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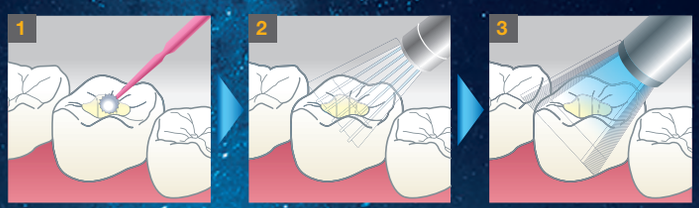

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MISSIONSTATEMENT

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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EVERYBODY BE COOL!

Welcome to the November/December issue of *Clinical Dentistry*!

This final edition of 2024 is packed full of articles that showcase the fantastic clinical work being carried out across the UK and beyond.

We're also delighted to bring you the winners of this year's Clinical Dentistry Awards. The ceremony, which took place at the glamorous Royal Garden Hotel in London on Friday 11 October, celebrated those practising outstanding dentistry and will be a magical memory for years to come for those who were there. Turn to page 12 to find out who our winners are, and to see some of the highlights from the evening.

We're at that point in the calendar when another year is on the horizon, but before we welcome in 2025 with open arms, there is one crucial thing that dentists must do... I am, of course, talking about continuing professional development (CPD).

The CPD year for dentists runs from 1 January to 31 December, meaning the deadline for completing your requirements for 2024 is looming.

This can be a stressful time, especially if you've got numerous hours to fulfil. But there's no need to fret, as we're here to help.

With more than 600 courses – more than a few of which come from the content in this magazine – Dentistry CPD can help you fulfil all your hours!

Our online platform offers an unparalleled selection of written and video content covering the full range of dental subjects (including all of the General Dental Council's recommended topics) to help power your development.

We all know the critical role CPD plays in keeping your professional skills and knowledge up to date. It contributes to improved patient care and ensures dental professionals have the tools needed to meet and maintain high professional standards.

I don't need to tell you that the repercussions for failing to meet the minimum requirements are severe – but we have designed Dentistry CPD to be as easy as possible to use, so you can focus on learning. It's a frictionless, stress-free way to stay up to date.

Don't miss the deadline. Stay calm and collected, and keep your cool – visit dentistry.co.uk/cpd!

Siobhan Hiscott
Group Managing Editor
siobhan.hiscott@fmc.co.uk

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Meet the experts

Introducing some of the people who have shared their expertise in this issue of *Clinical Dentistry*

DR AHMAD NOUNU

Ahmad Nounu provides his top 10 tips for tooth whitening, one of the most straightforward and accessible forms of cosmetic dentistry, on page 36.

Ahmad is the founder of Private Dental Mentor and clinical director at Black Swan Dental Spa & Implant Centre in Somerset, which was named winner of Aesthetic Treatment Practice at the Clinical Dentistry Awards 2024.

Ahmad provides a pathway for dental associates aiming to become highly sought-after private dentists with training, mentorship and support. You can explore the courses and resources on Private Dental Mentor at privatedentalmentor.co.uk.

DR NICK FAHEY

BDS MCLINDENT (PROS) MRD RCS(ED) FRACDS MFDS RCS(ENG)

Nick Fahey presents 10 top tips on page 62 that can help enhance the precision and success rate of guided implant surgeries, contributing to better patient outcomes and increased practitioner confidence.

Nick is a specialist in prosthodontics. With more than 20 years of experience, he focuses on dental implants, endodontics, prosthetics and cosmetic dentistry. Nick has authored *Guided Surgery: Making Implant Placement Simpler* and runs courses on guided surgery with Biohorizons Camlog.

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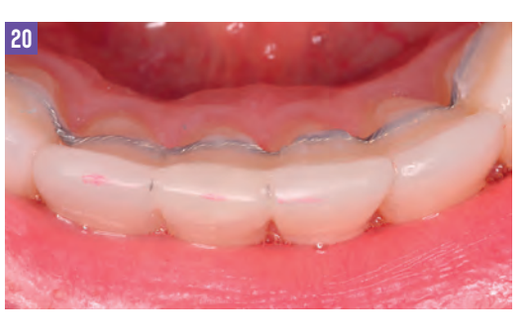
November/December 2024
Vol 4 No 10

FEATURES

GENERAL DENTISTRY 19

20 RESTORATIVE DENTISTRY UTILISING THE DAHL TECHNIQUE
A case of moderate crowding in the lower anterior dentition, followed by restorative treatment for tooth wear using the Dahl technique – Poonam Goyal



AESTHETIC DENTISTRY 25

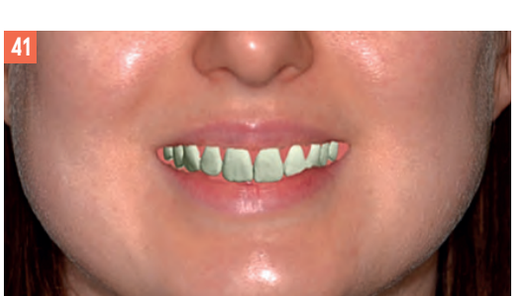
27 TOOTH SURFACE LOSS
A composite smile makeover, treating localised anterior tooth surface loss – Edward Li

34 TWO-STEP TOOTH BLEACHING PROTOCOL
A simple two-step bleaching protocol with custom trays for a brighter, more radiant smile – Sara Laface

36 TOP TIPS: TOOTH WHITENING
Guidance for acheiving predictable and consistent whitening – Ahmad Nounu

DIGITAL DENTISTRY 39

41 CAD TECHNOLOGY AND CLEAR ALIGNERS
Considerations for incorporating clear aligner therapy into your practice and the benefits of embracing CAD/CAM technology – George Dandanov



FEATURES

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CLINICAL DENTISTRY AWARDS 2024

CLINICAL DENTISTRY AWARDS 2024: HIGHLIGHTS FROM THE EVENING

CLINICAL DENTISTRY AWARDS
The Clinical Dentistry Awards aim to acknowledge clinical excellence in practice and are judged by a panel of leading clinicians and dental experts. This year's ceremony took place on 11 October at the Royal Garden Hotel in London.

AESTHETIC DENTAL LABORATORY
WINNER: Ceramic Designs
HIGHLY COMMENDED: Vivo Dental Lab

AESTHETIC TREATMENT PRACTICE
WINNER: Black Swan Dental Spa
HIGHLY COMMENDED: Start Smiling
HIGHLY COMMENDED: Cheadle Hulme Dental & Cosmetics

FACIAL AESTHETICS PRACTICE
WINNER: Citi Aesthetics

ORTHODONTIC PRACTICE
WINNER: Devon Square Orthodontics
HIGHLY COMMENDED: Lisburn Orthodontics

HYGIENIST OF THE YEAR
WINNER: Sakina Syed
HIGHLY COMMENDED: Jacqui Armstrong

THERAPIST OF THE YEAR
WINNER: Tracy Tang
HIGHLY COMMENDED: Jagjit Malhi
HIGHLY COMMENDED: Michaela Robinson

ORTHODONTIC THERAPIST
WINNER: Sarah Macdonald

PHILIPS SHINE-ON AWARD
WINNER: Sakina Syed
HIGHLY COMMENDED: Amy Mesilio Peralta

LOCAL ORAL HEALTH INITIATIVE
WINNER: Community Dental Services CIC, Oral Health Improvement Team

PERIODONTIC PRACTICE
WINNER: The Grove Practice

MULTIDISCIPLINARY PRACTICE
WINNER: Dentistry on the Square
HIGHLY COMMENDED: Start Smiling

ENDODONTIC PRACTICE
WINNER: The Square Dental Referral Clinic
HIGHLY COMMENDED: Shiraz Endodontic Practice

IMPLANT DENTISTRY PRACTICE
WINNER: Alban City Dental & Surgical Centre
HIGHLY COMMENDED: Inspired Dental Care
HIGHLY COMMENDED: Smile HQ

IMPLANT: INTERDISCIPLINARY TEAM
WINNER: Fusion Dentistry
HIGHLY COMMENDED: Smile HQ

IMPLANT: SINGLE TOOTH
WINNER: Viraj Patel
HIGHLY COMMENDED: Imran Nasser

IMPLANT: MULTIPLE TEETH
WINNER: Imran Nasser
HIGHLY COMMENDED: Mario Velrtri

YOUNG IMPLANT DENTIST
WINNER: Jamie Kerr
HIGHLY COMMENDED: Viraj Patel

YOUNG ORTHODONTIST
WINNER: Ciara Ennis

YOUNG AESTHETIC DENTIST NORTH
WINNER: Hassan Kanani
HIGHLY COMMENDED: Cameron Magee

YOUNG AESTHETIC DENTIST SOUTH
WINNER: Jana Denzel
HIGHLY COMMENDED: Ankeet Shah

CLINICALDENTISTRYAWARDS: WINNERS 2024

AESTHETIC DENTAL LABORATORY
WINNER: *Ceramic Designs*

AESTHETIC TREATMENT PRACTICE
WINNER: *Black Swan Dental Spa*

HYGIENIST OF THE YEAR
WINNER: *Sakina Syed*

ENDODONTIC PRACTICE
WINNER: *The Square Dental Referral Clinic*

IMPLANT DENTISTRY PRACTICE
WINNER: *Alban City Dental & Surgical Centre*

IMPLANT: MULTIPLE TEETH
WINNER: *Imran Nasser*

CLINICAL DENTISTRY AWARDS 2024

LOCAL ORAL HEALTH INITIATIVE
WINNER: *Community Dental Services CIC, Oral Health Improvement Team*

ORTHODONTIC PRACTICE
WINNER: *Devon Square Orthodontics*

IMPLANT: SINGLE TOOTH
WINNER: *Viraj Patel*

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THERAPIST OF THE YEAR
WINNER: *Tracy Tang*

YOUNG AESTHETIC DENTIST SOUTH
WINNER: *Jana Denzel*

YOUNG ORTHODONTIST
WINNER: *Ciara Ennis*






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GENERALDENTISTRY

POONAM GOYAL
Restorative dentistry utilising the Dahl technique

20

The patient was delighted with the outcome, acknowledging that the composite build-ups made a dramatic difference to the appearance of his dentition. He was given removable retainers for both arches and instructed to wear them consistently at night to minimise any orthodontic relapse – Poonam Goyal, p20

DR POONAM GOYAL
Poonam qualified from the prestigious University of Delhi in 2010, and shortly after achieved a master's degree in prosthodontics. She has also recently undertaken further postgraduate training in endodontics. Poonam is an associate dentist across two sites – Bupa Dental Care, Brackley and Mi Dental, Milton Keynes. She has taken multiple courses, including the Align, Bleach and Bond course with the IAS Academy.

ENHANCED CPD

GDC anticipated outcome: C

CPD hours: one

Topic: Restorative dentistry

Educational aims and objectives:
To present a case of moderate crowding in the lower anterior dentition, followed by restorative treatment for tooth wear using the Dahl Technique. This article qualifies for one hour of enhanced CPD; answer the questions on page 84 or scan the QR code.

A 33-year-old male patient presented at my practice with concerns about his smile aesthetics, seeking orthodontic treatment to resolve moderate crowding in his lower anteriors.

This individual was incredibly self-conscious about his smile, and it was affecting his everyday life. In professional meetings, he would instinctively cover his mouth out of embarrassment while smiling. Providing effective restorative care would not only seek to resolve aesthetic issues, but also potentially improve their psychological wellbeing.

He had no previous history of orthodontic treatment.

ASSESSING TREATMENT OPTIONS

Upon initial assessment, moderate crowding was confirmed in the lower anterior region, with mild crowding in the upper anterior teeth. The patient was, however, not concerned about the appearance of the upper dentition.

One carious lesion on the LR6 and the need for hygiene treatment were identified, along with visible wear on the anterior teeth. Radiographic examinations found appropriate bone health for orthodontic treatment.

Upper and lower impressions were taken to formulate the treatment plan.

A number of treatment options were presented to the patient, considering the advantages and disadvantages that each may present. This included both removable aligners and conventional fixed appliances, as well as composite bonding at the resolution of treatment. Veneers and crowns were also considered and discussed with the patient, but due to the malalignment of the teeth they were not a preferable option.

The patient was only interested in straightening the dentition at this time so decided to pursue orthodontic treatment. He was given the option of seeing an orthodontic specialist but was happy to continue treatment with me, and opted for clear aligners due to their aesthetic advantage over a conventional fixed appliance.

Standard oral hygiene and dietary instructions were provided and full consent attained before proceeding.

ORTHODONTIC TREATMENT

The patient saw a dental hygienist prior to care. I also judged that he needed an occlusal restoration on his LR6 prior to aligner treatment, which was carried out with direct composite.

Aligner treatment progressed as expected, with no significant complications encountered during this phase of treatment.

Following the planned orthodontic treatment for about eight months, some improvement was still needed to refine the aesthetic result. The patient

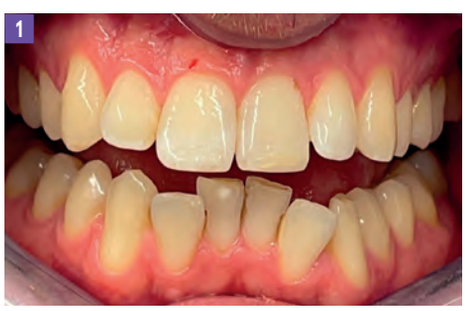


FIGURE 1: *Moderate crowding in the lower anterior teeth, and mild crowding in the upper anterior dentition*

Poonam Goyal presents a case of moderate crowding in the lower anterior dentition, followed by restorative treatment for tooth wear using the Dahl technique

Restorative dentistry utilising the Dahl technique

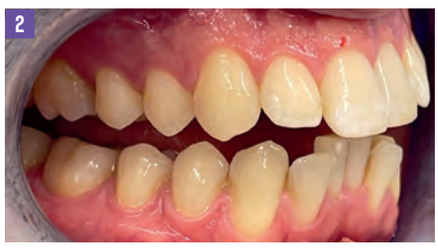


FIGURE 2: *Lateral right side view*

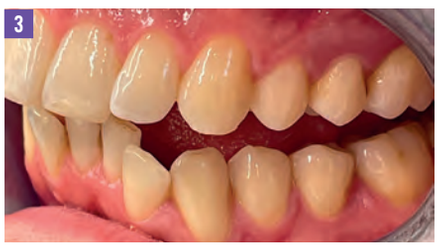


FIGURE 3: *Lateral left side view*

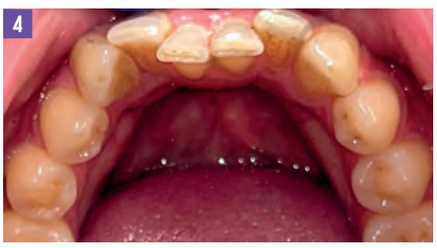


FIGURE 4: *Occlusal view of lower arch*

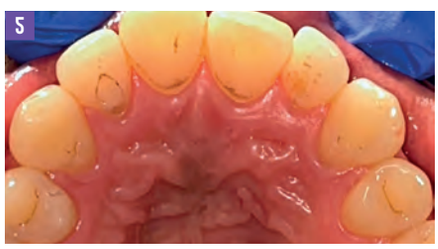


FIGURE 5: *Occlusal view of upper arch*

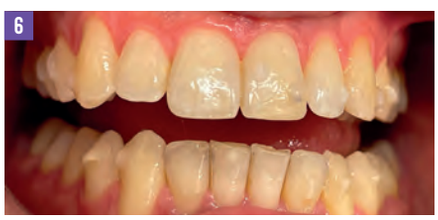


FIGURE 6: *Anterior view following clear aligner treatment*

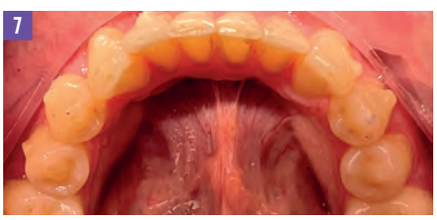


FIGURE 7: *Occlusal view of lower arch following clear aligner treatment*

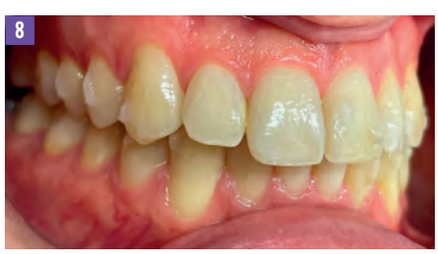


FIGURE 8: *Right lateral view following clear aligner treatment*

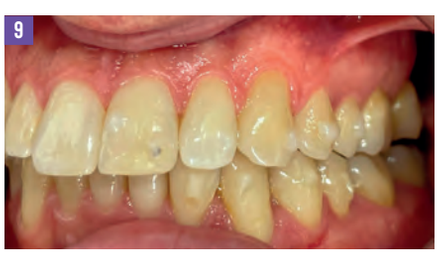


FIGURE 9: *Left lateral view following clear aligner treatment*

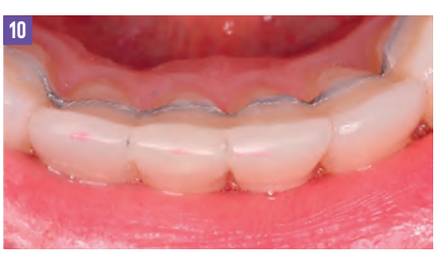


FIGURE 10: *Free hand edge build ups and lingual fixed retainers on the lower incisors*

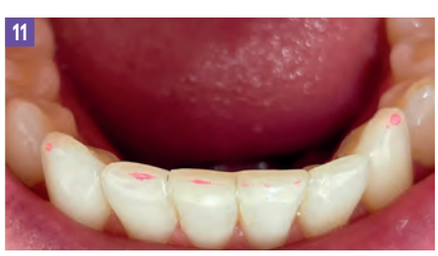


FIGURE 11: *Lower anterior contacts on day of build ups*

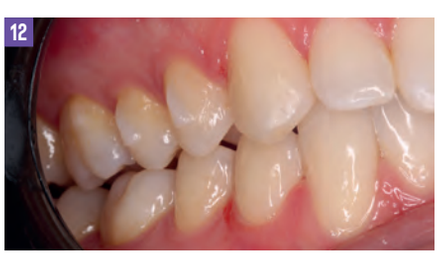


FIGURE 12: *Posterior open bite, right side on day of build ups*

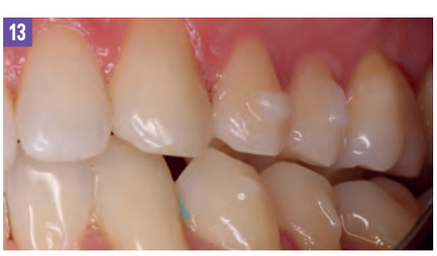


FIGURE 13: *Posterior open bite, left side on day of build ups*

was provided with one set of refinement aligners, which allowed for an improved outcome.

At this point, the patient was happy with the alignment of the teeth, but now saw the impact of wear on the upper and lower anterior teeth. He requested restorative work to help amend this issue.

I had undergone the Align, Bleach and Bond (ABB) course with the IAS Academy, which shaped my approach to effective, holistic restorations. The patient felt comfortable proceeding with restorative treatment with me, and so I planned to restore the anterior teeth using the Dahl technique.

EFFECTIVE RESTORATIVE CARE WITH THE DAHL TECHNIQUE

The patient's posterior wear was minimal in comparison to the edgewear on the anterior teeth (especially on the lower incisors and left sided canines). This made him an ideal candidate for a Dahl approach.

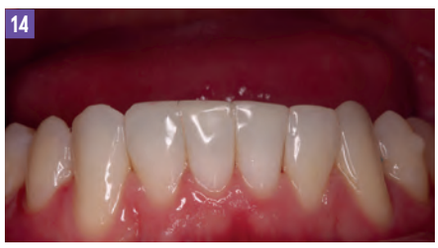


FIGURE 14: *Lower anteriors after whitening and composite Dahl build ups*

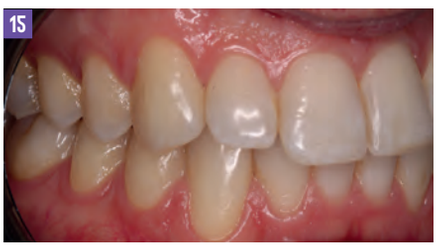


FIGURE 15: *Posterior bite closure, right side 12 weeks after build ups*

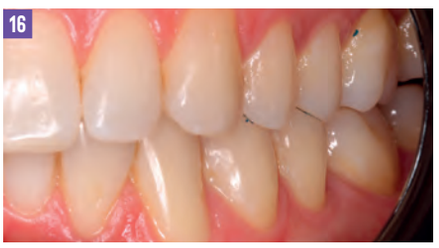


FIGURE 16: *Posterior bite closure, left side 12 weeks after build ups*

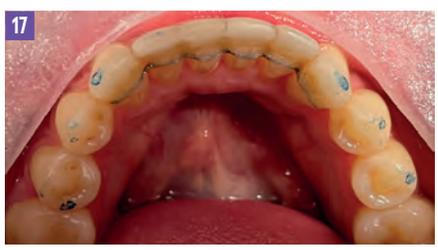


FIGURE 17: *Occlusal view of lower arch contacts following Dahl technique*

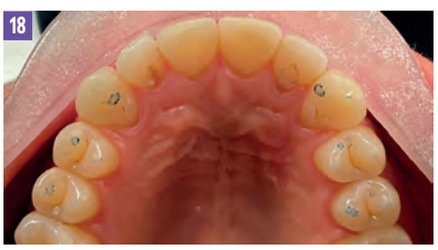
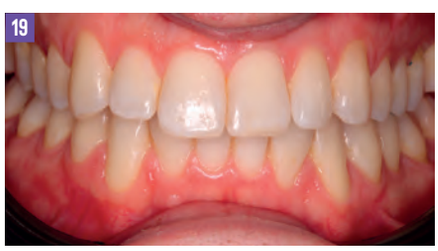
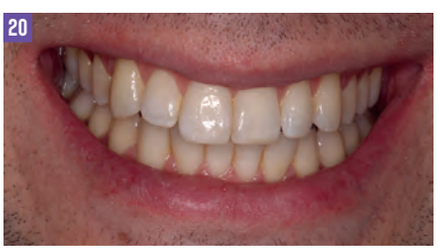


FIGURE 18: *Occlusal view of upper arch contacts following Dahl technique*





FIGURES 19 *and* **20:** *Final result*

I consulted with Tif Qureshi, my mentor at the IAS Academy, following the clear aligner treatment to ensure I was taking the most appropriate approach. He agreed that this was a suitable case to implement the Dahl method and composite edge bonding techniques.

Having such support on hand was brilliant for making clinical decisions, and reinforcing my confidence in the care I was going to provide. Tif's confirmation of my proposal and support allowed me to progress appropriately.

I discussed with the patient composite build-up on the anterior teeth, putting his posterior teeth into an open bite that could last for eight to 12 weeks. Getting his informed consent was essential.

He was advised that this may feel uncomfortable at first when chewing and at rest, and there was a chance that the bite would not fully settle. However, he was optimistic to proceed with this treatment, and trusted me to provide effective care.

The patient first underwent a course of whitening, and a fixed retainer was placed on the lower anterior teeth to prevent relapse from orthodontic treatment. All the composite attachments were thereafter removed, with the teeth being adequately smoothened and polished at these sites.

A yellow IPR strip was also used to loosen the posterior contacts and facilitate ample eruption of the posterior teeth to assist with bite closure later on.

Freehand direct composite was placed on each of the lower incisors, as well as the LL3 and UL3, to restore a functional and aesthetic shape. On the LR3 and UR3, I opted to smoothen the sharp edges instead of applying composite due to minimal wear on these.

No composite build-ups were performed on the upper incisors as they were already of an adequate profile. After the direct build-ups, I was able to achieve primary occlusal contacts on the canines bilaterally, with lighter contacts on incisors and, as expected, the posteriors were in open bite on the day of build-ups.

On the same day, I also modified the patient's last set of aligners to act as anterior sectional retainers. Impressions were taken too for the fabrication of temporary sectional essix retainers for both upper and lower anteriors to minimise relapse risk in the phase of posterior bite settling, which could take anywhere between eight to 12 weeks.

It would have been preferable to plan for composite edge build-ups when planning the initial clear aligner treatment. Doing so would have allowed me to create more space to facilitate this, however, it was important to work with the patient in a manner that made them comfortable.

At the beginning of treatment that meant planning only for orthodontics. A successful result was still possible with the current situation.

MONITORING PROGRESSION

I saw the patient at four-, eight- and 12-weeks to monitor the posterior occlusion settling. During this time, the patient experienced minimal complications as he became comfortable with the new bite in his dentition.

By the end of the 12-week period, the posterior teeth had erupted to completely close the posterior open bite and created uniform bilateral contacts that functioned optimally.

The patient also showed optimal guidances on excursions (incisor guidance on protrusion, and canine guidance on lateral excursions with no posterior interreferences).

OUTCOME AND REFLECTION

The patient was delighted with the outcome, acknowledging that the composite build-ups made a dramatic difference to the appearance of his dentition. He was given removable retainers for both arches and instructed to wear them consistently at night to minimise any orthodontic relapses.

