20} Prior to membrane fixation, we contoured the membrane to the desired ridge shape using the handle of a clamp, approximately 10 mm wide, folding the membrane over it to create a box-shaped regenerative compartment and a crestal plateau defining the desired ridge width and vertical gain. We then filled the compartment with sufficient bone graft.

Membrane fixation is a critical aspect of this procedure. It must provide stability and maintain the regenerative space, immobilising the graft to allow for integration. The membrane is first stabilised lingually using tacks and/or 3 mm fixation screws, employing at least one mesiolingual and one distolingual fixation. If the first lingual fixation is difficult to place, a temporary tack or screw can be placed at the most distal aspect of the ridge or at a mesiobuccal site to stabilise the membrane temporarily and facilitate lingual fixation.^{14, 35} Once membrane stability has been achieved, the temporary fixation is removed.

Using a Prichard periosteal elevator, we elevated the buccal portion of the membrane and then placed the bone graft, which had been prepared as a homogeneous mixture in a sterile metal dappen dish, over the ridge (Fig. 6). We then placed fixations on the buccal side from distal to mesial as we added and compacted more bone graft, finally securing the membrane mesially to achieve mechanical stability and maintain adequate space (Figs. 7+8). We thoroughly irrigated the membrane with sterile saline to remove any adherent dried blood clots and placed a collagen membrane over it in case of a wide gap or inadequate membrane adaptation over the defect.¹²

Wound closure

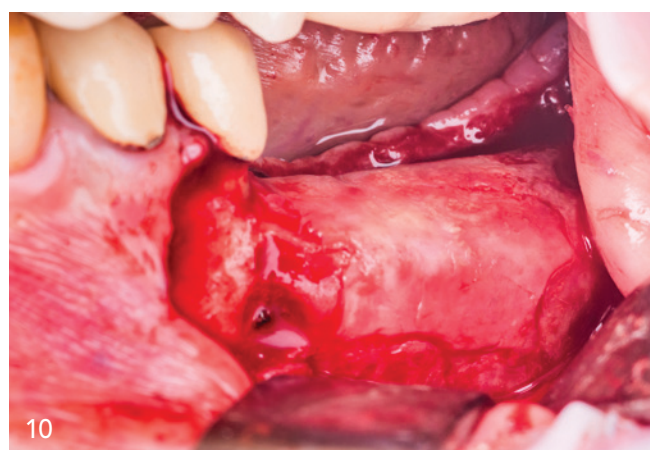
We immediately proceeded to wound closure, first reviewing the condition of the lingual flap and ensuring that the coronal advancement achieved using Urban's technique was sufficient.²⁷ We also confirmed that the buccal flap had achieved adequate coronal advancement, allowing tension-free closure of the wound. Next, we sutured the flaps in two layers, first with a horizontal mattress suture 5 mm from the flap edge using a #4/0 PTFE suture (W.L. Gore & Associates) and then by closing the mucosal incision with a #5/0 non-resorbable Polinyl suture (Sweden & Martina; Fig. 9). This close contact between the connective tissue of both flaps creates a barrier that prevents exposure of the membrane.¹⁴ As postoperative medication, an anti-inflammatory and antibiotic regimen was prescribed for seven days, and the patient was instructed to rinse with 0.2% chlorhexidine twice a day until the sutures were removed, between two and three weeks after the operation.

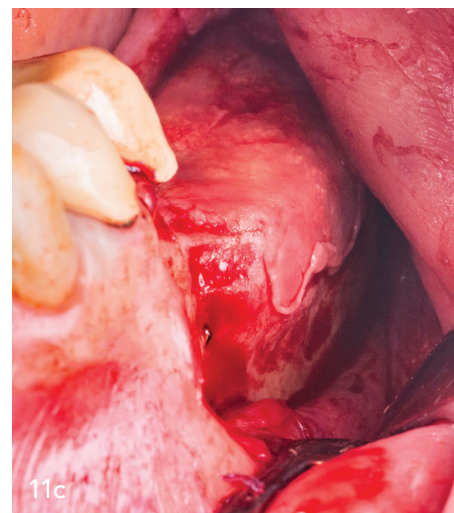
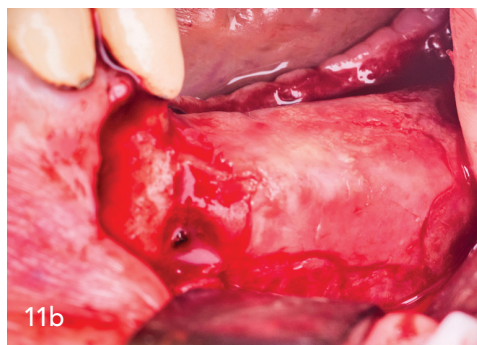


08
Primary tension-free closure through proper handling of the lingual and buccal flaps and adequate periosteal incisions, along with the application of horizontal mattress and simple sutures.

09a+b
Radiographic (a) and clinical status (b) of the regenerated area after ten months of healing.

10
Re-entry at ten months, after removal of the membrane, revealing solid and vascularised newly formed bone.



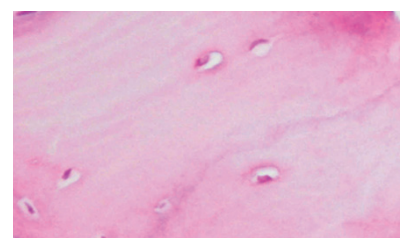
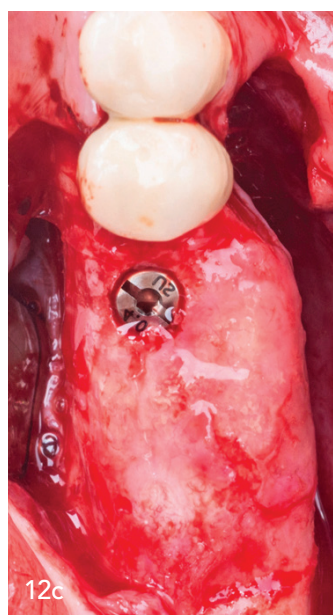
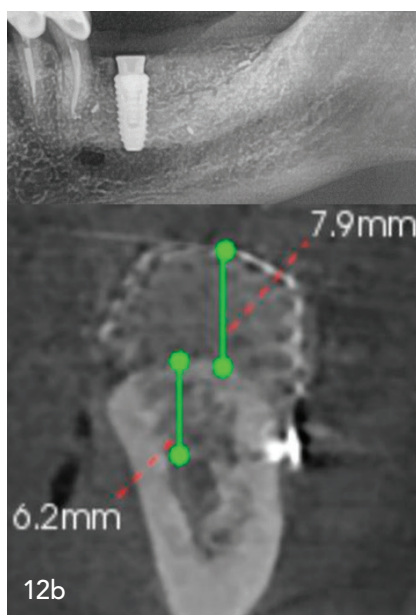
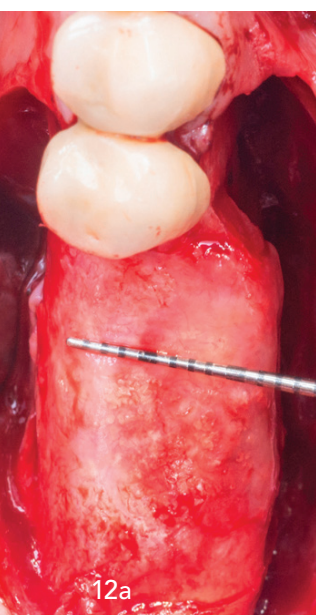


11a-c

Comparison of the situation before guided bone regeneration (a) and at re-entry ten months later (b+c).

12a-d

Width and height of the bone gain obtained (a+b), placement of implant #36 (c) and histomorphometric analysis of the bone tissue, obtaining 40 per cent vital bone (d).



Diagnosis:

Viable spongy bone tissue with foreign material.

HISTOMORPHOMETRIC STUDY

Cellular bone: 40,25%; Acellular bone: 9,16%;

Connective tissue: 26,59%; Graft material: 5,02%.



Results

After a healing period of ten months (Fig. 10), we proceeded with the re-entry surgery in the regenerated area. We used a flap design on the buccal side similar to that employed on the day of the bone augmentation surgery, and on the lingual side, we used the same design in the area of the defect, but with a small vertical releasing incision one or two teeth mesial to the defect, to facilitate the removal of the mesiolingual fixation devices.

After healing without incident or complication, we removed the e-PTFE membrane and re-entered the regenerated area, finding vital, solid bone that bled during drilling (Figs. 11+12) and an average vertical bone gain of 7.5–8.0 mm (Figs. 13a–d). As is common after this type of regeneration, a thin layer of soft tissue partially covering the newly formed bone, without signs of inflammation, was identified.³ This was classified as Type 1 (no pseudo-periosteum or a soft-tissue layer of < 1 mm) according to Cucchi et al.³⁶

Subsequently, during preparation of the osteotomy for placement of implant #36, an en bloc bone biopsy of 3 mm

in diameter was taken from the augmented area and immediately fixed in 10 per cent neutral buffered formalin. Histological analysis revealed the presence of cancellous bone tissue with trabeculae of varying sizes. At one end, these trabeculae were vital and attached to irregularly shaped fragments of an eosinophilic foreign material (anorganic porcine bone mineral graft). Histomorphometric analysis revealed an average of 40 per cent vital bone.

