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21 GENERAL DENTISTRY

Treating generalised erosive tooth wear – Kostas Karagiannopoulos

32 AESTHETIC DENTISTRY

Aesthetic zone restorations – Julian Conejo

69 ORAL HEALTH

Periodontal disease and dementia – Neesha Patel

82 ORTHODONTICS

Orthodontic digital workflow – Jack Milgate



September 2025
Vol 5 No 7



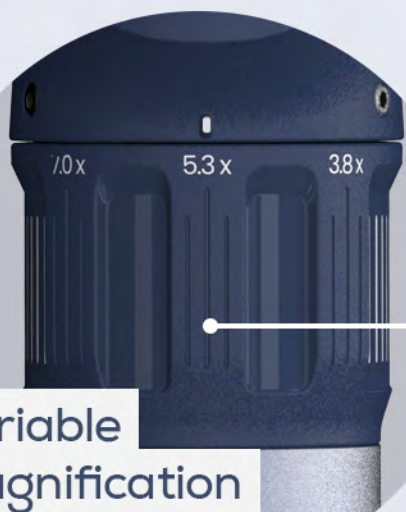
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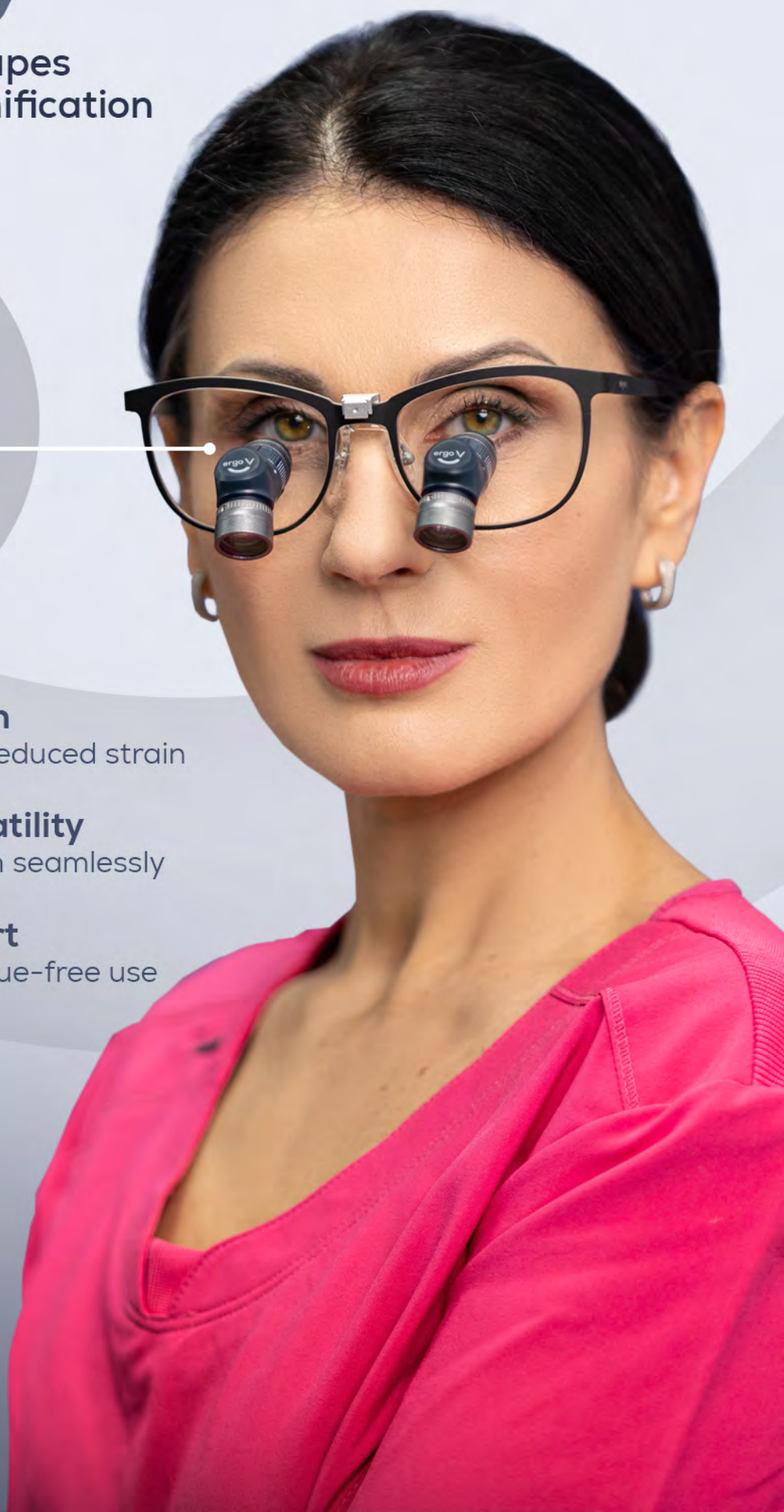
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Clinical Dentistry is committed to the advancement of practical clinical skills in dentistry. Through its focus on inspirational clinical casework, its sole aim is to help general dental practitioners enhance their skills and techniques across every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

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A NEW WAVE OF PATIENT



Welcome to the September issue of *Clinical Dentistry*!

I'm always intrigued when I see mention of dentistry outside of my working life. So imagine my surprise when I stumbled upon a cosmetic dentistry feature in a consumer lifestyle magazine last weekend.

I must admit that my expectations for the feature weren't sky-high. My experience is that the mainstream media often oversimplifies dentistry – articles usually focus on trends and beauty hacks rather than research and clinical insight. But this time, I was pleasantly surprised.

Packed with guidance from some of the UK's leading clinicians, the article delved into the latest cosmetic treatments, providing a clear and engaging guide to help readers navigate the 'new age' of dental care. And it struck me just how rapidly the public perception of dentistry is evolving.

Tune in and you'll notice the shift we're witnessing. Patients have become consumers – and their understanding of dentistry is growing ever-deeper (if not always wholly accurate). If I'd mentioned composite bonding to a non-dental friend five years ago, it would have been greeted with blank stares. Today, terms like Invisalign, bonding and whitening are casually discussed over coffee.

This heightened level of patient knowledge is something we can't afford to overlook. In fact, it should be mirrored – and embraced – within every dental practice.

Patients are walking through the doors armed with research, expectations and questions. They're comparing reviews, outcomes and digital portfolios before they even pick up the phone. It's time for dental practices to match this energy in turn: to elevate communication, treatment planning and educational resources in response to this shift. Proactive consultation, visual aids, transparent pricing and digital smile simulations should now be considered standard. Practices that fail to adapt are going to be left behind.

This new wave of educated patients isn't a challenge. It's an opportunity. By meeting their curiosity with clarity and expertise, dental professionals position themselves not just as healthcare providers, but as trusted partners in their decision making process. The question is: are you ready to meet them there?



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Meet the experts

Find out more about the people who have shared their expertise in this issue



PROFESSOR IAIN CHAPPLE

On page 74, Professor Iain Chapple, co-author of the global *Principles for Oral Health* (POH) report, answers a selection of questions following the recent unveiling of the POH initiative at Europerio11 in Vienna.