Upon reflection, I was also delighted with the outcome from implementing the Dahl method. The help of my mentor Tif made an immense difference, as his quick, supportive responses allowed me to devise an effective treatment plan that could be regularly monitored and adjusted where needed with confidence.

Without his support, and my experience on previous IAS Academy courses, I would not have felt that I could provide effective care, and would have likely referred the patient to a restorative specialist. Luckily, I didn't, and a fantastic outcome was achieved. CD

LLOYD POPE DETAILS THE SCIENCE BEHIND TOKUYAMA'S COLOURLESS OMNICHROMA COMPOSITE RANGE

THROW THE SHADE GUIDE AWAY!

Tokuyama's unique colourless Omnichroma composite means you don't need to use a shade guide to identify the shade of any teeth prior to restoration. One syringe or PLT of colourless Omnichroma replaces all the shades of every other range of composite.

LIGHT YEARS AHEAD!

When white light comprising all the spectrum of the rainbow hits most objects the object either absorbs none of the wavelengths, reflects them all back towards the observer and so appears white; absorbs some of the wavelengths, reflects the others back so that the object appears the colour of the wavelengths not absorbed; or absorbs all of the wavelengths, reflects none of them back and appears black.

The same occurs with traditional composite restorative materials, which are made up of resins and filler particles containing pigments to give them their desired Vita shade. Some of the wavelengths contained in the white light hitting the composite's surface are absorbed, so that only the wavelengths required to match the desired Vita shade are reflected back towards the observer.

NATURAL PHENOMENON OF STRUCTURAL LIGHT

Some objects behave in a completely different manner, peacock's feathers, soap bubbles etc. These objects exhibit the phenomenon of 'structural light'. When white light hits their surfaces it is reflected in different wavelengths depending upon the angle it hits the object and therefore altering the colour seen.

SURFACE TEXTURE

Another critical factor is the smoothness of the surface the light reflects off. If it is smooth the light is reflected back in a uniform manner and it appears shiny and smooth. If the surface is rough the light is reflected back in a haphazard manner and the surface appears dull.

When polishing composites, clinicians are trying to reduce the irregularity of the surface so that the light is reflected back in a uniform manner so that they look natural, smooth and shiny.

With composites containing irregular shaped filler particles it is difficult to create such a smooth surface because some of the particles are plucked out leaving an irregular crater-like surface. This is not the case with Tokuyama restorations because of their patented spherical filler particles.

CHROMAESTHETICS

All Tokuyama composites comprise spherical filler particles, which are grown in a Sol-Gel method to precise dimensions depending upon the physical properties Tokuyama want the composite to exhibit. This means Tokuyama composite materials are much easier and quicker to polish to a high lustre, saving time and delivering superior aesthetic results.

COLOURLESS OMNICHROMA

Omnichroma's spheres are grown to a very consistent and precise 260nm diameter. Not only does this provide Omnichroma with its unique physical and handling properties, but it also exhibits the natural phenomenon of 'structural light', generating light in the same red/yellow wavelengths as natural teeth.

Omnichroma is the only colourless composite comprising of unpigmented filler particles and a clear resin. When light hits an Omnichroma restoration and surrounding tooth it passes through the clear resin and bounces back from the cavity walls with the natural colour of the surrounding tooth. At the same time, red/yellow 'structural light' generated from the unpigmented spherical filler particles is reflected back too and combines with the light reflected from the surrounding tooth to perfectly match its colour.

This patented technology makes Tokuyama's colourless Omnichroma unique because it matches every tooth shade, eliminating the need for shade matching ever again!

If the patient subsequently has their teeth whitened, Omnichroma restorations adapt to the new situation. CD

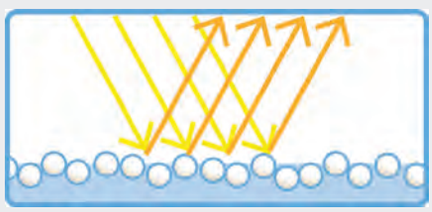


FIGURE 1: *Tokuyama spherical particles reflect light uniformly for a perfect shine*

FIGURE 2: *Traditional irregular particles reflect light randomly resulting in a dull matt appearance*

TRYCARE

For more information, contact your local Trycare representative, call **01274 885544** or visit **www.trycare.co.uk/omnichroma** or **tokuyama-dental.eu/en**.

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3 Viscosities – infinite possibilities

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OMNICHROMA – is all you need for state-of-the-art filling therapy.

More information:

Tokuyama Dental

OMNICHROMA

- without artificial colour pigments
  "automatically" adapts to the tooth shade
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  for better biocompatibility
- sustainable stocking
  only order 1 shade & no expired special shades

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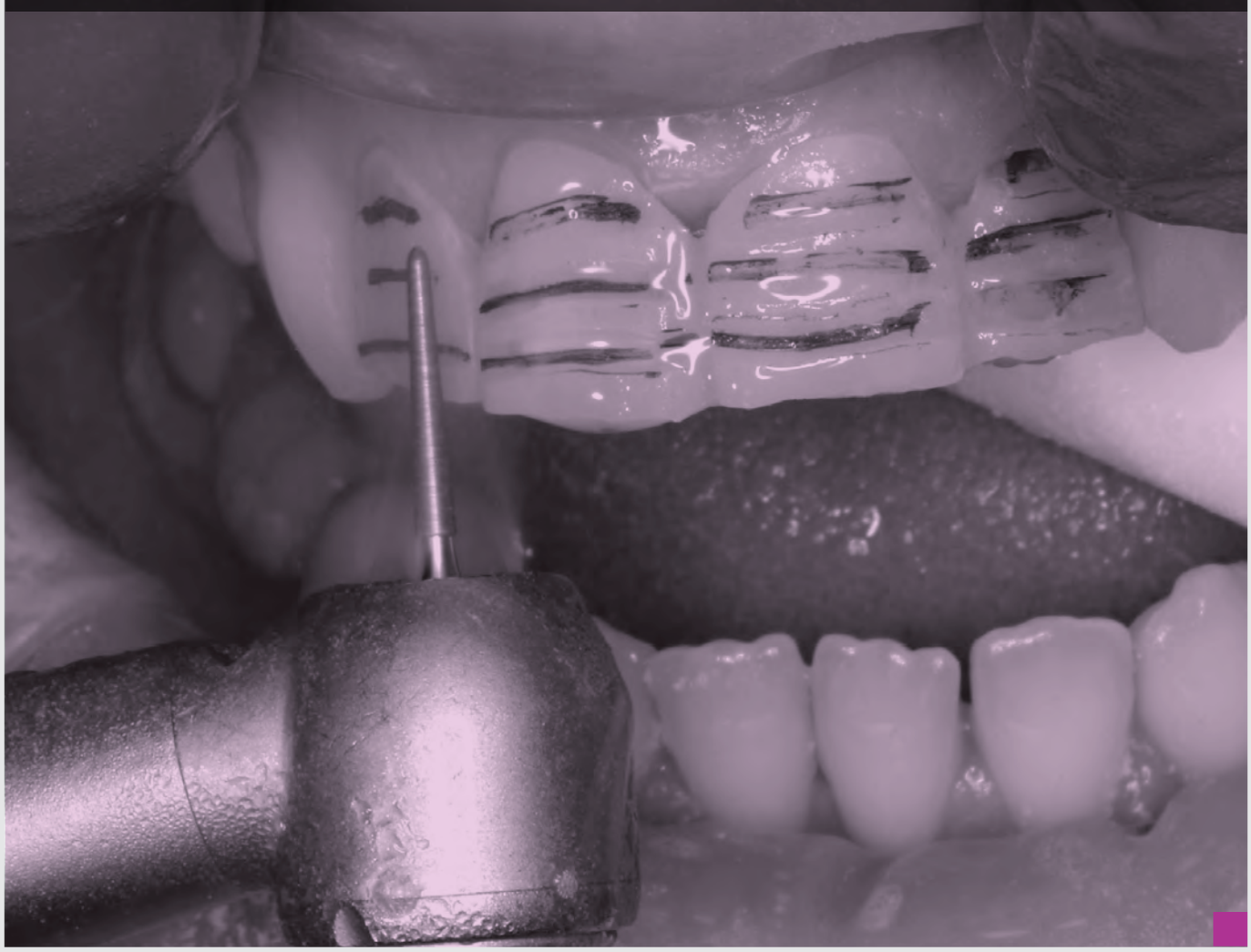

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Instrument ergonomics

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DR EDWARD LI
BDS
Edward graduated from King's College London. He is clinical director and principal dentist at the a.b.c. smile dental practice in London.

ENHANCED CPD
GDC anticipated outcome: C
CPD hours: one
Topic: Restorative dentistry
Educational aims and objectives: To present a composite smile makeover, treating localised anterior tooth surface loss. This article qualifies for one hour of enhanced CPD; answer the questions on page 84 or scan the QR code.

A patient in their early 50s came through a referral from the collaborating Dr Kaval Patel (E-Line Orthodontics) to continue their care and restore the worn teeth.

The orthodontics had been executed with great detail, utilising sectional fixed appliances, TADs and an aligners phase to culminate in a well aligned, perfectly occluding dentition ready for the restorative phase with myself (Figures 2 and 3).

The patient presented a well-looked after and moderately restored dentition, with moderate tooth surface loss on the anterior teeth that we determined to have the primary cause from attrition and mild bruxism (Figure 3a). The oral hygiene was very good and no social history of smoking and/or medications.

Assessing the patient's smile (Figure 3b), it is observed that at full smile the lip line is low, with the lips covering the cervical third-half of the clinical crown height. The shade of the teeth had the base colour of Vita A3.

TREATMENT OPTIONS

The following treatment options were considered and discussed with the patient:

- Stabilisation
  - Hygiene scale and polish and thorough OHI
- Prescription tooth whitening
- Restorative
  - Localised TSL treatment utilising Dahl principle
    - Direct composite resin
    - Indirect porcelain veneers/onlays
- Comprehensive TSL treatment
  - Direct composite resin
  - Indirect porcelain veneers/onlays
  - Hybrid approach combining the two modalities
  - Michigan splint or Essix retainers with orthodontist.

It is always great to work in conjunction with expert colleagues whose work allows the referral and handover to be effortless. With a great foundation from the orthodontics, the main points that needed to be conveyed in a consultation were the pros and cons of the localised versus comprehensive approach in treating tooth surface loss.

The anatomy of the patient's posterior dentition was fantastic and showed minimal signs of enamel loss. A factor that also contributed to the conversation leading towards a localised approach was the dental implant on the UR6.

I walked through the longevity of the options as well as my clinical recommendations and the restorative options simplified themselves quickly. I expressed that I recommend options that are 'just right', targeting what is necessary and reduce an overprescribed dentistry.

I also emphasised the importance of something that gives teeth and the TMJ time to adapt alongside the benefits of a material that can also adapt to a degree. Using layman's terminology, I explained that I would like to utilise the Dahl principle with localised treatment of the anterior teeth in

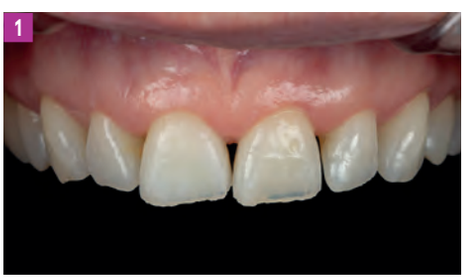


FIGURE 1: *Preoperative, upper anterior overview*

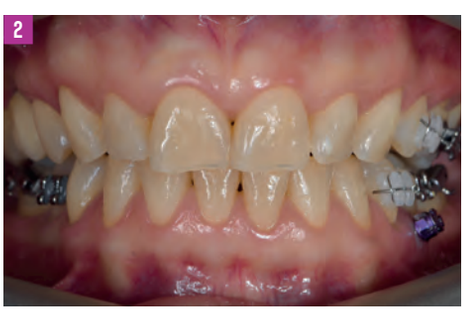


FIGURE 2: *Early orthodontic stage with sectional appliance by Dr Kaval Patel*

Edward Li presents a composite smile makeover, treating localised anterior tooth surface loss

Tooth surface loss

composite, to then allow the intrusion of the anterior teeth and extrusion of the posterior teeth to correct the alveolar compensation.

Once that is well established, there is a window of time in the space of a few years where the patient can consider replacing the anterior composites with porcelain, which is more biomimetic to that of enamel.

The benefits of reducing the amount of teeth involved in treatment and the more adaptive and adjustable nature of composite allows for a more forgiving result that I find crucial in these attritive patients.

TREATMENT PLAN

We agreed on the following treatment plan:

- Stabilisation
  - Hygiene scale and polish and thorough OHI
- Prescription tooth whitening
- Restorative
  - Localised TSL treatment utilising Dahl principle of upper and lower teeth
    - Direct composite resin
    - Diagnostic wax-up required and clear silicon transfer technique
  - Essix retainers with orthodontist.

CLINICAL CHALLENGES

This case presented a number of clinical challenges, including:

- Capturing a clinically reproducible centric relation
- Creating aesthetically pleasing designs in the wax-up
- Transferring the wax-up design and allowing contact points to remain cleansable
- Creating good functional and anterior guidance for the composites to have medium-term lifespan (five to seven years).

CLINICAL OVERVIEW

As the patient whitens in the provisional retainers over a four-week period of alternating nights with 16% CP, I complete my own wax-up in centric relation (CR) for the anterior 3-3 for both arches (Figure 5). CR was captured with an anterior deprogrammer and a silicon bite-registration taken.

The wax-up had the aim to minimise the thickness of the labial composite and maximising the palatal coverage to support the new OVD and guidance.

Outlining the capture of centric relation

There are many ways to execute this, with much debate as to which approach is more accurate. There is also the discussion of when a facebow is required to capture the maxillary plane relative to the position of the TMJ.

The fundamental principle is to dissclude the

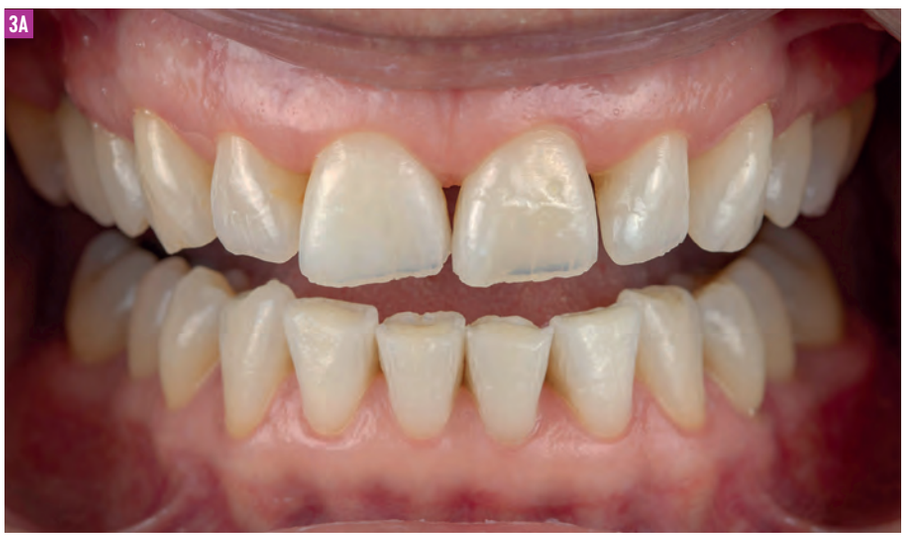


FIGURE 3A: *Preoperative, retracted*

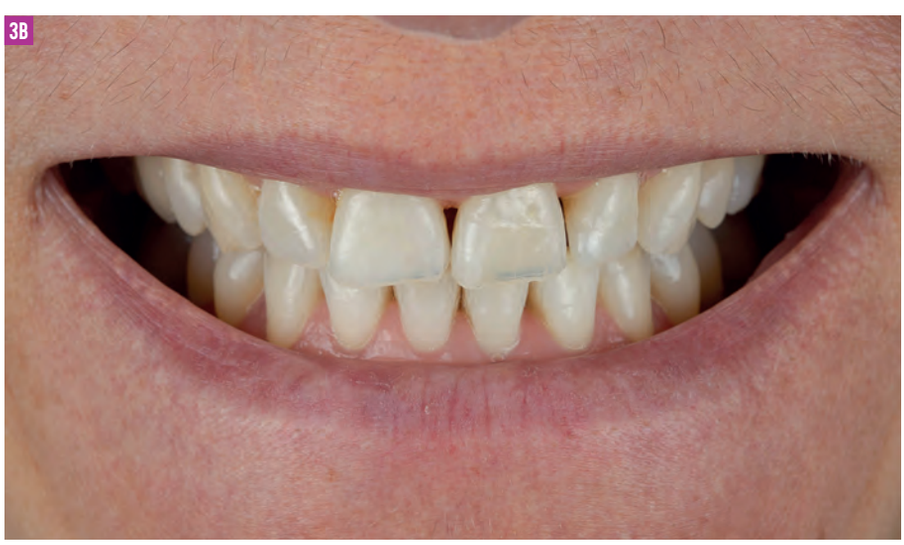


FIGURE 3B: *Preoperative, smile*

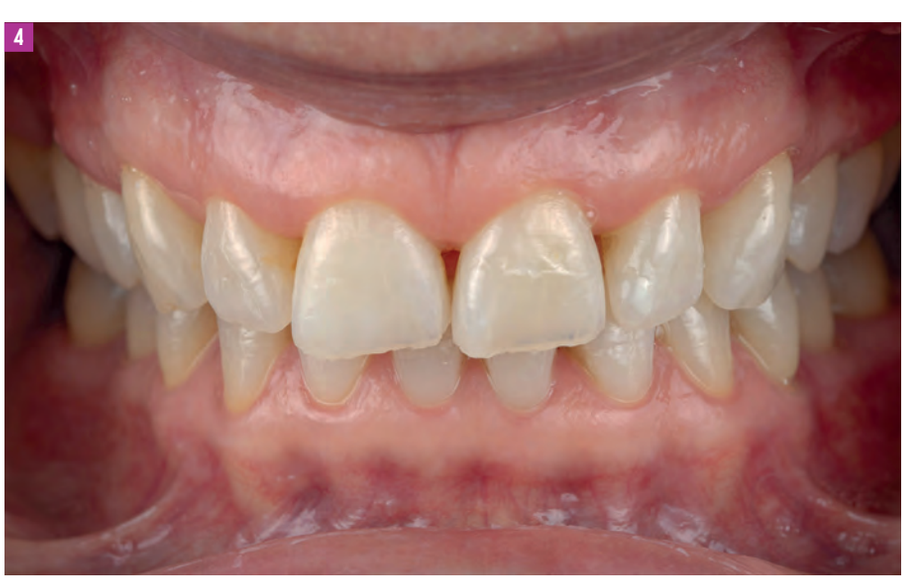
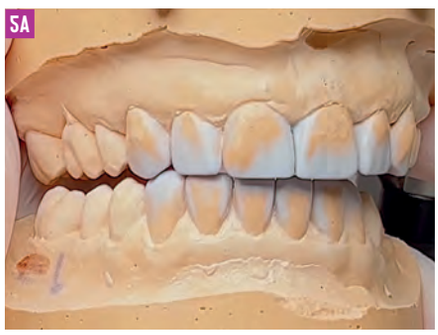
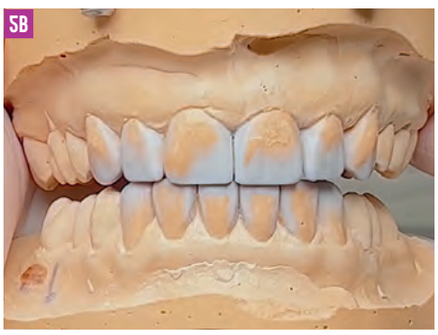
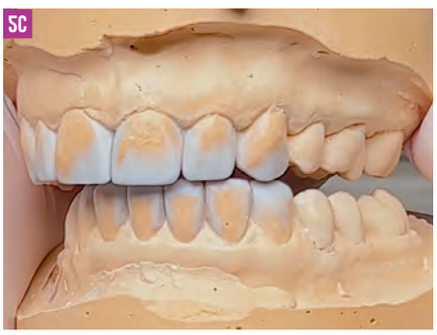


FIGURE 4: *Whitening*







FIGURES 5A *to* **5C:** *Wax-up, showing anterior guidance and lateral guidance*

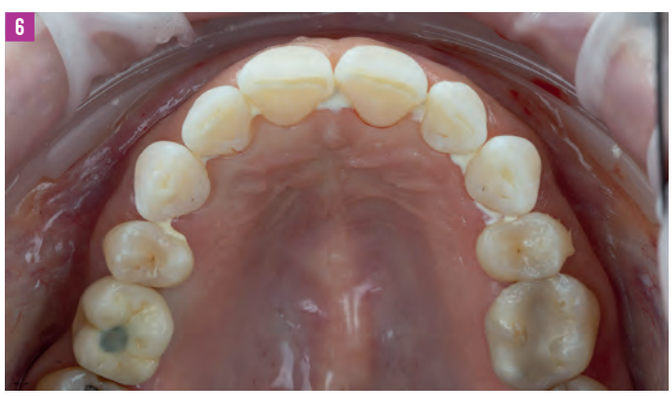


FIGURE 6: *Contact point separator applied from palatal view*

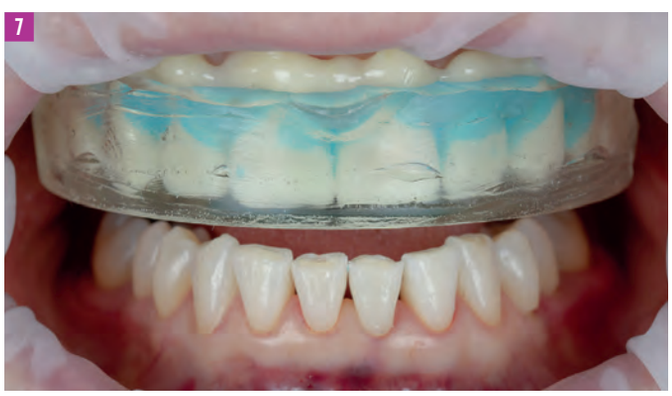


FIGURE 7: *Exaclear transferring heated composite*

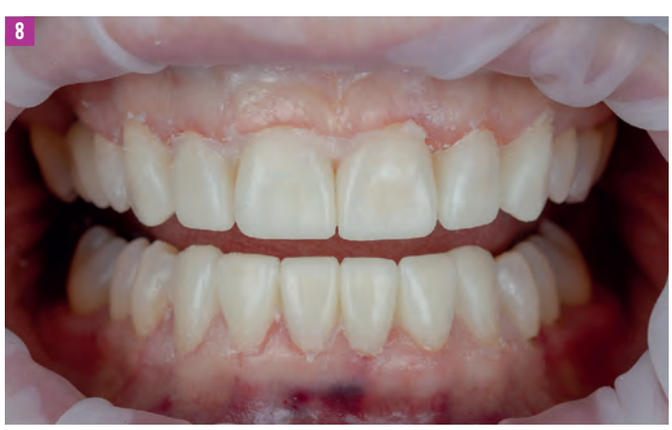


FIGURE 8: *Immediate removal of stents*

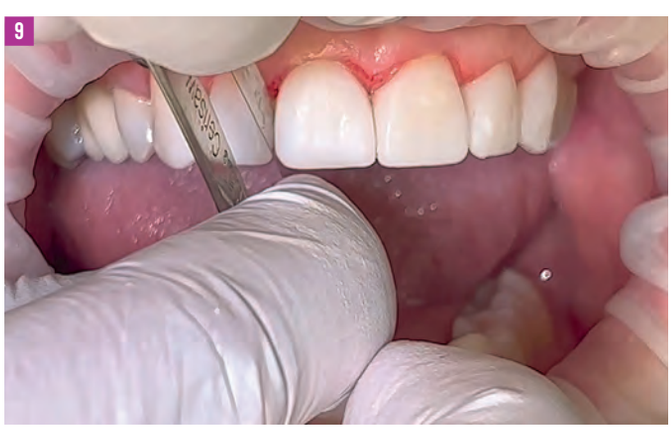
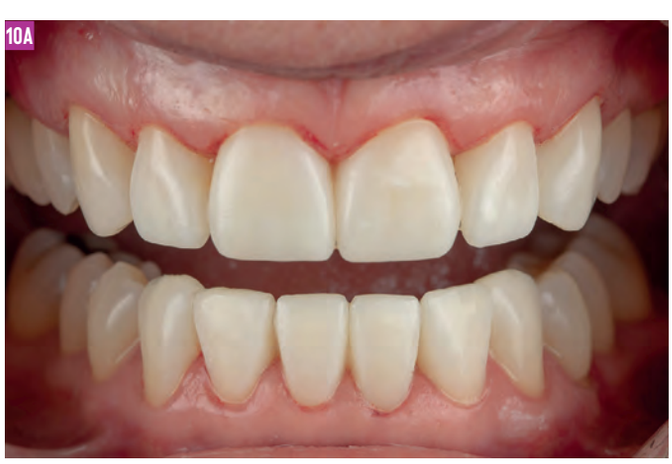
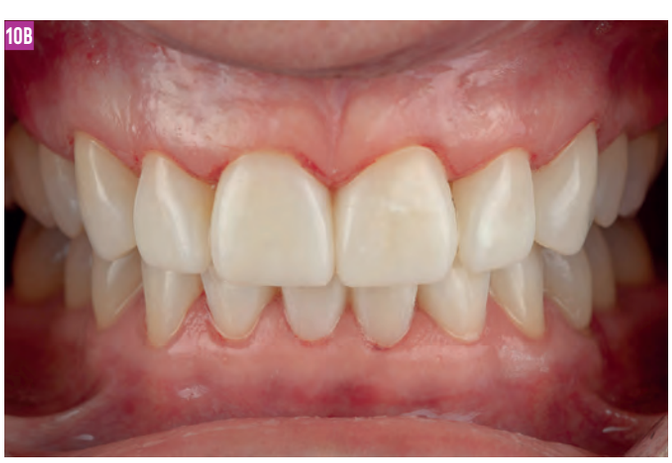
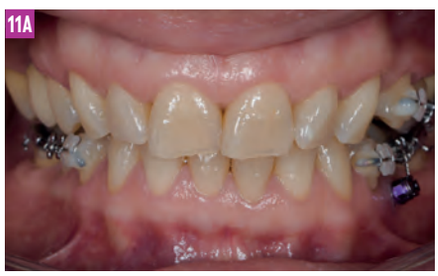