Three months after this last intervention, we performed soft-tissue surgery to increase the width of keratinised mucosa and vestibular depth. The best-documented and most commonly indicated technique for this purpose is the free gingival graft,³⁷ associated with an apically repositioned flap. Grafts in this area are more susceptible to contraction and to a reduction in the final gain in keratinised mucosa during healing because the buccinator muscle originates from the alveolar process of the mandible at the level of the molars. We therefore performed a free gingival graft using two strips (Figs. 14a–e), one placed crestally and the other apically, and then applied tissue adhesive (PeriAcryl 90HV, GluStitch) to improve graft stability and reduce contraction (Fig. 15).³⁸



Bone Growth Concept

copa
SKY
IMPLANT SYSTEM



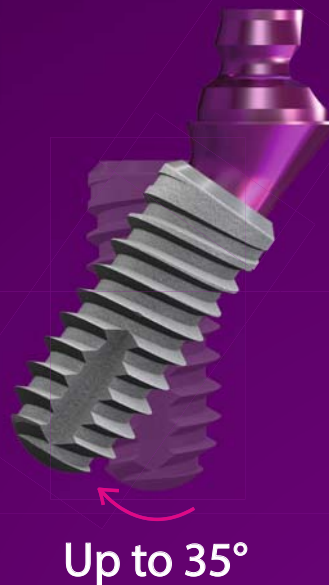
copaSKY

with one connection and
microstructured backtaper.

Slim.



Angled.



Ultra short.



PERFECT

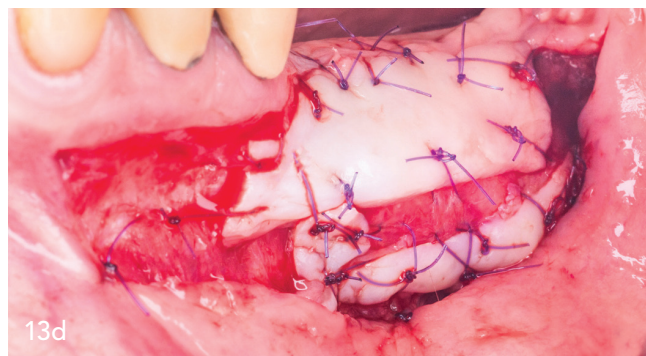
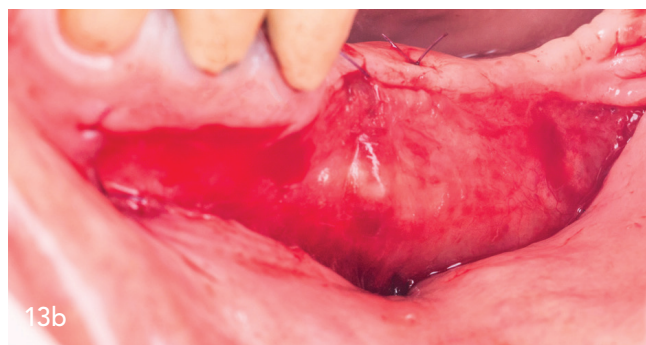
for any bone situation.
for all indications.
for immediate restoration.
for digital workflows.



SCAN ME

bredent
medical

bredent
group



13a–d
Soft-tissue surgery to increase the width of keratinised mucosa using a free gingival graft in the regenerated area, one strip placed crestally and the second apically.



14
Application of tissue adhesive over the free gingival graft to improve its stabilisation.

15
Free gingival graft during maturation before placement of a healing abutment and subsequent implant restoration.



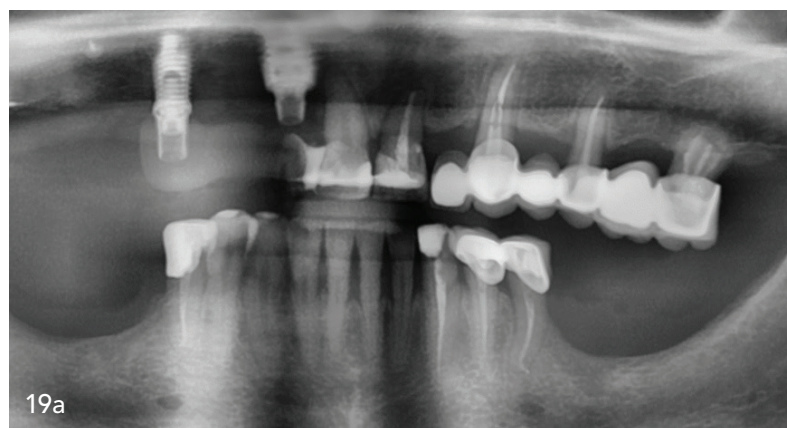
16
Restoration on implant #36 at the three-year follow-up, showing stable tissue around it and a satisfactory aesthetic and functional result.

The purpose of this mucogingival surgery around the implant, using the free gingival graft technique, is to promote adequate long-term peri-implant health, since it seems clear that the presence of at least 2 mm of keratinised mucosa is associated with a healthier peri-implant state (less mucosal recession and loss of attachment), especially in susceptible patients with poor oral hygiene or plaque accumulation^{39–41} and in patients with poor adherence to peri-implant maintenance therapy.⁴² After three months of healing (Fig. 16), we placed a healing abutment on implant #36, and subsequently, we took the appropriate records for the fabrication of the prosthesis.

At the three-year follow-up, clinical evaluation confirmed that the peri-implant soft tissue was stable and showed no signs of inflammation or recession (Figs. 17–19). These results underscore the long-term success and predictability of regenerative procedures using a non-resorbable dual-texture e-PTFE membrane and a combination of particulate autogenous bone (> 50 per cent and anorganic porcine bone mineral).



17a+b
Comparison between the initial state of the defect (a) and the gain in hard and soft tissue at the three-year follow-up after implant restoration (b).

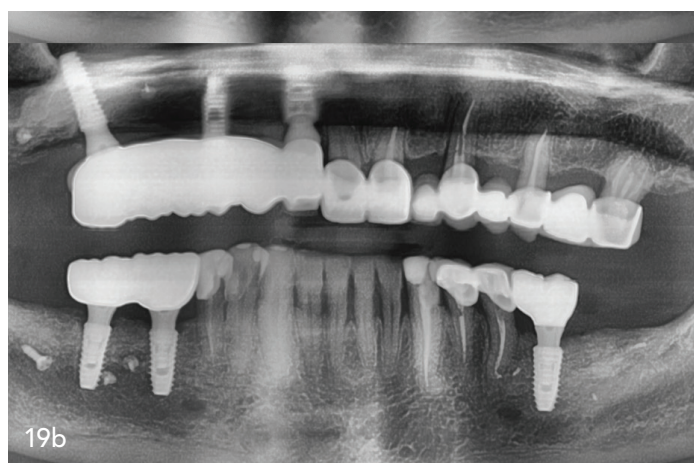


18

Periapical radiograph showing the bone gain in relation to the initial state showed in Figure 17a and the placement of the new implant surrounded by bone with the restoration in place.

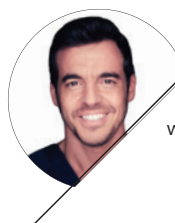
19a+b

Panoramic radiographs showing the initial situation (a) and the three-year follow-up after the implant was restored (b), demonstrating the bone gain.



Conclusion

Vertical and horizontal GBR is a predictable and effective technique when an appropriate clinical protocol is followed and quality biomaterials are used to maintain the regenerative space for sufficient time to allow new bone formation. This enables regeneration of the defect and formation of vascularised, solid and vital bone suitable for implant placement and restoration. We achieved all of this through the combined use of a non-resorbable, dual-texture e-PTFE membrane and autogenous bone graft with a small proportion of anorganic porcine bone mineral, along with an adequate healing period (greater than nine months) before implant placement. The implant showed stable marginal bone levels after loading, confirming that predictable clinical results can be achieved through appropriate biomaterial selection, a suitable surgical protocol and sufficient healing time for GBR.



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Literature



Fully guided full-arch implant rehabilitation

with immediate prefabricated PMMA provisionalisation by "Instant Screwing"

Full-arch implant rehabilitation has undergone a paradigm shift with the advent of digital planning and guided implant surgery. Compared with freehand implant placement, fully guided protocols provide significantly higher accuracy in implant positioning, angulation, and depth control, while reducing surgical variability and facilitating more predictable, prosthetically driven outcomes.¹⁻³

Drs Vincent Roubinet, France & Purvi Bhargava, India

A key clinical advantage of guided full-arch surgery is the ability to fabricate the temporary prosthesis before surgery, enabling immediate loading and rapid restoration of function and aesthetics on the day of implant placement.^{4,5}