Iain is Professor of periodontology and head of the School of Dentistry at the University of Birmingham. He has been scientific editor of the *British Dental Journal* and the *Journal of Periodontal Research*, as well as president of the British Society of Periodontology and the ADR Periodontal Research Group, and secretary general at the European Federation of Periodontology.

ORAL HEALTH

74



PROFESSOR DR BJÖRN LUDWIG

Ahead of his session at this year's British Orthodontic Conference (BOC), orthodontist Professor Dr Björn Ludwig discusses the evolution of temporary anchorage devices, 3D imaging and digital workflows as well as simplifying difficult situations on page 86.

Björn holds positions at the University of Homburg/Saar in Germany and the department of orthodontics, Institute of Odontology, Sahlgrenska Academy, University of Gothenburg, Sweden.

He will be speaking at BOC 2025, which runs from 24 to 26 September at the ICC Wales. For more information, visit www.bos.org.uk.

ORTHODONTICS

86

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PRACTICESeptember 2025
Vol 5 No 7

FEATURES

GENERAL
DENTISTRY
13

15 VAPING AND HEALTH: LITERATURE REVIEW

A comprehensive literature review on the risks of electronic cigarettes – Heba Abdulwahab Ghila and Mariam Hassan Nahnughi

21 TREATING GENERALISED EROSION
TOOTH WEAR

The treatment of severe generalised erosive tooth wear with injectable composites as long-term provisional restorations ahead of ceramic rehabilitation – Kostas Karagiannopoulos

AESTHETIC
DENTISTRY
25

27 AESTHETIC IMPLANT DENTISTRY

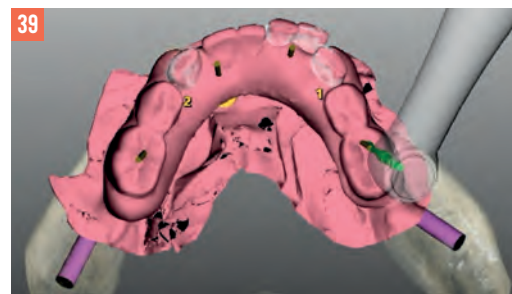
A complex implant-supported bridge case with advanced soft tissue management that achieved aesthetic excellence – Nigel Suggett and Emma Allsopp

32 AESTHETIC ZONE RESTORATIONS

Restoring central incisors with new CAD/CAM-fabricated crowns made of feldspar ceramic – Julian Conejo

DIGITAL
DENTISTRY
3739 IMMEDIATE IMPLANT LOADING:
DIGITAL WORKFLOW

A complex implant case that required the replacement of an ill-fitting denture to restore the patient's ability to eat properly – Homa Zadeh



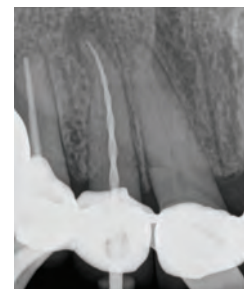
FEATURES

ENDODONTICS

45

47 ROOT CANAL SHAPING: RECIPROC BLUE

An overview of Reciproc Blue with a case presentation using the reciprocating file system – Martin Vorster and Peet van der Vyver



IMPLANT DENTISTRY

53

55 COMBINING DELAYED AND IMMEDIATE PLACEMENT

A case requiring different surgical techniques and bone augmentation to deliver an aesthetic outcome in a timely manner – Viraj Patel

62 RESTORING VERY THIN BONE

A challenging case in which hard and soft tissue augmentation was required to facilitate the placement of four dental implants in the mandible – Selvaraj Balaji

ORAL HEALTH

67

69 THE ORAL-BRAIN AXIS

Exploring periodontal disease and dementia, outlining the common inflammatory and microbiological processes as well as practical implications for promoting periodontal care to support systemic and cognitive health – Neesha Patel

74 Q&A: PRINCIPLES FOR ORAL HEALTH

An overview of the Principles for Oral Health (POH) report – Iain Chapple

ORTHODONTICS

81

82 ORTHODONTIC DIGITAL WORKFLOW

An orthodontic and restorative solution for a young patient and discusses digital dental pathways and how they are modernising visualisation, designs and clinical outcomes – Jack Milgate

86 Q&A: TADS, AI AND ALIGNERS

Anchorage, approaches and alignment – Björn Ludwig



MARKETPLACE

91

INDUSTRY INNOVATIONS

The latest product, services and equipment news from the industry

ENHANCED CPD

94

Q&A: ECPD

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GENERAL DENTISTRY

**HEBA ABDULWAHAB GHILA &
MARIAM HASSAN NGHNUCHI**
Vaping and health: literature review

15



KOSTAS KARAGIANNOPOULOS
Treating generalised erosive tooth wear

21



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ENHANCED CPD

CPD hours: one

GDC development outcome: C

Topic: General dentistry

Educational aims and objectives:

To provide an integrative review that consolidates current evidence from epidemiological, clinical and experimental studies to assess the health risks associated with e-cigarette use.

This article qualifies for one hour of enhanced CPD; answer the questions on page 94 or scan the QR code.



Electronic nicotine delivery systems (ENDS), commonly referred to as e-cigarettes or vapes, have rapidly gained popularity, particularly among adolescents and young adults, since their introduction to Western markets in the early 2000s (Almeida-da-Silva et al, 2021; Heldt et al, 2021).

Promoted as safer alternatives to combustible cigarettes and potential smoking cessation aids, these devices are often perceived as a less harmful way to consume nicotine. However, their expanding use has raised significant public health concerns due to mounting evidence of adverse health effects (Pisinger and Døssing, 2014; Grøner, 2022).

ENDS function by aerosolising a liquid typically composed of nicotine, flavourings and humectants such as propylene glycol or vegetable glycerine. While they avoid the combustion products of traditional tobacco, e-cigarette aerosols contain a variety of toxic and potentially carcinogenic substances, including formaldehyde, acrolein, heavy metals and volatile organic compounds (Pisinger and Døssing, 2014; Hua and Talbot, 2016).

Inhalation of these substances has been shown to cause oxidative stress, inflammation, DNA damage and cytotoxicity in preclinical studies, raising questions about their long-term impact on human health (Wills et al, 2021; Pisinger and Døssing, 2014).

METHODS

This review synthesises methodologies from seven peer-reviewed studies that investigate the health effects of electronic nicotine delivery systems (ENDS).

The methods employed span systematic reviews, epidemiological investigations, laboratory experiments and preclinical animal models, reflecting a broad, multidisciplinary approach.

SYSTEMATIC REVIEWS AND META-ANALYSES

Two of the reviewed papers adopted systematic review methodologies.

Wills and colleagues (2021) conducted a systematic literature review and meta-analysis to examine the relationship between e-cigarette use and respiratory disorders, such as asthma and chronic obstructive pulmonary disease (COPD).

The authors searched Pubmed and Psycinfo for studies using validated measures and statistically controlled for cigarette smoking.