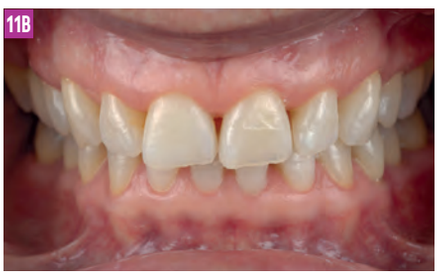
FIGURE 9: *Separating contacts*

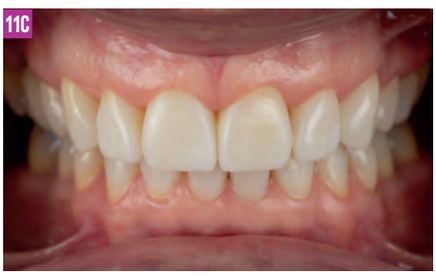




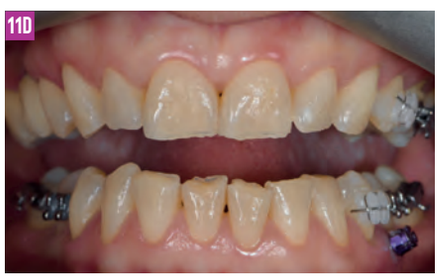
FIGURES 10A *and* **10B:** *Immediate postoperative*

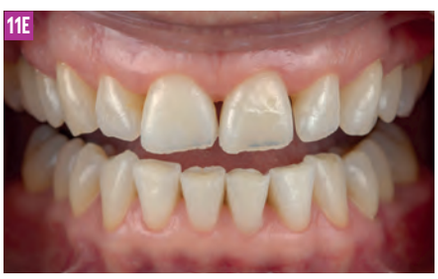


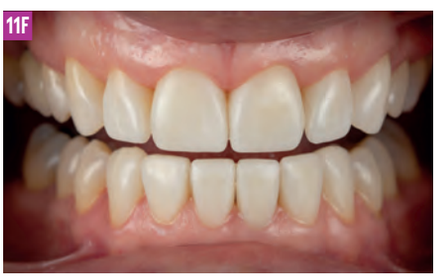




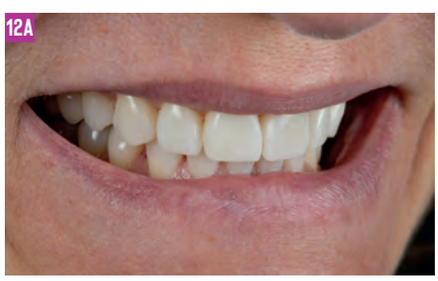
FIGURES 11A *to* **11C:** *Postoperative review a few weeks later compared with previous stages*

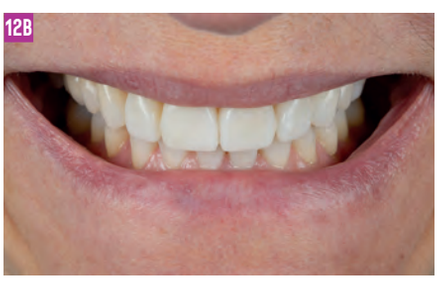


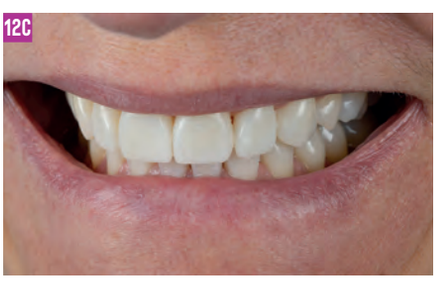




FIGURES 11D *to* **11F:** *Postoperative review a few weeks later compared with previous stages*







FIGURES 12A *to* **12C:** *Final result, smile*

posterior teeth to allow the freedom of movement of the mandible while it pivots/slides on a small point of contact in the anterior region to create form of tripod (two joints, one contact).

Now, the anatomy of the TMJ can dictate the position of the mandible without the interference any intercusping dentition.

I personally choose not to manipulate the mandible as, in my hands, I feel patients tend to resist as a reflex. I ask them to slide their mandible forward and back, slowly and repeatedly for around 60 seconds. As they slide backwards into a more retruded position, I ask them to focus on doing it slowly as I feel for a consistent and clinically repeatable position with my fingers on the TMJ. This can be done with a Lucia jig, leaf gauge, a bolus of composite, cotton wool roll… it's really how you use it to achieve the movements desired with the teeth disccluded.

The bite registration in a rigid silicon needs to be syringed as deep into the narrow interocclusal space as possible, capturing from the rear most tooth up to the canines bilaterally. You want to see the majority of the buccal cusps from the lower teeth to provide a stable platform to rest any models together on.

Next stages

I transfer my designs using GC Exaclear so I can use heated paste composites to transfer (Figure 7). I used BL monoshade in this case, which acted as an extension of the enamel surface. Silicon die separator (Figure 6) and efficient trimming of the stents allow for no escape hole on the incisal edges and easy contact point separation.

My wax-up design kept the majority of the cervical surfaces free from composite, which avoided the need to retract the gums with a cord or PTFE tape.

When looking at the teeth with the transferred composite immediately after stent removal (Figure 8), it is clear that the clean-up with a number 12 scalpel and finishing burs would be clean and non-traumatic (Figure 10).

Contacts are fairly predictable to separate with the great help of the use of a die separator. Tucking and well packing PTFE tape to do the same thing is also possible. An interproximal saw (non-abrasive, no diamond coating) is used to push through the contacts and separate each tooth (Figure 9).

At a review appointment a few weeks later, we made further refinements and achieved a high-gloss with 3M Sof-Lex Spirals (Figure 11).

REFLECTION

An elevated approach with a stent transfer would be to cut back the exterior surfaces and sculpt dentine-like anatomy in the incisal half.

Next, sandblast and activate the entire surface with silane/bond to then layer an achromatic composite to bring them to life, challenging the aesthetics of porcelain veneers. Some patients would desire this sort of result, whereas others may seek more uniformly 'white' teeth without the internal textures. CD

Acknowledgement

The author completed this case with Dr Kaval Patel, E-Line Orthodontics.

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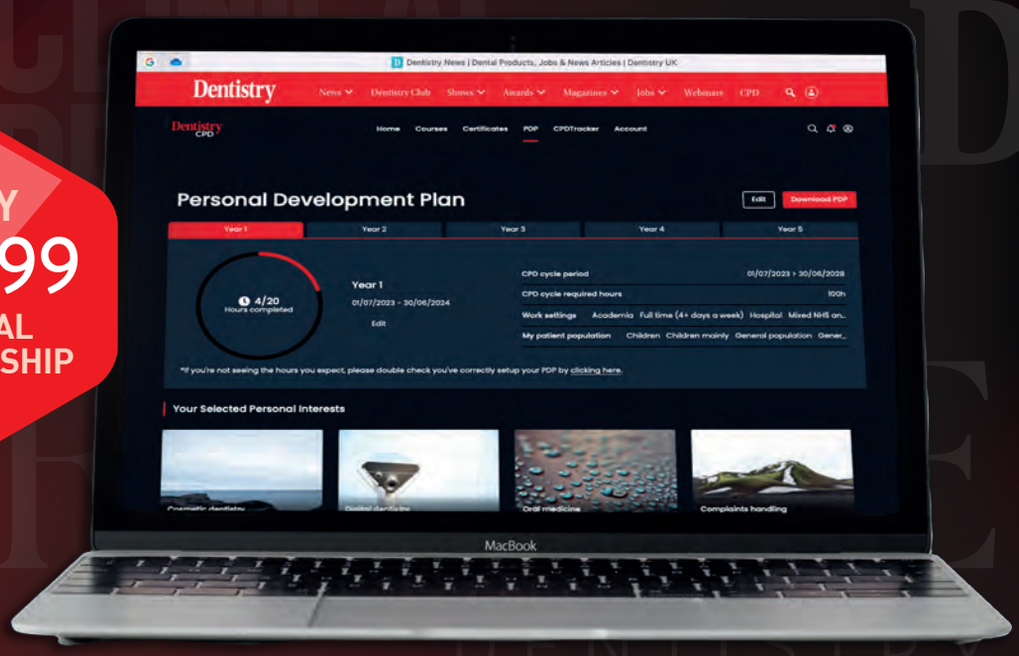

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ZIRKONZAHN DETAILS ITS MINIMALLY INVASIVE TOOTH PREPARATION TWO-DAY COURSE

ZIRKONZAHN PREPARATION COURSE

A new course has been launched within "The Zirkonzahn School", the extensive educational programme for dentists and dental technicians developed by the Italian company Zirkonzahn (South Tyrol).

The new course focuses on the importance of a minimally invasive approach to dental treatments, combining digital and analogue workflow steps. It is conceived for all dentists willing to practice and improve skills on minimally invasive tooth preparation for different clinical situations.

COURSE PROGRAMME

Day 1 – from 9.00 am to 6.00 pm:

- Explanation of the importance of a minimally invasive preparation
- Step-by-step demonstration of the five tooth preparation phases to produce zirconia crowns which each participant will re-apply on their own models.

Day 2 – from 9.00 am to 6.00 pm:

- Finalisation of the preparations
- Digital scanning of the final models with the new Detection Eye intraoral scanner
- Verifying the accuracy of the preparations in the software
- Introduction to the cementation technique and demonstration
- Crown cementation on the prepared models.

The course will be held on 13-14 February 2025 by a qualified dentist and allows a maximum of six participants.

It takes place at Zirkonzahn Klinik DeMedici, one of Zirkonzahn's nine training centres located in South Tyrol (Italy), which was designed to host events focusing on interdisciplinary collaboration between clinics and laboratories. CD

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Two-step tooth bleaching protocol

Sara Laface offers a simple two-step bleaching protocol with custom trays for a brighter, more radiant smile

Tooth whitening has become a popular cosmetic procedure to improve the appearance of smiles, with various methods available to brighten teeth. Among these, the bleaching of natural teeth using carbamide peroxide (CP) stands out as a widely used and effective approach.

This procedure relies on the breakdown of CP into hydrogen peroxide, which penetrates the enamel and dentine, releasing oxygen molecules that break down stains.

When administered properly, CP bleaching offers predictable and lasting results.

One of the common challenges in achieving a pleasing smile is the presence of canines that have a darker colour compared to other teeth.

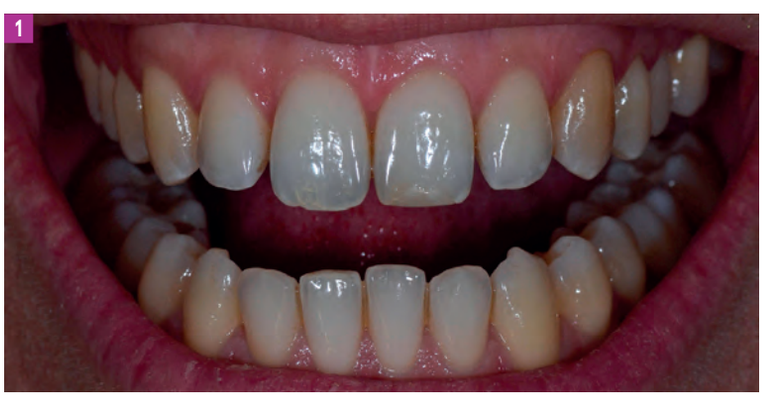
This article explores the use of CP for whitening natural teeth, addressing the specific issue of canine discoloration, in a two-step protocol.

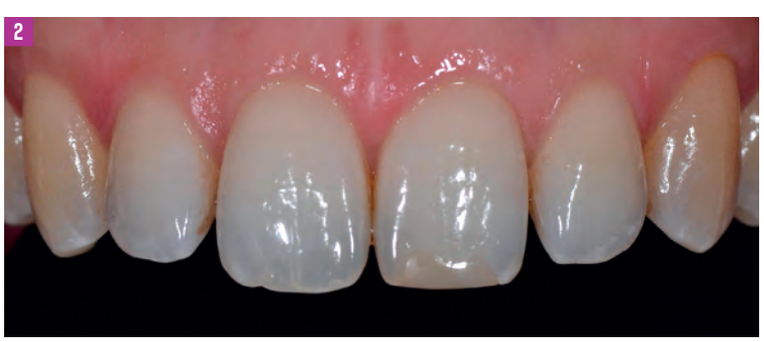
CASE STUDY

The patient's primary concern was regarding the aesthetics of her smile. She expressed dissatisfaction with the appearance of her canines, specifically their dark colour in contrast to her anterior teeth.

The patient presented with a significant difference in colour between the canines and the four anterior teeth (Figures 1 and 2).

She desired an aesthetically pleasing, minimally invasive treatment option that would not require drilling of the teeth.





FIGURES 1 *and* **2:** *Initial situation*

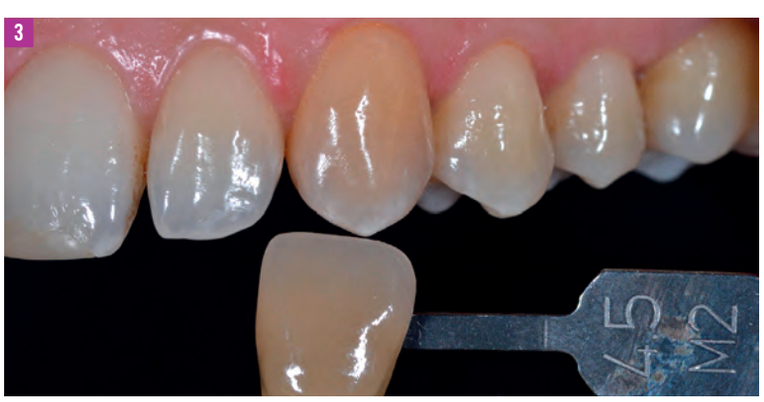


FIGURE 3: *Initial situation with shade guide*

DR SARA LAFACE
Sara graduated with honours from the University of Bologna in 2016, and obtained a master's degree in aesthetic conservative dentistry at the University of Bologna. She practises at Laface Dental Studio in Bologna, Italy. She is a community member of Styleitalino.

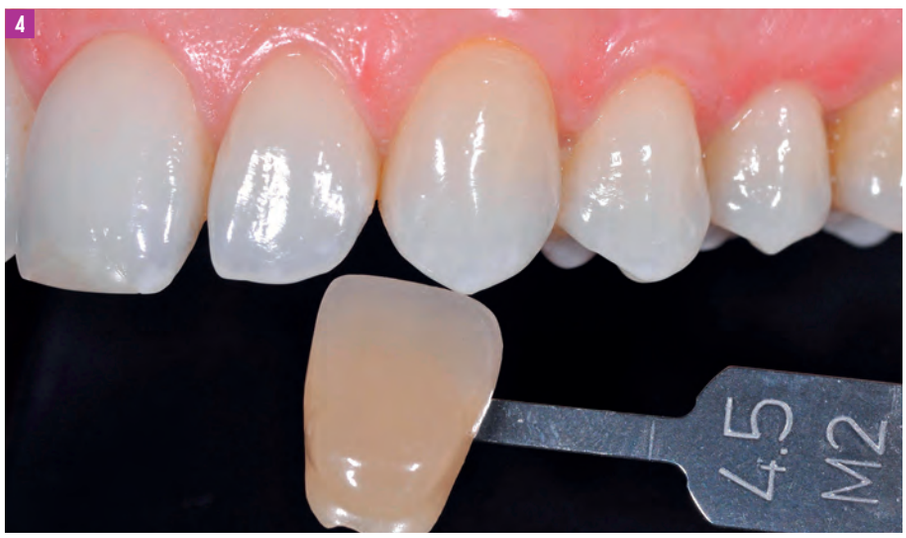


FIGURE 4: *Four weeks of home bleaching*

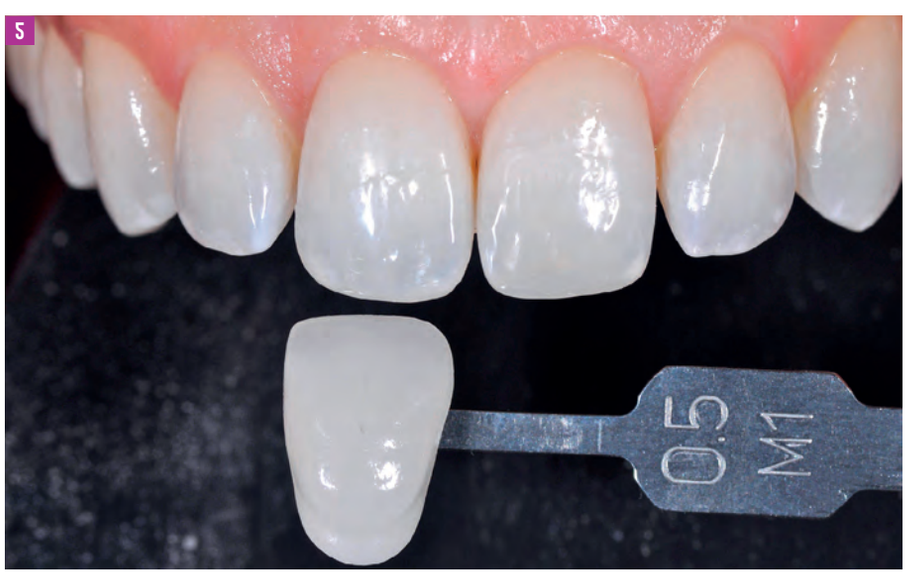


FIGURE 5: *One month of night bleaching*

FIGURE 6: *Before and after*

When administered properly, CP bleaching offers predictable and lasting results

In comparison to a Vita shade guide, the patient's canine was similar to the 4.5 M2 colour (Figure 3).

BLEACHING PROTOCOL

The decision was to create a two-step bleaching protocol that involves initially bleaching the canines only until their colour almost matches that of the anterior teeth, followed by bleaching the entire teeth.

Home bleaching was performed using a custom tray and 10% CP gel (White Dental Beauty Professional Tooth Whitening – Optident), applied exclusively to the canines for a duration of one month. The tray was worn throughout the night. After four weeks of night bleaching, the colour of the canines was pleasant and deviating from the 4.5 M2 shade guide colour (Figure 5).

At this stage, the second step started. The patient was requested to bleach all the teeth with the same product, overnight, for another month (using 10% CP gel from White Dental Beauty). After a month of undergoing a night bleaching procedure, the patient was delighted with the noticeable improvement in the colour of their teeth, which reached a shade of 0.5 M1. She was particularly pleased with the reduction in the colour difference between her canines and anterior teeth.

The difference is obvious when comparing the before and after treatment picture (Figure 6).

CONCLUSION

Patients deserve intelligent, minimally invasive treatments with minimal risk to their teeth. This two-step procedure is applicable in numerous bleaching cases due to the inherent colour difference between canines and other teeth.

Additionally, employing low concentration of CP is gentle on the teeth and minimises sensitivity. CD

PRODUCTS USED

10% CP gel White Dental Beauty Professional Tooth Whitening – Optident

TOP TIPS...

WITH AHMAD NOUNU

TOP TIPS FOR TOOTH WHITENING

These days, tooth whitening is arguably one of the most straightforward and accessible forms of cosmetic dentistry. However, it must be understood that many of us need more formal training. But what if we could make the process predictable and consistently deliver the exact results our patients desire while prioritising their comfort? Achieving that would undoubtedly establish you as a skilled cosmetic dentist with an excellent reputation.

1 **Patient expectation.** Discuss early on what the patient is looking in terms of results. Use shade tabs and show them on their teeth with mirrors and photos.

Can you realistically achieve what they're looking for? This must be discussed before you start to avoid a disappointed patient later.

2 **Diagnosis.** Why is the patient seeking whitening treatment? Are there any teeth that won't be whitened or change colour as well as the others?

If there are going to be any issues or changes to your normal whitening protocol needed, then change your tactic. Use less sensitive gels.

Consider whitening or internal bleaching, too, if you have a specifically darker non-vital tooth as part of the treatment.

3 **Limits of system.** Every system will have limitations. Understand your system's level of sensitivity after trying it on yourself, staff and patients, and incorporate that into your discussion at the start with each patient.

If your patient has had whitening previously, get a whitening history from them to be aware of what their experience has been like before. Ask about cold sensitivity, what type of toothpaste they use, and why. It's all part of the detective work needed.

4 **Options.** Depending on what will suit your patients best, you may need more than one whitening system.

Price isn't the only factor when choosing a tooth whitening product – for patients and clinicians alike; results and comfort matter just as much.

5 **Sensitivity.** If patients already use sensitivity toothpaste, do you need to trial a night-time gel first, or will they need a daytime whitening system instead?

Trial phases for a few days beforehand on low concentrations to give you and your patients great peace of mind and to build their confidence in you.

6 **Tray design.** Two different tray systems exist: vacuum-formed and pressed trays. Both have their uses.

Pressed trays, for instance, have a tighter seal and let in less saliva to mix with the gels and dilute them, but they are more expensive to produce.

7 **Time scales.** Ignore the traditional time scales and do your own. In the US, typical whitening lengths can take six to eight weeks to achieve the whiter finishes. The days of two-week whitening are disappearing, and patients are looking for whiter and brighter results, but that needs time. Tailor your results accordingly.

8 **Future top-ups.** No whitening treatment is complete without recommendations for maintaining the results and postoperative instructions that are tailored to each case.

If patients are happy with the results, they will keep coming back to you for life.

9 **Understand damage.** We are using peroxides, so understand that while the damage is very limited, it still exists. With the legal concentrations we use in the UK, we can control this superbly, but higher concentrations can cause more permanent damage, so be aware of non-official UK products.

10 **Grinding.** Be aware of bruxism, as this will have a detrimental effect on your night-time whitening treatments, as the patients won't be able to keep their trays in, and the gels will definitely become diluted.