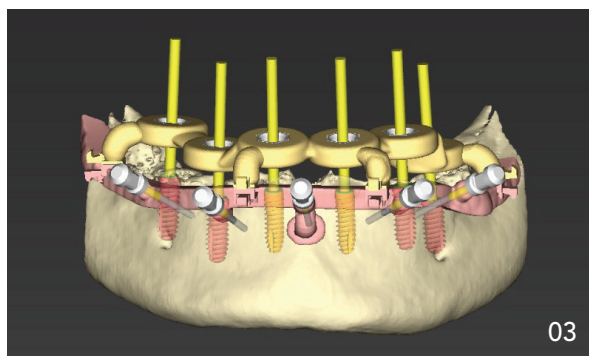
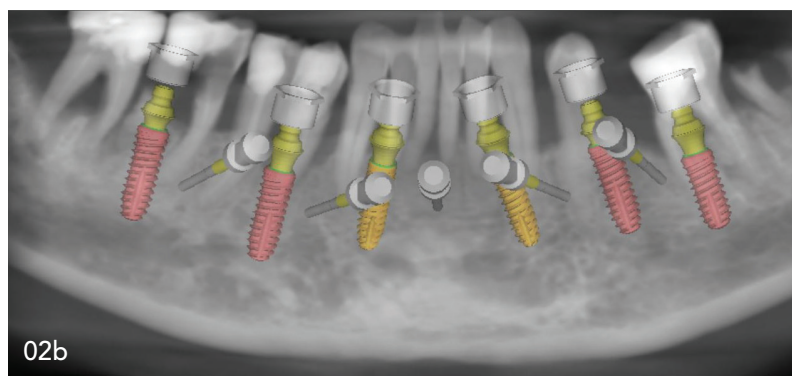
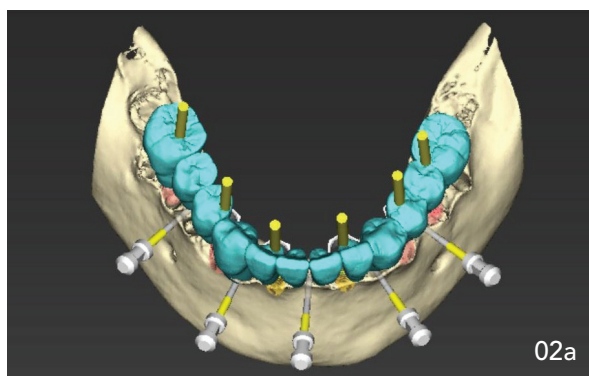
In freehand full-arch implant surgery, the provisional prosthesis is typically fabricated after implant placement, necessitating postoperative impressions and additional laboratory procedures. This may delay loading or require extensive chairside adjustment. By contrast, digital guided workflows enable prosthetically driven backward planning, potentially reducing treatment time and improving predictability by integrating the surgical and prosthetic phases into a single coordinated process.¹

Despite these advantages, guided full-arch immediate loading protocols are often associated with increased chairside time on the day of surgery. This is mainly due to the need for intra-oral modification, relining, or pickup of prefabricated provisional prostheses to compensate for minor discrepancies between planned and actual implant positions.⁶

From a biological and biomechanical perspective, implants subjected to immediate loading are not yet osseointegrated, but may tolerate limited, controlled mechanical stress provided that sufficient primary stability and favourable load distribution are achieved.^{7,8} This challenges the need to achieve absolute prosthetic passivity at the time of surgery. Instead, it supports the concept that the implant-bone interface can biologically adapt during healing, with functional passivity developing after osseointegration. Controlled functional loading during early healing may therefore be compatible with osseointegration, provided micro-



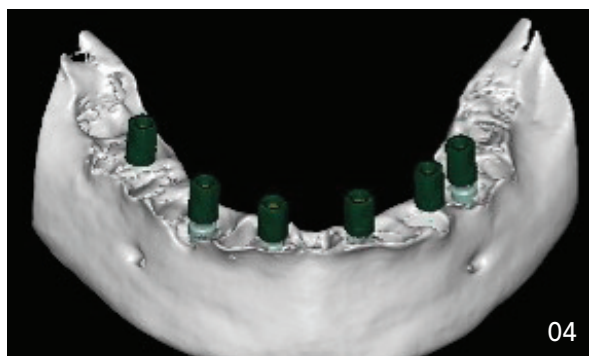
01a+b
Preoperative intra-oral view showing generalised periodontitis (**a**). Radiographic examination showing generalised bone loss (**b**).



02a+b
CoDiagnostiX
software used for
implant planning.

03
Design of the
metal stackable
surgical guide.

04
Virtual impres-
sion obtained
using scan
abutments.



05
Pre-milled
PMMA
provisional
prosthesis.

motion remains within biologically acceptable limits. Excessive micromotion, however, may lead to fibrous tissue formation rather than direct bone integration.⁸ Earlier experimental studies have identified a critical micromotion threshold, commonly reported to be in the region of 50–150µm, above which fibrous encapsulation is more likely; below this range, micromotion may even stimulate bone remodelling.⁷

To address these limitations, a continuous digital protocol has been proposed in which the provisional prosthesis is designed at abutment level and fabricated with pre-aligned screw channels, enabling direct fixation without temporary cylinders or intra-oral relining.⁹ In this workflow, the provisional PMMA prosthesis is screwed directly onto the implants at the time of immediate loading.

The present case report describes a fully guided, flapless mandibular full-arch rehabilitation using a prefabricated PMMA temporary prosthesis that is instantly screwed onto definitive abutments without any chairside modification. The objective is to demonstrate the clinical feasibility, accuracy, and biological rationale of the “instant screwing” protocol in immediate loading full-arch implant therapy.

Case report

A 55-year-old healthy, non-smoking female patient (ASA I) presented with generalised tooth mobility and gingival recession. Clinical and radiographic examinations were performed (Figs. 1a+b), leading to a diagnosis of generalised periodontitis, Stage III, Grade B. Following completion of periodontal therapy, the maxillary arch was stabilized through endodontic treatment and placement of provisional bridges.

Digital planning phase

Treatment planning for the mandibular arch was carried out according to the SKY fast & fixed protocol using a fully digital workflow. coDiagnostiX software was used to superimpose the DICOM and STL files, together with the virtual prosthesis, in order to plan implant positions and design the surgical guides (Fig. 2).

Metal stackable surgical guides (Remi Laffont, Teethproject Labo) were designed (Fig. 3) and fabricated by laser sintering to provide the rigidity and accuracy required for this protocol.

The SKY uni.cone fast & fixed abutments (SKY, bredent medical) were then positioned virtually on the planned implants (Fig. 4). A corresponding scan body was applied to obtain a pre-surgical virtual impression.

A provisional PMMA prosthesis was milled in advance in accordance with the protocol and kept ready prior to surgery (Fig. 5). Its internal geometry was digitally designed to replicate the configuration of the prosthetic coping, allowing the prosthetic screw to be torqued directly onto the abutment. This eliminated the need for temporary cylinders or copings during delivery of the provisional prosthesis.

Before surgery, the prosthesis was verified on three-dimensional printed models using laboratory analogues to confirm fit and seating accuracy. This integrated coping design allowed the provisional restoration to be fixed immediately to the abutments following implant placement, forming the basis of the "instant screwing" protocol.

Surgical phase

Under local anaesthesia, the mandibular teeth were atraumatically extracted. The base guide was positioned using the tooth-supported guide and stabilised with wedges (Fig. 6).

Socket curettage and antibacterial photodynamic therapy (aPDT) were carried out according to the manufacturer's instructions (Helbo™, bredent medical). Antibiotic irrigation was then performed, and the sulcular epithelium was deepithelialised (Fig. 7).

A fully flapless approach was adopted. The osteotomy guide was positioned on the base guide, and stability was ensured with fixation pins and ligatures (Fig. 8).

Using the SKY Proguide kit, the osteotomies were completed. Guided placement of the posterior implants was performed first in order to stabilise the template (Fig. 9). Following engine-driven implant placement, the final seating was completed manually through the guide using a torque wrench, placing the posterior implants first, followed by the anterior implants, and finally the middle implants. All implants achieved an insertion torque of at least 35 Ncm. The SKY uni.cone abutments were placed and prosthesis fit was verified.

Prosthetic and grafting phase

The temporary prosthesis and abutments were then removed, and socket preservation was carried out using sticky bone, consisting of injectable PRF (platelet rich fibrin), autogenous bone and xenograft material



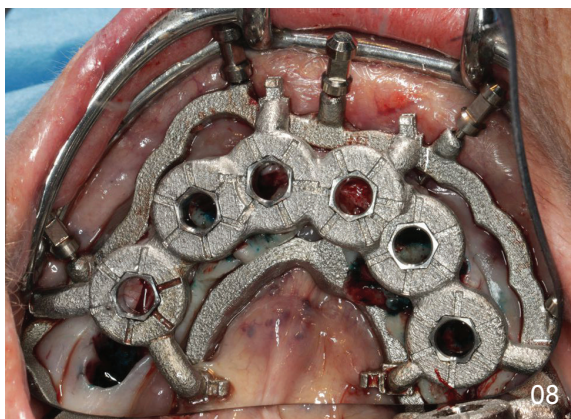
06
Tooth-supported
guide in position.

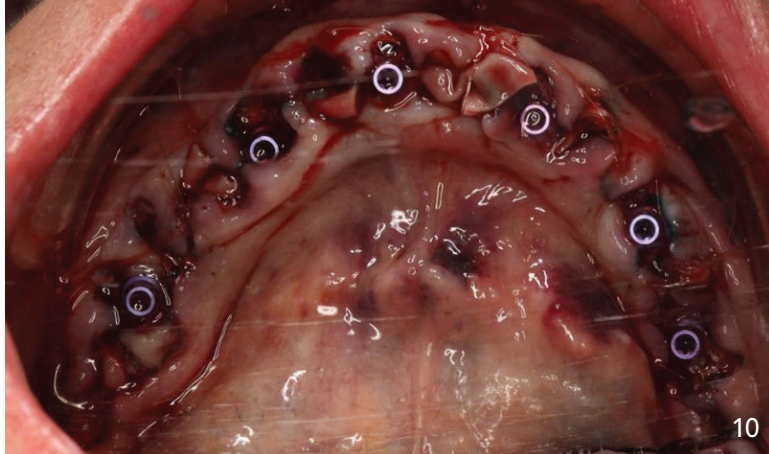
07
Atraumatic extractions,
curettage, and HELBO aPDT.