Meta-analytic techniques were used to pool adjusted odds ratios from 15 studies on asthma and nine on COPD, as shown on the flow chart in Figure 2.

DISCUSSION

Epidemiological research has identified significant associations between e-cigarette use and respiratory disorders, such as asthma and chronic obstructive pulmonary disease (COPD), even after controlling for traditional cigarette smoking (Wills et al, 2021).

Cardiovascular and neurovascular consequences have also been observed, including endothelial dysfunction and disruption of the blood-brain barrier, suggesting systemic risks beyond the respiratory tract (Hua and Talbot, 2016; Heldt et al, 2021).

Particularly concerning is the strong evidence linking youth vaping to increased likelihood of future combustible cigarette use, indicating that e-cigarettes may serve as a gateway to traditional smoking (Almeida-da-Silva et al, 2021).

Despite ongoing debate about their role in smoking cessation, e-cigarettes remain largely unregulated and insufficiently studied over the long term. Therefore, it is critical to synthesise current scientific knowledge on the health impacts of vaping to inform regulatory policy, clinical practice and

Heba Abdulwahab Ghila and Mariam Hassan Ngghnughi provide a comprehensive literature review on the risks of electronic cigarettes

Vaping and health: literature review



future research priorities (Groner, 2022).

Electronic cigarettes (e-cigarettes) contain a complex mixture of substances, many of which pose significant health concerns. The primary ingredients in most e-cigarette liquids are nicotine, propylene glycol and vegetable glycerine.

Nicotine is a highly addictive compound that can impair brain development in adolescents and increase susceptibility to future addiction (Wills et al, 2021). Propylene glycol and glycerine, while generally safe for ingestion, have not been adequately studied for safety when inhaled and may cause irritation or inflammation of the respiratory tract (Pisinger and Døssing, 2014).

In addition, e-liquids are commonly flavoured with a wide array of chemicals – some of which, such as cinnamaldehyde, have demonstrated cytotoxic effects in laboratory studies (Hua and Talbot, 2016).

Aerosol generated by e-cigarettes has been found to contain harmful substances, including formaldehyde, acetaldehyde and acrolein, all of which are known carcinogens, as well as volatile organic compounds (VOCs) and tobacco-specific nitrosamines (TSNAs) (Pisinger and Døssing, 2014; Almeida-da-Silva et al, 2021).

Heavy metals like lead, nickel, chromium and tin – likely originating from the heating elements – have also been detected in the vapour, raising concerns about inhalation exposure and systemic toxicity (Heldt et al, 2021). These chemicals can contribute to oxidative stress,

inflammation, DNA damage and other biological effects linked to cancer and respiratory diseases (Almeida-da-Silva et al, 2021).

Despite being marketed as a safer alternative to conventional cigarettes, e-cigarettes expose users to a variety of toxic compounds, highlighting the need for ongoing research and regulatory oversight (Pisinger and Døssing, 2014; Hua and Talbot, 2016; Almeida-da-Silva et al, 2021; Heldt et al, 2021).

A range of studies using epidemiological, laboratory and clinical methods reveal growing evidence that e-cigarette use poses significant health risks.

Wills and colleagues (2021) found that e-cigarette use increases the risk of asthma and COPD, while laboratory data showed it causes oxidative stress, inflammation and genetic damage. Heldt and colleagues (2021) reported that e-cigarettes impair vascular and neurovascular functions, elevate blood pressure and damage the blood-brain barrier, mainly due to chemicals like metals and aldehydes.

In an American Heart Association statement, Rose and colleagues (2023) confirmed that both nicotine and non-nicotine components of e-cigarettes harm the heart and lungs.

Lastly, Kundu and colleagues (2025) found that although human cancer links are still unclear, e-cigarette exposure is strongly associated with early biomarkers of cancer risk.

Together, the evidence supports concerns about the long-term health effects of vaping.

SPECIFIC COMPONENTS OF VAPING AEROSOLS: KNOWN HEALTH EFFECTS

Nicotine

Nicotine serves as an activator of the sympathetic nervous system, exerting direct effects on the cardiovascular system.

In postganglionic sympathetic nerve terminals and the adrenal medulla, nicotine binds to $\alpha_3\beta_4$ nicotinic acetylcholine receptors, initiating the release of catecholamines, specifically norepinephrine and epinephrine (Almeida-da-Silva et al, 2021).

The catecholamine release stimulated by nicotine activates β -adrenergic receptors in the heart, leading to an increase in heart rate, cardiac contractility and overall workload.

Prolonged overstimulation of the sympathetic nervous system can result in cardiac remodelling, which may contribute to the development of heart failure and an increased risk of arrhythmias (Pisinger and Døssing, 2014; Hua and Talbot, 2016).

Additionally, nicotine impacts the vascular system by inducing vasoconstriction, which raises blood pressure and hampers wound healing in the microvasculature. This effect is primarily mediated by the activation of the homomeric α_7 nicotinic acetylcholine receptor expressed on endothelial cells (Hua and Talbot, 2016).

Propylene glycol and glycerol

Emerging evidence indicates that nicotine solvents, specifically propylene glycol and glycerol, can have significant cardiopulmonary effects. Elevated levels of propylene glycol – exceeding the recommended daily maximum dose of 25mg/kg – may result in systemic complications such as metabolic acidosis, acute kidney injury, and a sepsis-like syndrome (Hua and Talbot, 2016; Almeida-da-Silva et al, 2021).

Glycol mixtures are often employed to produce theatrical fog and smoke, and prolonged occupational exposure has been linked to an increased incidence of wheezing and chest tightness. Conversely, short-term exposure has been associated with acute dry cough and throat irritation, as well as diminished lung function in individuals with higher exposure levels.

The upper airway irritation resulting from short-term occupational exposure to propylene glycol appears to be mediated by sensory receptors TRPV1 and TRPA1, which are also implicated in promoting asthmatic inflammation and airway hyperreactivity in animal models.

Flavouring additives and sweeteners

Animal models and in vitro studies involving pulmonary and cardiovascular cells indicate that flavouring additives exhibit varying toxicities

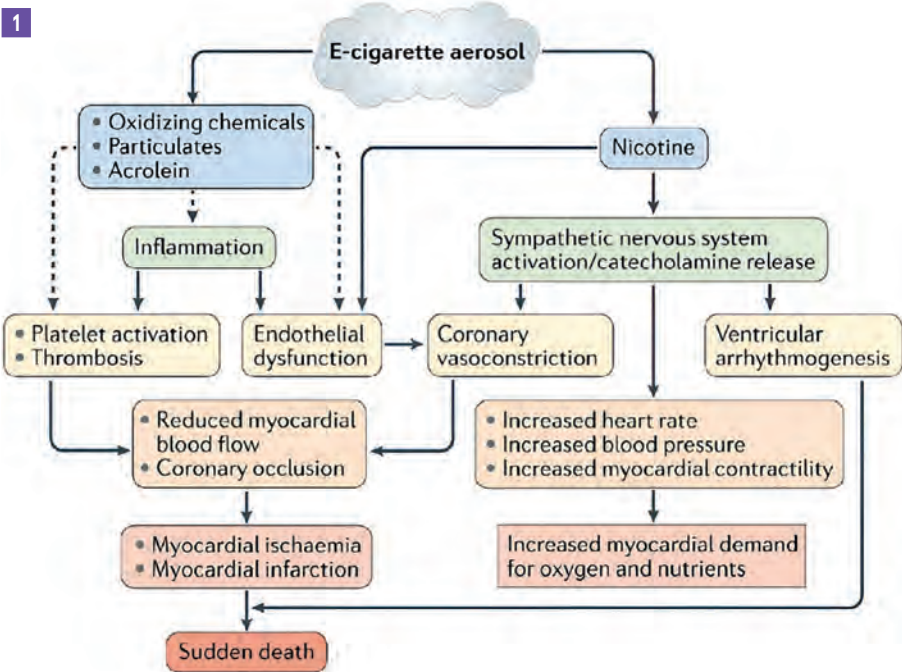


FIGURE 1: Overview of mechanisms by which electronic cigarette use might cause acute cardiovascular events