Consider a daytime whitening system, and expect sensitivity, too. CD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DIGITALDENTISTRY

GEORGE DANDANOV
CAD technology and clear aligners

41

As you explore incorporating clear aligner therapy into your general dental practice, embracing CAD/CAM technology can significantly elevate your treatment outcomes and patient satisfaction. Take the leap into this advanced, patient-friendly approach with confidence – George Dandanov, p41

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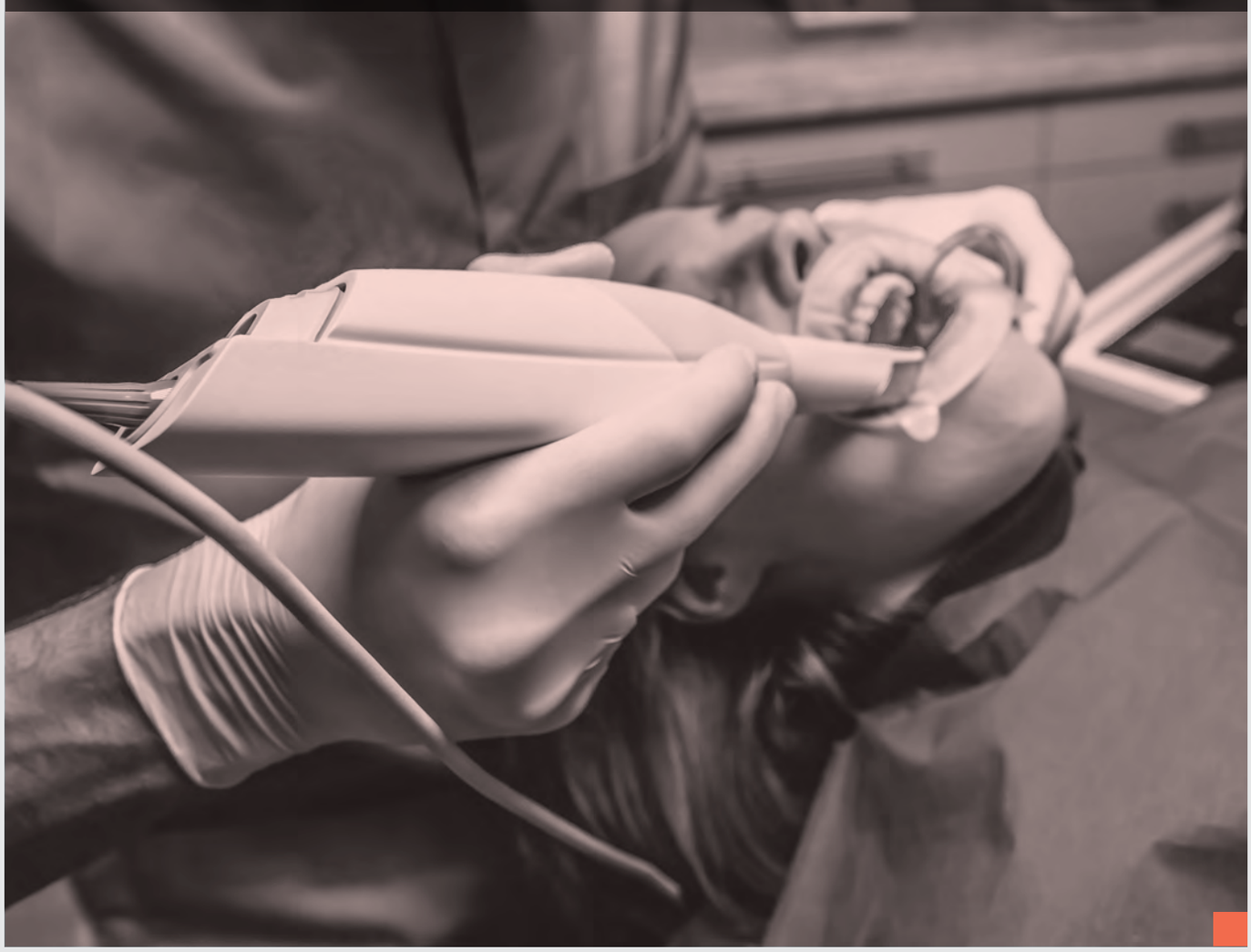

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GEORGE DANDANOV
George gained his DDM degree from Lviv National Medical University in 2018 and relocated to the UK shortly after. In 2022, he founded Smile Wide, a company dedicated to assisting clinicians, dental practices and labs with their CAD needs.

ENHANCED CPD
GDC anticipated outcome: C
CPD hours: one
Topic: Digital dentistry
Educational aims and objectives: To explore how to leverage CAD technology for clear aligner success. This article qualifies for one hour of enhanced CPD; answer the questions on page 84 or scan the QR code.

Though clear aligners may seem like a modern development, their origins date back to the early 20th century.

In 1945, Herald Dean Kesling pioneered the concept of using appliances to move teeth without traditional wires or bands. This idea was further advanced in 1959 by Henry Nahoum, who developed the first clear thermoplastic aligner. Nahoum also introduced the use of attachments; small buttons placed on teeth to enhance control during treatment.

Today, with the growing demand for aesthetic dentistry, clear aligner therapy has become a leading orthodontic solution, combining these early principles with advanced CAD/CAM technology for precise digital planning and custom fabrication, meeting patients' desires for a discreet and comfortable option.

CLEAR ALIGNER THERAPY

Newly qualified GDPs should strongly consider incorporating clear aligner therapy into their practice. With patient demand rising for aesthetic, comfortable orthodontic solutions, clear aligners provide a discreet and appealing alternative to traditional braces.

The streamlined digital workflow – utilising intraoral scanners and aligner software – makes integration efficient and manageable for any general dental practice. Additionally, clear aligners offer a profitable opportunity to expand services, retain patients and boost practice growth.

However, successful implementation hinges on a solid understanding of the biomechanics and clinical principles of clear aligner therapy, ensuring effective and predictable outcomes for patients.

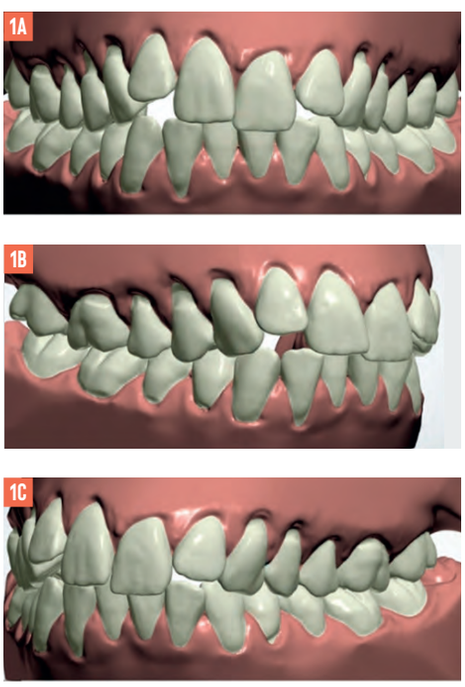
UNDERSTANDING CLEAR ALIGNERS

Clear aligner therapy is an orthodontic approach grounded in core biomechanical principles, though it differs significantly from traditional fixed appliances in how forces are applied, engagement is achieved, and anchorage is managed.

In fixed appliances, teeth are moved by pulling forces via archwires and brackets. Clear aligners, however, rely on pushing forces, with aligner material exerting pressure as it deforms over the teeth. The aligner's elasticity then guides the teeth into the desired position.

Engagement in traditional systems is achieved through archwires secured to brackets, with thicker wires providing more rigid control. In clear aligners, teeth are engaged by the aligner wrapping around them. Teeth with longer crowns have better engagement, while attachments on smaller teeth, such as peg-shaped incisors, can enhance the aligner's grip, optimising tooth movement.

Anchorage in fixed appliances typically involves reciprocal anchorage, where one segment of teeth stabilises another. Clear aligners offer more refined



FIGURES 1A *to* **1C:** *Study models*

George Dandanov discusses why you should consider incorporating clear aligner therapy into your practice and the benefits of embracing CAD/CAM technology

CAD technology and clear aligners

anchorage control, allowing for specific teeth to be stabilised at various stages of treatment, offering superior management throughout.

Understanding these distinctions is essential for clinicians when deciding between clear aligners and fixed appliances for individualised patient care.

TREATMENT PLANNING AND CASE SELECTION

Successful clear aligner therapy relies heavily on appropriate case selection, especially for GDPs and younger clinicians. To achieve optimal results, align the complexity of cases with your experience level.

As your expertise grows, you can gradually handle more complex malocclusions. For beginners, it's advisable to start with simpler cases and progressively take on moderate ones before attempting more advanced treatments.

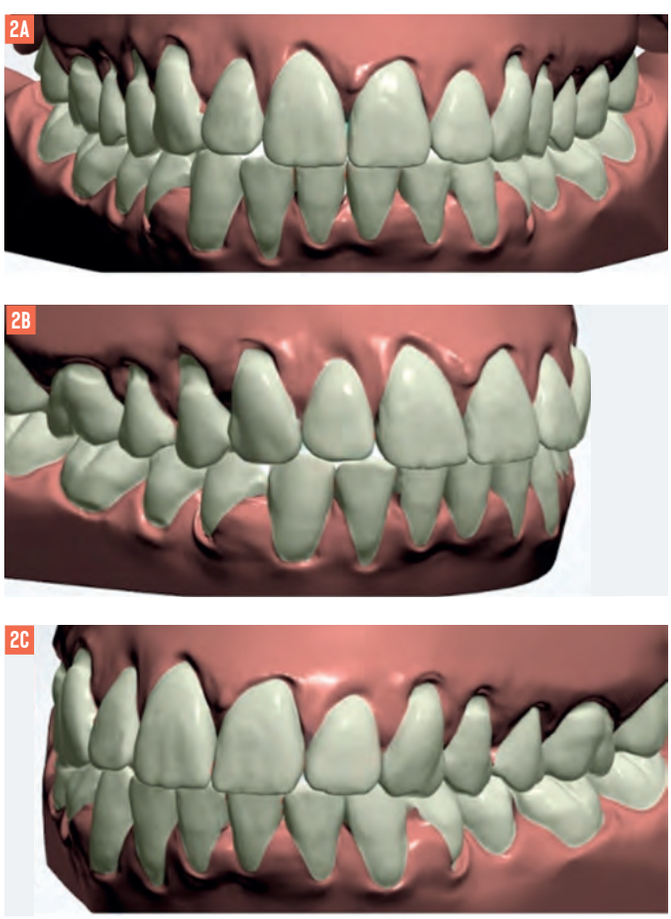
A systematic approach is key: evaluate case difficulty by analysing arch length, vertical, transverse, and anteroposterior discrepancies. This structured method ensures predictable results and helps clinicians develop their skills effectively over time.

ESSENTIAL TECHNIQUES

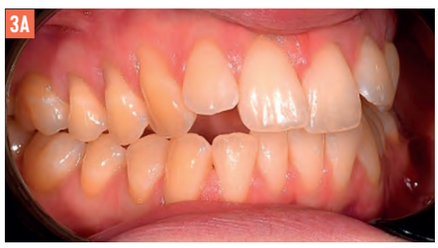
Attachments and interproximal reduction (IPR) are pivotal in optimising the biomechanics of clear aligner therapy.

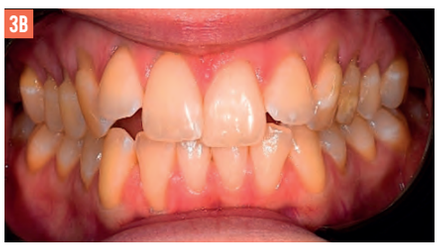
Attachments, bonded to specific tooth surfaces, enhance aligner retention and facilitate controlled movements like root torque, extrusion, and complex rotations.

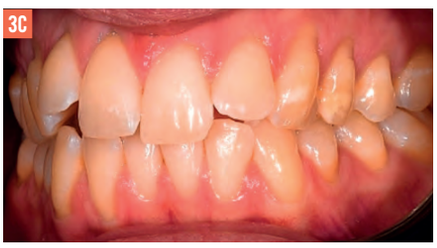
The strategic placement and design of attachments should correspond



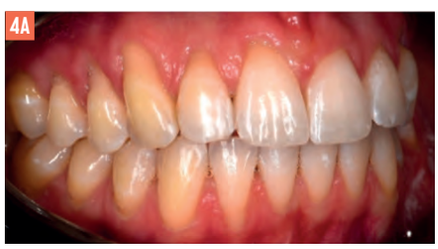
FIGURES 2A *to* **2C:** *Computer-aided design*

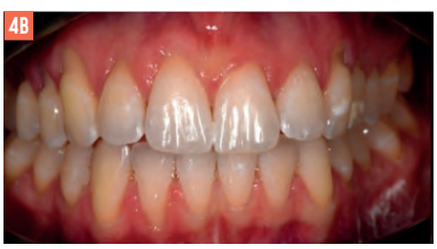


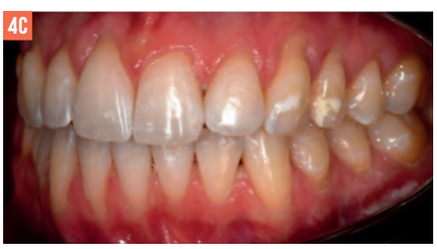




FIGURES 3A to **3C:** *Preoperative clinical photographs*







FIGURES 4A to **4C:** *Postoperative clinical photographs*

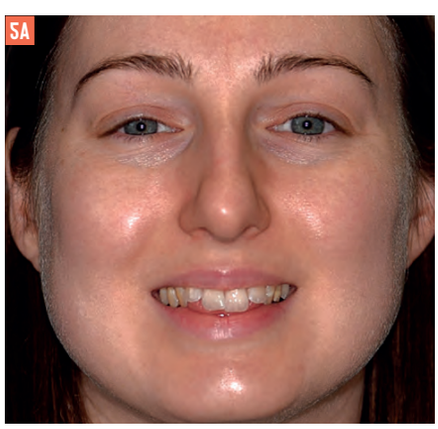


FIGURE 5A: *Preoperative full face*

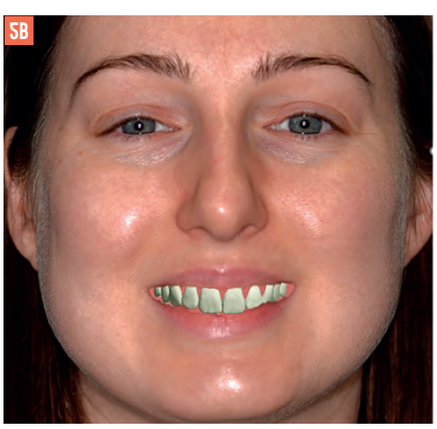


FIGURE 5B: *Digital smile design*

FIGURE 5C: *Postoperative full face*

to the biomechanical demands of the tooth movement to ensure precision.

IPR, an essential adjunct, alleviates crowding by creating interproximal space, allowing aligners to guide teeth smoothly into position. It should be performed conservatively, following a staged approach for gradual reduction while minimising enamel loss.

In more complex cases, combining elastics and TADs provides additional control over vertical discrepancies and occlusal correction, expanding the scope of clear aligner therapy for GDPs.

Mastering these techniques helps achieve superior clinical outcomes and boosts case success rates

CLINICAL CASE EXAMPLE

The patient presented with a class I molar and canine relationship, accompanied by narrowed posterior corridors and a need for expansion.

Notable anterior crowding was observed in both the upper and lower arches, with the upper lateral incisors requiring significant rotational adjustments and extrusion. A carefully planned treatment approach using clear aligners was devised to achieve the desired alignment and functional improvements.

Stage one – rotational adjustments and horizontal alignment

During the initial stage, the treatment focused on horizontal alignment and rotational adjustments. Attachments were utilised to enhance anchorage and facilitate expansion.

These attachments provided the necessary control for effective tooth movement and supported the alignment process.

Stage two – extrusion of upper lateral incisors

The second stage addressed the extrusion of the upper lateral incisors.

While attachments were crucial in the first stage, the extrusion phase employed buttons and elastics instead, offering a streamlined approach to achieve the desired vertical movement efficiently.

Outcome and results

The treatment concluded successfully with 21 aligners and one refinement stage. The results demonstrate the effectiveness of clear aligner therapy, combined with strategic use of attachments and elastics.

This case highlights the importance of meticulous planning and precise execution in achieving optimal clinical outcomes.

CONCLUSION

As you explore incorporating clear aligner therapy into your general dental practice, embracing CAD/CAM technology can significantly elevate your treatment outcomes and patient satisfaction.

Take the leap into this advanced, patient-friendly approach with confidence. Should you need any assistance with clinical planning or CAD strategies, I'm here to support your journey. Together, we can harness the full potential of clear aligners and drive your practice's success to new levels. CD

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The latest software innovation is designed to help doctors boost their practice efficiency and elevate patient experiences by shortening time to treatment through an intuitive way to design for in-practice 3D printing. The iTero Design Suite enhances the Align™ Digital Platform, which provides an innovative portfolio of customer-focused technologies that enable seamless end-to-end workflows for dental professionals.

TRANSFORMATION SOLUTIONS

"I'm excited to be working with the iTero Design Suite. I was looking for an in-practice design software that my team and I could use. The workflow is fast and efficient. We can easily design restorations, hard splints, models, and mockups to show patients the possibilities of cosmetic dentistry," said Dr. Steven Glassman, a cosmetic dentist and speaker for Align Technology who participated in the limited market release.

"We have seen growing interest in 3D printing technology from our customers, and bringing the iTero™ Design Suite to market reflects our commitment to offering our customers the digital transformation solutions they need to enhance practice efficiency and patient experiences through powerful technology," said Karim Boussebaa, Align Technology executive vice president and managing director, iTero scanner and services business.

Tillmann Steinbrecher, CEO of exocad added: "With the iTero Design Suite, doctors will benefit from a flexible solution that enables seamless workflows for in-practice production using exocad's innovative software."

EARLY ACCESS

iTero™ Design Suite is now available through an early access programme. Doctors using an iTero scanner can submit their interest via their scanner or the MyiTero™ portal. The software is expected to be available in selected markets including the UK and Ireland later this year. CD

KEY TAKEAWAYS

- Offers doctors an intuitive way to design for in-practice 3D printing of models, bite splints, and restorations, leveraging the power of exocad CAD/CAM software with simplified doctor and staff-friendly design applications.
- Seamlessly integrated with leading 3D printers.
- Doctors scanning with the iTero scanner can submit their interest via their scanner or the MyiTero™ portal.
- iTero Design Suite is expected to be made available to customers later this year.

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ENDODONTICS

Treatment began with an ID-block, followed by the placement of a Hysolate Latex Dental Dam (Coltene) to isolate the tooth. The tooth was opened, and three canals were located. The canals were found to have severe apical curvature, and the pulp was confirmed to be necrotic – Nicolai Orsteen, p48

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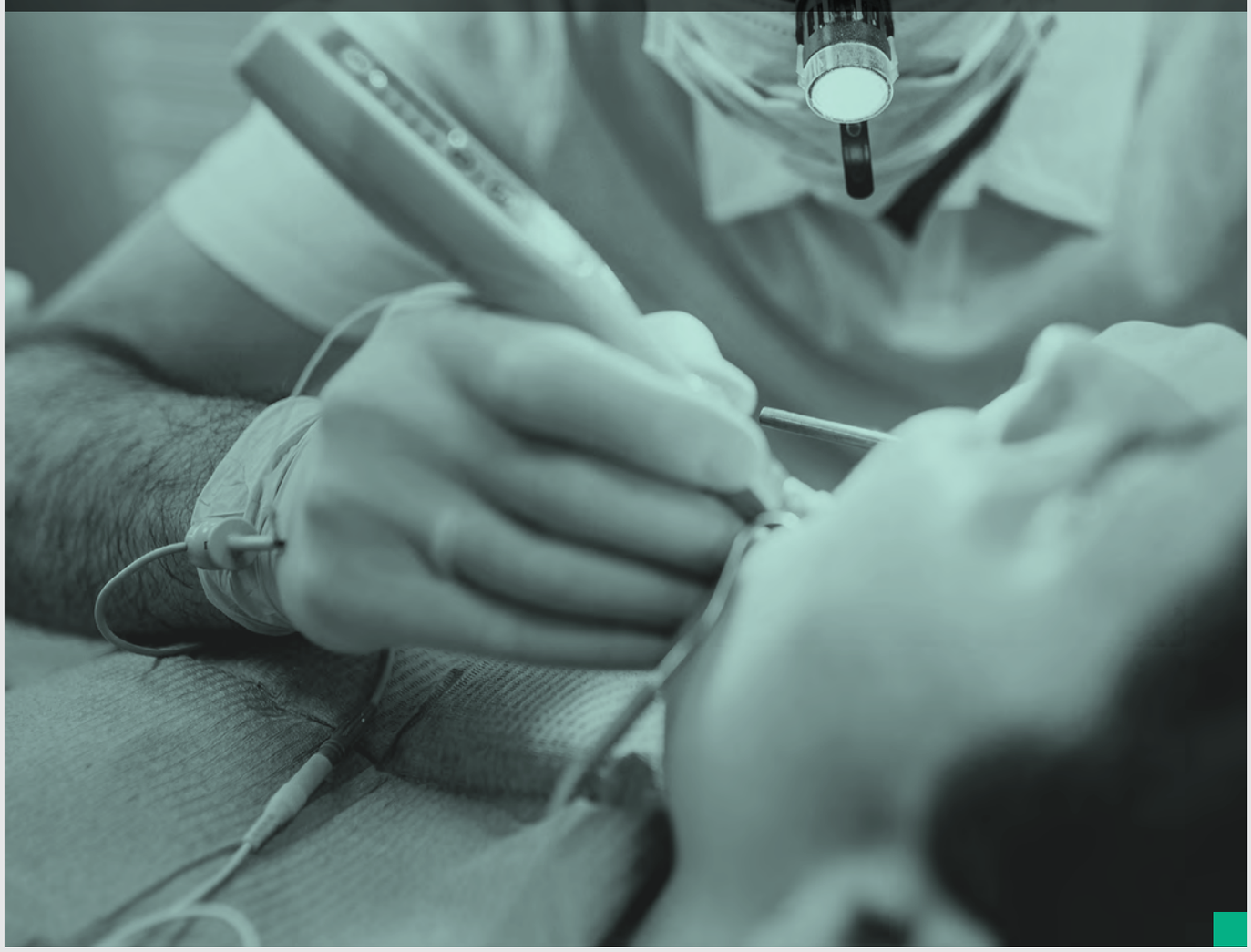

DR NICOLAI ORSTEEN
Nicolai is a specialist in endodontics. Nicolai graduated from the dental school at the University of Oslo in February 2002, going on to study for a further three years, specialising in endodontics. Nicolai has been working in private dental clinics in Oslo and London since 2002 and 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
GDC anticipated outcome: C
CPD hours: one
Topic: Endodontics
Educational aims and objectives: To present a challenging endodontic case highlighting root canal treatment on a lower molar with severe apical curvature. This article qualifies for one hour of enhanced CPD; answer the questions on page 84 or scan the QR code.

A 67-year-old female patient was referred to the practice. The referring dentist had identified the LL8 as requiring endodontic treatment, and had deemed the tooth to be restorable.

When the patient presented, she was asymptomatic. The patient's overall oral health was quite good, but she had existing restorations, including dental implants.

ASSESSMENT AND DIAGNOSIS

Tests were carried out to assess the LL8. The tooth did not respond to the ice test, or to percussion, and the periodontal probing depths were less than 3mm.

Apical radiographs were taken to assess the tooth structure. My assessment was that the restorability of the tooth was questionable, due to the substantial amount of coronal tissue loss. However, the referring dentist had assessed the situation and wanted to proceed with endodontic and restorative treatment.

TREATMENT PLANNING

The treatment options discussed included either root canal treatment or extraction, in addition to the option of doing nothing, which was not recommended in this case.

The patient wanted to proceed with root canal treatment, and we discussed the risks associated with the coronal loss on the LL8, to ensure the patient was fully informed.

TREATMENT PROVISION

Treatment began with an ID-block, followed by the placement of a Hysolate Latex Dental Dam (Coltene) to isolate the tooth.

The tooth was opened, and three canals were located. The canals were found to have severe apical curvature, and the pulp was confirmed to be necrotic.

Following this, the Hyflex OGSF file sequence was used to perform root canal treatment, beginning with the Orifice Opener file, followed by the Glidepath and Shaping files.

I felt confident about using this canal sequence to clean the root canals, without the files separating, as the files are flexible and able to adapt to the curvature of the canals.

The root canal treatment was completed with the Finishing file (30.04, 21mm).

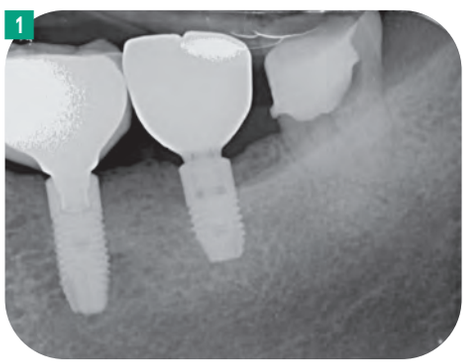

FIGURE 1: *Initial radiograph*

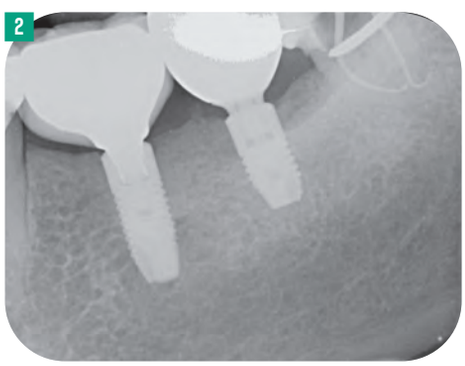

FIGURE 2: *Three canals with severe apical curvature were located. The pulp was confirmed to be necrotic*

Nicolai Orsteen describes a challenging case in which he performed root canal treatment on a lower molar with severe apical curvature

Managing severely curved root canals

Following this, the canals were sealed with gutta percha and bioceramic sealer, and the patient was provided with a temporary glass ionomer cement filling. The patient was then referred back to the referring dentist to receive her final restoration.

TREATMENT OUTCOME

The patient was very happy with the treatment outcome, and I was pleased that the endodontic treatment was successful in such a challenging situation.

DISCUSSION

In this case, I was tasked with performing endodontic treatment on a molar that had root canals with severe apical curvature.

Management of curved canals is clinically challenging, with common errors including:

- Ledge formation
- Canal blockage
- Root perforations
- Zipping
- File separation.

These complications can arise during the preparation of curved canals (Ambili and Keshava Prasad, 2021). In some cases, it may be beneficial to pre-curve hand instruments and use smaller file sizes to navigate curved canals and reduce the risk of complications (Ambili and Keshava Prasad, 2021).

