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Clinical Dentistry is committed to the advancement of practical clinical skills in dentistry. Through its focus on inspirational clinical casework, its sole aim is to help general dental practitioners enhance their skills and techniques across every facet of dentistry in an easy-to-assimilate and practical way.

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A NEW BEGINNING



Welcome to the January issue of *Clinical Dentistry*!

We're kicking off 2025 the only way we know how, and that's with an issue full of solid clinical casework. The treatment being performed in dental practices across the UK is nothing short of superb – and I can't wait to see what is to come as we head into a new year.

January presents an ideal moment for reflection, recalibration and renewal – as well as the perfect opportunity to embrace fresh starts. Will 2025 be the year you challenge yourself maybe to learn a new clinical skill or technique? Perhaps you'd like to bury your head in the latest research or even share your knowledge by taking on a mentee.

The concept of 'trying something new' resonates deeply in dentistry, where innovation and adaptability are integral to success. We've seen many advancements over the last decade – 3D printing, artificial intelligence, teledentistry, and biomaterials, to name just a few. These developments present exciting possibilities for enhancing patient care and optimising efficiency. Yet, with innovation comes the need for boldness: stepping beyond comfort zones and being open to change.

For some, a fresh start might mean investing in cutting-edge technology to elevate diagnostic precision and patient engagement. For others, it could involve adopting new approaches to patient communication, incorporating tools like digital scheduling systems that cater to an increasingly tech-savvy clientele. These small yet impactful changes can transform the way we connect with and serve patients.

But trying something new isn't solely about technology. It can also mean reevaluating your practice culture or focusing on personal growth. Or perhaps it's time to explore new areas of dentistry to diversify your practice offerings.

Of course, change can be daunting, but remember that growth often comes from taking risks and stepping into the unknown. In 2025, let's explore new opportunities and embrace innovation not just as a possibility, but as a professional imperative.

And remember, no matter the path you choose, we're here to guide you in your clinical practice throughout the year.

Happy new year!



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Everything you need to know about the 2025 North of England Dentistry Show

The North of England Dentistry Show returns to Manchester on 8 March 2025 with a renewed focus on delivering the UK's best conference for delegates and exhibitors alike.

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- **ADAM Theatre:** curated for dental administrators and managers, this theatre will provide the latest tips and tricks to ensuring practice processes run smoothly
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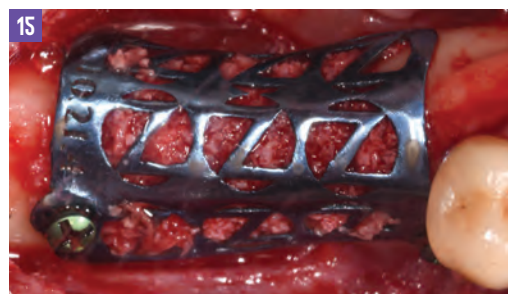


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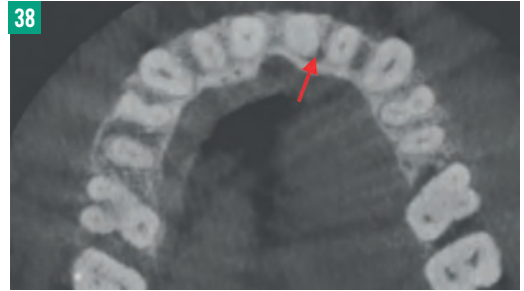
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GENERAL DENTISTRY

GIUSEPPE FIAMMINGHI

Utilising custom mesh in guided bone regeneration

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The guided bone regeneration (GBT) technique bases its principles on those of guided tissue regeneration, thus on the concept of distancing from the bone defect, epithelial cells and connective tissue, that would impede its regeneration - Giuseppe Fiamminghi, p15

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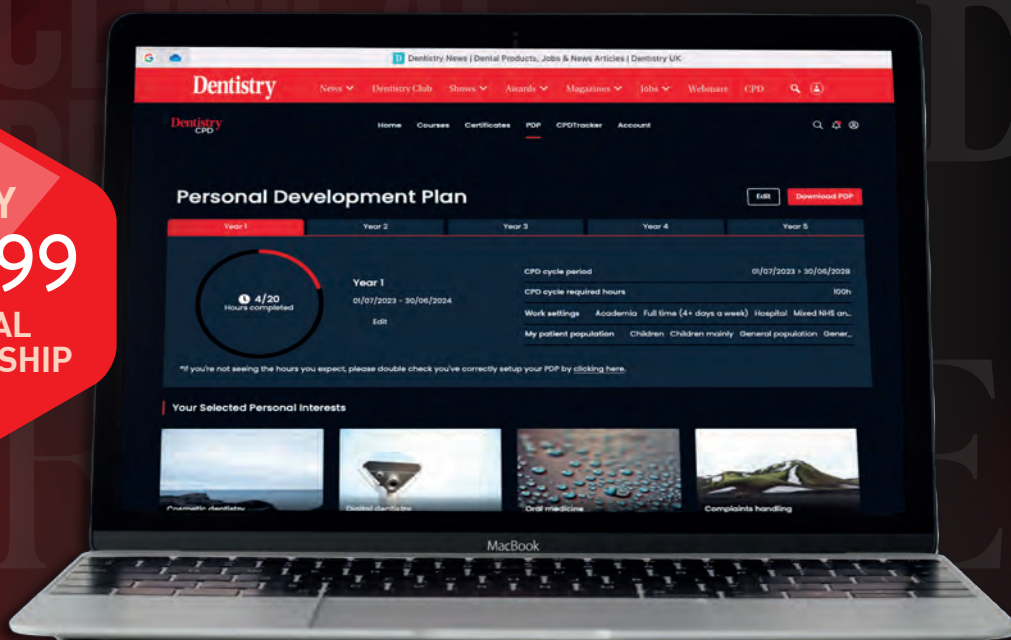
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**DR GIUSEPPE FIAMMINGHI**

Giuseppe graduated from dentistry and dental prosthetics in 2003 with an experimental thesis on immediate loading of post-extraction implants in the aesthetic zone. He practises in Parma, collaborating with numerous practices exclusively for oral surgery, implant dentistry and implant prosthetics.

ENHANCED CPD

CPD hours: one

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Topic: general dentistry

Educational aims and objectives:

To explore the use of a custom mesh in guided bone regeneration. This article qualifies for one hour of enhanced CPD; answer the questions on page 66 or scan the QR code.



The placement of osseointegrated implants in edentulous rehabilitations, both single and multiple, represents the treatment of choice to date, based on the high success rate achieved.

Very often, however, we are faced with bone resorption that is more or less severe, which prevents us from implant placement according to the standards established in the literature; that is, with at least 1.8mm of bone on the buccal aspect and 1.8mm on the lingual/palatal aspect.

The guided bone regeneration (GBT) technique bases its principles on those of guided tissue regeneration, thus on the concept of distancing from the bone defect, epithelial cells and connective tissue, that would impede its regeneration.

For this purpose, as a barrier, we have the

option of using resorbable and non-resorbable membranes. The former are mostly made of collagen, cross-linked or non-cross-linked, and in bovine or porcine pericardium.

Benefits include a greater ease of use and lower postoperative morbidity in the case of early exposure.

However, they also have limitations, such as space maintenance in large three-dimensional regenerations that involve vertical augmentation.

Titanium reinforced non-resorbable membranes (e-PTFE) and mesh titanium should therefore be the primary choice in these cases, if autologous block grafts are not to be used.

With regards to materials, a mix of autologous and heterologous bone is always recommended to take advantage of both osteo-induction and volume maintenance capabilities over time.

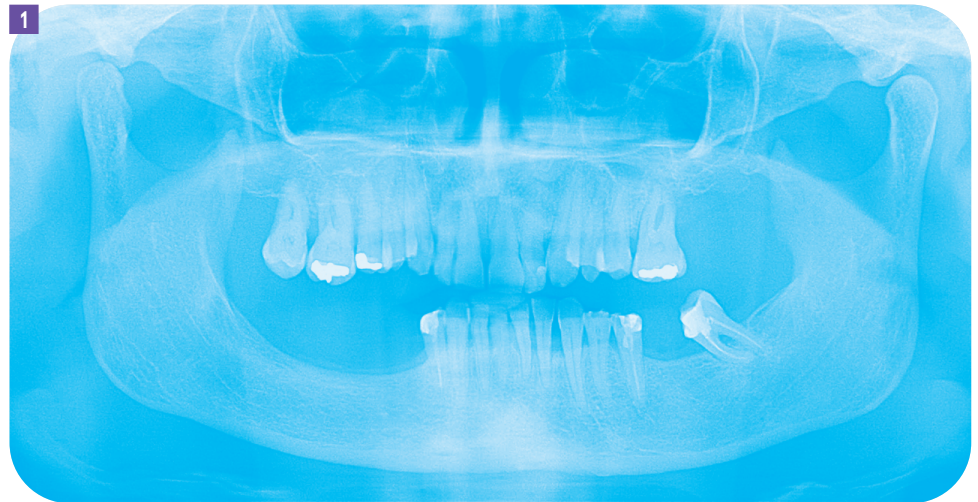


FIGURE 1: Initial overview

Giuseppe Fiamminghi discusses the use of a custom mesh in guided bone regeneration, presenting a rehabilitation case report

Utilising custom mesh in guided bone regeneration



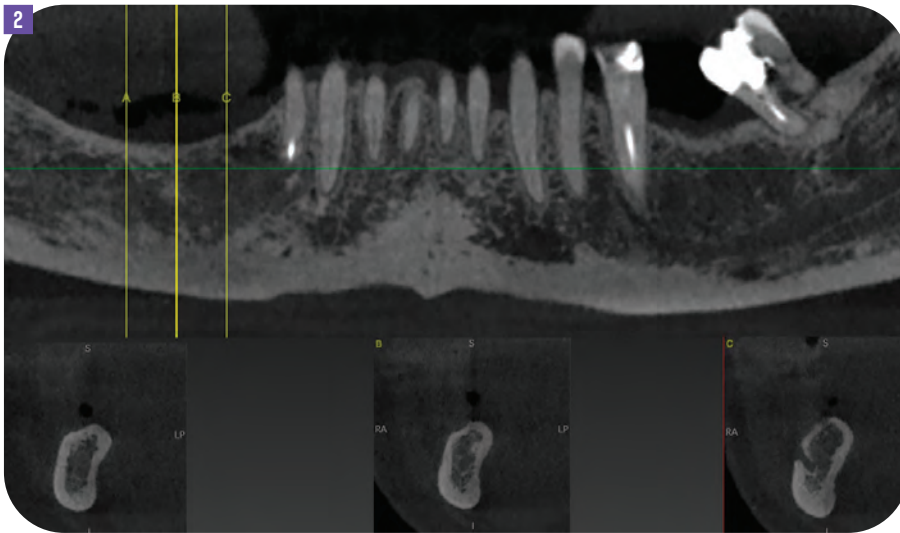


FIGURE 2: Cone beam section of the bone to be regenerated



FIGURE 3: Edentulous ridge preop



FIGURE 4: Virtual design of the custom-made mesh

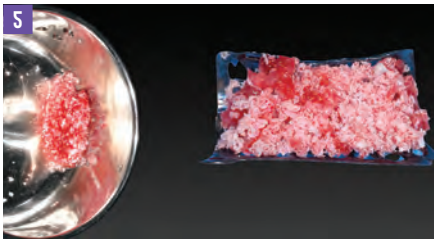


FIGURE 5: Autologous bone/heterologous mix

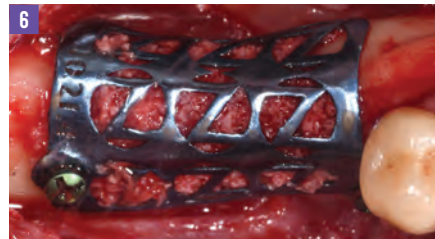


FIGURE 6: Mesh in place



FIGURE 7: Resorbable membrane made of collagen covering mesh

CASE REPORT

A 58-year-old female patient presented to our practice to rehabilitate the fourth quadrant with osseointegrated implants.

The patient was healthy, with a normal body mass index (BMI), a non-smoker, and consumed minimal alcohol, identifying her as ASA I, according to the ASA physical status classification system.

OVERVIEW

Figure 1 shows bone resorption due to the absence of the second premolar and the first and second molars that were extracted many years earlier.

After performing cone beam imaging, we discovered a vertical bone defect, manifested in the space for implant placement in area LR5 along with a mixed horizontal/vertical bony defect in the LR6 (Figure 2).

Implantation in the LR7 was not considered given the unfavourable prognosis of the antagonist and the patient's desire not to replace it.

A careful orthodontic evaluation was also done to consider reopening the bite, and after various proposals, it was decided to opt for a myofunctional therapy using activators.

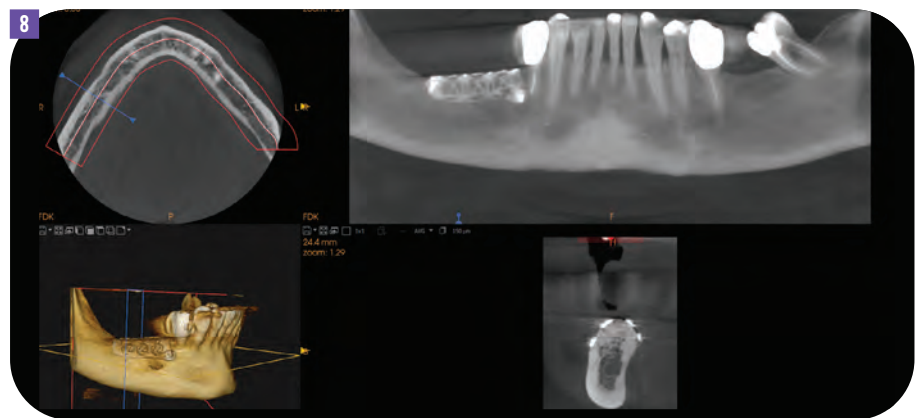


FIGURE 8: Cone beam at nine months after GBR

The surgery was performed under conscious sedation with the presence of a sedation physician, and was completed after two hours and 30 minutes.

During the primary incision, the band of attached gingiva was equally divided, half vestibular and half lingual (Figure 3). A full-thickness flap was then sculpted, with one vestibular outlet mesial to the canine and one at the level of the retromolar pad.

In the lingual component of the flap, a single discharge was made lingually at the

first premolar in the attached gingiva. For the vestibular flap passivation, the periosteum was incised to interrupt the elastic component.

The brushing technique was performed to dissociate and interrupt the more superficial fibres from the deeper part of the flap. For passivation of the lingual flap after a full thickness debridement to the mylohyoid line, the fibres were separated from the superficial main body of the mylohyoid muscle.