and are likely significant contributors to cardiopulmonary toxicity associated with ENDS.

Sweeteners such as glucose and sucrose, commonly found in e-liquids, facilitate the formation of reactive aldehydes, which are believed to be primary factors in the cardiovascular disease and chronic obstructive pulmonary disease (COPD) linked to combustible cigarette use.

Flavouring agents such as diacetyl and acetyl propionyl have been associated with respiratory diseases when inhaled during manufacturing processes.

Occupational exposure to diacetyl correlates with increased incidences of chronic cough, shortness of breath, airway obstruction, and diagnoses of asthma and chronic bronchitis. Furthermore, cumulative exposure to diacetyl is positively associated with spirometry abnormalities and a decline in forced expiratory volume in one second (FEV₁), potentially leading to the development of bronchiolitis obliterans, commonly referred to as 'popcorn lung'.

Inhalation of diacetyl or 2,3-pentanedione has been shown to cause fibroproliferation, partial airway occlusion and infiltration of immune cells in the lungs of exposed rats, which aligns with signs of airway remodelling. Diacetyl and similar flavouring additives continue to be present in e-liquids.

Other flavouring agents used in ENDS have also demonstrated pulmonary toxicity. Exposure of bronchial epithelial cells to menthol, coffee and strawberry-flavoured e-liquids at an air-liquid interface resulted in diminished cellular viability and heightened production of inflammatory cytokines.

Notably, strawberry-flavoured e-liquids elicited the most significant inflammatory response, comparable to the effects of combustible cigarette smoke exposure. Treatment of human bronchial epithelial cells for 24 hours with flavouring additives such as acetoin (butter flavour), diacetyl, ortho-vanillin, and maltol (malt flavour) increased interleukin-8 secretion, suggesting independent toxicity from these flavour additives.

In vitro exposure of pulmonary epithelial cells and monocytes to aerosol generated from eight flavoured JUUL pods resulted in elevated inflammatory cytokine levels, mitochondrial oxidant generation, DNA damage, and compromised pulmonary epithelial barrier function. Additionally, treatment with 2,5-dimethylpyrazine (chocolate flavour) reduced salt and water apical cellular transport, potentially affecting airway surface liquid homeostasis.

A variety of flavoured e-liquids and frequently used flavouring additives have been shown to

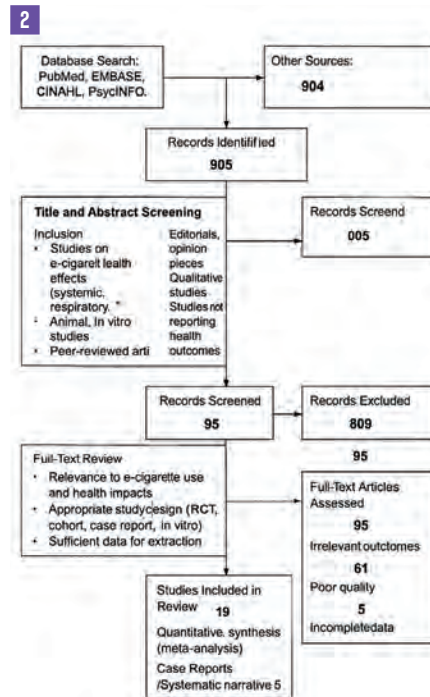


FIGURE 2: Flow chart – systematic reviews and meta-analyses

adversely affect endothelial cell function in vitro. For instance, exposure of induced pluripotent stem cell-derived endothelial cells to e-liquids containing cinnamaldehyde and menthol decreased cell viability through increased apoptosis, while also impairing tube formation and wound healing (as assessed by scratch tests) and upregulating inflammatory cytokine expression.

Endothelial cells exposed to cinnamaldehyde-containing e-liquids or RV4 e-liquids (which contain sweet tobacco, caramel and vanilla flavours) for 48 hours exhibited heightened activation of macrophage-like cells to a pro-inflammatory phenotype, indicating that these flavoured e-liquids promote the secretion of inflammatory cytokines and chemokines by endothelial cells.

Moreover, vanillin, menthol, cinnamaldehyde, eugenol (clove flavour), and acetylpyridine (burnt flavour) increased interleukin-6 expression and hindered A23187-induced nitric oxide production in human aortic endothelial cells.

Exposure to menthol or eugenol resulted in impaired nitric oxide production in response to A23187, similar to the impairment observed in endothelial cells from smokers of combustible cigarettes. In standing e-liquids, the interaction of flavour aldehydes with propylene glycol or glycerine may generate toxic acetals, which could lead to greater respiratory irritation than the parent aldehyde molecules.

Metals

The heating elements utilised in electronic nicotine delivery systems (ENDS) comprise metals that are released into both liquids and aerosols.

Research indicates that rats exposed to aerosols produced by a nickel-chromium alloy atomiser – devoid of nicotine, vitamin E acetate, or tetrahydrocannabinol – exhibited signs of laboured mouth breathing, decreased activity, and wheezing.

Histological assessments revealed pneumonitis, pulmonary inflammation and an accumulation of fibrin and inflammatory cells within the tracheal lumen (Hua and Talbot, 2016). Conversely, similar assessments of a device employing a stainless steel atomiser did not show any significant pulmonary alterations, suggesting that the metal heating element may serve as a source of pulmonary toxicants (Wills et al, 2021).

Furthermore, a lifetime exposure to chromium and nickel, resulting from the daily inhalation of 2ml of e-liquid, was evaluated to estimate the risks of cancer and non-cancer health effects, with chromium and nickel identified as the primary contributors.

Notably, nickel is one of the few carcinogens present in ENDS at levels higher than those found in combustible cigarettes (Hua and Talbot, 2016).

EPIDEMIOLOGICAL EVIDENCE

Epidemiological studies have played a central role in establishing the association between e-cigarette use and adverse health outcomes. Wills and colleagues (2021) conducted a meta-analysis of general population samples and found a significant association between e-cigarette use and respiratory conditions such as asthma and COPD, even after adjusting for confounding variables including combustible cigarette use.