I would always recommend using a flexible file system in cases like this – such as the Hyflex OGSF file sequence – to enable you to negotiate the canals' curvature. It is essential to use the latest high-quality files from a reputable manufacturer for the best results, ease of use, and reduced risk of file separation. CD

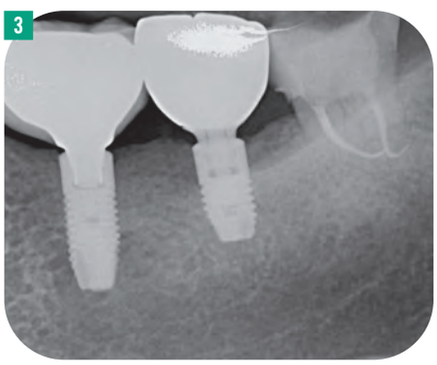

FIGURE 3: *Final radiograph*

CONTACT

www.rootcanalcentre.co.uk

REFERENCES

Ambili C, Keshava Prasad BS (2021) Trouble curve: endodontic management of severely curved root canal system – a case report. *RGUHS Journal of Dental Sciences* 13(1): 86-90

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IMPLANTDENTISTRY

In the current climate – where dental implant longevity and lack of complications are crucial – I believe allografts could provide a promising alternative – Aly Virani, p55

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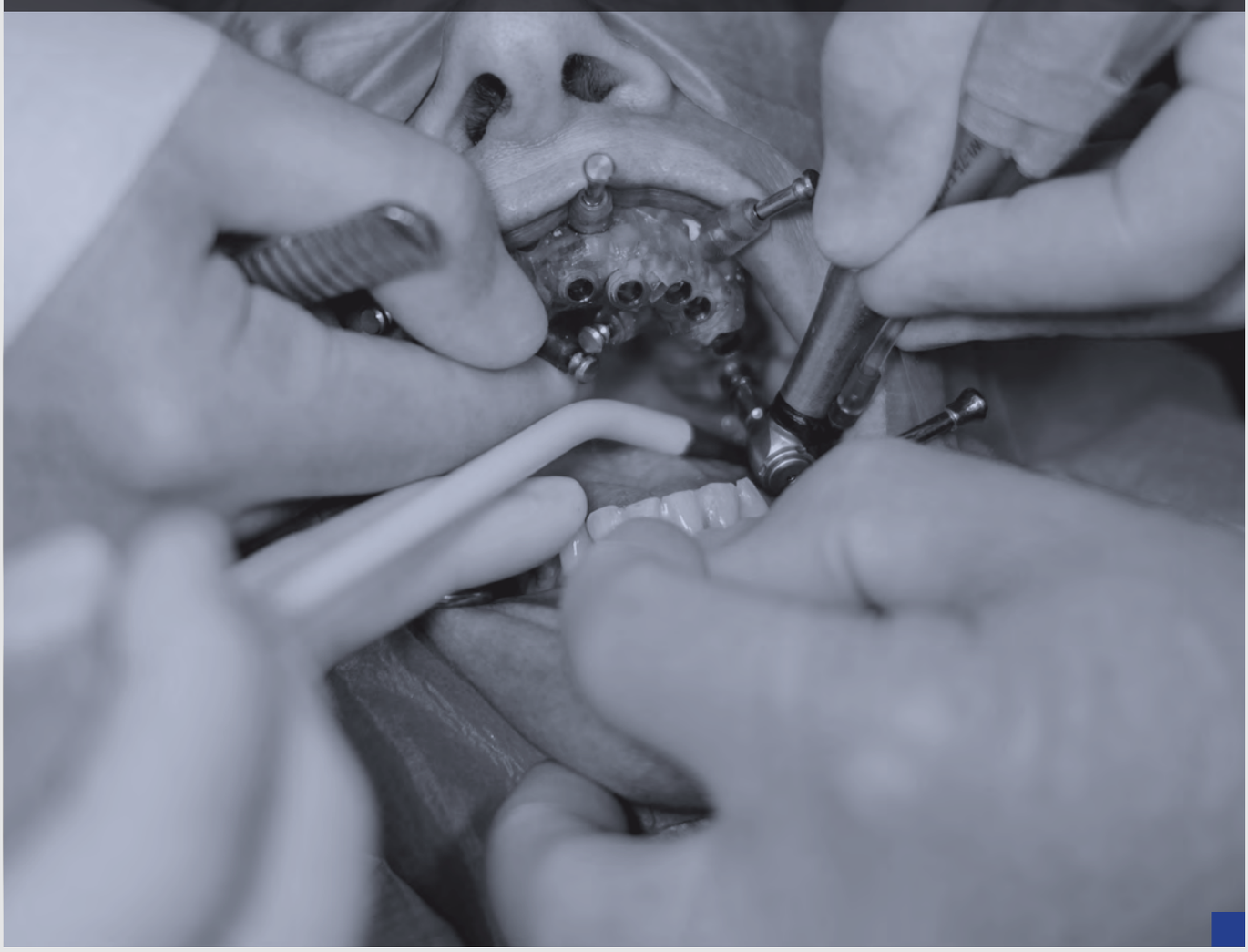

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ALY VIRANI
BDS(HONS) MJDF RCS(ENG) DIP IMP DENT RCSED MSC
Aly is clinical director and implant dentist at North Cardiff Dental & Implants.

ENHANCED CPD
GDC anticipated outcome: C
CPD hours: one
Topic: Implant dentistry
Educational aims and objectives: To explore the utilisation of synthetic bone grafting materials in the aesthetic zone for single tooth replacement. This article qualifies for one hour of enhanced CPD; answer the questions on page 84 or scan the QR code.

The use of synthetic (alloplast) bone grafting materials has been recently popularised amongst implant dentists through its prominence in clinical cases posted across social media platforms.

Despite alloplasts having a long history of different iterations, Ethoss (Swallow Dental Supplies) is a version that claims to have solved many of the problems presented by the older alloplasts, as well as the shortcomings of the alternative grafting methods.

ALTERNATIVE MATERIALS

Autogenous (bone from the same patient) graft remains the gold standard in regenerating bone with osteoconductive, osteoinductive and osteogenic potential.

However, the need to harvest this material, potentially from a secondary surgical site, can make it less popular amongst patients.

Speed of turnover can be overcome using cortical bone blocks with the Khoury technique, but this requires more advanced skills and patient acceptance.

Allografts (bone from other humans) are readily available and derived from cadavers. The risk of contamination is very low (Holtzclaw et al, 2008), but historic cases of contamination and the inability of graft recipients to donate blood can be barriers to patient acceptance.

Xenografts (bone from other animals) remain internationally popular and are still considered one of the only predictable long-term solutions to building bone outside of the bony envelope.

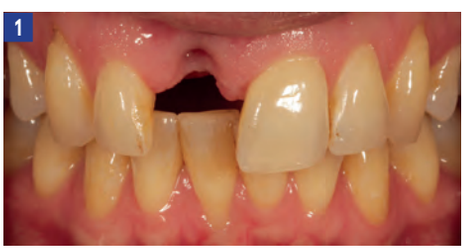
However, the need for barrier membranes and their stabilisation makes this more technique sensitive.

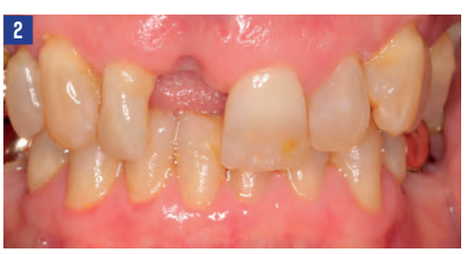
Despite the longstanding and robust clinical evidence base that surrounds the use of bovine xenograft in implant dentistry, the lack of turnover and potential immune reaction to these materials has been called into question (Rodriguez and Nowzari, 2019).

However, it is prudent, as always, to consider the potential funding bias behind the evidence base when evaluating these materials.

Autogenous grafting is the only option from those listed that does not carry the potential for a graft versus host response (Zhao et al, 2021).

In the current climate – where dental implant longevity and lack of complications are crucial – I believe allografts could provide a promising alternative.





FIGURES 1 *and* **2:** *Following extraction, the sites were left to heal for six weeks to allow soft tissue closure*

Aly Virani explores the utilisation of synthetic bone grafting materials in the aesthetic zone for single tooth replacement

Alloplast bone grafting in the aesthetic zone

MATERIAL PROPERTIES

Ethoss is composed of calcium sulphate and tricalcium phosphate. The tricalcium sulphate forms a nano-porous cell occlusive membrane, performing the function of a tradition barrier membrane without the need for further materials and stabilisation techniques.

As it breaks down, the calcium sulphate releases calcium ions that stimulate osteoblastic activity and retard osteoclastic activity. The loss of calcium ions leads to an antimicrobial acidic environment.

Without tricalcium phosphate, however, the rate of material turnover would be higher than the rate of new bone deposition and thus would not facilitate bone regeneration.

Tricalcium phosphate provides the porosity through which angiogenesis can occur, it increases the expression of angiogenesis related genes. The beta version (β-tricalcium phosphate) shows the highest regenerative potential and lends the materials a resorption rate of nine to 16 months.

Combining the calcium sulphate and β-tricalcium phosphate has produced a self stabilising paste that hardens in situ and adapts to bony defects while maintaining the ability to serve as a scaffold for bone regeneration.

Publications suggest that because there is no need for a barrier membrane, surgical procedures are shorter, simpler and less expensive (Cheah et al, 2021).

THERAPEUTIC GOALS

Achieving optimal outcomes in the anterior zone depends on both the white and pink aesthetics.

Despite there being truth behind David Garber's popularised phrase that 'the tissue is the issue, but the bone sets the tone', we know that we can enhance pink aesthetics and improve tissue thickness through various soft tissue grafting techniques.

Ethoss users have reported thicker than expected keratinised tissues following the use of the material for hard tissue regeneration (Leventis, Fairbairn and Lindner, 2019).

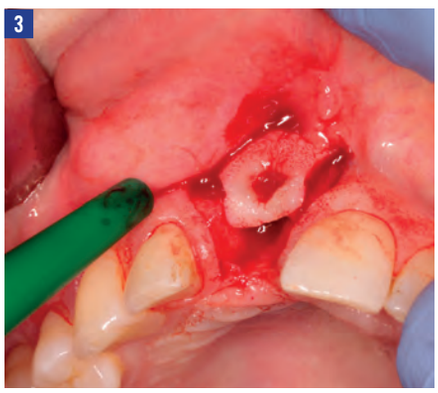
These anecdotal results have a sound theoretical basis (Bikle, Xie and Tu, 2012) and could be a reason to consider the material when working in the aesthetic zone.

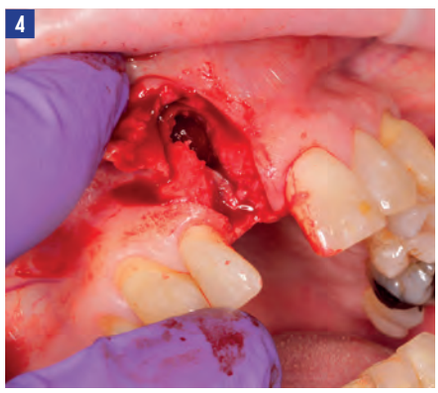
Achieving thicker keratinised tissues would provide the peri-implant tissue stability and cosmetic benefits without the need for further surgical intervention.

EARLY CASES

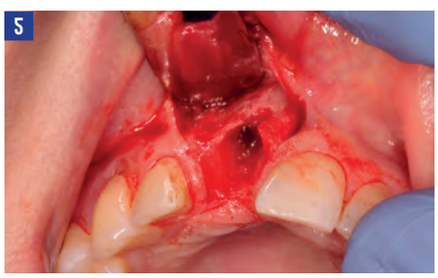
The Ethoss protocol

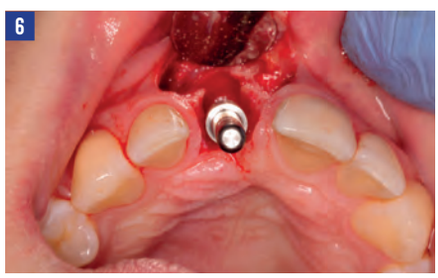
The author's early cases were carried out following the manufacturers' protocols (Leventis, Athens and Fairbairn, 2017).

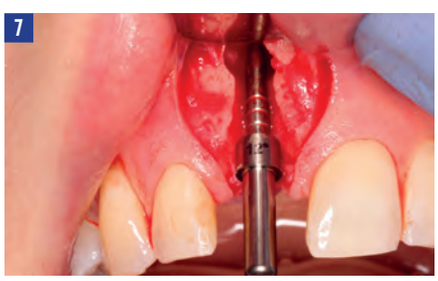


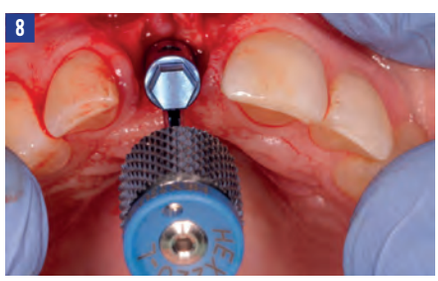


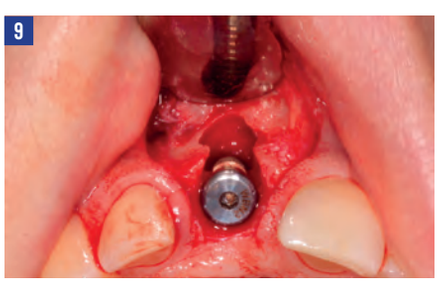
FIGURES 3 *and* **4:** *A papilla sparing mucoperiosteal flap was raised*

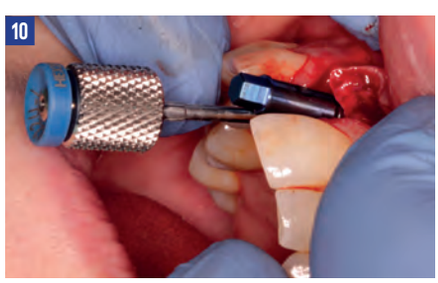












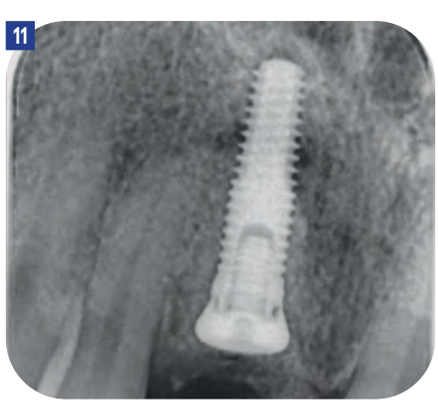
The anterior teeth to be replaced were extracted and sockets curetted. Sites were left to heal for six weeks to allow soft tissue closure (Figures 1 and 2).

A papilla sparing mucoperiosteal flap was raised (Figures 3 and 4) and a Co-Axis implant (Southern Implants) was placed in the correct anatomical position (Figures 5 to 11).

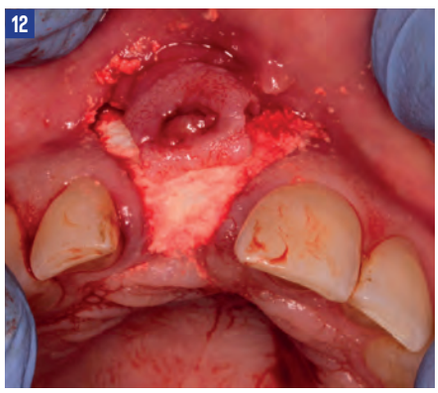
Ethoss was simultaneously used to graft any defects (Figures 12 to 15).

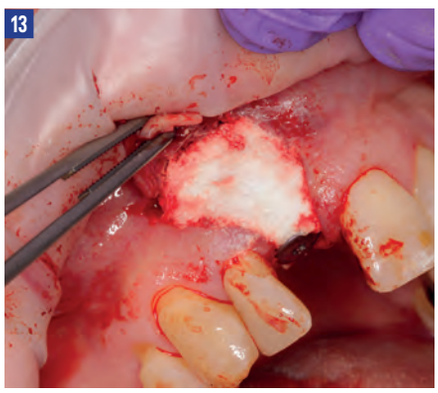
Healing was monitored with suture removal after two weeks (Figure 16).

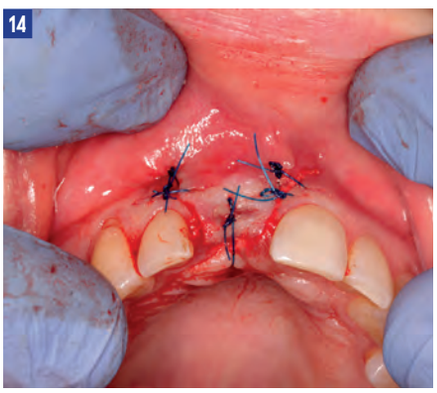
The dental implants were loaded after 10 weeks.

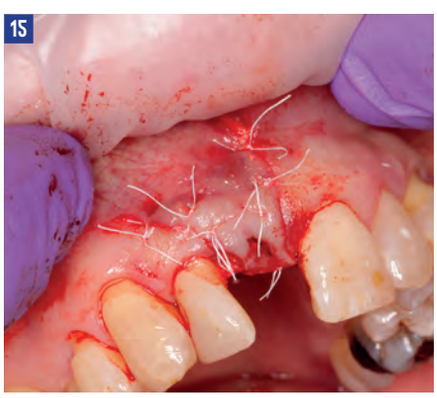


FIGURES 5 *to* **11:** *Implant placed in the correct anatomical position*









FIGURES 12 *to* **15:** *Ethoss was simultaneously used to graft any defects*

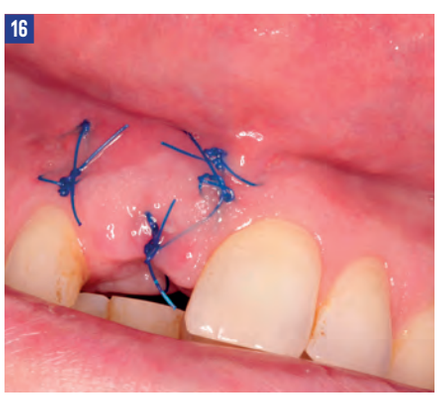


FIGURE 16: *Healing was monitored with suture removal after two weeks*

The results
Figures 17 to 19 display the resulting outcomes. The pink aesthetics have been affected by papilla loss and resulted in black triangles between the implant and adjacent teeth.

The published protocol consistently led to further similar results.

FACTORS TO CONSIDER

Lip line and patient expectations
These have been the mitigating circumstances that have led to an acceptable outcome on these patients' behalf, but the aim of implant treatment should be to comprehensively regenerate the lost tissues where possible.

Tooth shape
Loss of papillae is more noticeable with triangular teeth and longer papillae. Patients with square teeth had noticeably better aesthetic outcomes.

Timing of implant placement
Early implant placement at six weeks is encouraged, as soft tissue healing allows for primary closure of the surgical site, thus preventing washout of the graft material.

At this point, papilla volume loss can already be seen in the cases in Figures 1 and 2.

Timing of tissue and implants loading
Allowing an integration period of 10 weeks could result in further soft tissue volume loss if a mucosa borne temporary prosthesis is used in the interim.

THE ALTERNATIVE

In appropriate cases, where well documented, published criteria are followed, immediate implant placement with immediate loading (type 1A) could overcome these aesthetic challenges, as well as providing the patient with a better quality of life during the healing phase.

However, it is imperative that the patient understands that this temporary prosthesis is non-functional and should not be used for mastication.

The prosthesis should be kept out of occlusion and checked carefully in all functional movements to ensure that there are no interferences that could lead to the micro movement and consequent fibrointegration of the implant (Wittneben et al, 2023).

RECENT CASES

A modified protocol
Subsequent single implants in the aesthetic zone where appropriate were treated with a type 1A approach.

We can enhance pink aesthetics and improve tissue thickness through various soft tissue grafting techniques

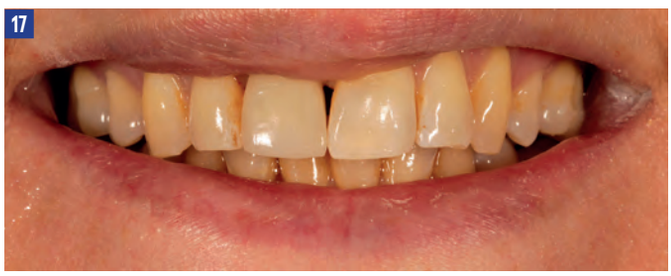
Tooth removal, flapless Co-Axis implant placement, jump gap grafting using Ethoss and immediate loading using a polyetheretherketone (PEEK) post and composite resin.

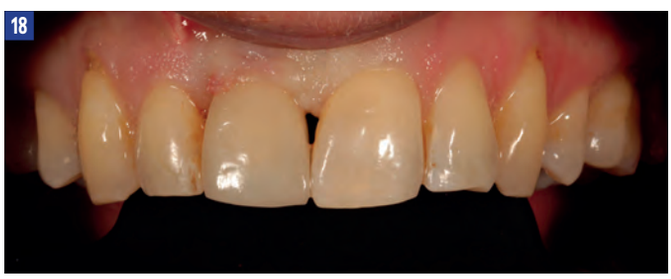
The implant depth and contour of the crown were carefully controlled in order to produce an S-line emergence, which prevents wash-out of the graft material, provides support to the existing soft tissues and allows space for peri-implant soft tissue infill within the critical zones (Figures 25 and 26).

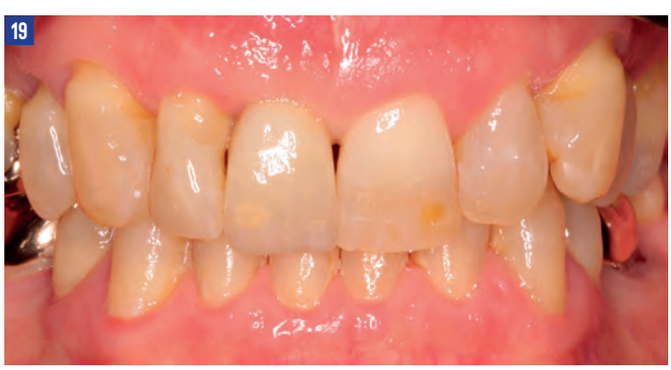
The following conditions should be met for type 1A protocol to be followed: healthy adjacent teeth, intact facial bone, no acute infection present, ability to place the implant in the correct three-dimensional position for an optimal restoration, and anticipated primary stability of the implant to allow immediate restoration.

The Co-Axis implant feature allows angle correction at implant level. Typically, this is 12-degrees in maxillary incisors when transitioning from root to crown, therefore Co-Axis implants allow for more cases to meet this criterion.

The implant can be placed with both a surgically and restoratively dictated position, according to the existing anatomy with less risk of buccal perforation of the implant apex, as is the case when uprighting conventional straight implants for straight screw retention in the aesthetic zone.







FIGURES 17 *to* **19:** *Resulting outcomes*

The results

Upon removal of the restorations at 10 weeks, there was a notable difference in gingival architecture in these cases versus the cases treated with the Ethoss protocol (Figures 27 to 30). Notably, there was no loss or even blunting of the interdental papillae.

Graft material can be seen in the peri-implant soft tissues, which would be expected for up to 18 months after the graft placement. The tissues look healthy with bleeding resulting from the interruption of the hemidesmosomal attachment between the tissues and the immediate temporary crown.

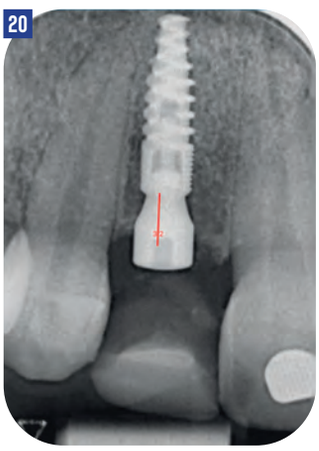
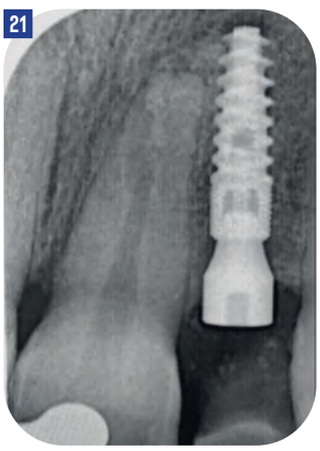
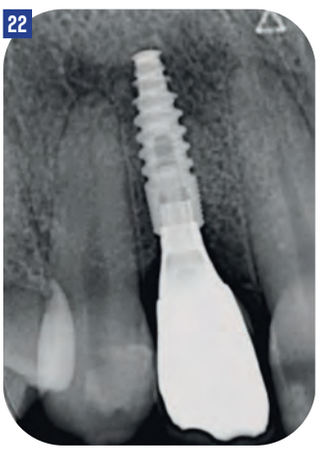
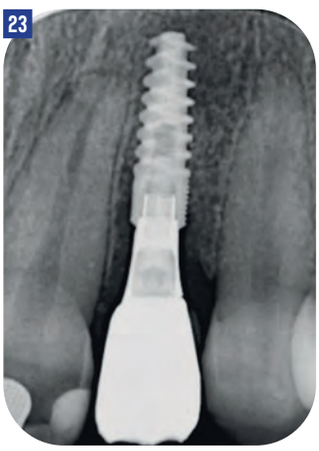
The pre-treatment and post final restoration photos for these cases can be seen in Figures 31 to 34.