Once flap release was obtained, we proceeded harvesting bone frustules by means

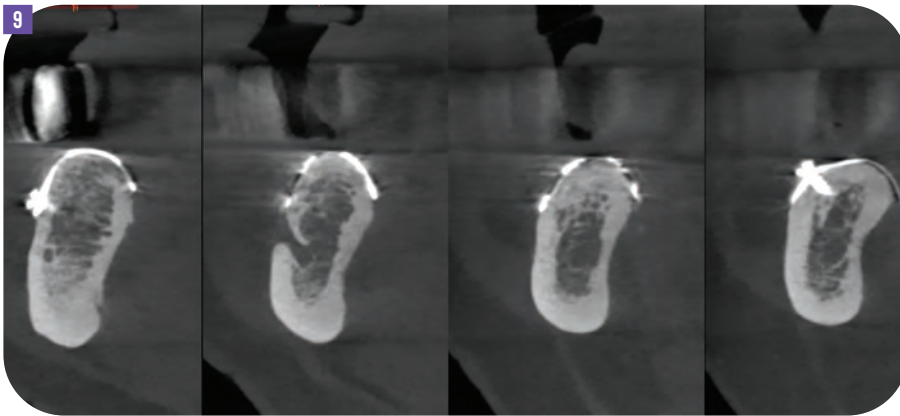


FIGURE 9: Cone beam sections of perfect bone regeneration

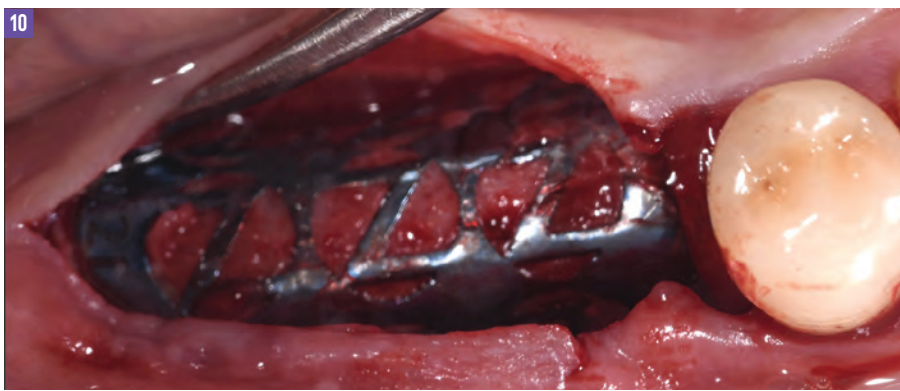


FIGURE 10: Framework removal surgery

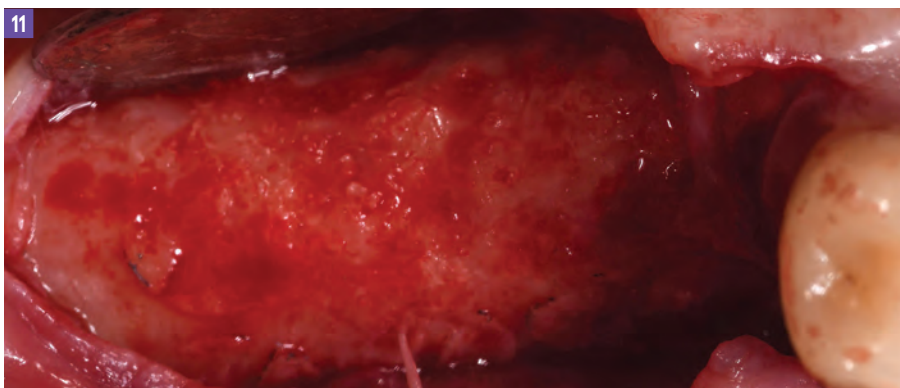


FIGURE 11: New bony ridge obtained

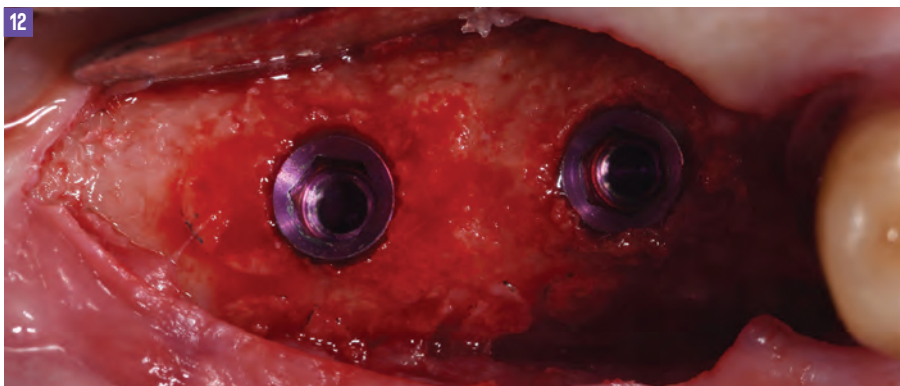


FIGURE 12: Implants in place

of a Safescraper with the added benefit of decorticating the area to be regenerated. With a calibrated bur we perforated the cortical plate to the medullary layer in several places to allow faster vascularisation of the graft.

Once the flaps and residual bone are managed, the mesh (Accuramesh) is tried on to find the exact position as per the design (Figure 4), after which it is filled with the mix of autologous/heterologous bone (Regeneross) (Figure 5) and fixed in place for osteosynthesis with two screws 2mm in diameter and 5mm in length.

The protocol involves placing a resorbable membrane covering the hole, which can be attached to the mesh itself (Figures 6 and 7). For suturing, a first line was performed using 4/0 PTFE (Osseoguard) with horizontal everted mattress stitches; above this, a second line with simple detached stitches.

In contrast, the drainage area is sutured with a resorbable 6/0 (Serapid). Two weeks later, the stitches were removed, and the patient was scheduled for monthly follow-up for nine months, until the graft was fully matured.

Before the surgical removal of the framework, a new cone-beam was taken to evaluate successful regeneration (Figures 8 and 9).

The removal surgery also included the insertion of implants, following the prosthetic design chosen during the case study. A flap was then sculpted at full thickness, without drainage cuts to reduce its invasiveness, the mesh was removed creating a vestibular lever point near the mesial osteosynthesis screw eye and the implants were placed (Figures 10 to 12).

CONCLUSION

The use of customised mesh proved to be very useful in reducing the operative time, as it avoided the whole process of shaping the non-resorbable membrane reinforced e-PTFE, which normally takes place intraoperatively.

All this led to better patient comfort and more accurate management of the GBR surgery as it was studied and designed virtually in the preoperative period.

In contrast, it was more complex to remove, but once we acquired the necessary manual dexterity and finished the learning curve, it became comparable to a GBR with a titanium-reinforced e-PTFE membrane. [C](#)

PRODUCTS USED

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SCAN ME



AESTHETIC DENTISTRY

CLAIRE O'CONNOR

Restoring structurally compromised teeth

21



RAJIV RUWALA

Composite bonding

26



I advised the patient that I would take a minimally invasive, defect driven approach to restoring both teeth. This means I would decide whether to restore directly or indirectly after removal of defective tooth structure and refining cavity margins –
 Claire O'Connor, p21

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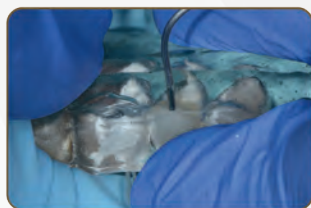
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- ✓ Injection moulding
- ✓ All direct posterior indications



Courtesy of Dr M. Peumans, Belgium

"I have now used G-ænial Universal Injectable (GUI) and Exaclear for about 3 years. Both materials set the gold standard for the injection moulding technique as well as other applications. Exaclear silicone is as clear as glass! GUI has struck a perfect balance between viscosity and physical properties. There is no way you will try GUI and not use it again."

- Dr Kostas Karagiannopoulos, Specialist and Consultant Prosthodontist



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Courtesy of Dr J. Tapia Guadix, Spain

"I treat a lot of structurally compromised teeth. We focus on preserving dentine during endo access, everX Flow has properties to help us to reinforce restorations and provides a high fracture toughness."

- Dr Daniel Flynn, Endo UK & Specialist



**DR CLAIRE O'CONNOR**

BDS NUI MFD RCSI

Claire graduated from UCC in 2006. In 2010, she completed the Membership exams at the Royal College of Surgeons in Ireland. With a passion for minimally invasive, bio-inspired advanced adhesive dentistry, she has pursued extensive training in this field including a Mastership in the USA in 2021 and the Mimétika Programme in Europe in 2023. Her clinical practice focuses on advanced biomimetic restorative dentistry with a particular emphasis on rubber dam isolation. She runs hands-on courses and lectures on biomimetic dentistry. Claire is a member of the Bio-Emulation global community, and is the Irish representative of the UK Bio-Emulation team.

ENHANCED CPD

CPD hours: one

GDC development outcome: C

Topic: aesthetic dentistry

Educational aims and objectives:

To present a restorative and aesthetic case to rehabilitate heavily restored, structurally compromised teeth in the upper right quadrant. This article qualifies for one hour of enhanced CPD; answer the questions on page 66 or scan the QR code.



A 48-year-old female patient attended complaining of transient sensitivity to hot and cold and occasional pain on biting in her upper right quadrant, which had been ongoing for about a month.

DENTAL HISTORY

This patient has attended my practice for the past five years. She has a heavily restored dentition, dating back to her pre-teen and teenage years (Figure 1). She now has good oral hygiene. Medically, she is fit and healthy with no medical issues or allergies.

Examination included the following special tests:

- Periodontal probing: within normal range in all teeth in upper right quadrant
- Occlusal analysis: mild tooth wear with a history of some cracks in heavily filled posterior teeth
- Vitality test all upper posterior teeth: all teeth tested vital
- Percussion test: no tenderness to percussion
- Radiograph: no pathology identified
- Clinical photographs: multiple cracks identified, emanating from old amalgam fillings
- Tooth sleuth test: positive response on upper first molar (pain experienced on release of pressure on UR6).

DIAGNOSIS

We diagnosed cracked tooth syndrome on the UR6 and structurally compromised UR7 and UR5.

Following a full assessment and consultation, I recommended a treatment plan to rehabilitate the heavily restored, structurally compromised posterior teeth in the upper right quadrant.

Due to financial limitations, the patient decided not to restore UR7 for now and to focus on UR6 and UR5.



FIGURE 1: Before treatment showing amalgam restorations



FIGURE 2: Rubber dam applied before amalgam removal

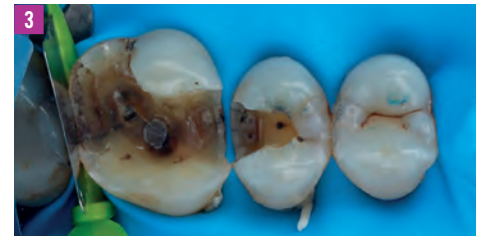


FIGURE 3: Amalgam removed

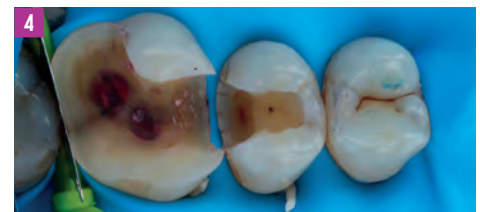


FIGURE 4: Further cavity preparation after application of caries dye

Claire O'Connor presents a restorative and aesthetic case to rehabilitate heavily restored, structurally compromised teeth in the upper right quadrant

Restoring structurally compromised teeth



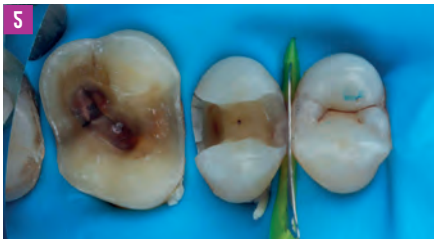


FIGURE 5: Decay discovered underneath crack on mesial wall of premolar

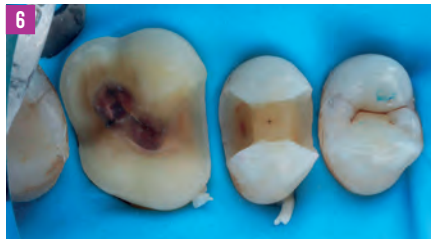


FIGURE 6: Cavities cleaned and conditioned using air particle abrasion

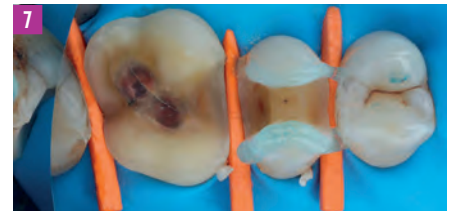


FIGURE 7: Selective etching of premolar, with wedging to create separation, peripheral cracks removed

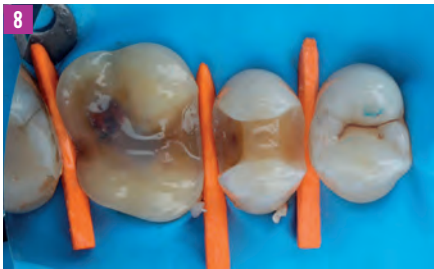


FIGURE 8: Resin coating with Everx Flow



FIGURE 9: Application of Everstick Net sheets to molar cavity in a thin bed of Everx Posterior

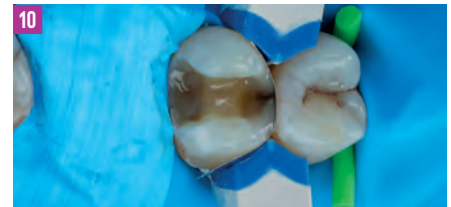


FIGURE 10: Molar covered with Teflon to protect during composite wall build-up of premolar with G-aenial A'chord



FIGURE 11: Distal wall built up with saddle matrix, prepared molar now visible, ready for onlay restoration



FIGURE 12: Dentine replaced in very small increments using a combination of Everx Flow and Everx Posterior



FIGURE 13: Enamel replaced using A2 G-aenial A'chord in a cusp-by-cusp technique

TREATMENT PLAN

Prior to commencing treatment, I advised the patient that I would take a minimally invasive, defect driven approach to restoring both teeth.

This means I would decide whether to restore directly or indirectly after removal of defective tooth structure and refining cavity margins.

The advantage of this is that it allows for maximum tissue preservation.

To ensure favourable postoperative contact points, we pre-wedged the interproximal spaces before etching the enamel

TREATMENT SEQUENCE

Appointment one

During the first appointment, we administered local anaesthetic and took the preoperative shade record (the UR5 was recorded as Vita A2 and the UR6 as Vita A3).

To ensure absolute isolation, we applied rubber dam before removing the old amalgam fillings with a micromotor set to high speed with copious irrigation (Figures 2 and 3).

We used Wedgeguards to protect the adjacent teeth and then applied caries detector dye to identify caries, which were removed using small, round diamond and rose head burs (Figure 4).

Cracks were detected in the periphery of both teeth. Cracks in the dentine were removed from inside the enamel-dentine junction using a small, fine round diamond bur at slow speed followed by air particle abrasion (50-micron aluminium oxide powder) (Figure 5).

We refined the enamel margins using diamond coated ultrasonic tips and a fine round diamond bur at very slow speed and the cavities were cleaned and conditioned using air particle abrasion (Figure 6).

To ensure favourable postoperative contact

points, we pre-wedged the interproximal spaces before etching the enamel with 37% phosphoric acid, applying an adhesive system to teeth and subsequently light curing (Figure 7).

A thin 'resin coat' of Everx Flow flowable composite was applied over the adhesive layer to ensure complete polymerisation of the adhesive and enhance fracture toughness of the floor of the cavity (Figure 8).

Three sheets of Everstick Net fibre mesh were applied sequentially over a thin layer of Everx Posterior fibre reinforced composite in the centre of the cavity in UR6 in the area where residual cracks remained over the pulp horns.

The purpose of Everstick Net fibre mesh is crack bridging and the creation of a fail-safe in the restoration to avoid any future catastrophic failure (Figure 9).

Deep margin elevation was carried out on the distal aspect of UR6 using G-aenial A'chord composite in small increments.

Everx Flow was applied in increments and spread across the preparation as a dentine replacement.

Finally, a thin layer of G-aenial Universal Flo injectable composite was applied on top to

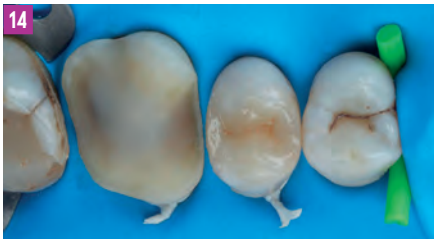


FIGURE 14: Brown tint applied in occlusal fissure



FIGURE 17: Onlay on model



FIGURE 20: Onlay after ultrasonic bath

All layering techniques were for the purpose of minimising contraction stress

ensure a smooth finish to the core build-up/biobase.

The mesial wall of the UR5 was restored incrementally using A2 G-aenial A'chord and a sectional matrix band (Figure 10). The distal wall was restored with the aid of a saddle matrix (Figure 11).

Dentine was replaced in very small increments in UR5 using a combination of Everx Flow and Everx Posterior (Figure 12).

Enamel was replaced using A2 G-aenial A'chord in a cusp-by-cusp technique. All layering techniques were for the purpose of minimising contraction stress and thus ensuring a long-

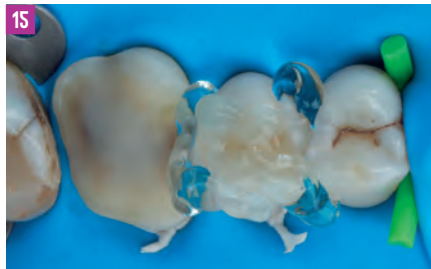


FIGURE 15: Glycerine gel cure



FIGURE 18: Onlay etched with hydrofluoric acid

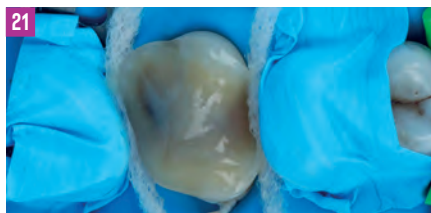


FIGURE 21: Teeth adjacent to molar protected using PTFE tape and Superfloss and fresh bond applied

lasting durable aesthetic restoration (Figure 13). Brown tint from GC was applied in the occlusal fissure for a natural effect (Figure 14). To ensure full polymerisation of the surface layer, we performed a final cure of the restoration through glycerine gel (Figure 15).