08
Drilling guide positioned
on the base guide.

09
Guided implant
placement.





10
GBR performed and
copaSKY uni.cone
abutments placed.

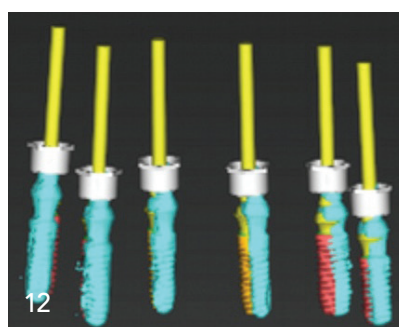


11a



11b

11a+b
Immediate PMMA
provisional
prosthesis (a).
Occlusal view of
the provisional
prosthesis (b).



12

12
Superimposition of
the virtual plan and
the segmented
actual implant
positions.

(Bio-Oss, Geistlich), protected with a PRF membrane. The surgical site was secured with resorbable monofilament sutures (BioSyn™).

The copaSKY uni.cone abutments were then torqued onto the implants (Fig. 10), and the temporary prosthesis was screwed into place by sequential tightening of the screws on each abutment to 15 Ncm (Figs. 11a+b).

The PMMA prosthesis was fitted to the abutments without any modification, thereby validating the "instant screwing" protocol. Radiographic assessment of fit was not possible owing to the radiolucent nature of PMMA. Prosthesis fit was therefore assessed clinically under $3.8\times$ magnification. The accuracy of guided surgery and prosthesis positioning was evaluated by superimposing the digital planning data with the segmented post-surgical implant positions. This demonstrated no clinically significant discrepancy (Fig. 12).

Outcome and follow-up

All implants osseointegrated uneventfully, with no postoperative complications. At the three-month follow-up, the peri-implant soft tissues were healthy and exhibited a favourable gingival profile (Figs. 13+14). Comparison of the immediate postoperative radiograph (Fig. 15a) with the three-month

follow-up radiograph (Fig. 15b) demonstrated stable crestal bone levels. Definitive prosthesis was completed six months after implant placement uneventfully. (Figs. 16a+b)

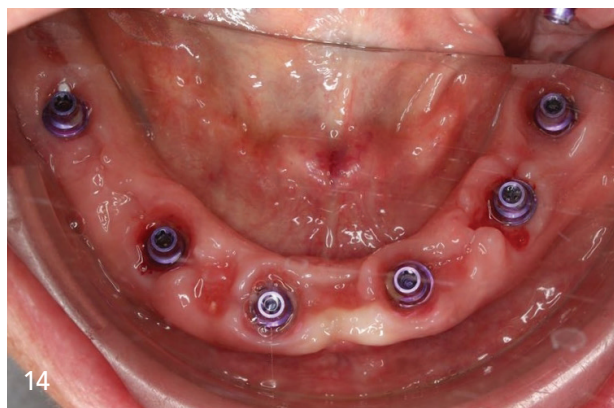
Discussion

The present case report demonstrates the clinical feasibility of a fully digital guided implant protocol in which a pre-fabricated PMMA provisional prosthesis was immediately fixed onto definitive abutments without intra-oral modification. The integration of surgical and prosthetic planning within a continuous digital workflow has been previously described as a key factor in improving predictability and reducing procedural variability in implant rehabilitation.⁹ By designing the provisional prosthesis at the abutment level prior to surgery, the present protocol aligns with the principles of continuous digital workflows, enabling a seamless transition from virtual planning to clinical execution.

Recent clinical studies support the use of digitally prefabricated provisional prostheses in full-arch immediate loading protocols. A prospective pilot cohort study reported high implant survival rates and minimal prosthetic complications when full-arch PMMA provisional prostheses were fabricated digitally and delivered immediately after guided implant placement, without the need for intra-oral relining or

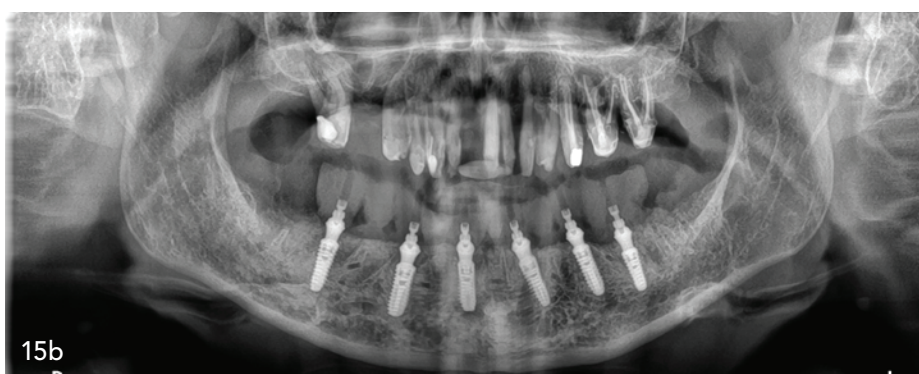
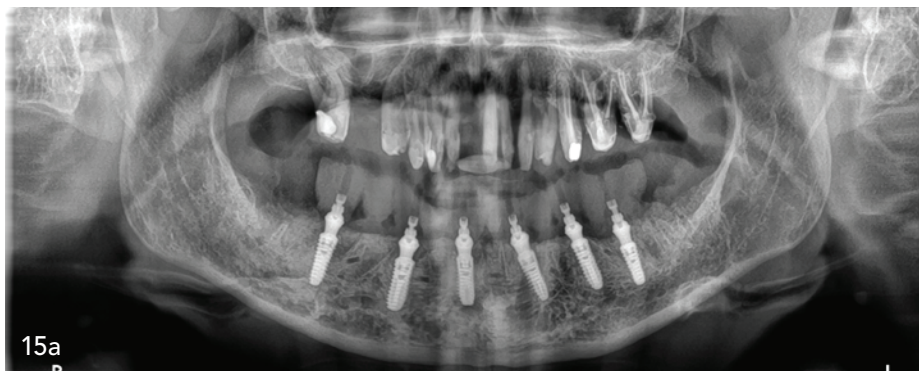


13
Three-month postoperative follow-up.



14
Three-month follow-up showing a healthy gingival profile after removal of the prosthesis.

15a+b
Immediate postoperative OPG (a). Three-month follow-up OPG showing stable crestal bone levels (b).



cast verification.¹⁰ These findings corroborate the clinical outcome observed in the present case, where the provisional prosthesis was delivered without chairside modification.

The material properties of PMMA further support its use in immediate loading scenarios. Recent evaluations of PMMA provisional restorations fabricated through a fully digital workflow have demonstrated favourable short-term survival, adequate mechanical behaviour, and minimal biological complications during the immediate loading phase.¹¹ This reinforces the suitability of PMMA as a provisional material in protocols requiring early function and controlled load distribution across multiple implants.

The accuracy of guided implant placement is a critical determinant for the success of prefabricated prostheses. Stackable and rigid surgical guides fabricated using advanced manufacturing techniques, such as selective laser melting, have been shown to improve positional accuracy and stability during full-arch implant placement.¹² Such guide systems reduce cumulative errors and are particularly advantageous

when immediate loading with a prefabricated prosthesis is planned, as even minor deviations may compromise prosthetic fit.

In the present protocol, the copaSKY implant system (bredent medical) was selected to support immediate loading and full digital integration. The implant macrodesign, combined with a conical-parallel internal connection, is intended to promote high primary stability and favourable force distribution—both critical prerequisites for immediate loading protocols. Achieving insertion torque values ≥ 35 Ncm across all implants allowed immediate functional loading in accordance with established biomechanical principles. Furthermore, the availability of system-specific digital components, including virtual implant libraries, definitive abutments, and corresponding scan body, enabled accurate preoperative virtual impressions and abutment-level prosthetic planning. This system compatibility supported the execution of a continuous digital workflow from planning to prosthesis delivery, minimising analogue steps and potential sources of error.



16a+b
OPG of definitive prosthesis at six month post implant placement (a). Frontal view of definitive prosthesis (b).

Recent advancements in guided and navigated implant surgery further support the trend toward precise, prosthetically driven workflows. Dynamic navigation systems have demonstrated promising results in immediate loading of full-arch restorations, offering improved control over implant positioning and facilitating prosthetic delivery with reduced adjustment requirements.¹³ Although static guided surgery was employed in the present case, these emerging technologies highlight the ongoing evolution toward greater accuracy and efficiency in full-arch rehabilitation.

Time efficiency and patient comfort are important clinical considerations in extensive implant procedures. Fully guided sequential template protocols for immediate loading have been shown to reduce surgical and restorative time while maintaining high implant survival and favourable soft-tissue outcomes.¹⁴ The elimination of intra-oral relining or pickup procedures, as demonstrated in the present case, directly contributes to reduced chairside time and enhanced patient experience.

Despite these advantages, limitations must be acknowledged. Systematic reviews have emphasised that although guided surgery improves accuracy, deviations between planned and placed implants remain inevitable due to multiple sources of error within the digital workflow.¹⁵ Therefore, strict case selection, precise digital planning, and rigid guide stabilisation are essential prerequisites for the successful application of prefabricated immediate provisional prostheses. In the present protocol, the exclusive use of axial implants minimised biomechanical and geometric complexity, which may not be applicable in cases requiring tilted implant placement.