DISCUSSION

This paper discusses a small number of cases with a relatively short follow-up time and the experience of only one clinician. This paper should only serve as a narrative for potential complications when using alloplastic graft materials.

Innovation is at its highest rate in history in implant dentistry and caution should be observed when exploring new materials and new protocols. However, without a willingness to explore new avenues in a stepwise manor, we will never progress past the issues we face when using today's materials and techniques.

Furthermore, patient demands and clinicians' expectations of themselves are increasing. Our willingness to openly discuss what has and has not

FIGURES 20 *to* **23:** *Radiographs*

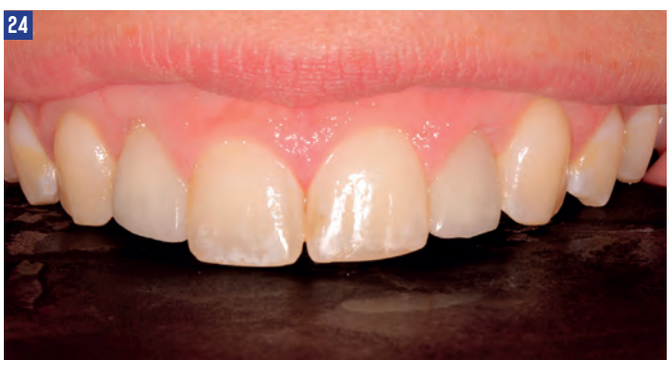
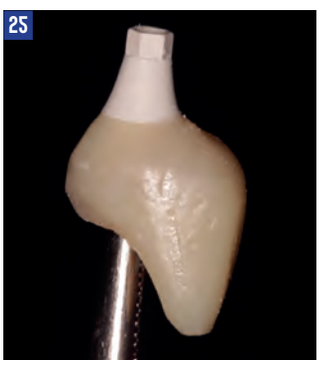
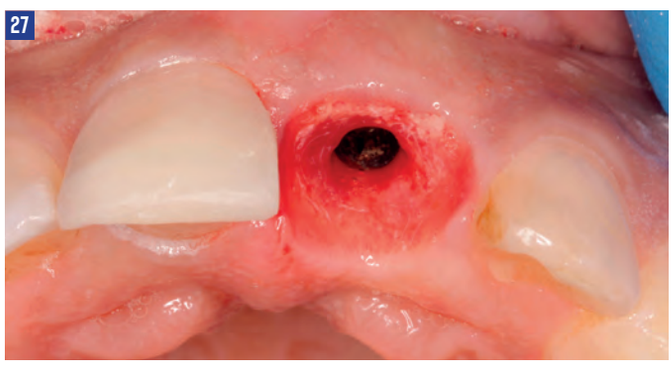
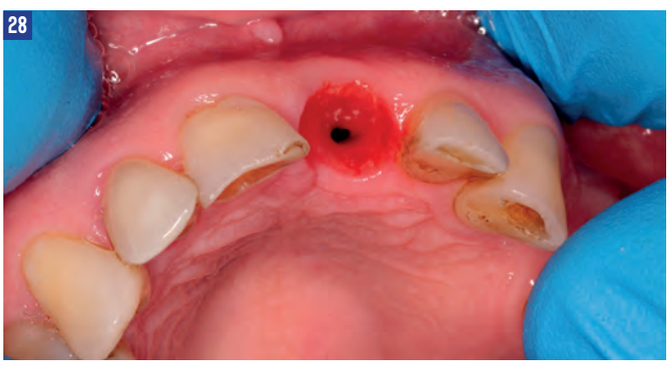
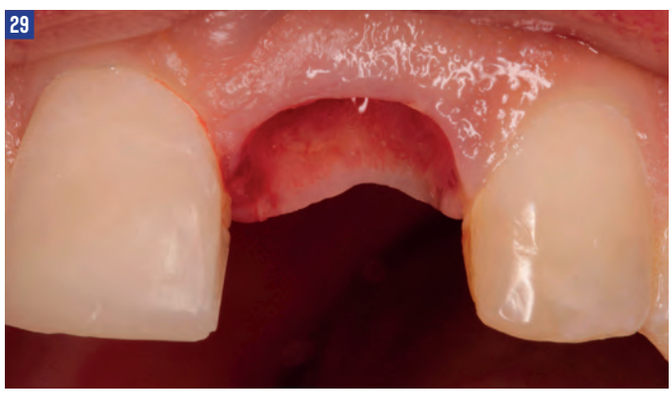
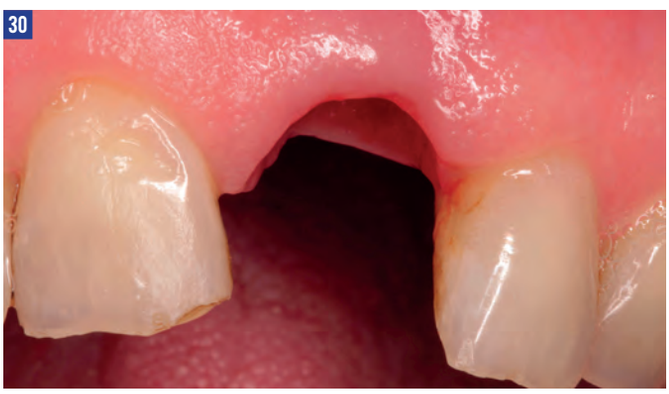


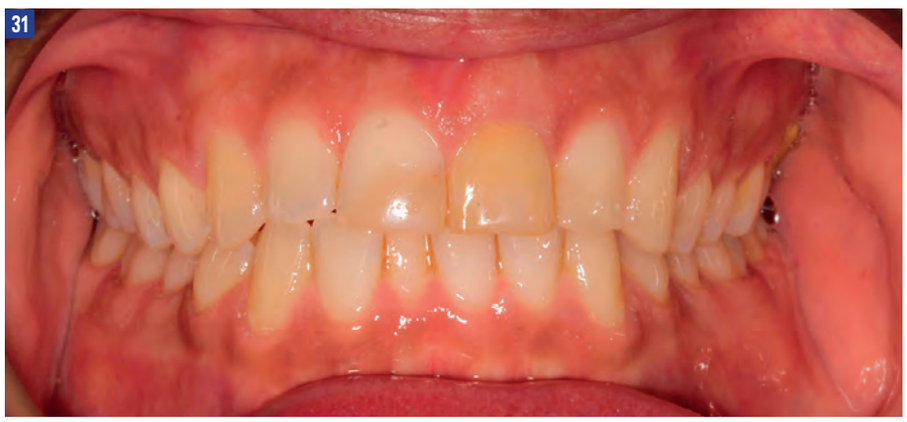
FIGURE 24: *Final result*

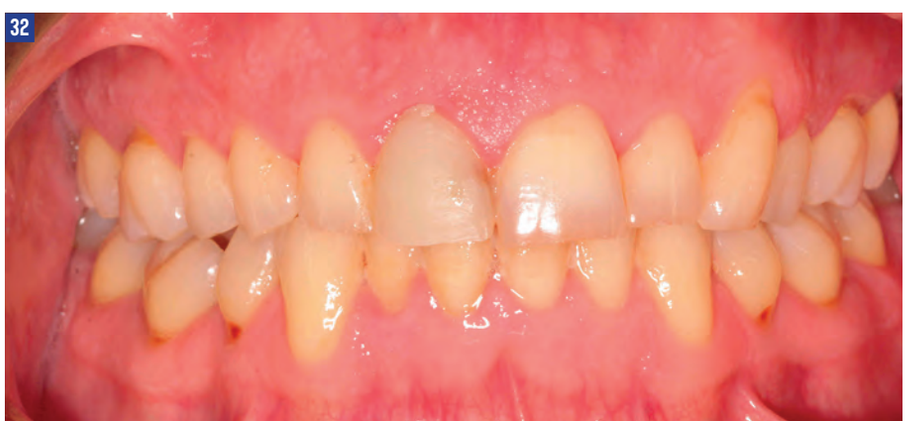


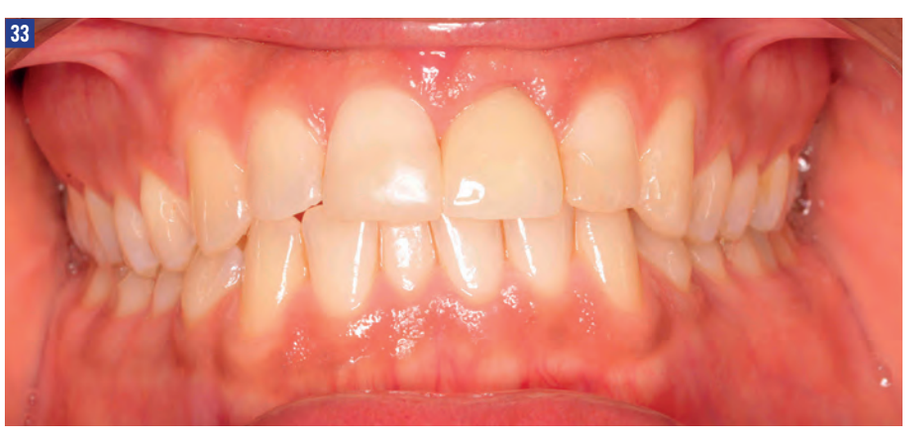

FIGURES 25 *and* **26:** *Implant depth and contour of the crown were carefully controlled in order to produce an S-line emergence*

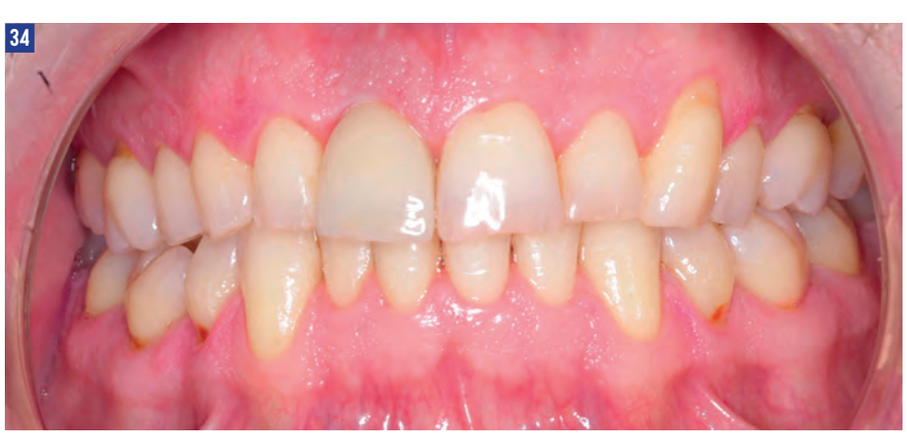





FIGURES 27 *to* **30:** *Upon removal of the restorations at 10 weeks, there was a notable difference in gingival architecture in these cases versus the cases treated with the Ethoss protocol*









FIGURES 31 *to* **34:** *Pre-treatment and post final restoration photos*

worked in our clinical practice will be more valuable as the proportion of complex implant dentistry is performed outside of academic settings.

CONCLUSION

Where appropriate, combining a type 1A implant protocol with site specific Co-Axis implants and Ethoss sythetic graft material can lead to better pink aesthetic outcomes. CD

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TOP TIPS...

WITH NICK FAHEY

TOP 10 TIPS FOR GUIDED SURGERY

Guided implant surgery offers numerous advantages, including being less invasive, requiring fewer surgical procedures, and reducing patient post-treatment discomfort. With its increasing popularity among implant dentists, there is a growing need to focus on best practices that ensure precision, safety and optimal outcomes. As more practitioners embrace this innovative approach, it's essential to understand the intricacies that make guided surgery successful. For that reason, I wanted to share my 10 top tips to help practitioners enhance their surgical planning, improve patient experience, and achieve consistently excellent results.

1 **Thorough preoperative planning.** Invest time in detailed preoperative planning, using advanced imaging techniques like CBCT (cone beam computed tomography) to assess the patient's anatomy and plan the exact placement of implants or other surgical interventions.

2 **Choose the right guide.** Selecting the appropriate surgical guide is important for successful outcomes. Consider the patient's specific anatomy, such as bone density and soft tissue thickness, to ensure the guide is customised and fits securely. Assess whether a tooth-supported, mucosa-supported, or bone-supported guide best suits the case. A well-fitting guide maintains stability and precision, reducing the risk of complications, so prioritise quality and make necessary adjustments to optimise performance.

3 **Accurate data acquisition.** Ensure that all data, such as digital impressions and scans, are accurate and up-to-date.

Even small errors in data can lead to significant complications during surgery. Remember: rubbish in will mean rubbish out.

4 **Verify guide stability.** It is best practice to confirm that the guide is stable and secure before surgery. Any movement during the procedure can lead to deviations from the planned surgical path. Sometimes, this is impossible, for example, in cases where teeth need to be extracted for immediate placement.

In these situations, have the necessary equipment ready in case you need to adjust the guide interoperatively.

5 **Practice with the guide.** Conduct a trial run with the surgical guide outside the patient's mouth to familiarise yourself with the guide's design, fit, and any potential issues that may arise during the actual procedure. Then place the guide in the mouth and make sure the armamentarium that you have for guided surgery fits accordingly.

6 **Minimise deviations.** Be mindful of potential deviations during drilling or placement. Use the surgical guide to control depth, angulation, and position to avoid errors. If you use too much force or create stresses in the surgical guide whilst drilling, the guide will flex and bend, resulting in the osteotomy being transported from its intended location.

In extreme cases, the surgical guide may even fracture or break.

7 **Sterilisation protocols.** Strict sterilisation protocols are crucial to prevent infections. Ensure the surgical guide and all instruments are properly sterilised, following the manufacturer's guidelines and best practices. And always check specific material requirements.

8 **Intraoperative imaging.** Use intraoperative imaging techniques, such as real-time radiography, to confirm that the surgery is proceeding according to plan and to make any necessary adjustments.

9 **Patient communication.** Keep the patient informed about the guided surgery process, including its benefits and any potential risks. A well-informed patient is more likely to be cooperative and calm during the procedure.

10 **Postoperative care.** After surgery, ensure proper postoperative care and follow-up.

Verify that the surgical outcomes align with the preoperative plan and address any complications promptly.

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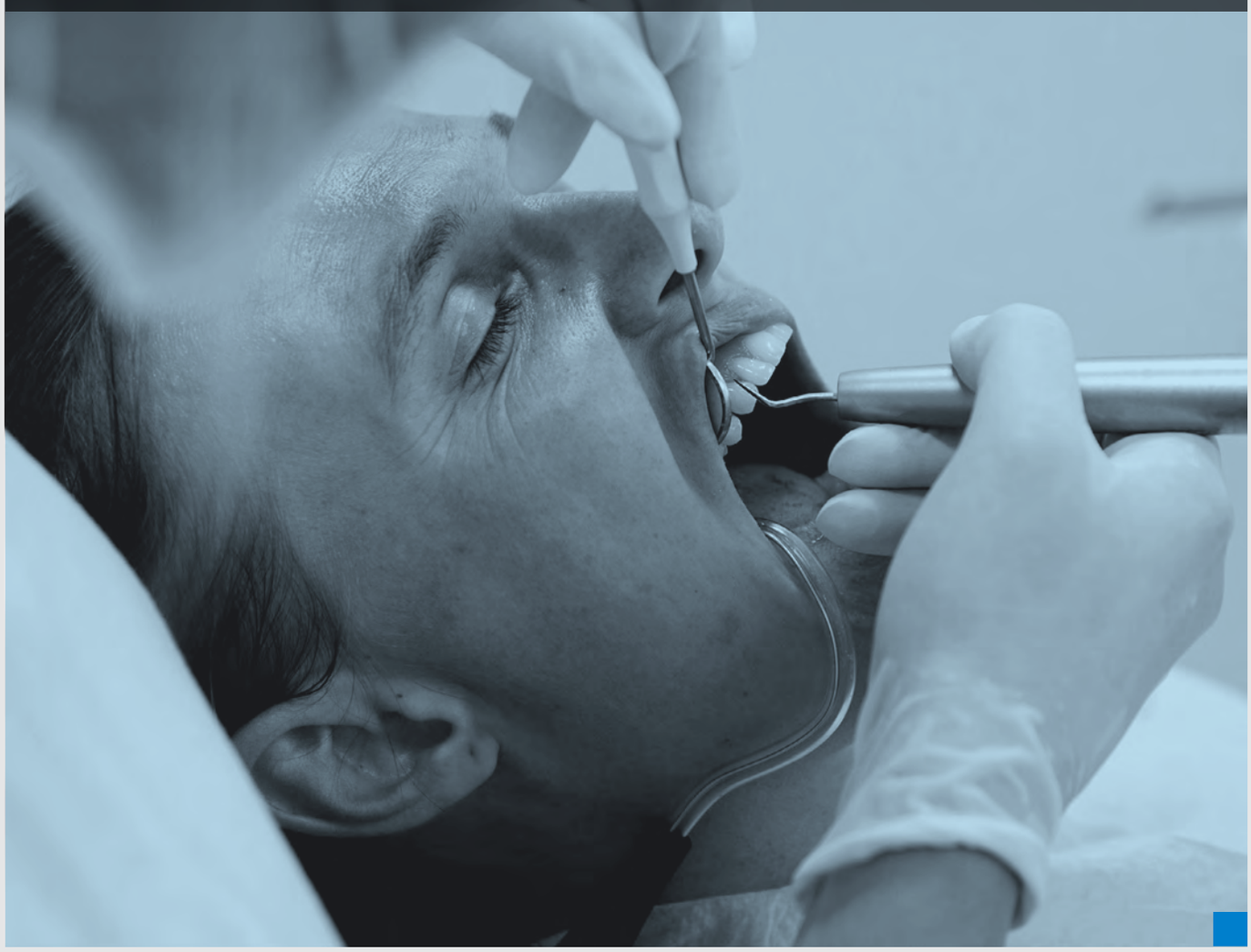
ORALHEALTH

Burning mouth syndrome (BMS) is the condition where a burning sensation is experienced of the oral mucosal surfaces without any identifiable clinical symptoms or lesions. The symptoms entail a burning and/or painful sensation of the mouth and may be associated with a dry mouth and, at times, an altered taste perception – Wynand Dreyer and Andre van Zyl, p67



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LISTEN TO THE EXPERTS: TACKLING GUM DISEASE TOGETHER

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

*The views and opinions expressed by the panel members are their own, and do not represent those of Corsodyl or Haleon plc.

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BDS HDD PHD FCD(SA)OMP
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DR ANDRE W VAN ZYL
MCHD
Andre is in private practice in Hermanus, South Africa.

ENHANCED CPD

GDC anticipated outcome: C

CPD hours: one

Topic: Oral health

Educational aims and objectives: To discuss burning mouth syndrome – its symptoms, clinical presentation and treatment. This article qualifies for one hour of enhanced CPD; answer the questions on page 84 or scan the QR code.

Burning mouth syndrome (BMS) is the condition where a burning sensation is experienced of the oral mucosal surfaces without any identifiable clinical symptoms or lesions (Slebioda, Lukaszewska-Kuska and Dorocka-Bobkowska, 2020).

It is a taxing burden on both patient and the dental practitioner. This is due to the pain and discomfort associated with this symptom complex and its possible persistence over an extended period.

The symptoms entail a burning and/or painful sensation of the mouth and may be associated with a dry mouth and, at times, an altered taste perception.

The pain is most often felt on the tongue, but other oral structures may also be involved.

It is difficult to diagnose BMS and it can only be confirmed once all possible local and/or underlying systemic conditions have been ruled out.

Systemic conditions include iron deficiency anaemia and other nutritional deficiencies, hormonal changes, use of certain chronic medications, acid reflux, local traumatic insults to the oral tissues (with or without the presence of xerostomia) and other, less common, conditions such as Sjögren's syndrome.

This may need to be done in conjunction with the patient's general practitioner/physician and where available, an oral medicine specialist.

The dental practitioner must ensure that the patient is carefully screened and examined for any oral lesions or conditions. This requires a comprehensive examination of all oral mucosal and dental tissues to identify the presence of any abnormality that may be associated with the patient's symptoms, such as soft tissue trauma or habitual bruxing/clenching.

Most patients with BMS will suffer from an unexpressed carcinophobia and a detailed screening of the oral soft tissues is essential to eliminate the presence of oral cancer. This should include a visual inspection of all oral mucosal soft tissues using good illumination and appropriate retraction of the tongue to examine the underside of the tongue and floor of the mouth.

This must be followed by a thorough palpation of the lymph nodes draining the oral tissues.

The patient should also be referred for a full blood screening and other appropriate tests to rule out other nutritional deficiencies and allergic conditions (see below). If an underlying local or systemic condition is involved, it is referred to as secondary BMS and should improve once the patient receives appropriate treatment.

CLINICAL PRESENTATION

BMS is classified as primary if no underlying causes can be found, or secondary if systemic or local underlying causes are found (Scala et al, 2003).

BMS onset may be sudden or gradual and although it cannot be tied to any specific cause, it is quite common to find patients blaming the onset after routine dental therapy – often a simple scaling of the teeth.

Burning is the most common complaint and tends to be more frequent on the tip, anterior dorsum and lateral sides of tongue and the inside mucosal surfaces of the lips (Ritchie and Kramer, 2018). The burning may, however, affect any oral surface and often patients will complain not just of burning but also tingling, taste alteration and even numbness.

Post-menopausal women are affected more than pre-menopausal women or men. Decades ago, BMS was thought to be caused almost exclusively by hormonal changes in post-menopausal women, however, this is not accepted anymore.

Another school of thought that was prevalent decades ago and that is now not accepted is that BMS was purely psychosomatic. Clinicians should always explain to the patient that the burning sensation is real, but without any real mucosal abnormalities.

Wynand Dreyer and Andre van Zyl explore burning mouth syndrome – its symptoms, clinical presentation and treatment

Oral lesions: burning mouth syndrome

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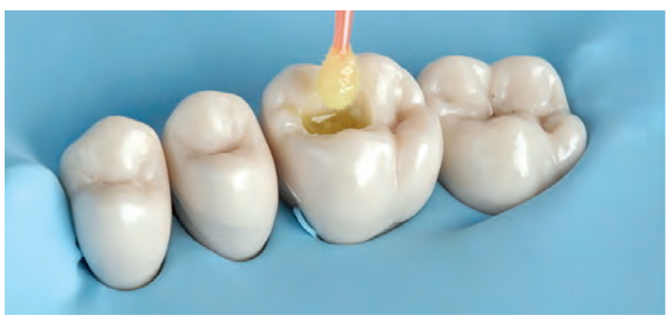

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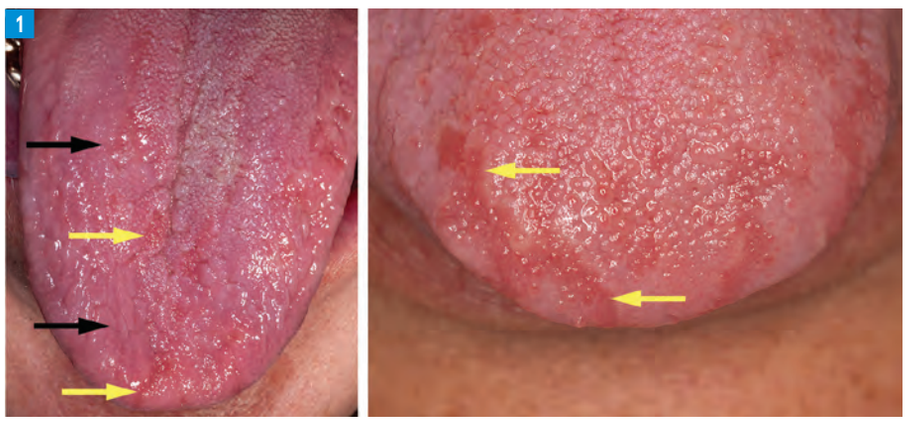

FIGURE 1: *Geographic tongue (also known as erythema migrans or benign migratory glossitis/stomatitis). The atrophic areas or red areas (black arrows) are surrounded by white borders (yellow arrows). The borders are often difficult to identify. Patients with these lesions may complain of a burning sensation and sensitivity to spicy foods. This is not to be confused with BMS*

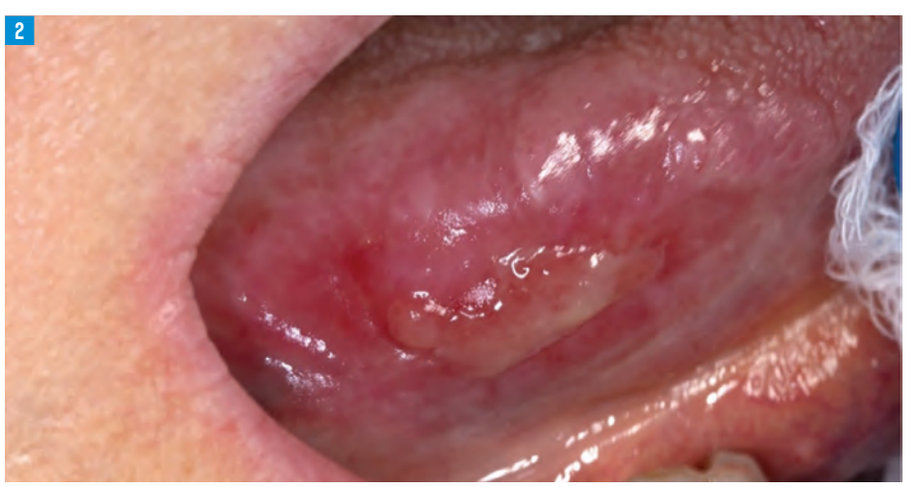

FIGURE 2: *Erosive oral lichen planus with clear ulceration. Any lesion or condition that can be identified clinically is not BMS and needs to be further identified with histology*

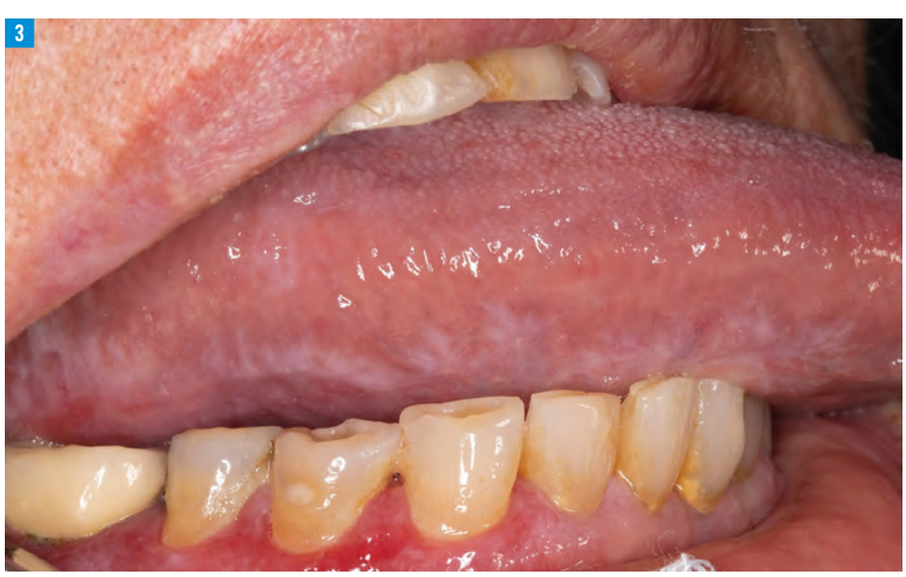

FIGURE 3: *Non-erosive (red lesions) oral lichen planus of gingiva and white-red lesions lateral of tongue. This may also present with burning sensation or be sensitive to spicy foods*

Three clinical variants are well described and accepted (Slebioda, Lukaszewska-Kuska and Dorocka-Bobkowska, 2020; Bookout, Ladd and Short, 2021), namely:

1. No burning present upon waking, with burning sensation starting through morning hours and getting progressively worse through the day and worst at bedtime. Approximately one third will present with this variant
2. In the second type, there is a non-stop burning sensation, every hour of every day. These patients usually are the most difficult to treat and may find it difficult to sleep. Close to 60% will present with this variant
3. The third type is uncommon where burning does not occur every day and the burning sensation is intermittent throughout day.