Excess adhesive/flash was removed carefully using a no. 12 scalpel.

The composite restoration in UR5 was contoured using a series of Sof-Lex discs along the marginal ridges and polished to a high gloss with ASAP polishers and finally, application of Enamelize on a felt wheel.

Digital scans of the upper and lower right quadrants and an occlusal scan were recorded using a Medita intraoral scanner, with an HD scan of the preparation on UR6 recorded. Laboratory instructions with accompanying shade records were sent to dental technician Mirko Borri of Da Vinci Dental Lab in Wallington.

For the indirect restoration, we requested a GC Initial Lisi lithium disilicate CAD/CAM block in high translucency to mimic natural enamel aesthetic properties. To achieve a natural appearance on the occlusal surface, we requested a brown occlusal tint.



FIGURE 16: Onlay fabricated from GC Initial Lisi block in high translucency



FIGURE 19: Onlay etched with phosphoric acid

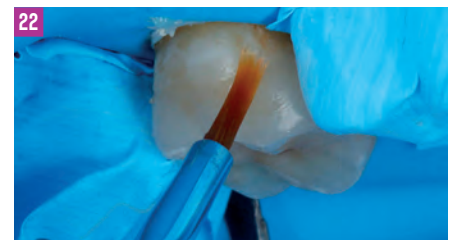


FIGURE 22: Removal of excess luting composite with GC Gradia Brush (Flat)

Appointment two

During the second appointment, we used 9.6% hydrofluoric acid for 60 seconds for pre-treatment of intaglio of the overlay (Figure 18) and we removed any salt precipitate using 37% phosphoric acid for one minute (Figure 19). The overlay was then immersed in an ultrasonic bath containing ethanol for five minutes (Figure 20).

We achieved absolute isolation again for stage two of treatment in UR6: bonding the overlay. The overlay preparation was cleaned and conditioned using air particle abrasion and the overlay fit was verified on tooth preparation UR6.

To facilitate easy clean-up post bonding, the adjacent teeth were protected using PTFE tape and Superfloss (Oral-B) applied interproximally (Figure 21). The preparation was etched with 37% phosphoric acid, adhesive system applied and luting composite heated to 55°C.

Silane coupling agent (ceramic primer) was applied to the intaglio of the overlay and air dried using warm air, followed by application of the adhesive system. The overlay was then bonded to the tooth using luting composite, followed by removal of excess prior to light curing each surface for 60 seconds (Figure 22).

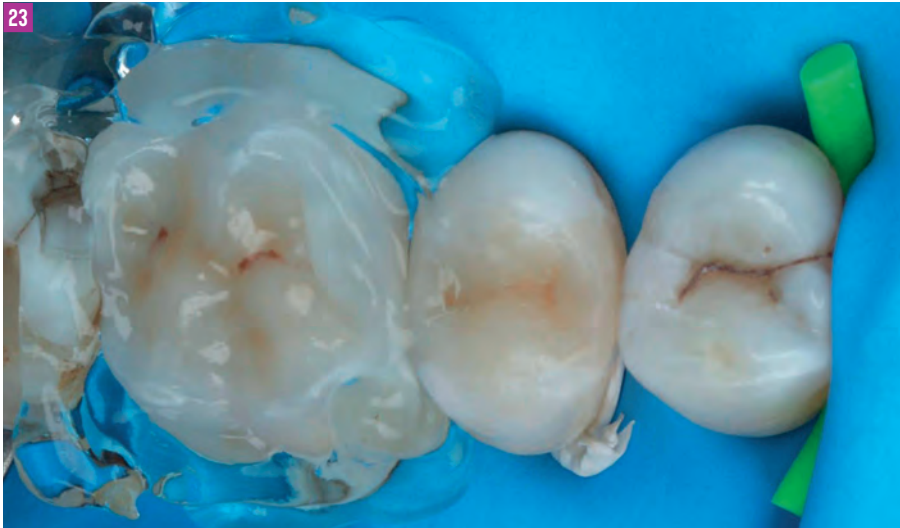


FIGURE 23: Final glycerine cure



FIGURE 24: Final result after four weeks



FIGURE 25: Final result, side view

A final cure was performed through glycerine to ensure adequate polymerisation of the surface layer of luting composite (Figure 23).

Finally, the rubber dam was removed and a postoperative radiograph was taken to ensure clean margins interproximally. Following occlusion analysis, we decided that no adjustments were needed.

MATERIALS REFLECTION

Everx Flow flowable composite is a convenient material for use as a dentine replacement and the fibre content provides excellent fracture strength. It is easy to apply and can be spread across the cavity surface using an applicator brush and modelling resin.

Everx Posterior fibre-reinforced composite handles differently due to its larger fibre dimensions but its higher modulus of elasticity makes it essential in larger cavities to use as a dentine replacement.

Everstick Net fibre mesh was used as a superficial failsafe as it offers excellent fracture resistance and aids in crack bridging. It can be cut to size depending on the clinical scenario and ideally two to three layers placed for maximum effect.

G-aenial A'chord composite is easy to apply and sculpt in small increments, which is essential when dealing with deep proximal cavities. It polishes well and blends seamlessly with the tooth structure, ensuring a durable, aesthetic restoration.

Initial Lisi CAD/CAM block provided excellent aesthetics, and the high translucency block ensured a seamless blend with the underlying tooth on the buccal aspect, considering it was a mid-coronal margin.

REVIEW

After four weeks, the patient attended for review and reported complete resolution of her symptoms. She was able to chew properly on her right side again and was delighted with the aesthetic outcome in both teeth. ☑

CONTACT

 [bantrydental.ie/claimeoconnor](https://www.instagram.com/bantrydental.ie/claimeoconnor)

PRODUCTS USED

Everstick Net, G-aenial A'chord, Everx Flow, Everx Posterior, Initial Lisi GC

Wedgeguards Dentsply Sirona

3M Sof-Lex discs Solventum

ASAP polishers Clinician's Choice

Enamelize Cosmedent



ENRICO STEGER SENDS A MESSAGE FOR THE NEW YEAR

A NEW PATH TO FORGE

A new year is like a blank canvas, ready to be filled with colours, shapes, and ideas.

It gives us the chance to start anew, to dream, and to transcend ourselves. And yet, as pure as this beginning may seem, it is marked by our experiences, our insights, and our achievements.

Looking back, we realise it wasn't only our successes that pushed us forward, but also the challenges from which we have learnt. They are not barriers, but signposts: small life lessons that teach us how to grow. Every experience shapes our thoughts and actions, preparing us

to walk new paths with courage and determination.

GROWING TOGETHER

The year ahead is rich with new opportunities and possibilities. Every challenge holds a lesson that makes us stronger, each opportunity is an inspiration to grow.

We do not walk this path alone, but together, driven by the will to work with passion, persistence, and creativity to leave an indelible mark. May the coming year bring us the courage to explore the unknown and the patience to face trials with determination. [🔗](#)

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*Enrico Steger, MDT, founder of Zirkonzahn
and father of Prettau® zirconia*



Composite bonding

Rajiv Ruwala presents a restorative case that uses composite bonding to achieve a bright white smile and improve the patient's smile aesthetics

A patient presented to the practice wanting to know more about composite bonding. She wanted to improve the aesthetics of her teeth, with the aim to give her self-confidence a boost.

ASSESSMENT AND DIAGNOSIS

The patient's suitability for restorative treatment was assessed. This involved carrying out a basic periodontal examination (BPE), which found BPE scores of 212 in the upper dentition, and 222 in the lower.

Her overall oral health and hygiene was good, and she had caries in her UL5, which had been restored using composite.

TREATMENT PLANNING

During the treatment planning stages, whitening and composite bonding were discussed.

As the patient was particularly interested in composite bonding, planning and treatment using Smilefast was discussed, as well as the use of a trial smile, and bonding the teeth immediately afterwards.

My advice to those looking to achieve a bright white smile is to add texture to help achieve a more natural looking finish



FIGURE 1: Pre-treatment full face



FIGURE 2: Pre-treatment smile



DR RAJIV RUWALA

BDS PGCERT
Rajiv qualified from King's College London in 2008. He is a principal dentist and facial aesthetics practitioner, and currently runs 2 Green Dental in Dartford. He offers surgical dentistry including implants and gum grafting surgery, as well as smile makeovers, orthodontics, and general dentistry.



FIGURE 3: Pre-treatment anterior



FIGURE 4: Pre-treatment left lateral



FIGURE 5: Pre-treatment right lateral



FIGURE 6: Pre-treatment upper arch

TREATMENT PROVISION

Smilefast was used to create a 3D design. This was approved digitally, and the appearance verified with the patient with a trial smile. Once verified, a stent was fabricated that features strips that fit between the patient's teeth.

In this case, Brilliant Everglow was used in shade Opaque Bleach (OBL) – this is the brightest white shade available and while not to everybody's taste, this was the patient's preference.

The stent was trialled, prior to composite placement, to ensure a good fit.

Brilliant Everglow was then heated to 65°C and placed inside the stent. This allows the composite material to be placed on all teeth at once.

Following placement of the composite, the material was light cured through the stent first, and then through glycerine. Once cured, the stent was removed, and the teeth were polished. Polishing rubber, diamond discs, and diamond polishing paste were used to achieve a nice finish.

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FIGURE 7: Pre-treatment anterior



FIGURE 9: Post treatment smile



FIGURE 10: Post treatment anterior



FIGURE 11: Post treatment left lateral



FIGURE 12: Post treatment right lateral



FIGURE 13: Post treatment upper arch



FIGURE 14: Post treatment upper anterior



FIGURE 8: Post treatment full face

OUTCOME

Both the patient and I were happy with the results of this treatment. We were able to achieve our initial goal, creating a white, bright smile to help her feel more confident.

CASE APPRAISAL

Having reflected on this case, I can appreciate that the OBL shade of the Brilliant Everglow composite allows you to achieve an ‘in-your-face’ look. This is exactly what the patient was hoping for, and she was happy with the aesthetic result.

Coltene’s Brilliant Everglow composite material is available in an array of shades, including dentine shades and the brightest white bleach shades. Coltene aims to meet the aesthetic desires of each patient, which makes this composite the ideal choice.

My advice to other dentists who are looking to achieve a bright white smile is to be sure to add texture to help achieve a more natural looking finish. [🔗](#)

PRODUCTS USED

Brilliant Everglow Coltene
Smilefast Smilefast



DIGITAL DENTISTRY

MAARTEN BOOGAARD

Computer-assisted implant placement

30



As always, planning is key in these difficult cases with severe resorption. 3D guided implant placement improves the precision and predictability of implant procedures. It is important to generate a prosthetic backward planning in which the prosthetic outcome dictates the position of the implants – Maarten Boogaard, p30

A WINDOW ON THE WORLD OF DIGITAL DENTAL WORKFLOWS

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MAARTEN J BOOGAARD

DMD

Maarten is in private practice in Amsterdam, The Netherlands.

ENHANCED CPD

CPD hours: one

GDC development outcome: C

Topic: digital dentistry

Educational aims and objectives:

To present a case report outlining step-by-step treatment of a patient who lost all his anterior mandibular teeth due to caries profunda, receiving two tapered titanium implants, which were planned by a 3D computer assisted planning software and placed using a sleeveless surgical guide. This article qualifies for one hour of enhanced CPD; answer the questions on page 66 or scan the QR code.



Techniques in the field of implant dentistry are rapidly advancing. Cone beam CT imaging, intraoral scanning, 3D implant planning software and guided implant placement are useful tools to improve the precision and predictability of implant procedures.

Recently, Megagen R2gate has presented a significant innovation in this field, featuring a sleeveless and keyless design, eliminating the need for traditional metal sleeves, stops or reducers. Instead, the R2gate guided implant set features a sequence of drills containing all the information relating to the sleeve, the stops for implant bed preparation, and the reducers.

This sleeveless and keyless approach has the potential to simplify surgery and shorten surgery time, assisting the implant surgeon in the surgical process (Chandran et al, 2022).

The accuracy of static computer-aided implant surgery generally falls within the clinically acceptable range in most clinical cases situations; however, careful attention is needed in the vicinity of vital structures, and a minimum of at least 2mm from these anatomical structures should be taken in account (Cassetta et al, 2013; Tahmaseb et al, 2018).

Despite being described as 'risk-free' and straightforward execute, computer-guided implant dentistry does not control all limitations and should only be used by the skilled/trained clinician to optimise the outcome.

A typical 'learning curve' effect has not been reported for static computer-assisted implant surgery (Cassetta et al, 2020).

The R2gate sleeveless system has demonstrated high accuracy in multiple studies. Mean (and standard deviation) of 3D error at the entry point was 0.798mm (+0.52), at the implant apex it was 1.17mm (+0.63), and mean angular deviation was 2.34 (+0.85) (Cristache and Gurbanescu, 2017).

The angle deviation R2gate was lower than the

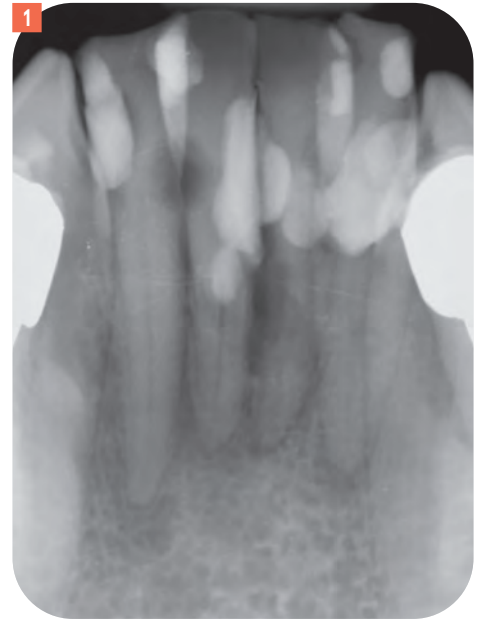


FIGURE 1: X-ray of failing mandibular incisors

mean rate (3.89) measured in the systematic review conducted by Tahmaseb and colleagues (2014) but also the same as the deviations as researched by Lee and colleagues (2016).

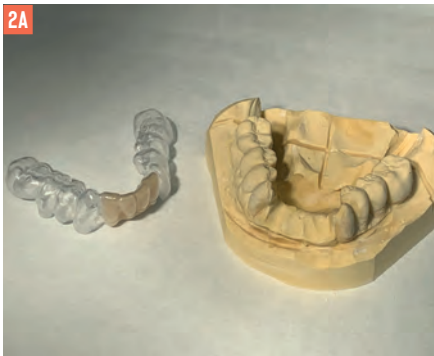
R2gate in combination with Bluediamond is a good duo because of the Xpeed surface (Esposito et al, 2018) and the tapered shape of the implant body provides a good primary stability in a suboptimal environment.

The Knifethread provides a higher surface area, resulting in wider bone-to-implant contact (BIC) and better initial stability. This will be beneficiary in soft bone.

When compared with resorbable blast media (RBM) surfaces produced by grit-blasting, the mean removal torque of the implants with Xpeed

Maarten Boogaard presents a case report highlighting computer-assisted implant placement in the reconstruction of a severely resorbed anterior mandible

Computer-assisted implant placement



FIGURES 2A and 2B: Essix retainer as temporary solution

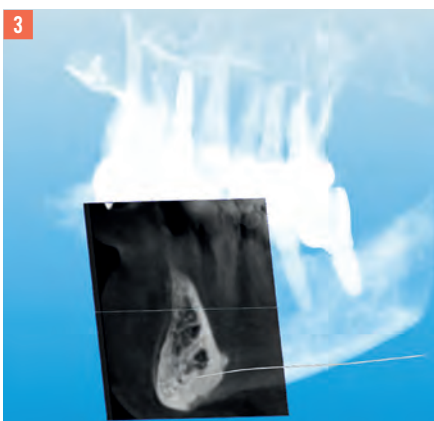
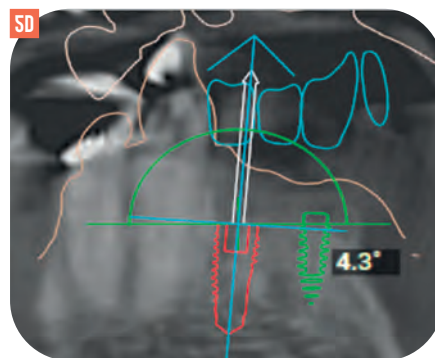
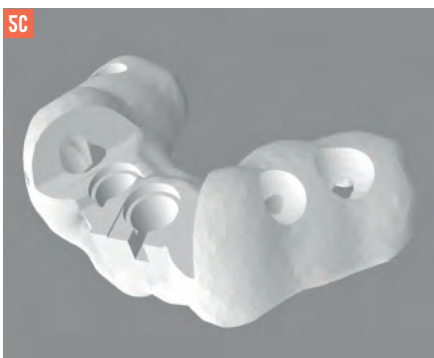
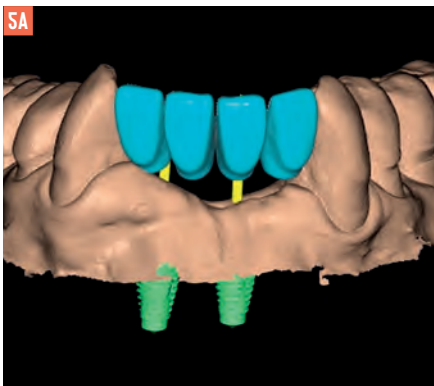


FIGURE 3: CBCT shows a thin mandibular ridge three month after extraction



FIGURE 4: STL file of mandibula



FIGURES 5A to 5D: Design and implant planning by R2gate

surfaces is higher and the percentage of BIC were increased (Lee et al, 2012).