The use of the same prosthetic screw system for fixation onto the uni.cone abutments eliminated the need for additional prosthetic cylinders or intermediary components. The design of the SKY unicone supports the direct screw-retained restorations, as the flat screw seat is easy to produce. The screw is additionally protected by form fit against the lateral forces, because functional loads are transferred directly from the prosthesis to the abutment through the cylindrical interface. This simplified prosthetic component chain, together with the digital compatibility of the copaSKY implant system with guided surgery planning and prosthetically driven workflows, contributes to a streamlined, economical, and clinically reliable approach for immediate loading in full-arch implant rehabilitation.

The primary limitation of this report is its single-case design with short-term follow-up. While the clinical and radiographic outcomes were favourable, larger prospective studies with long-term follow-up are required to validate the reproducibility, biological safety, and mechanical reliability of this protocol. Future research should focus on comparative analyses of chairside time, prosthetic accuracy, and patient-reported outcomes between prefabricated and conventionally adjusted immediate loading protocols, as well as the applicability of this approach to tilted implant configurations.

Conclusion

The present protocol demonstrates that a fully digital, guided workflow can facilitate the immediate fixation of a prefabricated PMMA provisional prosthesis in full-arch rehabilitation without intra-oral modification. By eliminating chairside relining or pickup procedures, the approach may reduce operative time on the day of surgery and improve overall patient comfort.

The “instant screwing” protocol, as described, is currently applicable to cases involving axial implant placement, where geometric alignment and prosthetic accuracy can be more predictably maintained. However, the findings are based on a single clinical case with short-term follow-up and therefore cannot be generalised.

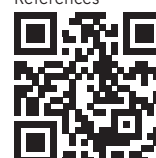
Prospective clinical trials with larger sample sizes and long-term evaluation are required to validate the reproducibility, biological safety, and biomechanical reliability of this approach. Future investigations should also explore modifications to the protocol to enable its application in cases involving tilted implants with guided full-arch immediate loading rehabilitations.



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References



Immediate implant placement with simultaneous GBR in a complex patient

Guided bone regeneration (GBR) following immediate implant placement in patients with significant medical comorbidities presents unique clinical challenges. This case report describes the management of a non-restorable dentition in a 78-year-old female patient with multiple chronic conditions, where minimising surgical appointments was paramount. The combination of Geistlich Bio-Gide® Forte for reliable membrane fixation and space maintenance, and REGENFAST® as a biological adjunct to support wound healing, contributed to a predictable regenerative outcome.

Dr Marco Zeltner, Switzerland

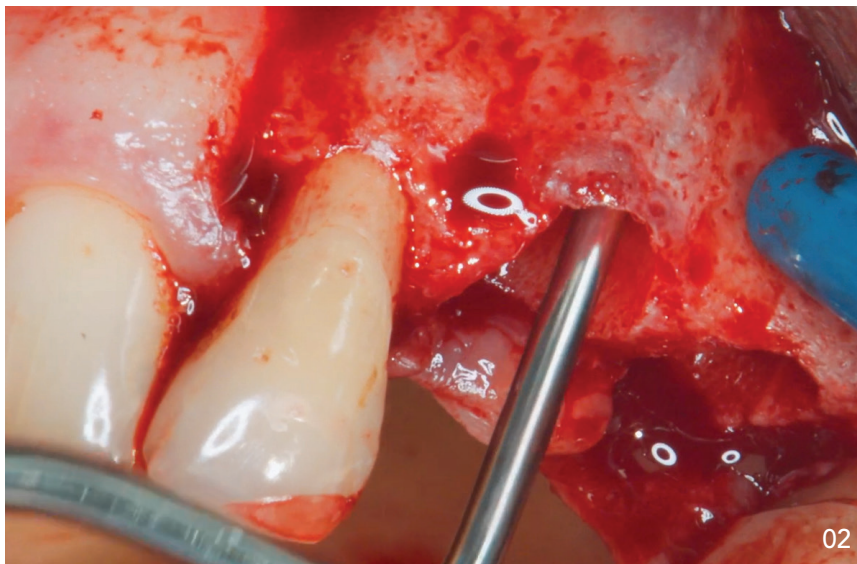
Predictable implant outcomes in patients with systemic conditions that may affect healing depend on sound treatment planning, careful material selection, and a strategy that minimises surgical burden without compromising biological outcomes. Collagen membranes are central to GBR, providing space maintenance and barrier function throughout the healing phase. In challenging clinical situations—multi-tooth defects, thin buccal walls, or cases requiring membrane fixation under tension—membrane stability and handling characteristics become critical factors.

Geistlich Bio-Gide® Forte (Geistlich Pharma) is a resorbable collagen membrane with high tensile strength and enhanced form stability upon hydration, building on the established biological performance of Geistlich Bio-Gide®. In cases involving medically compromised or elderly patients, where healing capacity may be reduced, additional biological support can be beneficial. REGENFAST® (Mastelli) is a viscoelastic gel containing polynucleotides and hyaluronic acid and is designed to support cellular processes involved in tissue repair and wound healing. This case report describes the combined use of both materials in a clinically demanding scenario.



01a+b

An elderly patient presented with loose crowns and apical infections affecting teeth #23 and #24. Both teeth had a hopeless prognosis, and the crowns were removed without resistance.



02

Clinical examination revealed an extremely thin buccal bone wall.

03

Tissue-level implants measuring 4.1 × 10 mm (Matrix®, TRI) were placed immediately at sites #23 and #24 using a guided surgical approach.

Case report

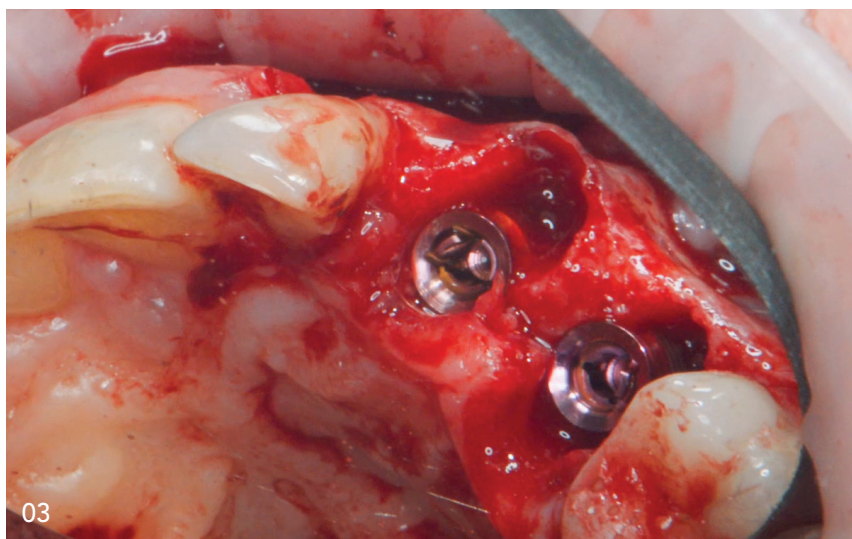
Initial situation

A 78-year-old female nonsmoker, with no history of hospitalisation within the preceding six months, presented with pain, mobile crowns, and clinical signs of an apical infection involving teeth #23 and #24. CBCT revealed a subgingival coronal fracture of tooth #23 and a subgingival coronal fracture associated with apical osteitis at tooth #24. Following comprehensive clinical and radiographic evaluation, both teeth were considered non-restorable and assigned a hopeless prognosis. The crowns were removed without resistance (Figs. 1a+b), followed by extraction of the affected teeth. Subsequent clinical inspection of the extraction sites revealed an extremely thin buccal cortical plate (Fig. 2).

The patient's medical history included anticoagulation therapy and antihypertensive medication. Given her systemic status and preference for limiting surgical visits, treatment planning prioritised efficiency while maintaining regenerative quality.

Treatment planning

Immediate implant placement was planned based on the absence of acute suppurative infection, the availability of sufficient residual bone to achieve primary implant stability, and the patient's medical profile, which favoured minimising the number of surgical interven-



03

tions. Both teeth were therefore atraumatically extracted, and the implants were placed during the same surgical session, obviating the need for a staged approach.

The simultaneous extraction of two adjacent teeth was expected to result in a non-self-stabilising osseous defect, where defect morphology poses a challenge and graft stability depends on a stabilising element. A slowly resorbing bone substitute, autogenous bone, a biologic adjunct, and a high-strength collagen membrane were selected to achieve reliable augmentation and support healing in this medically compromised patient.

Surgical procedure

Following administration of local anaesthesia, teeth #23 and #24 were extracted using an atraumatic technique. A full-thickness mucoperiosteal flap was elevated through a horizontal crestal incision and a single vertical releasing incision mesial to tooth #22. The extraction sockets were then thoroughly debrided.



04
Autologous bone was combined with 0.5 g of small Geistlich Bio-Oss® granules and REGENFAST® to promote faster healing.