SYSTEMIC ASSESSMENT/BLOOD TEST

It may be in your interest to refer the patient to their medical GP for the blood tests as it will ensure a team approach to solve this complex clinical condition.

Scala and colleagues (2003) recommend requesting the following tests:

- Vitamin B12
- Folate (serum/plasma)
- Iron profile
- Vitamin D
- Thyroid hormone
- Parathyroid hormone.

Common clinical conditions that may present with a burning sensation and need to be eliminated before a diagnosis of BMS can be made include:

- Geographic tongue (Figure 1)
- Oral lichen planus (Figures 2 and 3)
- Lichenoid stomatitis (Figure 4)
- Anaemia with atrophic tongue lesions (Figure 5).

Geographic tongue is a very common condition, may present with a burning sensation and may show subtle changes that can easily be missed.

Oral lichen planus may present with minor erosions that can present with burning and be difficult to distinguish from normal alveolar mucosa.

Lichenoid stomatitis may be varied in presentation and symptoms and may also present with burning sensation on almost all oral mucosal surfaces.

Anaemia with atrophic tongue lesions may be due to iron deficiency anaemia or vitamin B12/folic acid deficiency.

DISCUSSION

It should be clear that, to diagnose BMS, one must be very sure that no oral mucosal

abnormalities are present, that the salivary flow is not suppressed by taking medicine with anticholinergic properties (mostly antidepressants, sedatives and sleeping medication) and that no hormonal abnormalities or vitamin and iron deficiency are present.

All mucosal surfaces have to be examined in great detail and the patient should be assured that there really is no oral cancer present anywhere. This cannot be stressed enough.

To modify any medication prescribed by medical specialists or general practitioners, one should gain the trust of these colleagues and be able to explain the situation and the role of the anticholinergic effects of such medications with clarity and in detail. In our experience, medical colleagues are always willing to help once they understand the distress BMS may cause and the role of salivary flow in preventing, alleviating or aggravating the situation.

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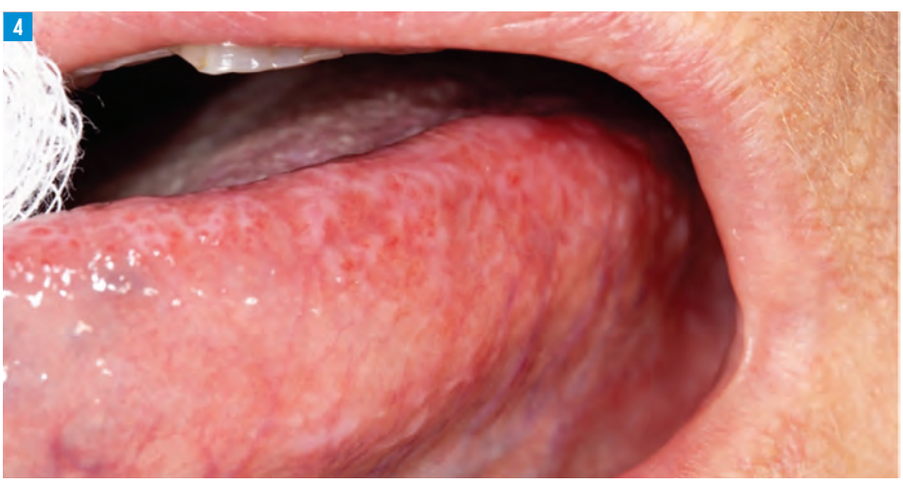

FIGURE 4: *Red and white lesions on the lateral border of tongue presenting with a burning sensation, identified as lichenoid stomatitis on histology. Such changes may be subtle or missed by the inexperienced clinician*

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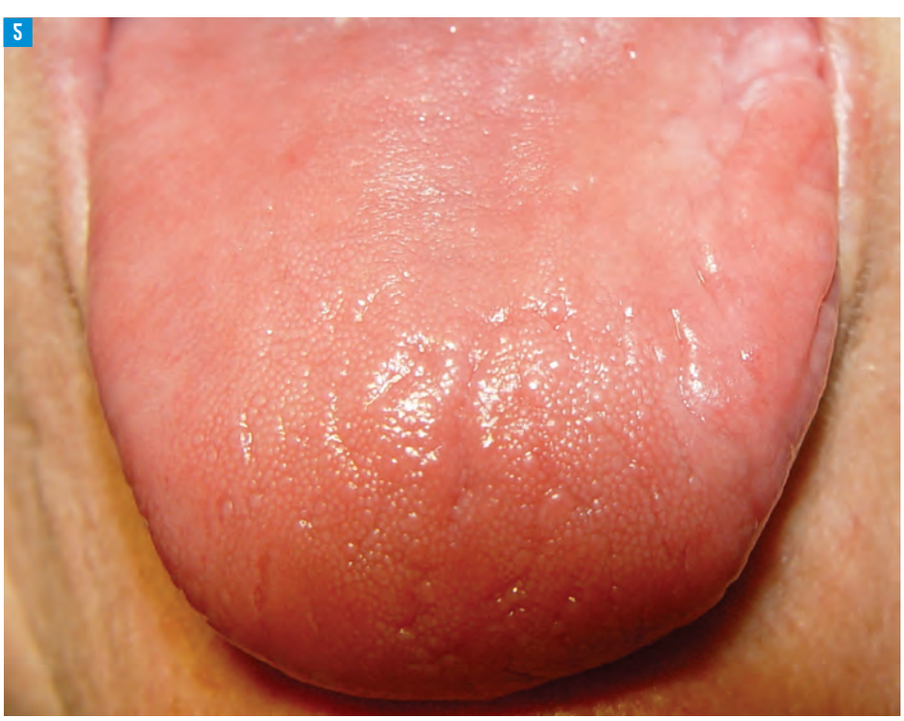

FIGURE 5: *Atrophic tongue changes due to iron deficiency anaemia. This may cause a burning sensation and is known as secondary BMS. One should always assess the salivary flow for xerostomia with atrophic tongue changes such as this as it may further aggravate the burning sensation*

BMS patients are usually highly stressed and should be treated with patience, empathy and compassion and a sincere effort must be made to explain to the patient the nature and prognosis of his/her condition.

It is also important to allow the patient time to ask questions and raise concerns and a sympathetic sincere approach may help the patient to better understand and accept the diagnosis.

Cognitive behavioural therapy may be of value (Ritchie and Kramer, 2018).

CLINICAL TIP

Patients seldom understand or easily accept the explanation of pain with no identifiable cause for the pain. A good analogy to use when explaining this concept is that of phantom limb pain, which is the perception of pain from a limb that is not there anymore. It does not make the pain any less real for those patients. BMS patients often understand this explanation and will better accept their burning pain if explained in this manner.

BMS patients need our support and should never be seen as an irritation in an otherwise busy clinical practice. CD

Acknowledgement

This article was first published in International Dentistry – African Edition and has been republished with permission. Dreyer WP, van Zyl AW (2024) Masterclass in oral diseases: oral lesions. International Dentistry – African Edition 14(2): 10-11.

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HIGHLIGHTS FROM THE LISTERINE® DENTAL HYGIENIST ROADSHOW 2024

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The LISTERINE® Dental Hygienist Roadshow has taken the UK by storm this year, delivering an exceptional blend of education and insight to dental professionals nationwide.

Beginning at the North of England Dentistry Show in Manchester, with warmly received stops at the Dentistry Show Birmingham, the Dentistry Scotland Show in Edinburgh, and Dentistry Show London, the Roadshow has drawn praise at each venue, positioning it as a highlight on the dental community calendar.

There is now one final opportunity to attend, as the Roadshow will be making a stop at the BSDHT's Oral Health Conference (OHC) in Harrogate on 22 and 23 November.

Building on last year's success, the 2024 Roadshow has offered an enriched experience, focusing on adjunctive mouthwash - a topic that resonated strongly with audiences in 2023. This year, the series expanded on this theme, integrating the latest research with practical applications for patient care.

EXPERT INSIGHTS

A key highlight has been the line-up of expert speakers, featuring Professor Iain Chapple, whose engaging style and findings from the EFP-WONCA workshop has shed light on the associations between periodontal health and systemic diseases.*

Prof. Chapple commented: 'The Dental Hygienist Roadshow provided a fantastic opportunity to connect oral health with overall wellbeing in ways that truly resonate with dental professionals.

Seeing attendees embrace evidence-based insights that empower them to make a real difference in patient care has been incredibly rewarding.

Each session has allowed us to share knowledge, challenge perspectives, and collectively elevate the standards of oral health education across the UK.'

Also contributing was Laura Bailey, whose clear and relatable approach empowered attendees by addressing 'spit, don't rinse with water' guidance, dispelling myths around fluoride retention, and providing practical information for patient education on effective at-home routines.

Benjamin Tighe further enriched the Roadshow with his insights into mouthwash, equipping clinicians with well-informed decision-making tools. Known for his direct, engaging style, Benjamin broke down complex topics, empowering attendees with practical knowledge they could confidently apply in practice.

EXCLUSIVE Q&A FORUMS

The limited-access, in-person Q&A forums have been another standout feature, held three times daily at each venue to ensure maximum engagement and impact.

These sessions have been praised for fostering an environment where participants felt comfortable asking questions and openly discussing their experiences.

Attendees have been able to delve into key topics beyond mouthwash, exploring broader themes in dentistry. Attendee feedback has underscored the value of this format, not only for in-depth learning but also for creating meaningful professional connections.

A LEGACY OF LEARNING AND CONNECTION

With the final event approaching at the OHC, the 2024 Roadshow is set to leave a lasting impact. From Edinburgh to London, each event has fostered a strong sense of community, celebrating shared knowledge and advancing patient care. CD

** European Federation of Periodontology / European World Organisation of National Colleges, Assemblies and Academies of Family Doctors. Consensus statement available at https://onlinelibrary.wiley.com/doi/10.1111/jcpe.13807*

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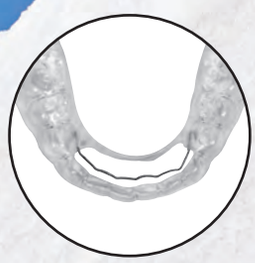

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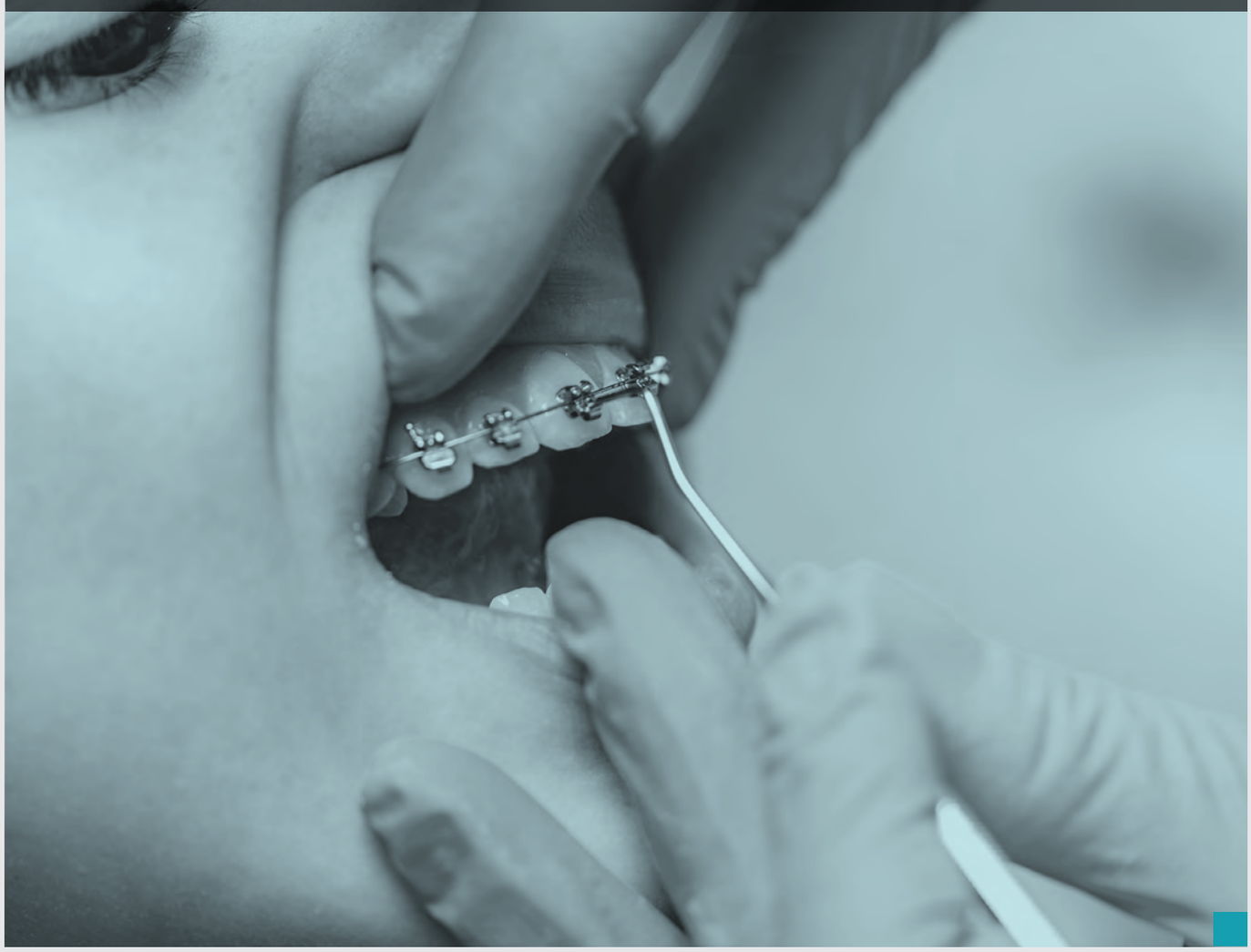
ORTHODONTICS

Malocclusion is a developmental condition caused by distortion of normal dental development. Early detection of the problem can help in effective management and treatment. Early treatment such as interceptive orthodontics can help – Avan Mohammed, p74



DR AVAN MOHAMMED
Avan is an award-winning specialist orthodontist working in private practices in Marylebone, Islington and south Kensington.

ENHANCED CPD
GDC anticipated outcome: C
CPD hours: one
Topic: Orthodontics
Educational aims and objectives: To explore the prevalence, classification and treatment of teeth transposition, primary failure of eruption (PFE) and ankylosis. This article qualifies for one hour of enhanced CPD; answer the questions on page 84 or scan the QR code.

This article aims to detail the prevalence, classification and treatment of teeth transposition, primary failure of eruption (PFE) and ankylosis.

TRANSPOSITION

Tooth transposition is an anomaly described as the positional interchange of two permanent teeth in the same quadrant, altering their normal position in the dental arch (Shapira and Kuftinec, 2001). It is an ectopic eruption of teeth (Shapira, Kuftinec and Stom, 1989).

It was first described by Harris in 1849 as an aberration in the position of teeth (Figure 1).

Prevalence

Transposition has never been reported in the deciduous dentition. The maxillary canine is the most common tooth affected. Other characteristic features or dental anomalies – peg-shaped teeth, supernumerary teeth, impactions, and congenitally missing teeth – can also coexist with tooth transposition (Ely, Sherriff and Cobourne, 2006).

According to Papadopoulos, Chatzoudi and Kaklamanos (2010), tooth transposition is rare. Their meta-analysis revealed that tooth transposition has a mean prevalence of 0.33%.

Ely, Sherriff and Cobourne (2006) found that unilateral transposition accounted for 88% of cases in their paper, with the maxilla being involved more commonly than the mandible.

Aetiology

Aetiology is often multifactorial and includes genetics (Peck and Peck, 1995), dental trauma, crowding, and early loss of primary or secondary teeth.

Classification

Tooth transposition can be complete; when both the tooth crown and the root are transposed (Figures 2 and 3), or incomplete (pseudo-transposition), when only the clinical crown is transposed, but the root apex remains in a relatively normal position (Peretz and Arad, 1992).

Table 1 details the five types of tooth transposition observed in the maxilla classified and reported by Peck and Peck (1995) according to the teeth involved.

Maxillary tooth transposition is more common and almost always involves the canine (Shapira

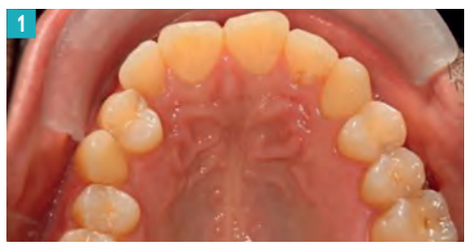


FIGURE 1: *Complete transposition of UR4 with UR3*

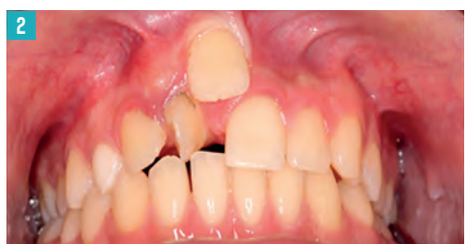


FIGURE 2: *Complete transposition of UR3 with UR2, the URc is retained and the UR1 erupted buccally*

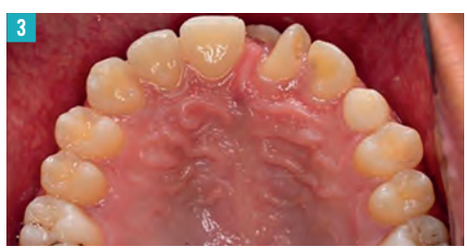


FIGURE 3: *Occlusal view complete transposition of UR3 with UR2, the URc is retained*

Avan Mohammed discusses the prevalence, classification and treatment of teeth transposition, primary failure of eruption (PFE) and ankylosis

Local factors and malocclusion

Maxillary transposition type	Number of cases
Canine – first premolar (Mx.C.P1)	143 (71%)
Canine – lateral incisor (Mx.C. I2)	40 (20%)
Canine – first premolar (Mx.C.M1)	8 (4%)
Lateral incisor – central incisor (Mx.I2.I1)	6 (3%)
Canine – central incisor (Mx.C.I1)	4 (2%)

TABLE 1: *Classification of transposition (Peck and Peck, 1995)*
MX: *Maxilla* **P1:** *First premolar* **C:** *Canine* **M1:** *First molar* **I1:** *Central incisor* **I2:** *Lateral incisor (eg, Mx.C.M1 = trasposition of maxillary canine to first molar)*

and Kuftinec, 2001b; Peck and Peck, 1995; Peck, Peck and Attia, 1993). This is often due to the displacement and migration of the maxillary canine, which most often transposes with the first molar and less frequently with the lateral incisor. In the mandible, tooth transposition is often a result of the distal migration of the mandibular lateral incisors (Shapira and Kuftinec, 2001b). This results in transposition more commonly occurring between the canine and the lateral incisor (Shapira and Kuftinec, 2001b; Peck and Peck, 1995).

It is also common for tooth transposition to occur with other dental anomalies such as ectopic teeth, hypodonia, rotations, retained primary teeth, supernumeries, and peg shaped lateral incisors (Shapira, Kuftinec and Stom, 1989; Peck, Peck and Attia, 1993); Peck and Peck, 1995) (Figure 4).

Treatment options

- No treatment – accept position of the transposed teeth
- Interceptive treatment – carried out before complete transposition has occurred. Removal of retained primary teeth may change the eruptive path of the permanent tooth
- Orthodontic alignment in the transposed position followed by restorative recontouring and reshaping of the transposed teeth
- Extraction of the transposed tooth
- Orthodontic movement of the transposed teeth into the normal arch position. This is only possible in incomplete transposition.

PRIMARY FAILURE OF ERUPTION

Primary failure of eruption (PFE) was originally described by Proffit and Vig in 1981. It is characterised by eruption failure of permanent teeth in the absence of a mechanical obstruction or a genetic syndrome (Figure 5).

Features of PFE include:

- Infraocclusion of affected teeth
- Significant posterior open-bite malocclusion accompanying normal vertical facial growth
- The inability to move affected teeth with orthodontics.

In terms of prevalence, according to Ahmad, Bister and Cobourne (2006), the teeth most commonly involved are the first and second

4

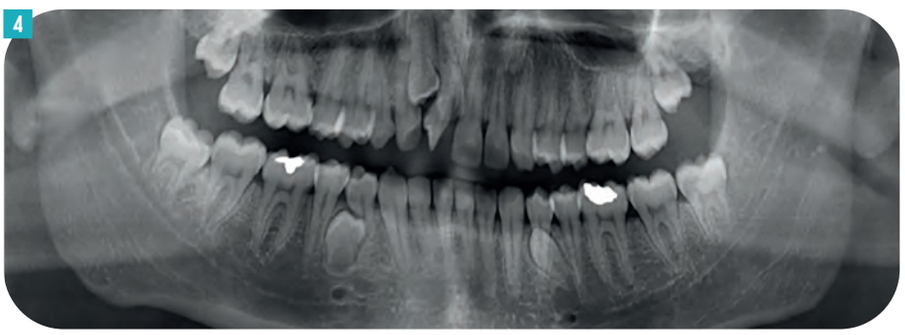


FIGURE 4: *Complete transposition of UR3 with UR2 and the URc is retained. Supernumeries present in lower right and lower left quadrants*

5

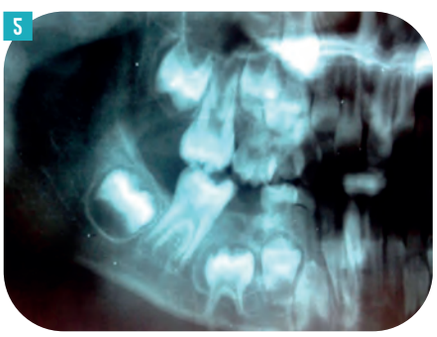


FIGURE 5: *PFE of LRE wit hypodontia of the LR5 causing malocclusion*

6

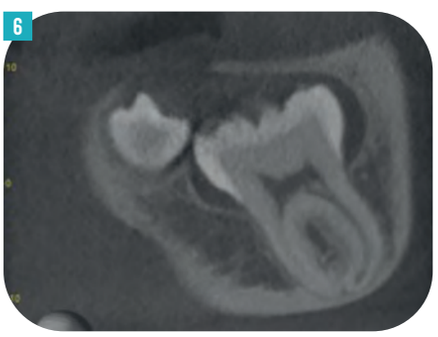


FIGURE 6: *A cross-sectional scan of an ankylosed of lower first permanent molar*

molars in all quadrants. Their review paper revealed a female to male ratio of 60:40. Aetiology includes familial inheritance, and mutation in parathyroid hormone receptor 1 (PTH1R).