In the described case, a bilateral tooth-supported guide was designed, which has exhibited in research to have the highest in vitro accuracy and similar in vivo accuracy to unilateral tooth-supported guides, mucosa-supported guides have the lowest in vivo accuracy (Shi et al, 2023).

PREOPERATIVE DISCUSSION

The patient is a 79-year-old male who has had a lot of dental work done in the past. He has multiple restorations and crowns, as well as two previous dental implants that are functioning well.

He puts a lot of time and care in his oral hygiene and the periodontal condition is good.

The chief complaint of the patient was that his lower incisors were failing because of progressive dental decay (Figure 1).

The patient’s medical history reported minor heart conditions, and was prescribed a regimen including acetylsalicylic acid 80mg, metoprolol, omeprazole, simvastatin and chlortalidone. The use of multiple medications can alter the buffering capacity of saliva, potentially contributing to the caries lesions observed in the patients.

The extraction was performed, and a Essix retainer was placed as a temporary provisional (Figures 2a and 2b).

PLANNING

After three months, the resorption was severe and we decided to plan the case digitally.

A CBCT was taken with Planmeca single DICOM (digital imaging and communications in medicine) files (Figure 3). These were converted into multi-frame DICOM file (100 ~500 single slice files according to FOV) and uploaded into the 3D planning software (Megagen R2gate).

An intraoral scan (Trios) of the patient was then performed (Figure 4). Both the CBCT and the STL files from the intraoral scan were uploaded

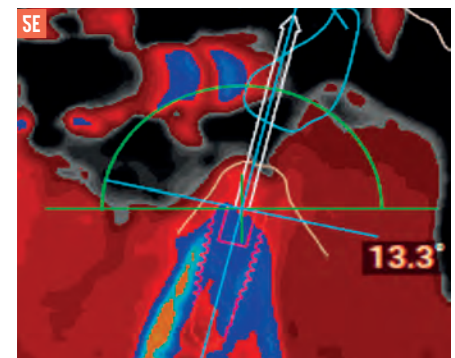


FIGURE 5E: Digital Eye analysis

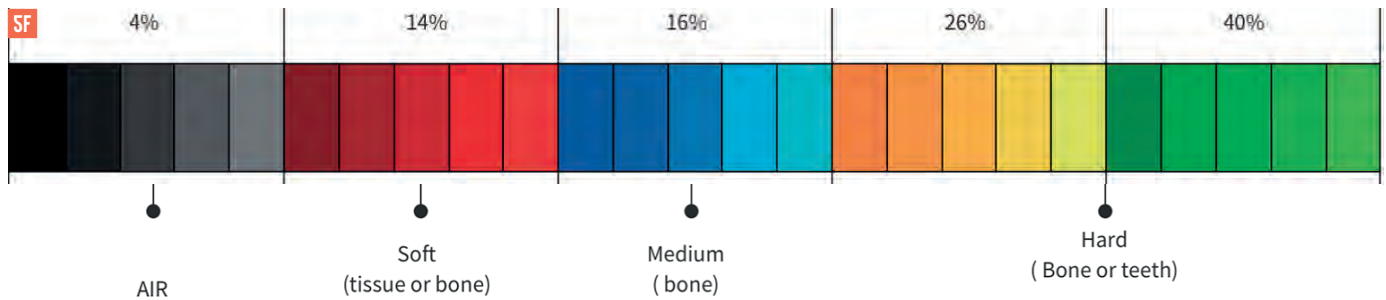


FIGURE 5F: Digital Eye analysis through R2gate



FIGURE 6: Intraoral situation after anaesthetics



FIGURE 7: Fitting of the guide intraoral

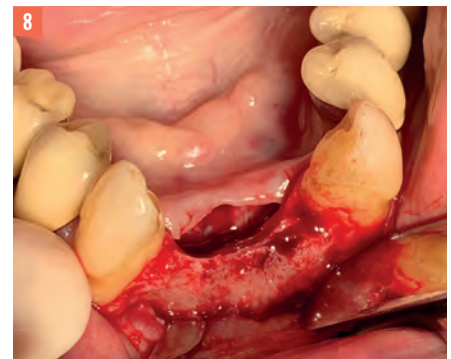


FIGURE 8: Full thickness flap raised

and an online order was placed at www.r2gate.com and a full digital planning was designed by R2gate.

Digital Eye analysis was done through R2gate and, as the CBCT was made three months after extraction, it indicated medium bone quality (blue colour).

Based on the analysis, a surgical guide and drilling protocol was created, planning the placement of the implants (Megagen, Bluediamond), each 13mm in length with a core diameter of 3.7mm and wide threads (Figures 5a to 5e).

After approval, the guide was 3D printed and delivered to the practice.

SURGERY

The patient received 2g amoxicillin an hour before the surgery, and was instructed to take 500mg of amoxicillin three times a day for five days postoperatively. Surgery was performed under local anaesthetic (Figure 6).

Before raising a full thickness flap, the guide was fitted. Seating of the guide was excellent (Figure 7). After raising the flap (Figure 8), the guide was repositioned and the surgical protocol of R2gate was followed (Figure 9), starting with the narrow drill, followed by the two initial drills. It is recommended to drill to the final depth first before widening the osteotomy.

Following this protocol, I started with the shortest drill and progressed through the kit until the final depth was achieved. Subsequently, the

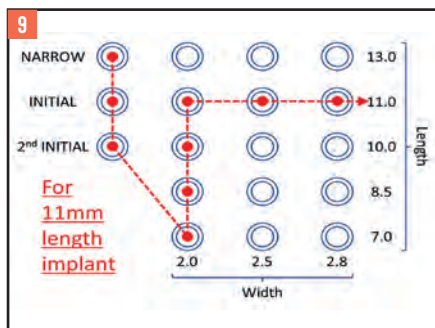


FIGURE 9: Extended drill for guide

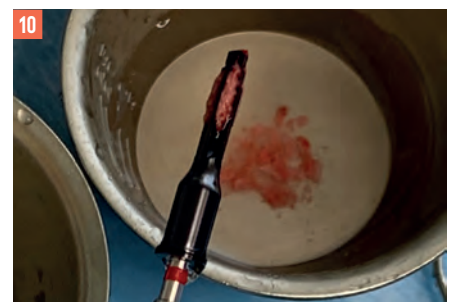


FIGURE 10: Collecting autologous bone from drill



FIGURE 11: Placement of Bluediamond implant through the guide



FIGURE 12: Implant placed and healing abutments

osteotomy was widened using the final depth drills.

During drilling, the autologous bone was harvested from the drills (Figure 10). Two Bluediamond implants (length 13mm, core diameter 3.7mm, wide threads) were placed

also using the R2gate guide (Figure 11). Initial torque value was high (45Ncm) and two healing abutments were placed (Figure 12).

Since the ridge was thin after the healing time of three months after extraction, bone grafting was necessary.



FIGURES 13A and 13B: Placement of membrane and xenograft

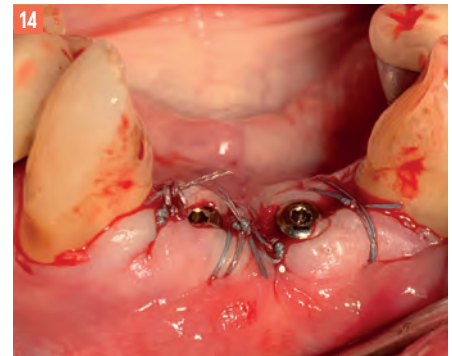


FIGURE 14: Situation after stitching



FIGURE 15A: Intraoral situation after three months of healing

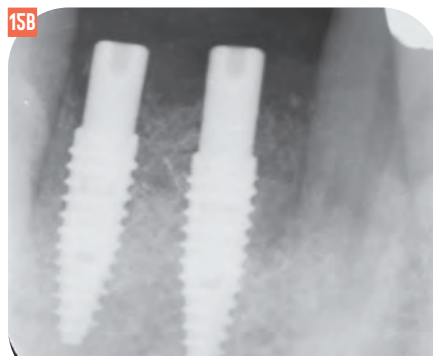


FIGURE 15B: X-ray after three months



FIGURE 15C: Emergence profile after removing healing abutments

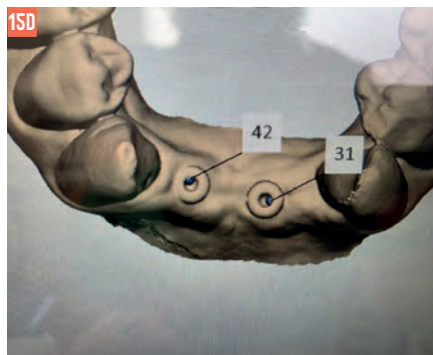


FIGURE 15D: Scan of situation after three months healing

A grafting material composed of autogenous bone and Endobon xenograft was used, covered with a 20mm x 30mm flexible Osseoguard membrane (Figures 13a and 13b) and secured with simple interrupted sutures (Figure 14).

The patient was instructed to rinse with chlorhexidine 0.20% for one minute twice a day for two weeks. The healing process was uneventful and after two weeks the sutures were removed.

PROSTHETIC PHASE

After a three-month healing period, the soft tissues around the healing abutments demonstrated well-keratinised tissues and

favourable bone levels without signs of resorption (Figures 15a and 15b).

Subsequently, the healing abutments were removed, showing a nice emergence profile of the soft tissue (Figure 15c).

Two Bluediamond Narrow connection scan abutments were placed on the implants and a digital impression with the 3shape Trios scanner was taken (Figures 16a to 16c).

After two weeks, a screw-retained monolithic zirconia bridge on individualised CAD/CAM abutments was placed (torque value ~35Ncm). The abutment screws were covered with Teflon tape and finalised with composite material.

The final X-ray demonstrates favourable

bone levels, with a precise and secure fit on the implants (Figures 17a to 17c).

DISCUSSION

Anterior teeth are often lost because of accidental dental trauma (Glendor, 2008) or, in this case, due to severe carious activity that require replacement.

When the neighbouring teeth are in pristine condition, implant-supported crowns are often the treatment of choice. Due to lack of space, there was not enough space to place four separate implants, so a two-implant supported bridge was the choice of treatment.

Sometimes a flapless implant technique approach is possible. This improves the patient's function and aesthetics and can be used to achieve a favourable clinical outcome in patients. The limitation is that flapless surgeries are restricted to only well-selected cases when proper clinical and radiological planning shows this is possible (Pal et al, 2021). In this case, the supporting hard and soft tissue were lost, and surgical reconstruction was needed.

Different approaches are possible to deal with tooth loss in the anterior mandibula, like the cortical bone plate method for alveolar ridge construction as described in a similar case by Baumer and colleagues (2016). This treatment option decision also depends on the surgical skills and experience of the clinician.

By using CAD/CAM technology, implant procedures have simplified using individually designed titanium meshes (Boogaard, Santoro and Romanos, 2022) and customised autologous allograft bone blocks for hard tissue reconstruction (Boogaard and Romanos, 2021). These solutions are particularly beneficial in cases of severe bone reconstruction.

In our case, despite the challenging bone conditions, the combination of a digital planning and guided implant placement allowed for minimal bone grafting to effectively replace the anterior mandibular tooth. Additionally, the tapered implant system that we used had a wide



FIGURE 16A: Bluediamond scan abutments placed on implants



FIGURE 16B: X-ray of scan abutments

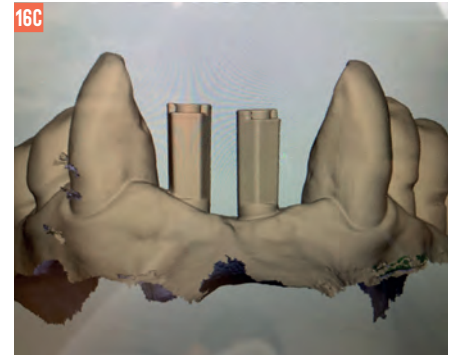


FIGURE 16C: Digital scan of scan abutments



FIGURE 17A: Bridge on 3D printed model



FIGURE 17B: Bridge



FIGURE 17C: X-ray post-treatment



FIGURE 17D: Final result with bridge placed

thread design. The combination of a tapered implant geometry and a wide thread design is beneficial in achieving initial stability and load distribution in areas with compromised bone quality. Also, a wide thread design increases the surface area in contact with the bone and can

enhance the mechanical stability of the implant and promote better osseointegration.

CONCLUSION

As always, planning is key in these difficult cases with severe resorption. 3D guided

implant placement improves the precision and predictability of implant procedures. It is important to generate a prosthetic backward planning in which the prosthetic outcome dictates the position of the implants.

Overall, the patient was satisfied the treatment process. He remarked positively on the efficiency and comfort of the surgery and was satisfied with the end result. [📄](#)

REFERENCES

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ENDODONTICS

NICOLAI ORSTEEN
Managing calcified canals

38



Performing endodontic treatments where there has been root canal calcification is complex and presents significant challenges. If the root canal space is partially or completely obliterated, it is difficult to locate, establish and maintain the glide path. This is due to the restricted space, loss of visibility and lack of clear reference points to indicate the anatomy of the canal - Nicolai Orsteen, p38

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DR NICOLAI ORSTEEN

Nicolai is a specialist in endodontics. He graduated from the dental school at the University of Oslo in 2002, going on to study for a further three years, specialising in endodontics. Nicolai has been working in private dental clinics in Oslo and London since 2002 and enjoys the challenge of difficult root canal cases. Since 2017 he has been the principal dentist at the Root Canal Dental Referral Centre in Richmond, London, which is a private practice solely limited to endodontics.

ENHANCED CPD

CPD hours: one

GDC development outcome: C

Topic: endodontics

Educational aims and objectives:

To present a challenging endodontic case detailing root canal treatment on a severely calcified canal. This article qualifies for one hour of enhanced CPD; answer the questions on page 66 or scan the QR code.



The patient, a male in his 60s, experienced trauma against the UL1 when he was young. He had fractured part of the tooth and had needed a crown.

He was asymptomatic for many years following his injury. Although he had received a lot of restorative treatment, the patient’s overall oral health was fair. The main concern was the UL1, which had become discoloured over time, turning yellow and brown.

ASSESSMENT AND DIAGNOSIS

The patient was originally referred concerning this tooth in 2022. A CBCT scan was recommended

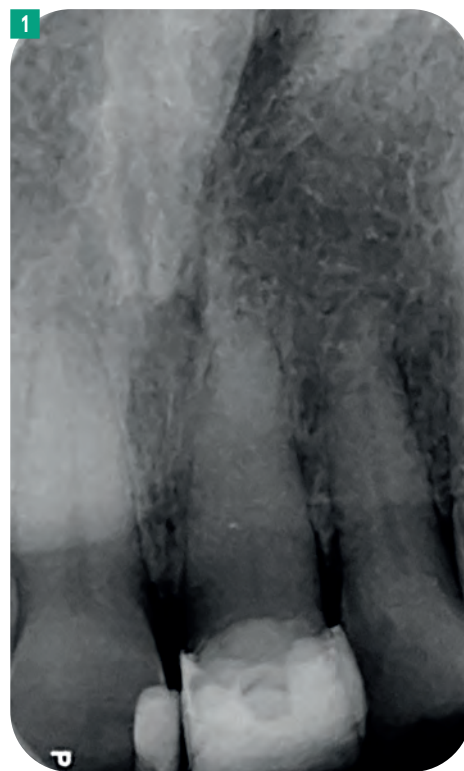


FIGURE 1: Periapical X-ray taken in 2022

because the clinical assessment revealed no pathological findings – however, a small lateral lesion was suspected. A periapical X-ray revealed severe calcification of the tooth (Figure 1).