Longitudinal cohort studies further support these findings by revealing that youth who engage in e-cigarette use are significantly more likely to initiate combustible cigarette smoking later in life (Almeida-da-Silva et al, 2021), highlighting a possible gateway effect.

In addition, large-scale national surveys such as the National Youth Tobacco Survey (NYTS), Monitoring the Future, and the Behavioural Risk Factor Surveillance System (BRFSS) have been used to assess usage patterns across demographic groups (Heldt et al, 2021; Groner, 2022).

These datasets indicate a notable rise in e-cigarette use among adolescents and young adults, with flavoured products particularly driving this trend.

LABORATORY AND PRECLINICAL FINDINGS

Complementing the epidemiological data, several laboratory and preclinical studies have investigated the biological mechanisms underlying e-cigarette-associated harm.

Almeida-da-Silva and colleagues (2021) reviewed *in vitro* experiments showing that exposure to e-cigarette aerosols results in cytotoxicity, heightened inflammation and disruptions in microbial balance in oral epithelial cells.

Heldt and colleagues (2021) contributed additional insights by analysing *in vitro* and animal model data, demonstrating that e-cigarette use impairs vascular function and compromises the blood-brain barrier. Moreover, toxicological assessments from studies such as those by Rose and colleagues (2023) have revealed evidence of oxidative stress, genotoxicity, DNA damage, and tumour-promoting effects linked to various aerosol constituents including heavy metals and aldehydes.

Together, these studies offer converging lines of evidence that e-cigarettes are not benign alternatives to traditional tobacco products. While epidemiological data point to behavioural and population-level risks, laboratory findings elucidate the underlying physiological damage, warranting continued research and policy scrutiny.

ASTHMA

In a study analysing e-cigarette use among Florida youth with and without asthma, Choi and Bernat (2016) identified a stronger association between e-cigarette use and asthma for current users (30-day use, adjusted odds ratio [aOR] = 2.20) compared to those with a lifetime history of use (aOR = 1.72).

Additionally, another study revealed a significant link between e-cigarette use and asthma within the broader sample of a Florida survey conducted in a different year. Two analyses focusing on adolescents with asthma indicated that both personal e-cigarette use and secondhand exposure to e-cigarette aerosol were associated with an increased likelihood of experiencing an asthma attack in the past year.

A study conducted in Canada revealed a significant correlation between e-cigarette use and lifetime asthma prevalence. Similarly, research in Hawaii demonstrated a notable association between e-cigarette use and current asthma, even after controlling for factors such as cigarette smoking and obesity.

A national study in the United States found a significant link between e-cigarette use and asthma, while accounting for cigarette and marijuana use, along with other covariates.

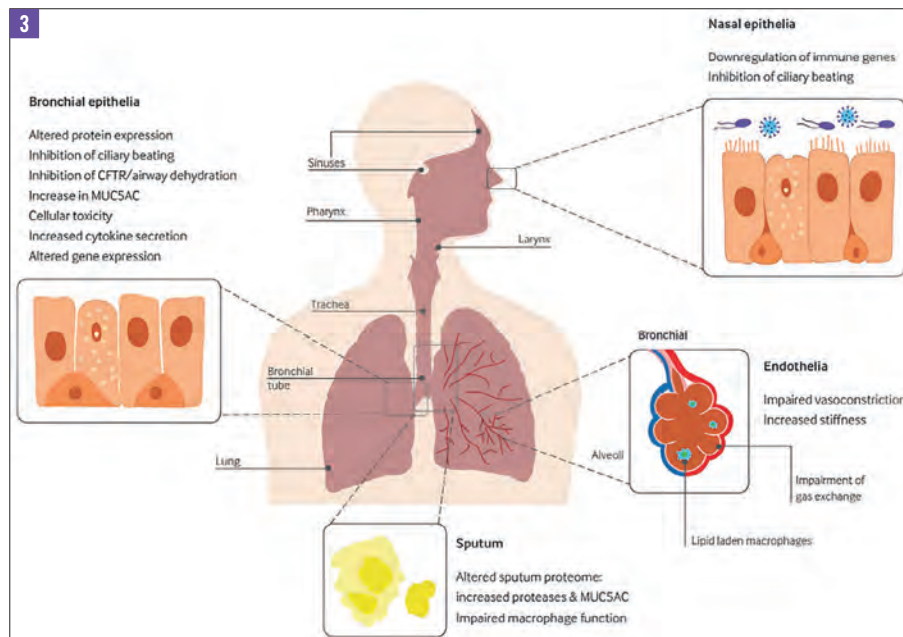


FIGURE 3: Reported effects of vaping on the human pulmonary system

In two separate investigations, both e-cigarette use and cigarette smoking were found to contribute additively to the likelihood of developing asthma; however, cross-product tests examining the interaction between e-cigarette and cigarette use yielded mostly non-significant results.

A national web-based survey conducted from 2013 to 2017 revealed a positive association between current e-cigarette use and asthma diagnoses, as well as elevated scores for breathing difficulties.

In Hawaii, data from the Behavioral Risk Factor Surveillance Survey (BRFSS) indicated a significant correlation between e-cigarette use and asthma, particularly among non-smokers, which aligns with findings from three adolescent studies.

Osei and colleagues (2019) pooled data from two years of national BRFSS research and found a notable association between current e-cigarette use and asthma among individuals who had never smoked. They also identified a dose-response relationship, indicating an increased likelihood of asthma with more frequent e-cigarette use.

Furthermore, Bhatta and Glantz (2020) utilised longitudinal data from the Population Assessment of Tobacco and Health (PATH) study to predict new cases of asthma at waves two and three among individuals without asthma at wave one.

Their prospective analysis demonstrated a significant relationship between baseline e-cigarette use and the incidence of asthma.

BRONCHITIS AMONG HIGH SCHOOL STUDENTS

A study conducted in California classified chronic bronchitis based on participants experiencing a daily cough, congestion, or phlegm for three consecutive months within the past year, excluding instances related to colds.

Analysis of the overall sample revealed significant associations between both e-cigarette use and smoking with chronic bronchitis, demonstrating a dose-response relationship; the likelihood of bronchitis increased with more frequent e-cigarette use. Notably, a significant association between e-cigarette use and bronchitis was observed among never-smokers, though a comparable analysis for smokers was not reported.

CONCLUSIONS

Current research highlights significant potential health risks associated with e-cigarette use, including biological markers indicative of cancer risk (eg oxidative stress, DNA damage).

E-cigarette aerosols contain harmful substances similar to those in traditional cigarettes, which may impair vascular, immune and cognitive functions. Particularly concerning is adolescent use, which is linked to nicotine dependence and increased risk of transitioning to smoking.

The evidence supports the need for further long-term clinical and population-level studies.