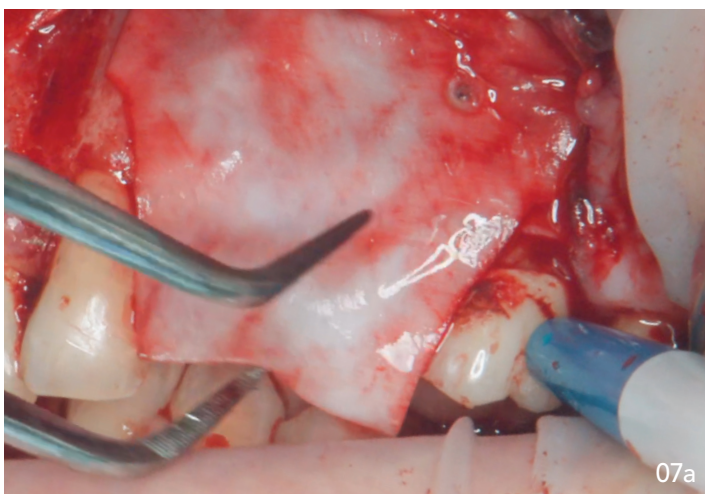


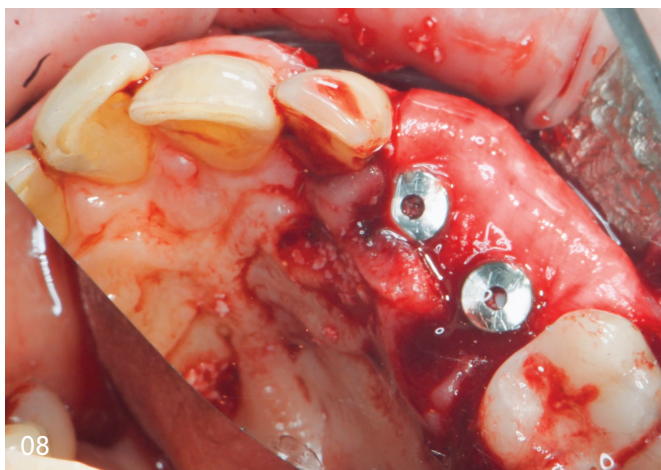
05
The Geistlich Bio-Gide® Forte membrane was hydrated with sterile saline and trimmed to conform to the defect morphology.



06
The defect was grafted with the mixture of autologous bone, Geistlich Bio-Oss®, and REGENFAST®.

07a+b
The membrane was positioned over the graft and stabilised with resorbable pins.





08

A small incision was made in the membrane to adapt it around the healing abutments. REGENFAST® was then applied to the Geistlich Bio-Gide® Forte membrane.

09a+b

The surgical site was closed using two horizontal mattress sutures and additional single interrupted sutures.

10

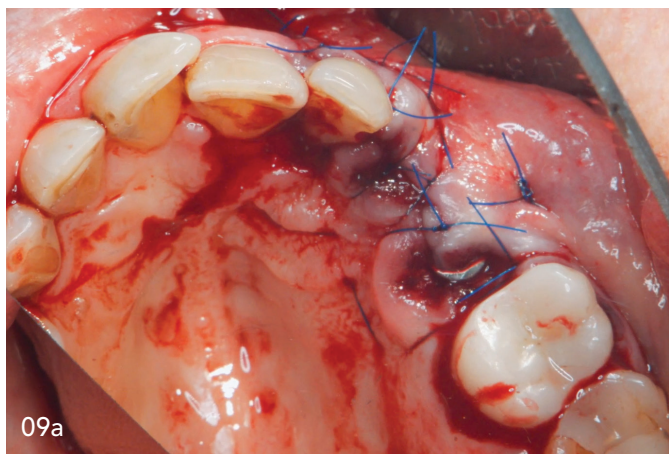
Postoperative radiographic assessment.

Immediate implant placement was performed at sites #23 and #24 (Fig. 3) using 4.1 × 10mm tissue-level implants (Matrix® implants with a P45 platform, TRI).

Both implants were placed using guided surgery and inserted with 25 Ncm torque. This value was sufficient for transmucosal healing but did not support immediate loading; healing abutments were placed on both implants to avoid further surgical access.

The osseous defect was grafted with a mixture of autogenous bone harvested with a Safescraper® (META Technologies), 0.5 g of Geistlich Bio-Oss® small granules (Geistlich Pharma), and REGENFAST® to support bone regeneration and soft-tissue healing (Figs. 4–6).

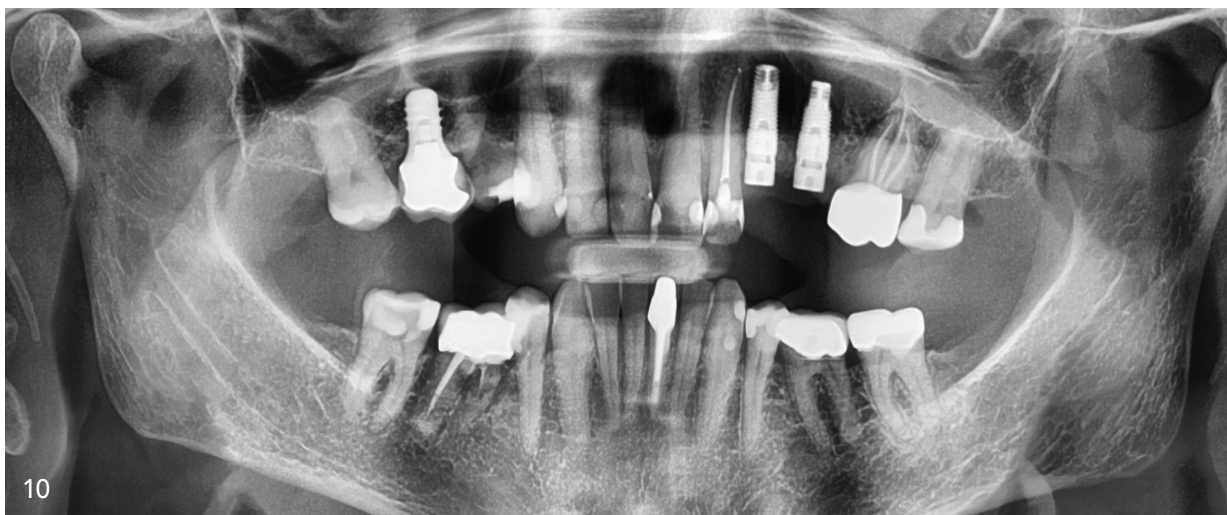
Geistlich Bio-Gide® Forte was hydrated with sterile saline and trimmed to the defect (Figs. 7a+b). Two small cuts were made to position the membrane around the healing abutments (Fig. 8). The membrane was stabilised with LeadFIX resorbable pins and the healing abutments, ensuring stable coverage of the augmented volume. REGENFAST® was additionally applied on top of the membrane (Fig. 8). The flap was closed with SERALON® 4/0 and 5/0 non-resorbable



09a



09b



10

sutures using two horizontal mattress and single interrupted sutures (Figs. 9a+b).

Postoperative medication consisted of amoxicillin 750 mg three times daily for five days, Dafalgan® as needed for analgesia, and a 0.12% chlorhexidine mouthrinse supplemented with hyaluronic acid.

Postoperative course and follow-up

Postoperative radiographic imaging confirmed satisfactory implant position and osseous fill (Fig. 10). The postoperative course was uneventful with very good soft-tissue healing—a notable result given the patient's age and medical status (Figs. 11+12). Prosthetic restoration followed five months after surgery. The bone and soft-tissue conditions, including the emergence profile, were highly favorable, allowing for straightforward placement of the crowns.

Discussion

This case illustrates a clinical scenario where the goal of reducing surgical burden shaped every decision, from treatment planning to material selection. A 78-year-old patient receiving anticoagulant and antihypertensive therapy and presenting with two adjacent, non-restorable teeth would not generally be considered an ideal candidate for immediate implant placement.

Yet the alternative—staged extraction and delayed implant placement—would have required additional surgical appointments, additional anaesthesia, and a longer overall treatment timeline. Given her systemic profile and her own preference, this was not the preferred path.



11a+b
Soft-tissue healing following surgery.

12
Healed soft tissues and successful implant osseointegration before intra-oral scanning for fabrication of the definitive prosthetic restoration.

13
Five months post-operatively, with the final prosthetic restoration in place.



14
Lateral view of the final prosthetic restoration in place, demonstrating the resulting occlusal relationship.

The key regenerative challenge was defect morphology. The simultaneous extraction of two adjacent teeth results in a non-contained defect, where graft stability cannot be achieved without a reliable stabilising element. In this case, the membrane needed to be pinned and simultaneously adapted around the healing abutments, requiring sufficient mechanical stability to minimise tearing or deformation. Geistlich Bio-Gide® Forte could be securely pinned and shaped around the abutments without tearing and maintained its form upon hydration, facilitating stable positioning.

The choice to support regeneration with autogenous bone, Geistlich Bio-Oss®, and REGENFAST® was driven by both the biological demands of the defect and the patient's age. In older patients, healing conditions are less favourable and regenerative potential is reduced. REGENFAST® was incorporated into the graft and applied over the membrane as a biological adjunct, with the aim of supporting cellular processes involved in tissue repair and wound healing*, which may be particularly relevant in patients with reduced regenerative capacity.

The predictable handling of Geistlich Bio-Gide® Forte—stable, trimmable, and tear-resistant—allowed the procedure to be completed efficiently. In a patient where reducing surgical time and complexity matters, this enabled us to provide a very patient-friendly approach.

Conclusion

This case demonstrates that immediate implant placement combined with simultaneous GBR can be clinically viable even in older, medically compromised patients, provided that regenerative materials are selected to meet the specific biological and biomechanical demands of the clinical situation. Geistlich Bio-Gide® Forte provided the membrane stability required to manage a non-self-stabilising defect; REGENFAST® provided additional biological support in a clinically challenging healing environment. The outcome demonstrates that a well-planned approach can reduce treatment burden without sacrificing regenerative predictability.

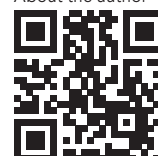
* Beretta M, et al. Int J Periodontics Restorative Dent 2025 Mar 6;45(2): 209–19.