The patient returned in May 2024, reporting a history of slight discomfort from the tooth. In the intervening two years, the patient’s dentist had applied a composite build-up, secured using two pins, making the UL1 heavily restored. A new CBCT scan showed severe calcification of the root canal, and a lateral radiolucency mid-root on the distal aspect (marked with red arrow) (Figure 2).

TREATMENT PLANNING

The patient was presented with three options. The first was to do nothing for now and monitor the tooth. The second was to extract the tooth and replace it with an implant. The third was to attempt root canal treatment (RCT).

Although the patient was warned that the RCT might not be possible because of the severe calcification, he opted for RCT because he wanted a fully functional and aesthetic crown, and wasn’t happy with the current appearance of the tooth. He also wanted to avoid a dental implant for as long as possible.

TREATMENT PROVISION

The Hyflex OGSF sequence was the system of choice for this procedure, due to the system’s excellent cutting efficiency. All of the files in the sequence – consisting of an orifice opener, glidepath file, shaping file and finishing file – were employed, with irrigation between each file.

Locating the canal was challenging due to the extent of the calcification. Establishing the location took time and required a dental microscope. Once the tooth was opened with the orifice opener, it was over to a Micromega K-File ISO o8 to reach as deep down as possible into the canal. Then it was the turn of the glidepath file, 1mm short of the length achieved with the K-File, and this process was repeated all the way to the root apex.

Nicolai Orsteen presents a challenging case in which he performed root canal treatment on a severely calcified canal

Managing calcified canals

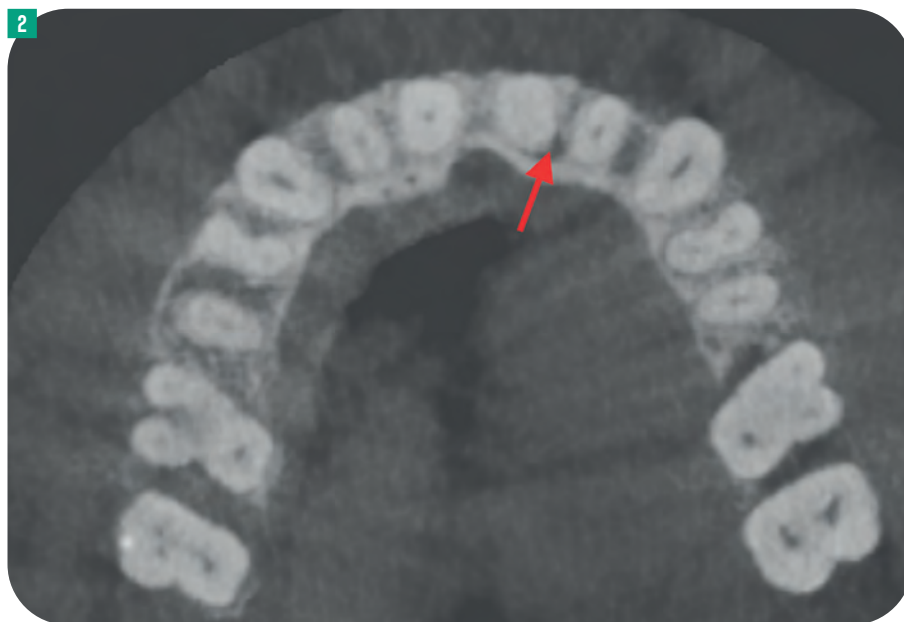


FIGURE 2: CBCT taken in 2024



FIGURE 3: Periapical X-ray to check orientation of file



FIGURE 4: Periapical X-ray to check

Once the root was open, the shaping file was utilised, ending with the 30/.04 finishing file to clean out the canal, completing the OGSF sequence. The canal was irrigated using Canalpro NaOCl 3% during the instrumentation and Canalpro EDTA as a final irrigation.

The tooth was restored using a glass ionomer cement, and the patient went back to the dentist for the final restoration.



FIGURE 5: Postoperative periapical X-ray

TREATMENT OUTCOME

Both the patient and I were happy with the results. The tooth was successfully restored all the way down the root. The prognosis for the tooth going forward is positive.

LEARNING POINTS

The main challenge in this case was the calcified canal. Pulp calcification is the gradual formation of hard tissue along the root canal walls. It can take place slowly as part of the ageing process or due to tooth decay, but dental trauma can accelerate the deposition of hard tissue.

The process of rapid narrowing or complete closure of the root canal space is called calcific metamorphosis, root canal calcification or pulp canal obliteration (Chaniotis, Sousa Dias and Chanioti, 2024). Performing endodontic treatments where there has been root canal calcification is complex and presents significant challenges. If the root canal space is partially or completely obliterated, it is difficult to locate, establish and maintain the glide path. This is due to the restricted space, loss of visibility and lack of clear reference points to indicate the anatomy of the canal (Nasiri and Wrbas, 2023).

In my experience, when treating a severely calcified canal, it is vital to use good files and magnification – ideally using a microscope. [C](#)

CONTACT

www.rootcanalcentre.co.uk

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 Nasiri K, Wrbas KT (2023) Management of calcified root canal during root canal therapy. *J Dent Sci* 18(4): 1931-1932

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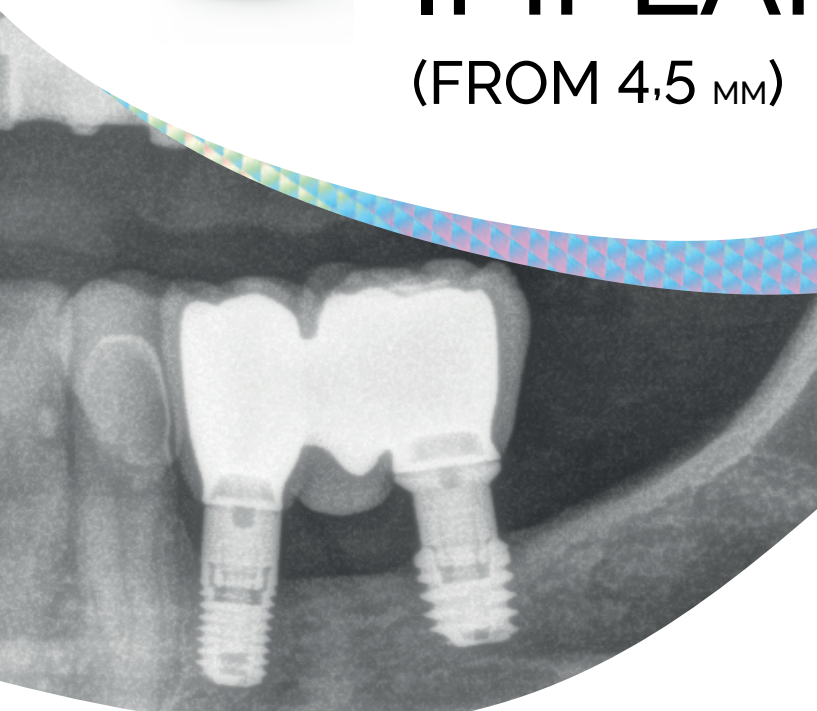


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IMPLANT DENTISTRY

ABDUL OSMAN

Immediate implant placement:
factors for success

44



SELVARAJ BALAJI

Double lateral incisor implant
placement

46



The planning for a case such as this one is crucial. It presents 'double trouble' in that the lateral incisor site is extremely difficult to place an implant into due to how narrow the space tends to be – and we were treating both lateral incisor sites – Selvaraj Balaji, p46

ACCURACY AND EXCELLENCE IN IMPLANT DENTISTRY

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Immediate implant placement: factors for success

Abdul Osman examines current challenges in immediate implant placement

The clinical, practical and financial rationale for immediate implant placement – surgical tooth extraction followed by implant placement in one dental appointment – has been the subject of much debate among dental practitioners.

We need to remind ourselves that the loss of a tooth is very traumatic for a patient, physically and psychologically. Losing a tooth affects a person socially and functionally, with changes to speech, facial profile and eating habits. Regrettably, dentists seem to have become somewhat desensitised to this loss.

Yet for the patient, reduced chair time, fewer interventions, lower fees and the comfort of knowing they can leave the appointment with all the surgical aspects completed, are all compelling arguments in favour of immediate implant placement.

For the clinician, immediate implant placement is also beneficial, and this has been evidenced in early reviews of clinical studies (Chen and Buser, 2009). Preservation of bone and soft tissue may also be more attainable in the right circumstances.

The opportunity to put something straight back into the patient's mouth to replace their extracted tooth, and for them to quickly regain a tooth with immediate loading of the dental implant, is particularly gratifying (Figure 1). This, in my experience, often leads to better postoperative compliance and

satisfaction, mainly due to not having to open a surgical flap or deal with subsequent inflammation.

Dentists adopting immediate implant placement protocols may also enjoy greater professional recognition and personal reward having achieved a more aesthetic result.

FEAR OF LITIGATION

Conversely, many dentists are concerned with the threat of complications with the healing process, loss of soft tissue, implant instability and, ultimately, implant failure.

One of the biggest worries is maintaining control of the implant positioning. The implant dentist will want to avoid malposition or poor aesthetic outcomes due to crown or soft tissue appearance.

The fear of the unknown is understandable: it is not only costly to begin the process again, allowing sufficient healing time and then rebuilding the anatomy; the patient also pays a high emotional and physical price. Consequently, immediate implant placement does not seem to enjoy the same adoption rate in the UK compared to other countries, despite a growing body of clinical evidence in support of the protocol.

Chen, Wilson and Hammerle's (2004) report specifically addresses the placement of implants in extraction sockets, including immediate implants, and still offers valuable guidelines and recommendations that are widely cited in clinical practice. Meanwhile, my own

clinical and professional experience has led me to believe there are five ingredients that are essential to help overcome concerns.

1. Communication to foster mutual respect and understanding

Poor communication with the patient is often the root of the problem. As dental students we are not given the time to develop our softer skills. Yet good communication underpins so much of our clinical, professional and commercial success. We dentists need to work hard to develop and foster a culture of mutual respect and understanding with our patients.

Explaining the benefits, risks and, above all, their responsibilities for good oral health routines, leads to a better-informed patient. A patient who understands all of the risks will confer much more respect on the clinician and recognise the challenges and the lengths we go to in order to mitigate those risks.

A robust benefits-to-risk calculation presented to the patient will enable them to make an informed choice. Good communication skills are paramount.

2. Implant design and support for a range of scenarios

Careful assessment and measurement of the buccal bone and a systematic approach to planning and preparation will help to overcome challenges (Figure 2). Case selection is therefore critical, along with our choice of implant systems, some of which lend themselves to the protocol.



ABDUL OSMAN
DMD MSC PGDIP
PGCERT MINSTLM
Abdul is the principal dentist and director at Face Dental and The Smile Centre in Coventry. He runs short courses on immediate implant placement and mentors young implant surgeons. He is currently a key opinion leader for Bredent.

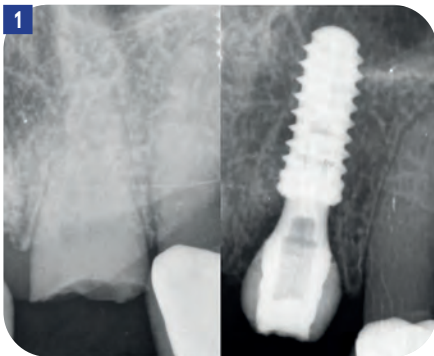


FIGURE 1: Immediate implant loading allows the patient to quickly regain a tooth



FIGURE 2: A systematic approach to planning and preparation will help to overcome challenges



FIGURES 3 and 4: Bone and soft tissue growth and management are not only achievable but should now be the standard

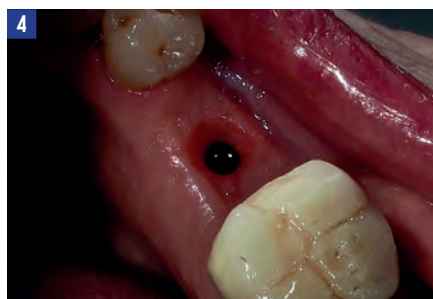


FIGURE 5: Guided surgery is essential for peace of mind

With more modern implant designs, bone and soft tissue growth and management are not only achievable but should now be the standard (Figures 3 and 4).

In my experience, for placement in immediate post-extraction sockets, Bredent's Copasky implants deliver the ultimate blend of primary stability, restorative aesthetics and a reliable prosthetic connection. Copasky offers a range of implant sizes to suit most patient requirements, any bone quality and a multitude of clinical scenarios.

Access to a reliable implant system goes hand in hand with the backing of an experienced team of representatives to help guide you through the journey and support your growth as an implant dentist.

The importance of a good partnership with your implant supplier cannot be underestimated. For me, a one-to-one relationship where I am looked after, nurtured and treated well is invaluable for my personal and practice development.

3. Guided options for peace of mind

Guided surgery is essential for peace of mind with immediate implant placement protocols (Figure 5).

Using either an anatomical, pilot or fully surgical guide, the implant practitioner is able to place with more confidence. That is not to say that the procedure does not carry risks. But for achieving the gold standard of optimal papilla and zenith heights, or crown and gum aesthetics, a guide will be an essential tool in the implant dentist's instrumentarium.

Wax-ups and guides will also demonstrate to bodies like the General Dental Council that good practice has been adhered to in cases that are disputed. A range of guided options are available nowadays to take away the hassle from the dentist. These represent a small price to pay for being able to sleep better at night.

4. Mentoring and training to gain experience

Having a good clinical mentor and access to hands-on training help to build confidence and dispel common myths about the protocol.

Increasing numbers of dental postgraduates are embarking on courses, many of which follow a rigid didactic approach, providing the student with a sound theoretical framework but limited opportunities to gain practical experience. These flaws in our education system will ultimately hold us back.

Implant surgeons are very practical people; we learn by doing and we love to get hands on. This has sadly been a missed opportunity in UK dentistry. If dentists do not receive adequate training on the correct pathways, it is natural that mistakes will be made, and the inevitable result will always be a rising number of reported cases. My own implant education included rigorous hands-on training and even after several years I still have the support of clinical, non-clinical, business and personal mentors.

5. Teamwork to enhance the patient journey

Perhaps the most important factor in immediate implant placement success is the team we build around us.

Effective teamwork is key to successful implant placement. Your dental nurse, treatment coordinator, receptionist, laboratory technician and, not least, your implant supplier are all key players and have a stake in ensuring the patient journey from start to finish is a comfortable, supportive and pleasant experience.

TITANIUM MINDSET

What does the future hold for immediate implant placement? My vision is for any patient in the UK to be offered immediate placement alongside the option of a delayed approach. My 'titanium mindset' concept is a mission that aims to do just that, making a positive contribution to the debate about immediate placement and exploring the psychology behind being a great implant surgeon. [📄](#)

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DR SELVARAJ BALAJI

BDS MFDS RCPS(GLA) MFD SRCS(ED) LDS RCS(ENG)

Since obtaining his BDS degree, Selvaraj has worked in maxillofacial units in the UK and gained substantial experience in surgical dentistry. He is the principal dentist of The Gallery Dental Group, which is made up of Meadow Walk Dental Practice and The Gallery Dental & Implant Centre. Selvaraj is also the founder of the Academy of Soft and Hard Tissue Augmentation (ASHA) and runs courses, lectures and study clubs for aspiring implant dentists. Find out more at ashaclub.co.uk.

ENHANCED CPD

CPD hours: one

GDC development outcome: C

Topic: Implant dentistry

Educational aims and objectives:

To present a double lateral incisor implant case that utilises hard and soft tissue augmentation techniques.

This article qualifies for one hour of enhanced CPD; answer the questions on page 66 or scan the QR code.



A female 30-year-old patient presented to the practice with congenitally missing lateral incisors.

She was a non-smoker, her medical history confirmed her to be generally fit and well and her oral hygiene was in good condition.

The patient had a fixed bridge in place, but reported that this was continually debonding every six months or so. Given that this type of restoration wasn't working for her, she was seeking a more permanent solution in the form of a dental implant.

The patient also informed us of her upcoming wedding, for which she hoped to have all dental treatment complete in time.