REFERENCES

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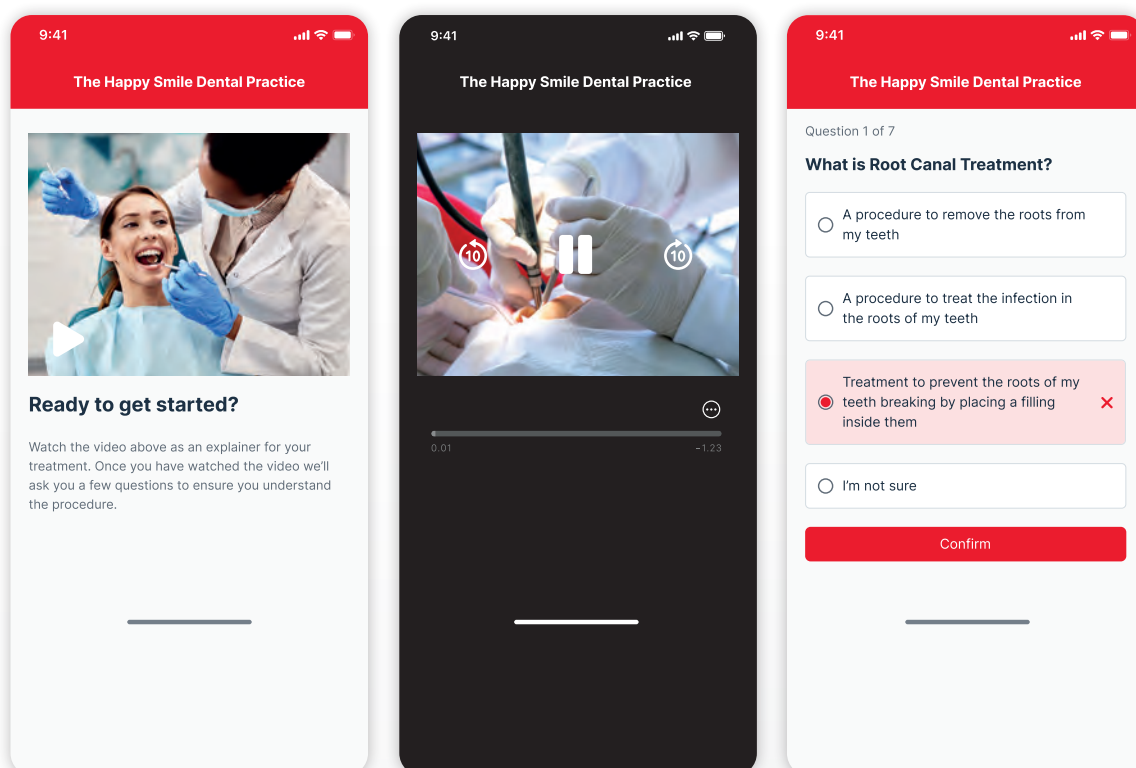
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Treating generalised erosive tooth wear

Kostas Karagiannopoulos discusses treating severe generalised erosive tooth wear with injectable composites as long-term provisional restorations ahead of ceramic rehabilitation

A 48-year-old man presented with severe generalised erosive tooth wear. A maxillary rehabilitation in ceramics was planned as a long-term outcome.

The complexity and severity of his tooth wear, as well as bruxism concerns, favoured a trial therapy with injectable composites as long-term provisional restorations. Moreover, due to cost implications, the patient preferred to delay the ceramic rehabilitation for a few years in order to make it more affordable.

Eight resin composite restorations were planned as transitional restorations, using the injection moulding technique. An upgrade to ceramics would then be provided two to three years after that.

FACIALLY DRIVEN SMILE DESIGN

Facially generated treatment planning helps the clinician and lab technician to decide where the teeth need to be (Figures 1a to 1c). This process is performed irrespective of the restorative materials to be utilised.

A digital, additive wax-up was ordered at an increased occlusal vertical dimension.

After verifying the aesthetic and functional outcome through a process of an additive, diagnostic mock-up, the eight injectable restorations were carried out using monoshade A2 G-aenial Universal Injectable with the alternate tooth technique.

TWO-YEAR FOLLOW-UP

Two years after placing the resin



FIGURES 1A to 1C: Facially driven smile design



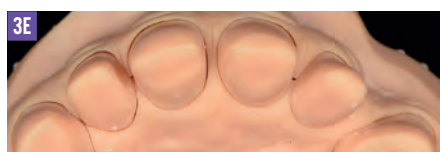
FIGURES 2A to 2C: Injectable composites at two-year review



DR KOSTAS KARAGIANNPOULOS

Kostas is a specialist in prosthodontics and associate clinical lecturer at University College London.





FIGURES 3A to 3G: Preparations and models for indirect crowns



FIGURES 4A to 4C: Provisional crowns



FIGURES 5A to 5D: Layered zirconia crowns (technical work by Joao Martins)

restorations, some wear and chippings were evident and the patient felt ready to upgrade to the long-term ceramics (Figures 2a to 2c).

The injectable composites offered valuable information regarding the patient's functional and parafunctional habits. Some features were replicated with an incisal guidance table and others were altered to avoid ceramic fractures.

Injectable composites offer an advantage over PMMA or bisacryl long-term provisional restorations. Any loosening of PMMA/bisacryl provisionals may not be related to occlusal problems and will act as a false negative 'alarm' regarding the ceramics.

Injectable composites have a favourable flexural strength and wear properties to act as excellent diagnostic tools to help us design the final ceramics.

The injectable composites had a dual function regarding tooth preparation for ceramics:

1. Provided an outcome based on which the preparation was guided
2. Provided a core material.

As the composite build-ups were full contour and old proximal restorations were present,



FIGURES 6A to 6C: Two-year review of final ceramics

full crown preparations were carried out with a 0.3mm chamfer based on a layered zirconia material (Figures 3a to 3g).

Provisional crowns, stained and glazed with various shades of Optiglaze, were provided for a few weeks and were copied on the final zirconia crowns (Figures 4a to 4c).

The zirconia crowns were surface treated with 29-micron alumina powder and an MDP-10 Primer from G-Multi Primer prior to cementing with G-Cem One resin cement (Figures 5a to 5d).

In summary, the injection moulding technique, albeit a direct restorative technique, can also be used in conjunction with indirect restorations as a long-term provisional restoration (Figures 6a to 6c). [C](#)