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About the author



Implant dentistry meets the "Florence on the Elbe"

The 55th Annual Congress of the DGZI, taking place in Dresden on 13 and 14 November, will bring together the international implant dentistry community. Alongside a comprehensive scientific programme, the congress will provide ample opportunities for face-to-face exchange, stimulating discussions and professional networking. Key highlights will include the Young Generation Arena and practice-oriented table clinics.

More information
and registration



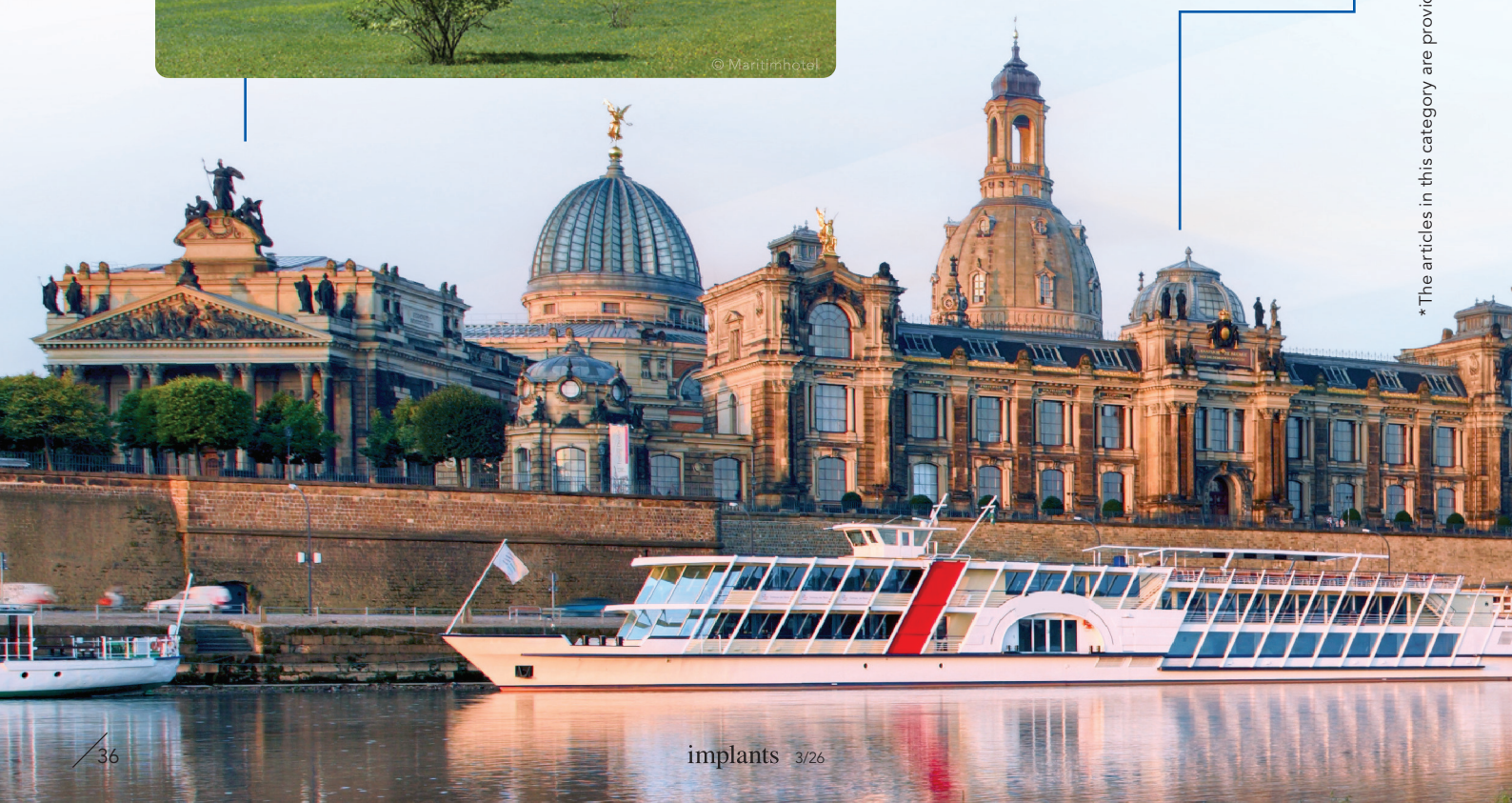
MORE THAN LECTURES AND EXPERT INSIGHTS

The congress places personal exchange, fresh perspectives, current developments and valuable professional connections at its heart. Bringing knowledge, dialogue and inspiration together under one roof, the DGZI Annual Congress offers an experience that extends well beyond the lecture hall.



DRESDEN: A CONGRESS DESTINATION WITH A UNIQUE ATMOSPHERE

With its dynamic scientific community, renowned cultural institutions and magnificent historic architecture, Dresden offers an exceptional setting for the congress. Iconic landmarks such as the Frauenkirche, Semperoper and Zwinger, along with the picturesque banks of the River Elbe, provide an inspiring backdrop for professional development and exchange among colleagues. Thanks to the city centre's compact layout, attendees can effortlessly combine the congress programme with exploring all that Dresden has to offer.



*The articles in this category are provided by the manufacturers or distributors and do not reflect the opinion of the editorial team.

YOUNG GENERATION ARENA: SPOTLIGHTING THE NEXT GENERATION OF IMPLANT DENTISTRY

The Young Generation Arena places emerging talent in implant dentistry centre stage. Under the leadership of Dr Stefan Röhling, early-career clinicians will present current research and clinical cases.

The programme will also offer young dentists practical guidance as they enter the field, along with valuable opportunities to connect with experienced speakers and like-minded peers.

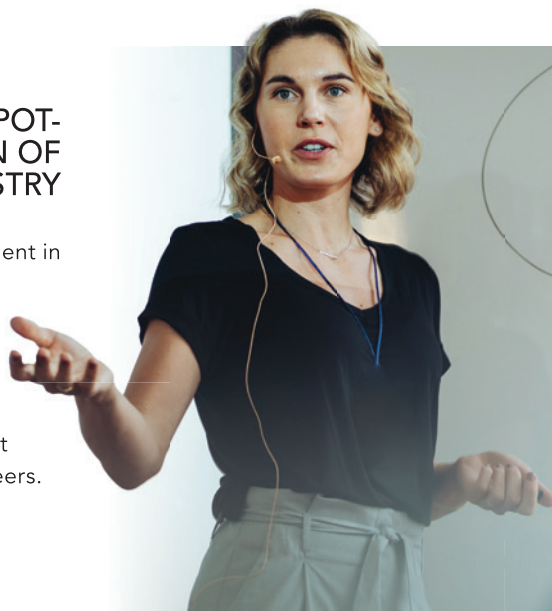


TABLE CLINICS: FOCUSED LEARNING THROUGH DIRECT EXCHANGE

The table clinics focus on live demonstrations, in-depth discussion and personal interaction. In small groups, experts will present selected techniques, products and clinical solutions. This compact, interactive format gives participants the opportunity to ask specific questions and gain practical insights that can be applied directly in everyday clinical practice.



A CONGRESS NOT TO BE MISSED

Attendees can look forward to two rewarding days of professional development, inspiring discussions with colleagues and a memorable DGZI Congress in one of Germany's most beautiful cities at a particularly enchanting time of year.



Complete laser support for implantology



© Fotona

Laser technology from Fotona can support multiple stages of implant treatment, including tooth extraction, post-extraction ridge preservation and peri-implant disease management. Fotona offers a comprehensive implantology solution through three powerful technologies on its LightWalker and SkyPulse dental laser systems: TwinLight, SWEEPS and ComfortLase.

Fotona's TwinLight protocol combines Er:YAG and Nd:YAG wavelengths for two key implantology applications: post-extraction ridge preservation and minimally invasive peri-implant disease management. In post-extraction treatment, Er:YAG supports cleaning and decontamination of extraction sockets, while Nd:YAG enables deep disinfection and biostimulation, promoting healing. In peri-implant disease management, Er:YAG supports effective removal of granulation tissue and cleaning of implant surfaces, while Nd:YAG enables bacterial reduction and biostimulation, supporting re-osseointegration.

Fotona's proprietary SWEEPS Er:YAG photoacoustic technology enables cleaning and decontamination in anatomically complex or difficult-to-reach areas. ComfortLase photo-biomodulation utilises Nd:YAG laser energy to stimulate tissue repair, promote faster healing and support patient recovery. Together, TwinLight, SWEEPS and ComfortLase help clinicians preserve tissue, support healing and improve implant outcomes.

Fotona
www.fotona.com

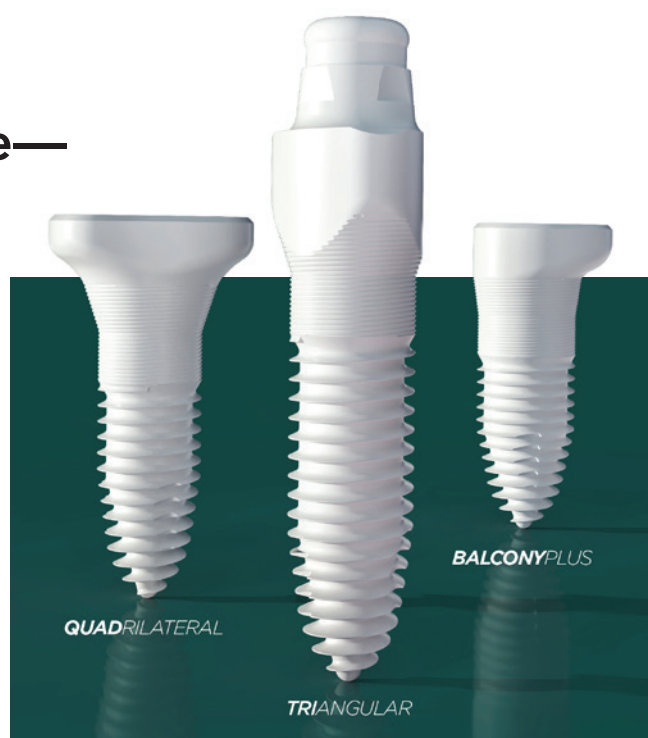
Cutting edge performance—designed for aesthetics

More than implants: a new dimension of aesthetically and anatomically oriented implantology. With the SDS Aesthetic and Anatomic series, SDS SWISS DENTAL SOLUTIONS presents a system that consistently combines design, function, and clinical requirements.