CLINICAL ASSESSMENT

A comprehensive clinical assessment was conducted to determine suitability for implant treatment, including a full suite of clinical photographs and an intraoral impression.

A medium-high lip line was noted, which would make the avoidance of black triangles important to the final outcome.

It was also established that the existing spaces were very narrow, which indicated that orthodontic treatment would be required prior to implant placement. This was discussed with the patient, along with detailing the potential implant therapy

options post realignment, and she was very keen to proceed.

A referral was made for Invisalign treatment to widen the spaces at the lateral incisor sites and the patient returned to the practice a few months later for full implant planning.

A radiograph and CBCT image were taken to show adequate width had been obtained for the placement of two lateral implants. However, there was a lack of bone buccally, indicating that bone augmentation would be necessary for successful implant treatment. Soft tissue grafting was also recommended in order to boost gingival volume and restore any height lost postoperatively for an ideal aesthetic (which was especially important given the medium-high lip line in mind).

A fully digital workflow was utilised to plan the ideal position, angle and depth of the implants, as well as the accompanying restorations. It was decided to use a guided surgical approach in order to increase the accuracy, predictability and efficiency of the procedure, encouraging a faster and more comfortable patient experience. This was particularly beneficial given the narrow area in which we were placing the implants.

The diagnostic wax-up was created and shared with the patient as part of the consent process. Once the benefits, risks and limitations of treatment were discussed once again with the patient, informed



FIGURE 1: Starting point for implant treatment post orthodontic treatment



FIGURE 2: Retracted view of congenitally missing lateral incisors

Selvaraj Balaji presents a case of moderate complexity in which he places two implants in the difficult positions of the upper lateral incisors, utilising both hard and soft tissue augmentation techniques for the best result

Double lateral incisor implant placement

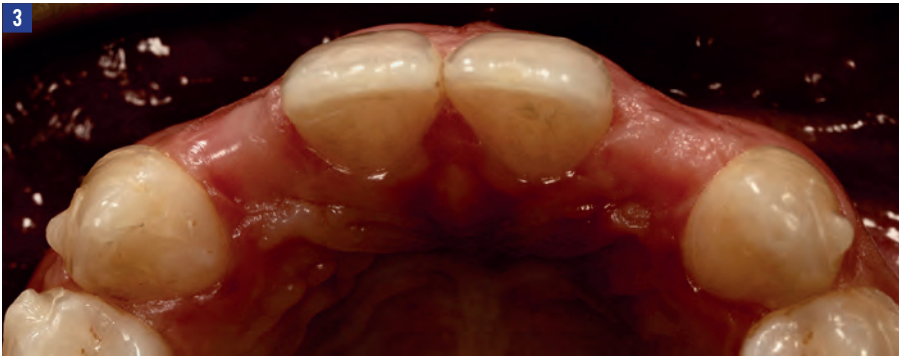


FIGURE 3: *Occlusal view of lateral incisor locations*

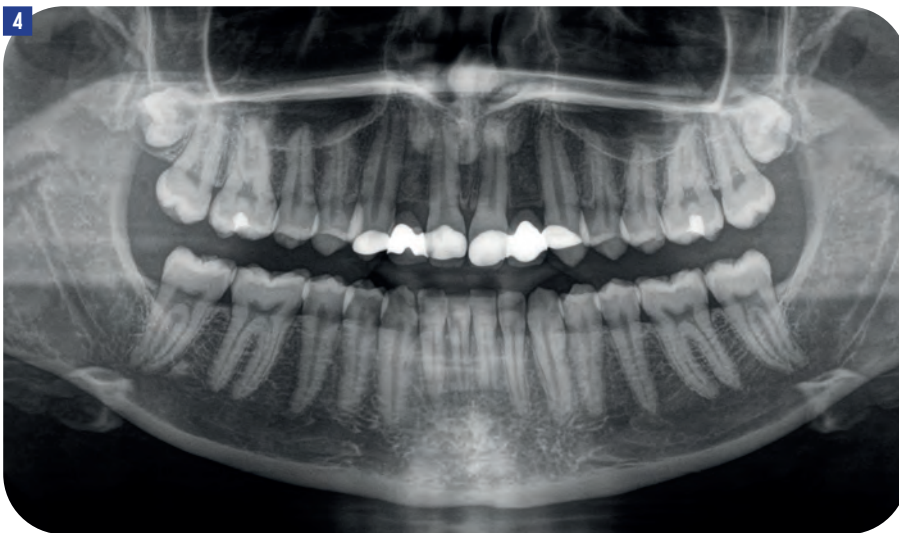


FIGURE 4: *Pre-treatment OPG*



FIGURE 5A: *CT scan for implant planning*

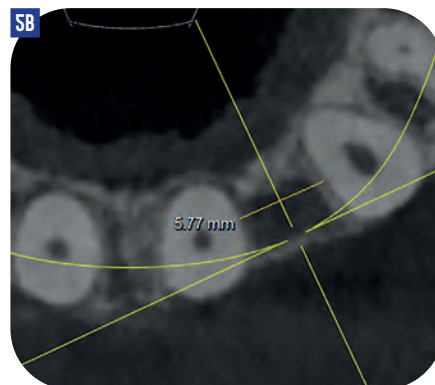


FIGURE 5B: *CT scan for implant planning*

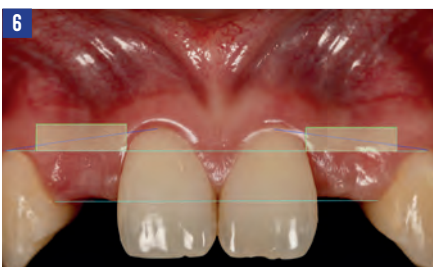


FIGURE 6: *Assessment of space available for implant placement*



FIGURE 7: *Surgical guide tried in mouth*

consent was recorded to proceed.

The scans, diagnostic wax-up and photos were sent to the dental laboratory to fabricate the surgical guides.

PHASE ONE

Surgical treatment with implant placement, soft and hard tissue augmentation

On the day of surgery, the patient was numbed with a local anaesthetic and a split-mucogingival, full thickness flap was raised. The surgical guide was fitted into the mouth and the two implants were placed through the guide to replicate the exact positions, angles and depths determined during the planning phase.

Bone was harvested from the left mandible and used to augment the implant sites. The bone grafting was performed by combining this autogenous bone with xenograft and using the ‘mini sausage’ technique. A collagen membrane was used to hold the graft material in place, secured with periosteal sutures.

Soft tissue was then harvested from the palate – enough for two connective tissue grafts (CTGs) at each lateral incisor location.

The aim of these was to regain the soft tissue contour around the implant sites and build the papillae back up. This would not only reduce the soft tissue shrinkage that occurs post-surgery, but would actually increase the width of the papillae compared to where we started for optimal aesthetic results.

The flap was coronally advanced to increase root coverage and sutured closed. Upon conclusion of the surgery, the patient was given standard postoperative oral hygiene and dietary instructions, with particular focus on oral hygiene.

She returned to the practice one week later for the post-surgical review, reporting no abnormal pain or discomfort. The sites also looked to be healing as expected.

PHASE TWO

Restoration

The patient returned three months later for the restorative phase of treatment.

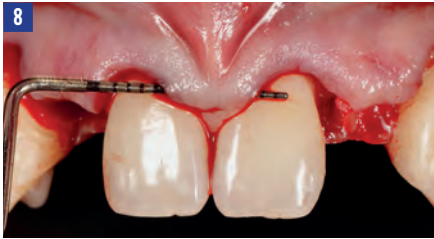


FIGURE 8: Raising flap



FIGURE 9: Implant position checked after osteotomy

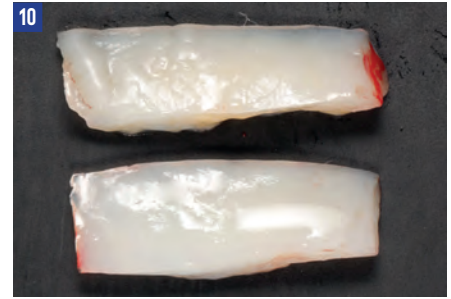


FIGURE 10: Grafting material harvested from patient

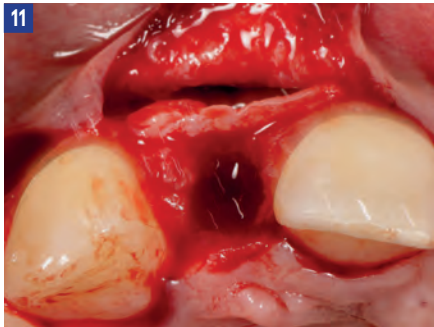


FIGURE 11: Grafting material placed



FIGURE 12: Coronally advanced flap (CAF) closed

The implants were exposed and the abutments and temporary crowns were fitted. These were designed to help contour the newly enhanced soft tissue and shape the papilla accordingly. They also provide an excellent trial for the patient, ensuring she was happy with the shape and colour of the crowns before the final restorations were fabricated in zirconia.

Both the patient and I were delighted with the outcome reached in this case. The patient achieved her primary aim of restoring the lateral incisors with a fixed solution that wouldn't require adjustments or re-bonding every six months. We were also able to deliver a highly aesthetic and functional result with the use of soft and hard tissue augmentation.

DISCUSSION

The planning for a case such as this one is crucial. It presents 'double trouble' in that the lateral incisor site is extremely difficult to place an implant into due to how narrow the space tends to be – and we were treating both lateral incisor sites. As such, this case was very aesthetically demanding, plus we had to consider the time restrictions imposed by the patient's upcoming wedding.

The soft tissue management was particularly important for the aesthetic outcome. This was made slightly simpler by the use of guided surgery, which ensured that the implants were placed accurately for the best results.

CONCLUSION

This type of case requires meticulous planning and sufficient skill with both bone and soft tissue

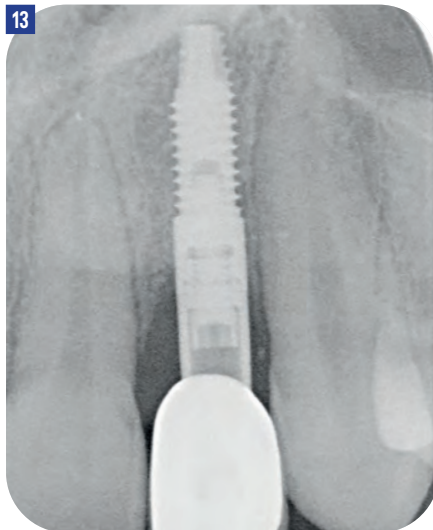


FIGURE 13: Post implant placement radiograph left lateral

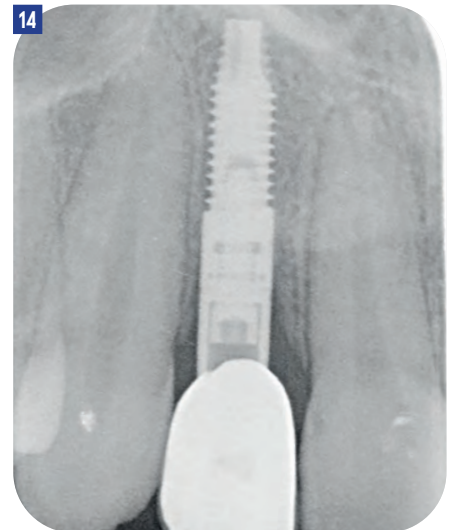


FIGURE 14: Post implant placement radiograph right lateral



FIGURE 15: Post treatment smile



FIGURE 16: Post treatment upper arch

grafting techniques. However, with adequate training, it is possible for most dentists within the implant field to achieve an excellent result.

I would recommend that colleagues have

at least five years of experience with dental implants before moving onto situations that present the complexity that a double lateral incisor restoration offers.



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** Sustained plaque reduction above the gumline with continual twice daily use for 12 weeks after a dental cleaning. Flossing was performed by a dental hygienist.

1. Milleman J, et al. Journal of Dental Hygiene. 2022;96(3):21-34.

2. Bosma ML, et al. Journal of Dental Hygiene. 2022;96(3):8-20.



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ORALHEALTH

NEESHA PATEL

Cardiovascular disease and periodontal disease

53



While periodontal disease and cardiovascular disease are seemingly disparate conditions, recent studies suggest that the systemic inflammation caused by periodontal disease may contribute to the development or exacerbation of cardiovascular conditions – Neesha Patel, p53

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Haleon recently hosted a panel of dental experts to discuss the barriers dental professionals face in encouraging behaviour change for improved gum health. Led by Professor Tim Newton, President of the Oral Health Foundation, the panel explored practical strategies for motivating patients.

The experts included Rhiannon Jones, President Elect of the British Society of Dental Hygiene and Therapy; Dr. Neha Mehta, a newly qualified dentist; and Dr. Amit Rai, a general dental practitioner.*



Watch the panel videos to learn more



**DR NEESHA PATEL**BSC HONS BDS MFGDP MCLINDENT PERIO
MRD RCS (EDIN)Neesha is a specialist periodontist and
clinical director at Pure Periodontics in
London.**ENHANCED CPD****CPD hours: one****GDC development outcome: C****Topic:** oral health**Educational aims and objectives:**

To provide a comprehensive review of the current scientific understanding of the relationship between cardiovascular disease and periodontal disease, elucidating the role of inflammation and outlining the implications for public health. This article qualifies for one hour of enhanced CPD; answer the questions on page 66 or scan the QR code.



The growing interest in systemic health and inflammation reduction has placed cardiovascular disease and periodontal disease under the spotlight of both scientific enquiry and public attention.

Media outlets and health campaigns have increasingly focused on the role of inflammation in various chronic diseases, reinforcing the need to address modifiable risk factors.

One area that has seen a surge in interest is the potential link between periodontal disease, an inflammatory condition affecting the gums, and cardiovascular disease, which remains the leading cause of mortality worldwide.

Periodontal disease is caused by bacterial infection and immune response, leading to the destruction of gum tissues and bone. Meanwhile, cardiovascular disease encompasses a range of conditions affecting the heart and blood vessels, often driven by atherosclerosis and inflammation.

While periodontal disease and cardiovascular disease are seemingly disparate conditions, recent studies suggest that the systemic inflammation caused by periodontal disease may contribute to the development or exacerbation of cardiovascular conditions.

This connection has profound implications, particularly as public health initiatives strive to reduce the burden of chronic diseases through preventive care and early intervention.

This article aims to synthesise current research on the link between cardiovascular disease and periodontal disease, exploring the biological mechanisms that underlie this relationship, the evidence supporting the association, and the broader public health significance of these findings.

PATHOPHYSIOLOGY: A COMMON INFLAMMATORY PATHWAY

Periodontal disease, particularly its advanced form known as periodontitis, is characterised by chronic inflammation of the supporting structures of the teeth, leading to tissue destruction, bone loss and, eventually, tooth loss.

The condition is initiated by the accumulation of plaque – a biofilm of bacteria – on the teeth and gums. This microbial presence elicits a host immune response, which, if dysregulated or excessive, results in the release of pro-inflammatory cytokines, including interleukin-1 (IL-1), interleukin-6 (IL-6), and tumour necrosis factor-alpha (TNF- α) (Preshaw et al, 2022).

These inflammatory mediators not only drive tissue damage locally but can also enter the systemic circulation, contributing to a broader inflammatory state.

Cardiovascular disease, particularly atherosclerosis, is similarly influenced by inflammation. The development of atherosclerotic plaques within arterial walls is driven by the infiltration of lipids and immune cells, which contribute to plaque formation and instability (Libby, 2021).

Inflammatory cytokines play a crucial role in promoting endothelial dysfunction, plaque formation and plaque rupture, which can lead to acute cardiovascular events such as myocardial infarction or stroke (Libby et al, 2018).

Given that both periodontal disease and cardiovascular disease share a common inflammatory aetiology, it is hypothesised that periodontal infection could serve as a source of systemic inflammation, thus influencing cardiovascular health.

Neesha Patel discusses the link between cardiovascular disease and periodontal disease and provides a review of evidence and implications for public health

Cardiovascular disease and periodontal disease



Specifically, oral bacteria, such as *Porphyromonas gingivalis* (*P. gingivalis*) and *Aggregatibacter actinomycetemcomitans* (*Aa*), have been identified in atherosclerotic plaques, suggesting a direct microbial link between oral and cardiovascular health (Kholy et al, 2015). Moreover, the systemic spread of inflammatory mediators from periodontal lesions can exacerbate endothelial dysfunction, a precursor to atherosclerosis, further solidifying the connection between the two diseases (Tonetti et al, 2007).