CONTACT

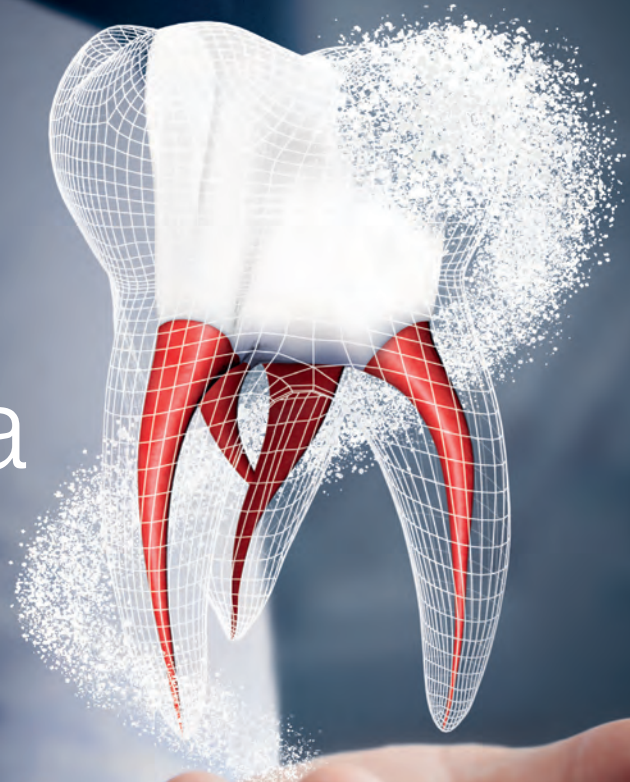
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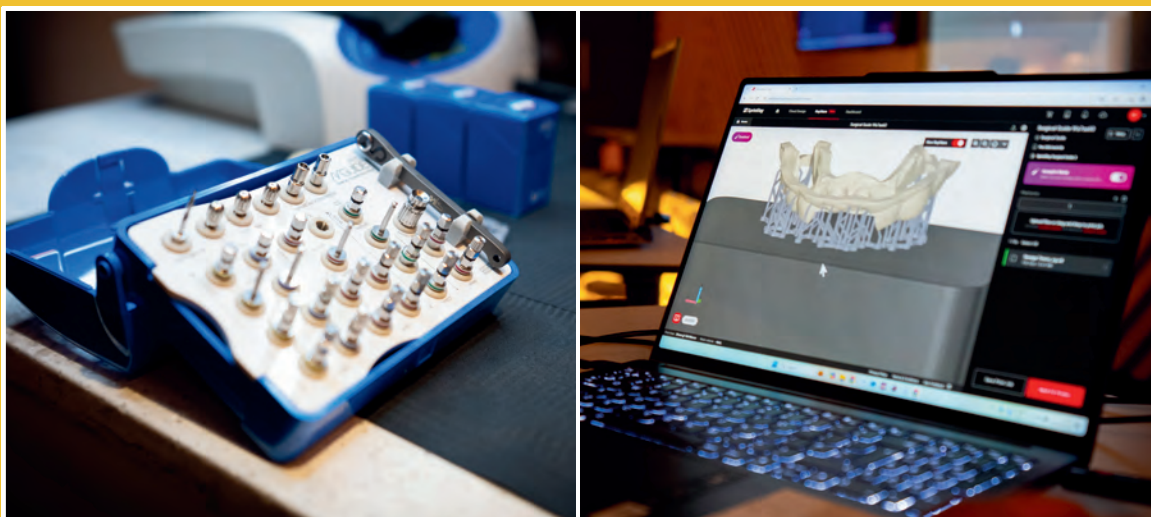
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AESTHETIC DENTISTRY

NIGEL SUGGETT & EMMA ALLSOPP
Aesthetic implant dentistry

27



JULIAN CONEJO
Aesthetic zone restorations

32



This case report underscores the critical role of interdisciplinary collaboration and meticulous attention to detail in overcoming the complexities of aesthetic implant dentistry – Nigel Suggett and Emma Allsopp, p27

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**NIGEL SUGGETT**

Nigel studied dentistry at Sheffield University, graduating in 2006. He owns two private dental practices (Seaham Smiles and Brunswick Dental) and is a key opinion leader for Denstply Sirona Implants.

**EMMA ALLSOPP**

Emma qualified in dental technology in 1992 after studying at South London college. She joined Nexus Dental Laboratory in 2022.

ENHANCED CPD

CPD hours: one

GDC development outcome: C

Topic: Aesthetic dentistry

Educational aims and objectives:

To discuss achieving aesthetic excellence in a complex implant-supported bridge case with advanced soft tissue management.

This article qualifies for one hour of enhanced CPD; answer the questions on page 94 or scan the QR code.



Implant-supported restorations have become a cornerstone of modern dentistry, offering predictable and long-term solutions for replacing missing teeth. However, achieving optimal aesthetics, especially in the highly visible anterior maxilla, presents unique challenges.

This case report delves into a complex scenario involving multiple surgical interventions and intricate soft tissue management techniques to achieve a harmonious and natural-looking final restoration.

It underscores the critical role of interdisciplinary collaboration and meticulous attention to detail in overcoming the complexities of aesthetic implant dentistry.



FIGURE 1: Initial clinical situation – severely compromised upper right central incisor



FIGURE 2: Temporary bridge in place, highlighting the visible 'black triangle' between the central and lateral incisor

CASE OVERVIEW

The patient presented with a severely compromised upper right central incisor, displaying significant discolouration, a large buccal soft tissue defect, and a periodontally involved and mobile upper right lateral incisor, necessitating extraction (Figure 1).

The patient's primary concern revolved around the aesthetic rehabilitation of their smile, aiming for a restoration that seamlessly blended with their natural dentition.

The treatment plan encompassed:

- Extractions
- Guided bone regeneration (GBR)
- Implant placement
- Multiple connective tissue grafts (CTGs)
- Meticulous soft tissue manipulation using a temporary cantilevered bridge.

The ultimate goal was to fabricate an aesthetically pleasing implant-supported bridge, effectively addressing the initial aesthetic concerns and cultivating optimal soft tissue contours and papilla growth.

Challenges

The following challenges were identified in this case:

- Bone loss and regeneration: the extraction site of the upper right central incisor exhibited significant bone loss, requiring guided bone regeneration (GBR) to ensure long-term stability of the implant
- Soft tissue aesthetics: achieving harmonious soft tissue contours and regenerating the large buccal defect, and black triangle management requiring papilla growth in the aesthetic zone demanded meticulous planning and execution (Figure 2)
- Interdisciplinary communication: maintaining seamless communication and collaboration between the dentist and the dental laboratory throughout the extended treatment process was paramount.

Nigel Suggett and **Emma Allsopp** present a complex implant-supported bridge case with advanced soft tissue management that achieved aesthetic excellence

Aesthetic implant dentistry





FIGURE 3: Extraction sockets following the removal of the compromised teeth

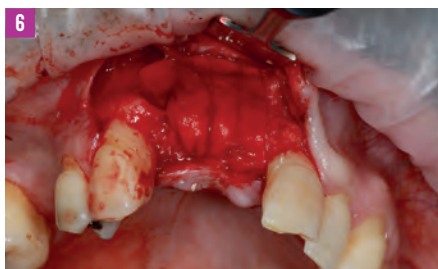


FIGURE 6: GBR procedures to augment bone volume and support the implant, shows the Bio-Gide being stabilised with periosteal sutures in 5/0 Monocryl

The compromised upper right central incisor and lateral incisor were extracted

SURGICAL AND TECHNICAL WORK

Extraction

The compromised upper right central incisor and lateral incisor were extracted under local anaesthetic.

The soft tissue defects present made it high risk for immediate implant placement, so the teeth were removed and the site was left to heal for three months.

A temporary partial denture was used to manage the space during the healing period (Figure 3).

Implant placement and guided bone regeneration

Following a suitable healing period, a Primetaper EV 4.2mm x 8mm implant (Dentsply Sirona) was placed in the upper right central incisor space.

The buccal threads of the implant were exposed so guided bone regeneration (GBR) was carried out.