In the anterior region, the SDS Aesthetic series offers oval and new triangular implant shapes that are aligned with natural tooth contours. They deliberately create interproximal space to preserve the papillae and support a consistent emergence profile. At the same time, the geometry enables precise positioning and supports efficient surgical workflows.

In the posterior region, the SDS Anatomic series complements the concept with a quadrilateral design and a further developed Balcony+ approach. This shape supports both effective coverage of the alveolar space and peri-implant hard- and soft-tissue healing, while allowing flexible adaptation to different anatomical conditions.

The new implants follow a clear principle: implant design aligned with natural anatomy, creating the foundation for reproducible, functional, and aesthetically demanding outcomes.



Further information on the SDS ceramic implant system can be found at www.swissdentalsolutions.com.

SDS SWISS DENTAL SOLUTIONS
www.swissdentalsolutions.com

CleanImplant strengthens the digital presence of certified practices

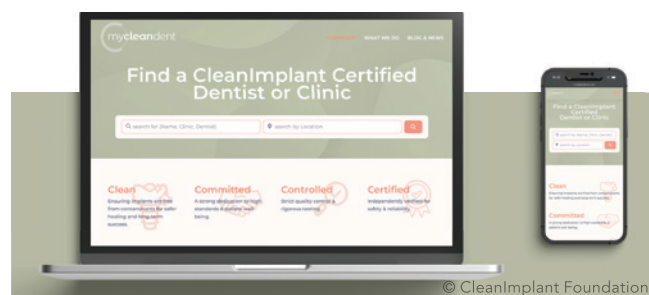
The CleanImplant Foundation has launched the new patient-oriented platform mycleandent.com and expanded its membership programme with another exclusive benefit: every CleanImplant Certified Dentist now receives an individual landing page that is search-engine optimised, locally targeted, AI- and SEO-supported, and editorially managed by CleanImplant.

Excellence deserves visibility

CleanImplant-certified practices benefit from enhanced digital visibility precisely where patients are actively searching for quality and trust in implant dentistry: Certified Dentists work with award-winning implant systems and earn the confidence of their patients through a demonstrated commitment to product quality. mycleandent.com serves as a dedicated search platform where patients can rely on their clinicians' promise of uncompromising quality standards in implant dentistry.

The range of benefits

For CleanImplant Certified Dentists the range of benefits extends well beyond digital visibility. High-quality marketing materials support consistent and professional communication of the practice's commitment to quality—from personalised quality certificates and



acrylic reception displays to patient brochures for waiting areas and consultation rooms. These tools facilitate informed and trust-based patient discussions.

In addition, members gain access to a practice-oriented expert network, professionally designed social media templates, and reliable independent analytical data on dental implant systems.

CleanImplant Foundation
info@cleanimplant.org
www.cleanimplant.com
www.mycleandent.com

Further information available on the initiative's website



A new look, the same passion

The new brand identity of OEMUS MEDIA AG

OEMUS MEDIA AG is embarking on a new chapter in its history. After more than 30 years, the Germany-based media company is unveiling a new brand identity—one that reflects its transformation from a traditional specialist publisher into an integrated media, events and community-driven enterprise.

For more than three decades, the company's previous logo appeared across OEMUS MEDIA AG's magazines, congresses, websites, newsletters and trade show displays. During that time, the company continued to evolve. What began as a traditional specialist publishing house has long since become an integrated media company, with its Print, Online, Event, Study and Corporate divisions working together to shape communication within the dental industry. The new brand identity brings this evolution to life visually.

A smile at the core of the brand

At the heart of the new identity is "oemus"—lowercase, pared back and focused. Its defining feature, the redesigned "u," evokes a smile and reflects the company's dental roots. It also stands for "you," "us" and "we,"

symbolising the community and collaboration that have long shaped OEMUS MEDIA AG: #welovewhatwedo.

The new colour palette pairs Deep Viola—combining professionalism and creativity—with a modular system that gives each business division its own secondary colour. This creates clear visual structure while maintaining a cohesive identity.

The distinctive "u" also forms a brand pattern used across magazines, websites, social media, congresses, newsletters and trade shows. Together, these elements create a comprehensive, instantly recognisable design system.

Modern in appearance, true to our values

The new brand identity builds on everything OEMUS MEDIA AG has stood for over the past three decades: close ties to the market, a passion for dental topics and a strong network connecting people, knowledge and communication. The visual language may be more modern, but the values behind it remain unchanged. They will continue to provide the foundation for everything that defines the OEMUS brand.



OEMUS MEDIA AG
www.oemus.com

New expert consensus aims to improve peri-implant health

Practical clinical recommendations unite surgical and prosthetic planning to help prevent disease and support long-term implant success.

With more than 6,000 member periodontists and oral health professionals, the Spanish Society of Periodontology (SEPA) is the scientific society dedicated to periodontology and implant dentistry, and is recognised as a global leader in periodontal science and clinical practice.

The society has recently led the development of a major expert consensus report providing clinical recommendations on the influence of surgical and prosthetic factors on peri-implant health and disease. The paper, bringing together the clinical expertise of periodontists, prosthodontists and dental technicians, has been published in the *Journal of Esthetic and Restorative Dentistry*, under the title "Influence of surgical and prosthetic factors on peri-implant health or disease: clinical recommendations from a SEPA expert consensus". "This guidance document stems from the need to offer clinicians a practical framework to prevent peri-implant diseases from the outset of treatment, taking into account both surgical and prosthetic considerations," says Dr Ignacio Sanz Sánchez, co-author of the paper. Dr Beatriz de Tapia, co-author and SEPA board member for education and research, adds:

"Implementing these recommendations may have a meaningful impact both nationally and internationally, by providing clear and consistent criteria for clinicians and dental technicians, and supporting more predictable decision-making in both clinical and laboratory settings."



Dr Ignacio Sanz Sánchez

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Peri-implant diseases, including peri-implantitis, remain a major concern in implant dentistry and are frequently associated with prosthesis-related factors. This review highlights the importance of integrating both surgical and prosthetic planning to reduce the risk of disease development. Clinicians are encouraged to prioritise prosthetic designs that facilitate effective oral hygiene. Three-dimensional implant-positioning—guided by the intended prosthetic outcome—is essential to minimise complications. Material selection, including ceramic and zirconia restorations, may also influence plaque accumulation.

Long-term success in implant dentistry depends on prosthetically driven planning, hygienic prosthetic design, appropriate selection of implant–abutment connections and materials, minimal implant manipulation, and maintenance tailored to patient risk.

SEPA's leading role

SEPA has played a leading role in coordinating and driving this multidisciplinary consensus, bringing together leading expertise in periodontology, prosthodontics and dental technology, with the support of the dental company Eckermann, to translate scientific evidence into practical clinical guidance.

Key topics included three-dimensional implant positioning, implant–abutment connections, prosthetic design and component handling. This collaborative approach reflects SEPA's ongoing commitment to promoting integrated, evidence-based dentistry and improving long-term patient outcomes.

Access here
the full paper



Clinical recommendations

The expert consensus is structured around five key clinical domains:

1

Prosthetic design and emergence profile

- Prosthetic factors play a major role in peri-implant health.
- Designs should facilitate effective hygiene for both patient and clinician.
- Overcontouring should be avoided.
- Convex profiles are associated with increased risk of peri-implant disease.
- Straight or concave profiles with an emergence angle $< 30^\circ$ are preferred.

2

Implant positioning and surgical planning

- Implant placement should be prosthetically driven.
- Three-dimensional positioning is essential (mesio-distal, apico-coronal and bucco-palatal).
- Poor positioning may lead to unfavourable prosthetic compromises.
- Guided surgery may be beneficial in complex cases.

3

Implant–abutment interface

- Internal conical connections are preferred.
- Platform switching may improve crestal bone stability.
- Polished-neck implants may benefit higher-risk patients.

4

Prosthetic components and handling

- Intermediate abutments may provide a protective effect in multiple-unit restorations.
- Narrow or concave designs are preferred.
- Abutment height $> 2\text{mm}$ may reduce early bone loss, particularly in patients with thin mucosa.
- Placement of the definitive abutment at surgery is recommended.
- The “one abutment–one time” concept may reduce bone remodelling.

5

Materials, retention and maintenance

- Screw-retained restorations are preferred.
- Excess cement is a well-established risk factor for mucositis and a potential contributor to peri-implantitis.
- Zirconia shows favourable soft-tissue response and lower plaque accumulation.
- No clear evidence of reduced peri-implantitis risk versus metal-ceramic restorations.
- Hygienic design, patient education and regular maintenance are essential.

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