EPIDEMIOLOGICAL EVIDENCE

Several epidemiological studies have examined the relationship between periodontal disease and cardiovascular outcomes, with many suggesting a significant association between the two.

A large-scale meta-analysis by Sanz and colleagues (2020) found that individuals with periodontitis had a one-and-a-half- to two-fold increased risk of developing cardiovascular disease compared to individuals without periodontitis.

Furthermore, studies have shown that the severity of periodontal disease correlates with the risk of cardiovascular events, such as heart attacks and strokes (Kebschull et al, 2010).

One particularly compelling piece of evidence comes from the Atherosclerosis Risk in Communities (ARIC) study, which followed more than 10,000 participants for more than a decade.

The study found that individuals with moderate to severe periodontal disease were at an increased risk of developing atherosclerosis and experiencing cardiovascular events, independent of traditional cardiovascular risk factors such as smoking, diabetes, and cholesterol levels (Beck et al, 2005).

This suggests that periodontal disease may be an independent risk factor for cardiovascular disease.

The consistency of findings across multiple studies suggests that the link between periodontal and cardiovascular health is robust

However, it is essential to note that while these epidemiological studies establish a correlation, they do not prove causality.

The observed association between periodontal disease and cardiovascular disease may be confounded by shared risk factors, such as smoking, socioeconomic status as well as diabetes.

Despite these limitations, the consistency of findings across multiple studies suggests that the link between periodontal and cardiovascular health is robust.

BIOLOGICAL MECHANISMS

The biological mechanisms that link periodontal disease to cardiovascular disease are complex and multifactorial.

The primary hypothesis centres around the role of systemic inflammation, which is initiated by the local inflammatory response in the periodontal tissues and then disseminates throughout the body.

Bacteremia and endothelial dysfunction

During periodontal inflammation, oral bacteria and their byproducts can enter the bloodstream, a condition known as bacteremia. These bacteria, including *P. gingivalis*, can adhere to and invade endothelial cells, promoting endothelial dysfunction – a key step in the development of atherosclerosis (Desvarieux et al, 2013).

The presence of these bacteria in distant tissues, such as atherosclerotic plaques, suggests a direct microbial contribution to cardiovascular pathology (Kholy et al, 2015).

Inflammatory mediators

The systemic dissemination of pro-inflammatory cytokines from the periodontal tissues can amplify systemic inflammation. IL-6 and TNF- α , for example, are potent inducers of the acute phase response, which leads to the production of C-reactive protein (CRP) in the liver.

Elevated CRP levels are a well-established marker of cardiovascular risk (Ridker and Cook, 2017).

Moreover, these inflammatory mediators contribute to the recruitment of immune cells to sites of vascular injury, promoting the development and progression of atherosclerotic plaques (Libby et al, 2018).

Hyperlipidemia and dysbiosis

Periodontal infection can also alter lipid metabolism, leading to hyperlipidemia, a known risk factor for cardiovascular disease (Loos and Van Dyke, 2014).

This disruption in lipid homeostasis can further exacerbate atherosclerosis.

Additionally, the oral microbial dysbiosis observed in periodontal disease may influence systemic microbial communities, contributing to metabolic alterations and cardiovascular risk (Preshaw et al, 2022).

CLINICAL IMPLICATIONS AND PUBLIC HEALTH SIGNIFICANCE

The growing body of evidence linking periodontal disease and cardiovascular disease has significant implications for both clinical practice and public health policy.

Given the prevalence of both conditions, addressing periodontal health could represent a novel and effective strategy for reducing cardiovascular risk.

Interdisciplinary care

The recognition of periodontal disease as a potential risk factor for cardiovascular disease highlights the need for interdisciplinary care, where dental professionals collaborate with cardiologists and primary care providers to manage patients' overall health.

Regular periodontal assessments should be integrated into cardiovascular risk screening, especially for high-risk individuals. Conversely, patients with established cardiovascular disease should be evaluated for periodontal health, as periodontal treatment may reduce systemic inflammation and improve cardiovascular outcomes (Tonetti et al, 2007).

Public health campaigns

Public health initiatives should emphasise the importance of oral health in the prevention of systemic diseases. Campaigns focused on reducing inflammation – through lifestyle changes, improved diet and smoking cessation – should also address periodontal health as a modifiable risk factor.

Given the public's growing interest in reducing inflammation and chronic disease risk, promoting oral health as part of a holistic approach to cardiovascular prevention may be well-received.

Preventive measures

Preventive care in dentistry, such as regular cleanings, scaling and root planing, can significantly reduce the microbial burden and inflammation in patients with periodontal disease. These measures may not only improve oral health but also have downstream effects on cardiovascular health by mitigating systemic inflammation.

Emerging evidence suggests that treating periodontitis can lead to reductions in inflammatory markers, such as CRP, and improve endothelial function (D'Aiuto et al, 2013).

CONCLUSION

The link between periodontal disease and cardiovascular disease represents an exciting and rapidly evolving area of research with important implications for both clinical practice and public health.

The shared inflammatory mechanisms that underlie both conditions suggest that maintaining good periodontal health may be a valuable strategy for reducing cardiovascular risk.

As awareness grows around the systemic health risks of periodontal disease, it is essential for healthcare professionals to adopt an interdisciplinary approach to care that addresses the connections between oral and systemic health.

Future research should focus on elucidating the causal pathways linking these conditions and determining the impact of periodontal treatment on cardiovascular outcomes. [C](#)

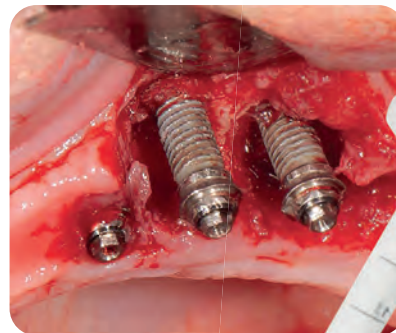
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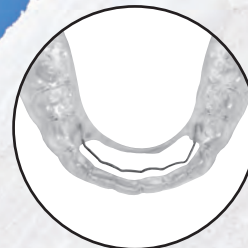


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ORTHODONTICS

OLIVIA NIXON

Fixed orthodontics with sporting considerations

59



This case was particularly interesting due to the patient's occupation as a professional rugby player. Participation in the sport is well known as a risk factor for dental trauma, and a systematic review published in 2024 observed a prevalence in rugby players of 34.1% - Olivia Nixon, p59

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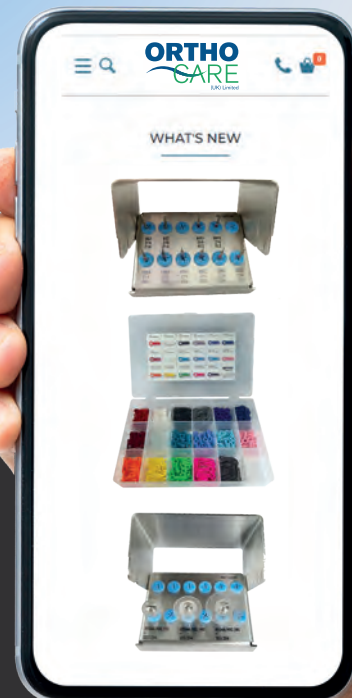
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**DR OLIVIA NIXON**

Olivia studied at Bristol University before working in an NHS practice providing general dentistry to patients of all ages. She went on to spend time as a senior house officer in the oral and maxillofacial surgery department at the Royal United Hospital, during which she was awarded membership to the Royal College of Surgeons in London. She currently provides care at Clove House Dental & Implant Centre in Wiltshire.

ENHANCED CPD

CPD hours: one

GDC development outcome: C

Topic: orthodontics

Educational aims and objectives:

To present a case of mild crowding that required sporting considerations. This article qualifies for one hour of enhanced CPD; answer the questions on page 66 or scan the QR code.



A patient presented with crowding in his maxillary and mandibular arches, seeking orthodontic treatment that would improve the aesthetics of his dentition. He was not looking to correct midlines or his bite as such, but rather reduce the crowding for a uniform look to his smile.

The patient presented with good oral hygiene and dental health, without any missing teeth or existing restorations. His UR1 and UR2 were chipped slightly from previous sporting injuries.

Intraoral images were attained with a DSLR camera, and the appropriate X-rays and scans were taken to inform all treatment considerations. A Spacewize+ – digital space calculator – assessment was carried out to assess the extent of crowding within each arch.

The patient exhibited 3.9mm of crowding in the mandibular arch, and 3.5mm in the anterior labial segment of the maxilla.

SPORTING CONSIDERATIONS

This case was particularly interesting due to the patient's occupation as a professional rugby player. Participation in the sport is well known as a risk factor for dental trauma, and a systematic review published in 2024 observed a prevalence in rugby players of 34.1% (de Lima et al, 2024).

With the risk of dental injury so high in this contact sport, an individualised mouthguard is strongly recommended by both the literature and sporting bodies such as the Rugby Football Union.

Orthodontic treatment therefore must consider the patient's need for a mouthguard on a regular basis, working with both the chosen style of appliance – fixed or removable – and the dentition as it adapts over time.



FIGURE 1: Crowding in the upper and lower jaw



FIGURE 2: Patient presentation, anterior view



FIGURE 3: Crowding and a tilted UR1, right lateral view

Olivia Nixon presents a case of mild crowding with unusual treatment requirements

Fixed orthodontics with sporting considerations





FIGURE 4: Crowding, left lateral view



FIGURE 5: Crowding in the maxilla, occlusal view



FIGURE 6: Crowding in the mandible, occlusal view



FIGURE 7: Fixed braces placed in the mandible and maxilla, anterior view



FIGURE 8: Fixed braces in place, right lateral view



FIGURE 9: Fixed braces in place, left lateral view

The patient noted that he was interested in treatment that would not only deliver an optimal result but would also do so quickly

TREATMENT DISCUSSION

Following a successful analysis of the patient’s dentition, suitable solutions were discussed. The patient noted that he was interested in treatment that would not only deliver an optimal result but would also do so quickly.

The treatment options that were presented included:

- No action taken, return to GDP on a regular basis
- Clear aligner orthodontics
- Fixed brace orthodontics that treated the entire dentition
- Fixed brace orthodontics that focused on the anterior labial segment.

As the patient was actively seeking orthodontic treatment, referral back to his GDP without treatment was unfavourable.



FIGURE 10: UR1 bracket adjusted to optimise movement

Clear aligners were the individual’s preferred solution prior to the orthodontic assessment, and while the benefits of improved aesthetics and the ability to remove the appliance during sporting activity were discussed, the time and cost it would take to complete treatment were not ideal.

Fixed brace orthodontics would be able to deliver the final result sooner for the patient, and while for sporting needs a removable solution would no doubt be easier, the patient was receptive to this option with a customised mouthguard.

To make the treatment time more efficient, treating only the anterior dentition was

proposed, recognising that the patient would have to accept an increased overjet and an overbite, as well as the initial positioning of the posterior dentition. This would not be wholly detrimental to function and aesthetics.

The benefits and drawbacks of each option were discussed. The patient chose to proceed with fixed brace orthodontics that affected the anterior labial segment, and provided informed consent.

TREATMENT CONSULTATION

Prior to treatment, I consulted my IAS Academy mentor Dr Hooria Olsen. We discussed my thoughts for the case, and my intended



FIGURE 11: Treatment progression, right lateral view



FIGURE 12: Treatment progression, left lateral view



FIGURE 13: Progress made in the maxilla, occlusal view



FIGURE 14: Progress made in the mandible, occlusal view



FIGURE 15: Final result of orthodontic treatment in the maxilla, occlusal view



FIGURE 16: Final result of orthodontic treatment in the mandible, occlusal view



FIGURE 17: Alignment achieved with cosmetic bonding on the UR1 and UR2

approach with fixed orthodontics. As treatment progressed, we would revisit the case to discuss next steps and ensure the patient was receiving the best care available to him.

A stent from the IAS Laboratory was used to place 3M Gemini Ceramic Brackets on the UR6 to UL6 and the LR6 to LL6. Two 0.12 nickel titanium wires were placed, with tiebacks utilised on the UR6 to UR4, UL6 to UL4, LR6 to LR4 and LL6 to LL4 to stabilise the dentition and avoid drifting.

Interproximal reduction (IPR) was implemented to create space in the maxilla and mandible for tooth movement as a preferred approach to tooth extraction. IPR was guided by Archwize, and 50% of the recommended

adjustments were completed in the initial appointment.

The patient immediately required a mouthguard to continue competing safely in rugby. When ordering the stent from the IAS Laboratory, the need for a mouthguard that would be compatible with the fixed appliance was shared with the technician team. The technicians were able to block out the prospective bracket fixtures on a model with wax, and use it to create a bespoke mouthguard that could be fitted on the same day.

The resulting device was available for the initial appointment, and was immediately provided to the patient, meaning his professional

responsibilities as a rugby player were in no way disrupted.

Routine oral hygiene advice was given and reiterated at each follow-up appointment.

As treatment progressed, the patient kept an adequate oral hygiene routine, and only experienced two debonded brackets, which were rectified without concern.

The 0.12 nickel titanium wire was replaced with a 0.16 wire as treatment proceeded.

PROGRESSION

I continued to reflect on the case with Dr Olsen after each appointment. We discussed the need for the bracket on the UR1 to be adjusted, as crowding had forced the tooth to overlap the UL1.

Dr Olsen advised that the bracket be repositioned higher on the tooth and twisted slightly to direct optimal movement, and this was carried out in practice. Further IPR was carried out in the maxilla and mandible to facilitate adequate tooth movement.

The patient progressed to a 20:20 nickel titanium wire as treatment neared its conclusion. Once the planned occlusion had been achieved, the fixed appliance was removed.

Staining had occurred over time, which was managed with a course of tooth whitening at the conclusion of orthodontic treatment.

Composite bonding was carried out on the UR1 and UR2 to resolve the minor chips and fulfil the patient's aesthetic aims.

Removable retainers were provided for both arches with direction to wear them nightly. A new mouthguard was produced, as the appliance





FIGURE 18: Final result, right lateral view



FIGURE 19: Final result, left lateral view



FIGURE 20: Final result, smile view

Composite bonding was carried out on the UR1 and UR2 to resolve the minor chips

used during treatment was no longer suitable, and the solution employed prior to treatment no longer fit – perhaps the most apt sign of treatment success in this specific case.

RESULT AND REFLECTION

The patient was delighted with the result, and felt confident in his new smile.

I was equally pleased with the final outcome. All treatment aims were achieved in a timely manner, less than six months, fulfilling the patient's primary wish.

While removeable clear aligners may have made sense considering his sporting obligations, treatment would have been prolonged. Working with the IAS Laboratory to fabricate a bespoke mouthguard that facilitated fixed orthodontic care made for a unique opportunity for an efficient treatment time.

Being able to reflect on the case regularly with my IAS Academy mentor, Dr Olsen, also meant I could receive confirmation for my plan and additional insights when the case needed adjusting midway through treatment, as seen with the repositioning of the UR1 bracket. [📄](#)

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PRODUCTS USED

- 3M Unitek Gemini Ceramic Brackets Solventum
- Spacewize+, Archwize IAS Laboratory

ALIGN TECHNOLOGY RECEIVES CE MARK IN EUROPE FOR THE INVISALIGN® PALATAL EXPANDER SYSTEM TO ADDRESS SKELETAL AND DENTAL EXPANSION IN GROWING PATIENTS, INCLUDING TEENAGE PATIENTS



AT A GLANCE

- Invisalign® Palatal Expanders offer doctors a removable, safe, and clinically effective alternative to traditional palatal expanders
- With Invisalign First aligners and Invisalign® Palatal Expanders, Align Technology now provides doctors with a full early intervention treatment solution, including both skeletal (orthopedic) and dental (orthodontic) arch expansion
- The Invisalign Palatal Expander System has also completed registration with the United Kingdom Medicines and Healthcare products Regulatory Agency (MHRA)
- Both approvals are for broad patient applicability, including growing children, teens, and adults (with surgery or other techniques).

INVISALIGN® PALATAL EXPANDER COMING TO THE UK

Align Technology has received CE marking in Europe under the Medical Device Regulation (MDR 2017/745) for its Invisalign® Palatal Expander System. The Invisalign Palatal Expander System has also completed registration with MHRA for the United Kingdom and overseas territories.

Both approvals are for broad patient applicability, including growing children, teens, and adults (with surgery or other techniques). These approvals mark a significant milestone in Align's efforts to enhance clinical outcomes and efficiency in orthodontics.