Classification

Frazier-Bowers and colleagues (2007) used the following classification to describe failure of eruption:

- Primary failure of eruption (PFE) often has some or all of the following characteristics:
  - More common in posterior teeth
  - Affected teeth may initially erupt into occlusion and then cease to erupt further, or may fail to erupt entirely and remain impacted in the jaw
  - Can affect primary or secondary molars
  - Unilateral or bilateral teeth maybe involved
  - Where permanent teeth are involved there is a high chance of ankylosis
  - Application of orthodontic force in an attempt to bring the affected teeth into the arch leads to ankylosis rather than normal tooth movement
  - The condition tends to occur in isolation, with an absence of affected family members
- Mechanical failure of eruption (MFE) has a normal eruption mechanism. Radiographically the tooth appears to be submerged, possibly due to transient ankylosis. There eruptive path is not clear, there is evidence of a physical obstruction. Often responds to surgical and orthodontic treatment
- Intermediate failure of eruption (IFE) features in between PFE and MFE.

ANKYLOSIS

This is an eruption defect commonly confused with primary failure of eruption. It is defined as the fusion of cementum to the alveolar bone (Figure 6).

Aetiology

Several theories have been proposed on the different aetiologies that may cause ankylosis:

- Mechanical damage to the roots, likely due to previous dental trauma (risk is higher with teeth that have experienced avulsions or subluxation injuries)
- A disruption of local metabolism of the periodontal ligament (PDL) (Biederman, 1962)
- Genetics disturbances
- Primary teeth without a permanent successor (McKibben and Brearley, 1971)
- Untreated dental infections that can spread to the periodontal ligament.

Diagnosis

Where teeth are partially erupted, ankylosis can be diagnosed both clinically and radiographically. The ankylosed tooth is often infra-occluded with an abscess of the periodontal ligament space on the radiograph. Imaging such as cone beam CTs can further aid in diagnosis.

On clinical examination, the tooth is found to lack physiological mobility with a solid sharp percussion sound. Given the difficulty in diagnosing ankylosis, it can be difficult to distinguish from primary failure of eruption (PFE).

Treatment

There are multiple factors to consider when treatment planning ankylosed teeth:

- Site of the ankylosed tooth
- The time of ankylosis
- The age of the patient
- Whether the ankylosed tooth is primary or secondary tooth.

Orthodontic consideration

If the diagnosis on ankylosis cannot be accurately confirmed, PFE should be considered as the likely diagnosis and in such cases. If PFE can be confirmed, traditional orthodontic treatment with a continuous arch wire should be avoided.

Early detection is key in the management of PFE and ankylosis as this will help reduce risk of developing a malocclusion. In cases where the first molar fails to erupt, it is recommended to extract the first molar when the furcation of the second molar has developed. This will allow for mesial drift of the second molar.

Treatment options

- No treatment
- Restorative build-up of the infra-occluded tooth to a normal crown height
- Surgical extraction of the affected tooth and orthodontic space closure
- Surgical extraction of the affected tooth and prosthetic replacement (bridge, implant or denture).

CONCLUSION

Malocclusion is a developmental condition caused by distortion of normal dental development. Early detection of the problem can help in effective management and treatment.

Where there is an impaction or failure of complete eruption of one or more first permanent molars, a referral to the orthodontist is advised.

Early treatment such as interceptive orthodontics can help to reduce the severity of malocclusion and treatment time in the permanent dentition.CD

REFERENCES

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Complex multidisciplinary case: staged approach

Sara Belo explains each stage of a two-year challenging case, which required root canal treatment and a wisdom tooth extraction before Invisalign treatment could begin and a crown placed

A 32-year-old female patient originally came to me for orthodontic treatment, as her teeth were crowded and the smile lacked symmetry. However, initial investigations revealed a number of problems with her teeth, including some signs of gum disease. It was important to address these issues before we could proceed with her orthodontics.

She was good at brushing her teeth but was missing some areas because of crowding and this was causing gum inflammation.

The first step, prior to treatment, was for me to investigate and diagnose using Itero digital scans, X-rays, photographs, and smile analysis. These revealed that the lower left, first molar needed root canal treatment. Additionally, the patient had a pre-molar extracted on the upper left side as a child.

Post treatment, the patient's smile was symmetrical, and her teeth less crowded

TREATMENT PLAN

To balance the overall symmetry of her mouth and smile, I planned to extract the wisdom tooth on the upper right. This would allow adequate space for me to correct the bite, as well as allow for effective teeth cleaning.

For the root canal I referred the patient to an endodontist. For the wisdom tooth extraction, I referred her to an oral surgeon, and a dental hygienist treated her gums for the gum disease that was present.

It was important for these steps to be carried out first, and for her gum disease to be stabilised before I proceeded with the Invisalign treatment and subsequent crown.

ORTHODONTIC TREATMENT

The first Clincheck allowed me to plan the sequence of movements, bite and overall position of teeth following the initial treatments.

The lower right second premolar was infra-occluded and the teeth on the upper right quadrant and lower left quadrant had to be distalised to achieve the ideal bite correction and required symmetry.

I combined the aligners with class II elastics on the right-hand side and class III on the left-hand side.

The movements were achieved using 40 aligners for the initial stage, followed by three further refinements.

In this case, after the sagittal correction was achieved, refinements were needed to settle the posterior occlusion, using elastics.

I positioned the lower left first molar to create the ideal space to be restored with a crown once the patient's orthodontic treatment was completed.

COMPLIANCE AND COMMUNICATION

The patient's compliance was very good throughout the treatment. I regularly showed her the tooth movements and the treatment plans, so she understood what was happening in her mouth.

At the beginning of the treatment, I communicated with the endodontist and restorative dentist, sharing the patient's Clinchecks. This helped them understand it was important to restore the patient's tooth with a suitable material for attachments.

The ideal timing for placing the crown was after the orthodontic treatment to ensure a stable bite before completing the final restoration on this tooth.

Align Digital Platform's software and tools undoubtedly helped with all these communications in this multidisciplinary case.

I used the Clincheck Bolton analysis tool to assess the discrepancy between the arches to plan the interproximal reduction accordingly, while the 3D controls, staging panel and tooth movements table allowed me to

SARA BELO
MSC PG DIP
Sara graduated from the University of Porto with a masters degree in dentistry in 2016. Sara also holds a masters degree in the specialist practice of clear aligner orthodontics, complemented by advanced postgraduate studies from renowned institutions worldwide. Her comprehensive education and extensive experience equip her to expertly manage a wide range of complex orthodontic cases.

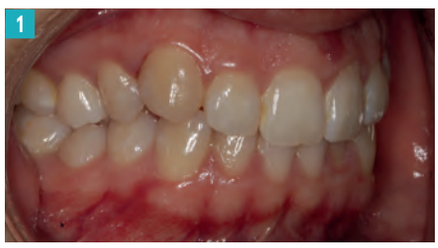

FIGURE 1: *Initial situation, buccal right-hand side*

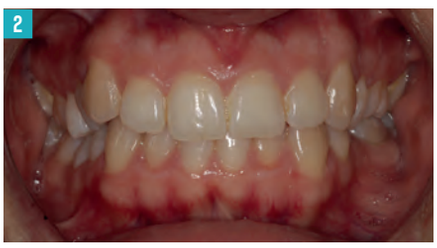

FIGURE 2: *Initial situation, anterior*

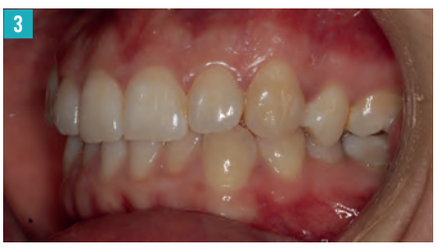

FIGURE 3: *Initial situation, buccal left-hand side*

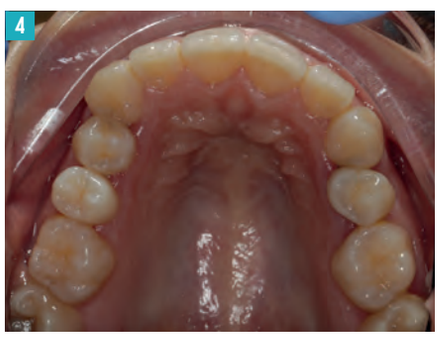

FIGURE 4: *Initial situation, occlusal maxillary*

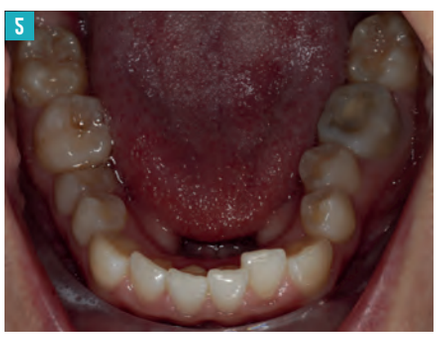

FIGURE 5: *Initial situation, occlusal mandibular*

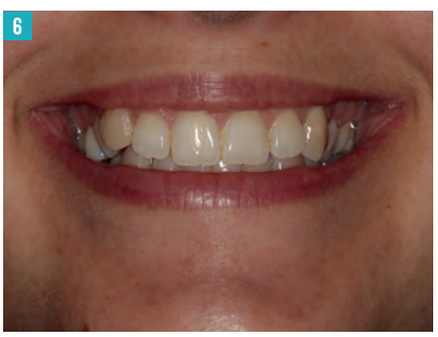

FIGURE 6: *Initial situation, smile*

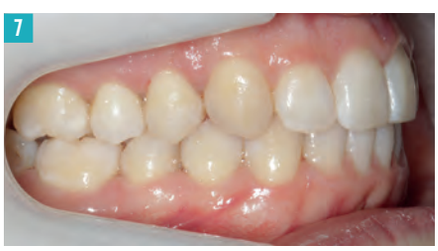

FIGURE 7: *Post treatment, buccal right-hand side*

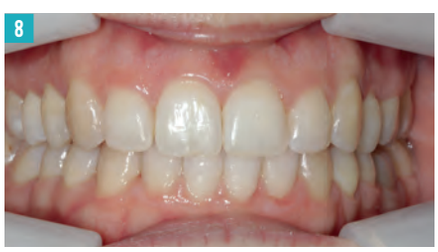

FIGURE 8: *Post treatment, anterior*

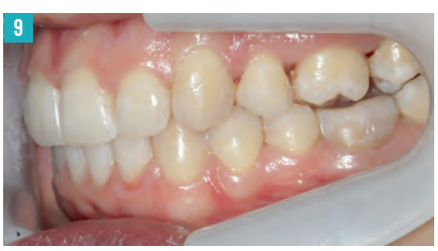

FIGURE 9: *Post treatment, buccal left-hand side*

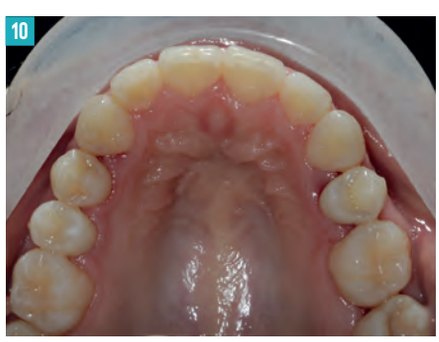

FIGURE 10: *Post treatment, occlusal maxillary*

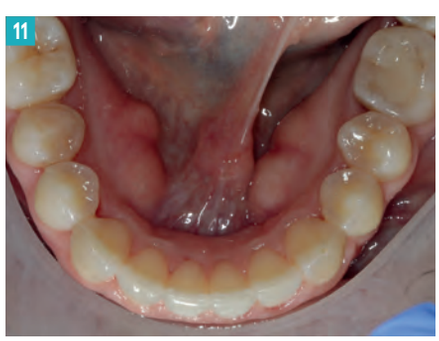

FIGURE 11: *Post treatment, occlusal mandibular*

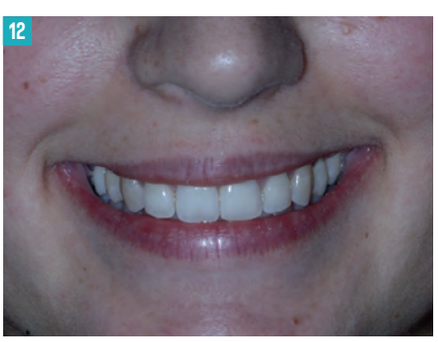

FIGURE 12: *Post treatment smile*

customise the patient's treatment plan to ensure the best result.

Within the Clincheck, I also used the occlusal plane inclination tool, allowing me to set up the orientation of the 3D model to correspond to the orientation of the patient's occlusal plane, while the superimposition tool helped me to understand the starting position of teeth in comparison to the final position.

FINAL RESULT

Post treatment, the patient's smile was symmetrical, and her teeth less crowded. The patient was very happy with her final result and her smile has become a source of pride.

I was also happy because I restored occlusal harmony, facilitated proper restoration, enhanced oral hygiene, and instilled self-confidence. CD

AN AWARD WINNING CASE

This complex multidisciplinary case won an award at Align's UKI Forum Live 2023 in Manchester.

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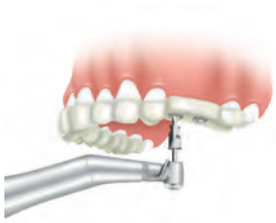

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‘MORE THAN AN IMPLANT COMPANY’
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Dr Chetan Mathias is a highly renowned cosmetic and implant dentist based in Coventry who understands the impact that mentorship can have on an individual and the dentistry they deliver.

He provides mentoring to colleagues through the Chairside Visitation programme with Biohorizons Camlog, commenting: ‘The Chairside Visitation programme gives clinicians an opportunity to observe a case first-hand, from start to finish. The clinical strategy and techniques employed can then be more easily replicated in their own clinics. The entire learning experience is tailored to the individual. Many courses present some really amazing cases, but they are not always at the right level for the clinician. To observe a case that has been picked specifically for your expertise, and to see it happen in real-time is a completely different experience.

‘I have been working with Biohorizons Camlog for the last 15 years. I’ve been part of its journey as it has grown into the company it is today, and it has been a pivotal part of mine.

‘For me, the organisation is more than an implant company – it is an extension of what I do, of my team. I firmly believe that to be able to offer the service and treatment that I do, I need a company that can back me at every stage of my journey.’

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At this point, the generated 3D printing data is transferred to Zirkonzahn’s P4000 Printer either via USB, LAN or wifi and the large printing volume (20x12.5x20cm) permits the simultaneous production of, for instance, up to 21 Geller models or 15 dental arches. The P4000 system for 3D printing works ideally in combination with the Printer Resins and the Printer Resins Waterbased by Zirkonzahn.

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www.zirkonzahn.com

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GENERAL DENTISTRY CD/NOV/DEC/GOYAL/PAGE 20

1. On which tooth was a carious lesion identified in this case?
- ☐ a. LR6
- ☐ b. LR5
- ☐ c. LR4
- ☐ d. LR3

2. In this case, what treatment option was the patient only interested in at the outset?
- ☐ a. Composite bonding
- ☐ b. Crowns
- ☐ c. Orthodontics
- ☐ d. Veneers

3. What did the patient first undergo following the clear aligner treatment?
- ☐ a. Removal of composite attachments
- ☐ b. Tooth whitening
- ☐ c. Fixed retainer placement
- ☐ d. Tooth polishing

4. On which teeth did the author opt to smoothen the sharp edges instead of applying composite?
- ☐ a. LR3 and UR3
- ☐ b. LL3 and UL3
- ☐ c. LR3 and UR2
- ☐ d. LL2 and UR3

AESTHETIC DENTISTRY CD/NOV/DEC/LI/PAGE 27

1. What did the orthodontic phase of this case consist of?
- ☐ a. Sectional fixed appliances
- ☐ b. TADs
- ☐ c. Aligners
- ☐ d. All of the above

2. What was the initial shade of the teeth, according to the Vita shade guide?
- ☐ a. A2
- ☐ b. A3
- ☐ c. A3.5
- ☐ d. A4

3. The patient in this case had a dental implant placed at which site?
- ☐ a. UR3
- ☐ b. UR4
- ☐ c. UR5
- ☐ d. UR6

4. What clinical challenge presented in this case?
- ☐ a. Capturing a clinically reproducible centric relation
- ☐ b. Creating aesthetically pleasing designs in the wax-up and transferring the wax-up design, allowing contact points to remain cleansable
- ☐ c. Creating good functional and anterior guidance for the composites to have medium-term lifespan
- ☐ d. All of the above

DIGITAL DENTISTRY CD/NOV/DEC/DANDANOV/PAGE 41

1. In 1945, who pioneered the concept of using appliances to move teeth without traditional wires or bands, according to the author?
- ☐ a. Henry Nahoum
- ☐ b. Edward Angle
- ☐ c. Herald Dean Kesling
- ☐ d. Pierre Fauchard

2. According to the author, what do clear aligners offer a profitable opportunity for?
- ☐ a. To expand services
- ☐ b. To retain patients
- ☐ c. To boost practice growth
- ☐ d. All of the above

3. In the case example, the patient presented with...
- ☐ a. A class I molar and canine relationship
- ☐ b. Narrowed posterior corridors
- ☐ c. A need for expansion
- ☐ d. All of the above

4. How many aligners were needed to complete treatment in the case example?
- ☐ a. 14
- ☐ b. 19
- ☐ c. 21
- ☐ d. 24

ENDODONTICS CD/NOV/DEC/ORSTEEN/PAGE 48

1. In the case presented in this article, how old was the patient?
- ☐ a. 63
- ☐ b. 65
- ☐ c. 67
- ☐ d. 70

2. The referring dentist in this case had identified which tooth as requiring endodontic treatment?
- ☐ a. LL8
- ☐ b. LL7
- ☐ c. LL6
- ☐ d. LL5

3. When the tooth was opened, how many canals were located?
- ☐ a. One
- ☐ b. Two
- ☐ c. Three
- ☐ d. Four

4. What does the author state as a reason of using the latest high-quality files from a reputable manufacturer?
- ☐ a. To gain the best results
- ☐ b. For ease of use
- ☐ c. For reduced risk of file separation
- ☐ d. All of the above

IMPLANT DENTISTRY CD/NOV/DEC/VIRANI/PAGE 55

1. **What is highlighted as a potential advantage of Ethoss compared to other bone grafting materials in the paper?**
- ☐ a. Faster treatment times
- ☐ b. Lower risk of contamination
- ☐ c. Longer-term resorption rate
- ☐ d. Higher regenerative potential

2. **According to the paper, which grafting material is considered the gold standard for bone regeneration?**
- ☐ a. Allografts
- ☐ b. Xenografts
- ☐ c. Ethoss
- ☐ d. Autogenous grafts

3. **What criteria must be met for following the type 1A implant protocol, as described in the paper?**
- ☐ a. Presence of facial bone loss
- ☐ b. Acute infection at the implant site
- ☐ c. Need for extensive bone augmentation
- ☐ d. Healthy adjacent teeth and intact facial bone

4. **What factor is emphasised as crucial for achieving optimal outcomes in the anterior zone, according to the paper?**
- ☐ a. Implant stability
- ☐ b. Soft tissue thickness
- ☐ c. Bone turnover rate
- ☐ d. Graft material composition

ORAL HEALTH CD/NOV/DEC/DREYER/PAGE 67

1. **In addition to burning, what do patients commonly complain about when it comes to BMS?**
- ☐ a. Tingling
- ☐ b. Taste alteration
- ☐ c. Numbness
- ☐ d. All of the above

2. **According to the article, who are more affected by BMS?**
- ☐ a. Pre-menopausal women
- ☐ b. Post-menopausal women
- ☐ c. Men
- ☐ d. Teenagers

3. **How many clinical variants do the authors say are well described and accepted?**
- ☐ a. One
- ☐ b. Two
- ☐ c. Three
- ☐ d. Four

4. **What is another common clinical condition that may present with a burning sensation and needs to be eliminated before a diagnosis of BMS can be made?**
- ☐ a. Geographic tongue
- ☐ b. Hairy tongue
- ☐ c. Geological tongue
- ☐ d. None of the above

ORTHODONTICS CD/NOV/DEC/MOHAMMED/ PAGE 74

1. **When did Harris first describe tooth transposition as an aberration in the position of teeth?**
- ☐ a. 1839
- ☐ b. 1849
- ☐ c. 1859
- ☐ d. 1869

2. **In terms of prevalence, which tooth is most commonly affected by transposition?**
- ☐ a. Mandibular canine
- ☐ b. Maxillary canine
- ☐ c. Lateral incisor
- ☐ d. Central incisor

3. **According to the author, what was originally described by Proffit and Vig in 1981?**
- ☐ a. Primary failure of eruption (PFE)
- ☐ b. Mechanical failure of eruption (MFE)
- ☐ c. Intermediate failure of eruption (IFE)
- ☐ d. None of the above

4. **According to the author, what is a feature of PFE?**
- ☐ a. Infraocclusion of affected teeth
- ☐ b. Significant posterior open-bite malocclusion accompanying normal vertical facial growth
- ☐ c. The inability to move affected teeth with orthodontics
- ☐ d. All of the above

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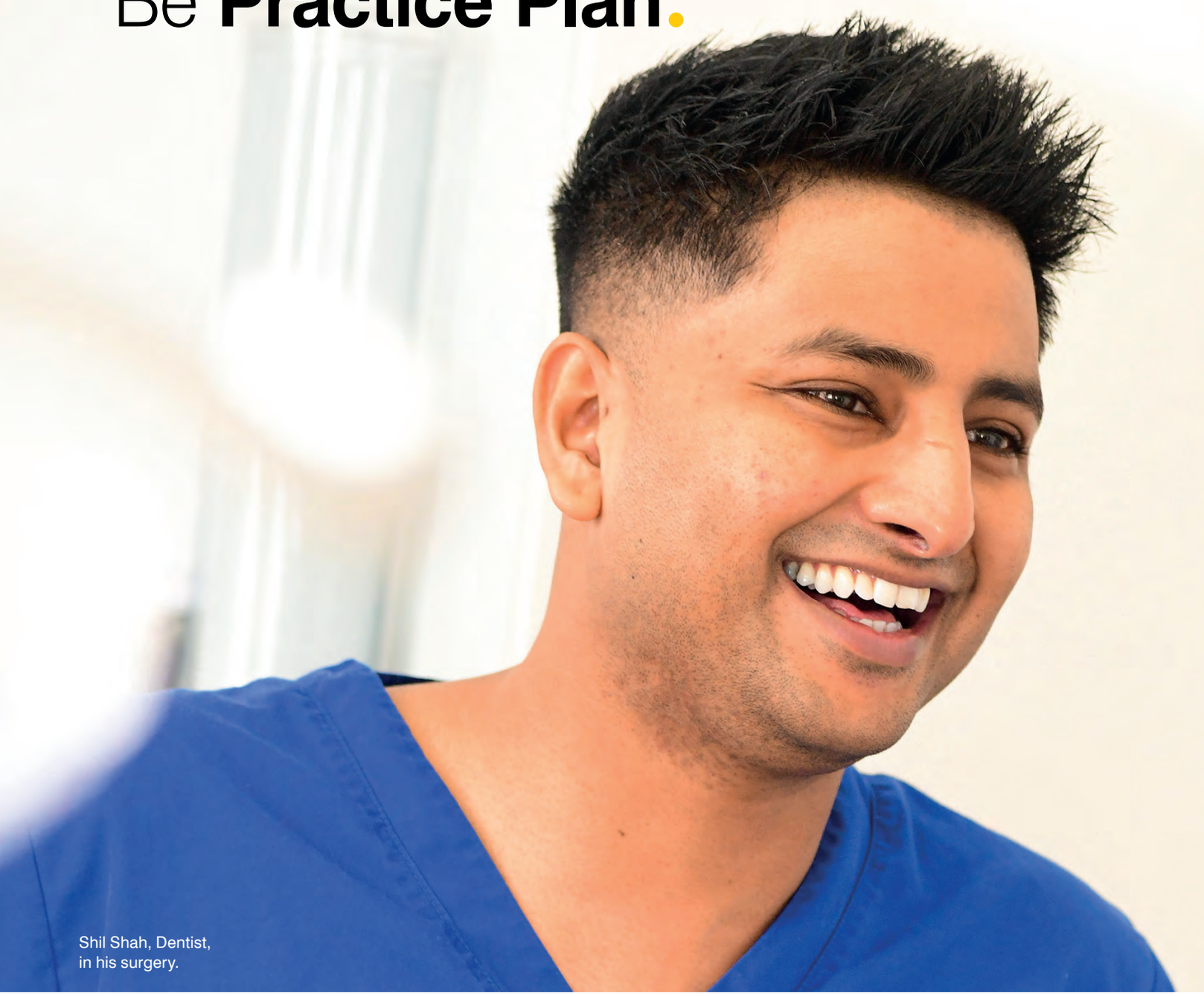

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