CONTINUOUS COMMITMENT

The Invisalign Palatal Expander System is a modern and innovative direct 3D printed device based on proprietary and patented technology. Invisalign Palatal Expanders are intended for use in rapid expansion and subsequent holding of skeletal and/or dental narrow maxilla (upper jaw) with primary, mixed, or permanent dentition during treatment of patients.

'The Invisalign Palatal Expander is an example of Align's continuous commitment to innovative digital orthodontics by delivering products with greater efficiency for doctors and better treatment experiences for young patients,' said Simon Beard, Align Technology executive vice president and managing director, Europe, Middle East and Africa (EMEA). 'We are thrilled to extend the availability of this transformative alternative to traditional palatal expanders to doctors and their patients across the EMEA region.'

EARLY INTERCEPTIVE TREATMENT

The Invisalign Palatal Expander System consists of a series of removable devices staged in small increments of movement to expand a patient's narrow maxilla to

a position determined by their treating doctor. Each direct 3D printed device is customised to the patient's unique anatomy based on an iTero™ intraoral digital scan. A palatal expansion treatment plan and device design are then developed using Align's proprietary orthodontic software.

With Invisalign First™ aligners and Invisalign Palatal Expanders, Align Technology can provide doctors with a full early intervention treatment solution for phase one treatment, an early interceptive orthodontic treatment for young patients.

Phase one treatment is traditionally done through arch expanders or partial metal braces, before all permanent teeth have erupted – typically at ages six through 10.

Invisalign First clear aligners are designed specifically to address a broad range of younger patients' malocclusions, including shorter clinical crowns, management of erupting dentition, and predictable dental arch expansion.

'Phase one or early interceptive treatment accounts for 20 percent of orthodontic case starts each year and is growing,' said Dr Mitra Derakhshan, Align Technology executive vice president, chief clinical officer.

'Together with Invisalign First aligners, Invisalign Palatal Expanders enables Align Technology to provide doctors with a solution set to treat the most common skeletal and dental malocclusions in growing children.

'The addition of mandibular advancement features to Invisalign aligners also provides doctors with more options for treating skeletal and dental jaw imbalances and bite correction for their growing patients during their teenage years.'

The Invisalign Palatal Expander System is expected to be commercially available across EMEA in 2025. [CD](#)

LEARN FROM THE MASTERS

ADI

With a variety of lectures and workshops, the ADI Team Congress 2025 is the best place to be for all those wanting to further their knowledge and skills in implant dentistry.



Many of these educational sessions will highlight the challenges that clinicians and team members face and how exciting new technologies or innovative techniques can be reliable solutions to overcome such hurdles.

The ADI Team Congress is an unmissable event to hear from some of the leading pioneers in implant dentistry, many of whom have years of experience in the field.

This means they know first-hand the importance of continual professional education and how events like the ADI Team Congress can enhance the careers of those who attend, with ample opportunities to network, socialise and have fun.

Don't miss out on the many educational benefits of the ADI Team Congress 2025 and add it to your calendar today.

The ADI Team Congress 2025 will take place from 1-3 May at The Brighton Centre.

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Zirkonzahn's zirconia range has grown over time into a material line consisting of six different types of Prettau zirconia.



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- With the new Prettau 3 Dispersive zirconia, the concept of Gradual-Triplex-Technology was introduced. In addition to the colouring, also translucency and flexural strength levels change. In this way, while the incisally increasing translucency results in a highly translucent incisal edge, the cervically increasing flexural strength leads to an extremely high flexural strength at the tooth neck
- Prettau 4 Anterior and Prettau 4 Anterior Dispersive have been specially designed for the anterior region and are therefore characterised by a particularly high translucency. Both materials are suited for the posterior region. These two types of zirconia are suitable for the production of single crowns, inlays, onlays, veneers and three-unit bridges. Zirkonzahn Shade Guides are composed of monolithic zirconia sample teeth in the shape of premolars, upper and lower incisors. They are available in Prettau 2 Dispersive, Prettau 3 Dispersive and Prettau 4 Anterior Dispersive zirconia.



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Coltene has designed the Hyflex EDM OGSF file system for the fast, safe and effective preparation of endodontic procedures. Standing for opener, glider, shaper and finisher, the file system is beneficial for the patient, offering a smoother feeling when switching from one file to the next and ensuring that fewer insertions are needed.

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AI-POWERED INSIGHTS

Clinbi

Clinbi has announced significant advancements in its AI-powered activity-based costing software designed for dental clinics and dental service organisations (DSOs). This state-of-the-art platform is set to redefine how dental practices manage their costs, optimise operations, and enhance profitability through real-time, data-driven insights.

The platform provides easy to implement workflows that enable activity-based costing, forward modelling, and benchmarking that give decision makers an incredible edge in operational improvement, transparency, and forward modelling.

This is paralleled with consultancy services that enable the software to be customised to the needs of large customers. The platform employs advanced machine learning algorithms for rapid data analysis, delivering actionable insights tailored to each clinic's operations and activities.

'At Clinbi, our mission is to empower decision-makers and practitioners to create meaningful, operational improvements that drive impact. We are here to support you in setting clear, achievable goals and building the confidence to shape a sustainable future,' said Eric Marcuson, co-founder and CPO of Clinbi. Clinbi can help dental clinics realise up to 27% improvement in their revenue. This can equate to nearly £135k in extra revenue for a dental practice earning £500k yearly. The platform has been instrumental in reducing operational costs for many, highlighting its role in the modern dental practice's toolkit.

www.clinbi.com

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Guided implant surgery is the treatment modality of choice for an increasing number of clinicians, as they endeavour to provide precise and predictable restorations that improve patient outcomes.

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Smop is a cloud-based open framework application that allows clinicians to precisely devise guided implant placement workflows, improving surgery times and patient outcomes in tandem.

It has true integration between lab and clinician, allowing for enhanced collaboration between each member of the dental team. Together, surgical guides with a 'clamp' system can be designed, featuring the ability to easily irrigate and improve visibility, in turn creating the optimal environment for precision placement.

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**GENERAL DENTISTRY
CD/JAN/FIAMMINGHI/PAGE 15**

1. According to the literature, how much bone should there be on the buccal aspect for implant placement?
 - a. At least 0.8mm
 - b. At least 1.8mm
 - c. At least 2.8mm
 - d. At least 3.8mm
2. How was patient in the case identified, according to the ASA physical status classification system?
 - a. ASA I
 - b. ASA II
 - c. ASA III
 - d. ASA IV
3. What technique was used to enhance vascularisation of the grafted area in the case study?
 - a. Placement of cross-linked collagen membranes
 - b. Perforation of the cortical plate to the medullary layer with a calibrated bur
 - c. Application of a brushing technique to the periosteum
 - d. Use of resorbable membranes attached to the mesh
4. What was the main benefit of using customised mesh in the case study?
 - a. Reduced postoperative complications
 - b. Avoidance of shaping the non-resorbable membrane intraoperatively
 - c. Eliminated the need for bone grafting
 - d. Easier removal compared to other membranes

**AESTHETIC DENTISTRY
CD/JAN/O'CONNOR/PAGE 21**

1. The patient attended complaining of transient sensitivity to hot and cold and occasional pain on biting in which area?
 - a. Upper left quadrant
 - b. Upper right quadrant
 - c. Lower left quadrant
 - d. Lower right quadrant
2. A diagnosis of cracked tooth syndrome was made for which tooth?
 - a. UR4
 - b. UR5
 - c. UR6
 - d. UR7
3. What was the preoperative shade record of the UR6 taken during the first appointment?
 - a. Vita A1
 - b. Vita A2
 - c. Vita A3
 - d. Vita A4
4. What did the patient report at the four-week review appointment?
 - a. She had complete resolution of her symptoms
 - b. She was able to chew properly on her right side again
 - c. She was delighted with the aesthetic outcome
 - d. All of the above

**DIGITAL DENTISTRY
CD/JAN/BOOGAARD/PAGE 30**

1. With the R2gate sleeveless system, the mean (and standard deviation) of 3D error at the entry point has been demonstrated as what?
 - a. 0.798mm
 - b. 1.17mm
 - c. 2.34mm
 - d. 3.21mm
2. In the case study, how many dental implants did the patient already have in place?
 - a. One
 - b. Two
 - c. Three
 - d. Four
3. What was the core diameter of the implants used in this case?
 - a. 2.5mm
 - b. 2.7mm
 - c. 3.5mm
 - d. 3.7mm
4. How long was the healing period in this case ahead of the prosthetic phase?
 - a. One month
 - b. Three months
 - c. Six months
 - d. Eight months

**ENDODONTICS
CD/JAN/ORSTEEN/PAGE 38**

1. Which tooth was the main concern in this case?
 - a. UL1
 - b. UR1
 - c. UL2
 - d. UR2
2. When was the patient originally referred in the case presented?
 - a. 2020
 - b. 2021
 - c. 2022
 - d. 2023
3. Locating the canal was challenging in this case due to...
 - a. Severe curvature
 - b. The number of canals
 - c. The extent of the calcification
 - d. A broken microscope
4. In the case presented, which file was used to clean out the canal, completing the OGSF sequence?
 - a. K-File ISO 08
 - b. 20/.04 finishing file
 - c. 30/.04 finishing file
 - d. 40/.04 finishing file

IMPLANT DENTISTRY CD/JAN/BALAJI/PAGE 46

1. What was the main reason the patient sought a dental implant solution?
 - a. Discomfort from the existing fixed bridge
 - b. Regular debonding of the fixed bridge every six months
 - c. Poor oral hygiene maintenance
 - d. Aesthetic dissatisfaction with the current restoration
2. Why was orthodontic treatment necessary before implant placement?
 - a. To realign the patient's bite
 - b. To improve the medium-high lip line aesthetic
 - c. To widen the narrow spaces at the lateral incisor sites
 - d. To create a more stable gingival structure for implant support
3. Which technique was employed for bone augmentation during the surgical phase?
 - a. Ridge splitting with autogenous bone only
 - b. Mini sausage technique with autogenous and xenograft bone, secured by a collagen membrane
 - c. Alloplastic bone grafting combined with barrier membranes
 - d. Vertical ridge augmentation using titanium-reinforced membranes
4. What was the primary function of the temporary crowns during the restorative phase?
 - a. To act as final restorations until the wedding
 - b. To shape the soft tissue and papilla around the implant sites
 - c. To evaluate the functional occlusion of the implants
 - d. To protect the implants during healing

ORAL HEALTH CD/JAN/PATEL/PAGE 53

1. What is the primary hypothesis linking periodontal disease to cardiovascular disease?
 - a. Shared genetic predispositions between the two conditions
 - b. Systemic inflammation initiated by local periodontal inflammation
 - c. Direct bacterial invasion of cardiac tissue from the oral cavity
 - d. The disruption of oral hygiene leading to heart valve dysfunction
2. Which oral bacteria have been identified in atherosclerotic plaques, suggesting a microbial link between oral and cardiovascular health?
 - a. Streptococcus mutans and Treponema denticola
 - b. Porphyromonas gingivalis and Aggregatibacter actinomycetemcomitans
 - c. Fusobacterium nucleatum and Candida albicans
 - d. Lactobacillus acidophilus and Actinomyces israelii
3. What did the large-scale meta-analysis by Sanz and colleagues (2020) conclude regarding individuals with periodontitis?
 - a. They have a reduced risk of cardiovascular disease due to improved oral hygiene
 - b. They have a one-and-a-half- to two-fold increased risk of cardiovascular disease compared to individuals without periodontitis
 - c. Their cardiovascular disease risk is only significant in the presence of diabetes
 - d. There is no proven association between periodontitis and cardiovascular outcomes
4. According to the author, the observed association between periodontal disease and cardiovascular disease may be confounded by shared risk factors, such as...
 - a. Smoking
 - b. Socioeconomic status
 - c. Diabetes
 - d. All of the above

ORTHODONTICS CD/JAN/NIXON/S9

1. Why was the patient seeking orthodontic treatment in this case?
 - a. To correct midlines
 - b. To correct the bite
 - c. To reduce the crowding for a uniform look to the smile
 - d. None of the above
2. How much crowding did the patient exhibit in the mandibular arch?
 - a. 3.3mm
 - b. 3.5mm
 - c. 3.7mm
 - d. 3.9mm
3. What was the patient's occupation in this case?
 - a. Professional football player
 - b. Professional rugby player
 - c. Professional hockey player
 - d. Professional basketball player
4. How long did it take to achieve all treatment aims in this case?
 - a. Less than six months
 - b. Six months
 - c. One year
 - d. More than one year

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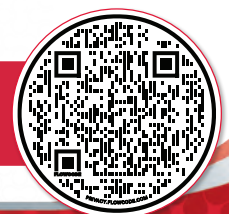
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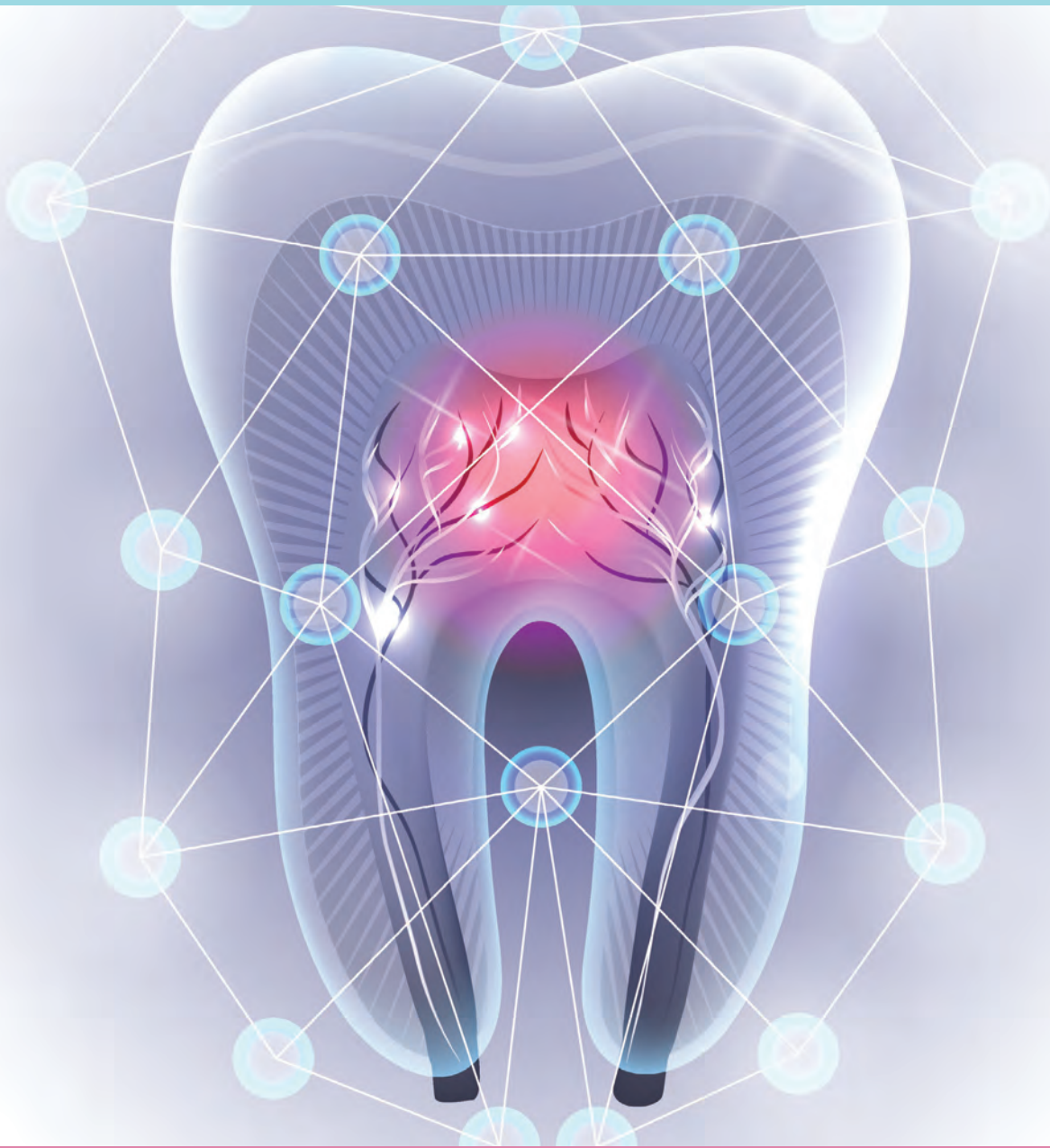


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