FIGURE 4: View of the edentulous ridge after tooth removal and healing, illustrating the deficient bone volume prior to implant placement



FIGURE 7: Bone and soft tissue after implant placement and healing



FIGURE 9: CTG procedure to enhance tissue thickness with periosteal sutures and healing abutment to fix the graft

Autogenous bone (harvested bone chips from the left external oblique ridge with a Micros scraper from Geistlich) only was placed over the exposed threads, and then autogenous bone was mixed in a 50:50 mix with a Bio-Oss 0.25-1mm particles from Geistlich.

This was covered with a Bio-Gide resorbable membrane (also from Geistlich), and this was fixed with periosteal sutures using a 5/0 Monocryl resorbable suture (Figures 4 to 6).

First connective tissue graft

A connective tissue graft (CTG) procedure was performed to augment soft tissue volume. The mid-palate was chosen as the donor site to harvest the graft, which was then placed as a 'table-top' graft to enhance soft tissue thickness in a vertical dimension.

A mid-crestal split thickness flap was lifted in the recipient site, and the graft was secured to the underlying connective tissue bed using a

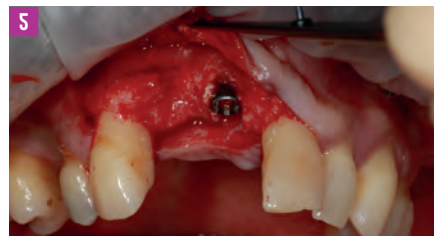


FIGURE 5: Implant placement. The implant (4.2 x 8mm DS Primetaper) was placed in the correct vertical dimension (3.5mm below the proposed gingival zenith)

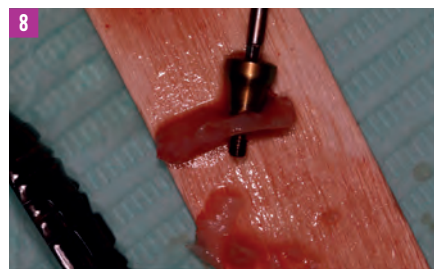


FIGURE 8: Healing abutment placed through CTG to aid fixation of it



FIGURE 10: One of the photos sent to the laboratory to start the fabrication of the temporary bridge

heal-design 3.5mm x 4mm healing abutment and some periosteal sutures in 5/0 Monocryl (Figures 7 to 9).

The mid-palate was chosen as the donor site to harvest the graft, which was then placed as a 'table-top' graft to enhance soft tissue thickness in a vertical dimension



FIGURE 11: Temporary bridge produced at the laboratory



FIGURE 14: After second CTG, pontic adjustment and soft tissue manipulation a sling suture can be seen using seralon 6/0

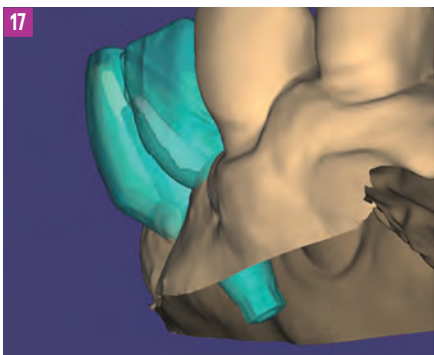


FIGURE 17: Digital dental design showcasing the emergence profile and custom abutment shaping from a proximal view

Temporary bridge fabrication

A temporary cantilevered bridge was fabricated at Nexus Dental Laboratory, with shade selection performed using visual shade matching (Figure 10).

This temporary restoration served as a crucial tool for shaping the soft tissue and guiding its maturation.

The bridge was fabricated with a stock temporary cylinder and composite, which allowed it to be adapted chairside (Figure 11).

Temporary bridge placement

The temporary bridge was placed, allowing soft tissue conditioning and guiding the emergence profile for the final restoration.

A 'black triangle' was evident when the bridge



FIGURE 12: Temporary bridge in situ



FIGURE 15: Temporary bridge with one of the adjustments made to the basal area of the pontic to eliminate soft tissue pressure

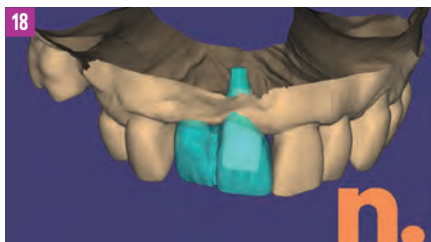


FIGURE 18: Digital dental design of the custom abutment shape from the buccal view

The buccal flap was sutured over the embrasure and used to support a pseudo-papilla and close the visible 'black triangle'

was placed, so further soft tissue work was needed (Figure 12).

Second connective tissue graft

A second connective tissue graft (CTG) was harvested, this time from the tuberosity. It was again placed as a 'table-top' graft, this time only over the pontic and midline papilla space.



FIGURE 13: Second connective tissue graft



FIGURE 16: Temporary bridge after soft tissue manipulation using pontic site development

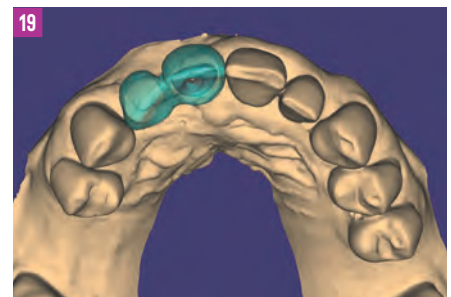


FIGURE 19: Digital dental design of the custom abutment shape from the incisal view

5/0 Monocryl periosteal sutures were used to fix the CTG and then the buccal flap was sutured over the embrasure and used to support a pseudo-papilla and close the visible 'black triangle'.

The temporary bridge pontic basal surface was adjusted to eliminate the tissue pressure to over build the area (Figures 13 to 15).

Temporary bridge adjustments

Precise adjustments were carried out on the temporary bridge, meticulously shaping the basal surface of the pontic to create an ideal environment for soft tissue maturation (Figure 16).

Final bridge fabrication

After receiving the digital scan using a Trios 3 intraoral scan of both the implant and soft tissues and the temporary bridge, where the





FIGURE 20: Close look at the gum tissue after shaping around the temporary bridge



FIGURE 21: Final restoration in situ



FIGURE 22: Final result

correct emergence profile was established using the temporary bridge, the CAD team at Nexus Dental Laboratory meticulously replicated this emergence profile onto a titanium abutment (Atlantis abutment).

This precise shaping ensures that the soft tissue maintains its integrity and natural contours, preserving both aesthetics and function (Figures 17 to 19).

To further enhance soft tissue integration, the zirconia bridge placed on top of the abutment was carefully polished around the cervical area

This process highlights the critical role of custom abutments, which allow for a seamless transition from the temporary to the final restoration while maintaining the soft tissue architecture.

Additionally, the use of titanium was chosen for its biocompatibility, which promotes tissue attachment and long-term stability.

To further enhance soft tissue integration, the zirconia bridge placed on top of the abutment was carefully polished around the cervical area. This polishing minimises bacterial adhesion and encourages hemidesmosomal attachment, contributing to a healthier and more natural-looking restoration.

Ultimately, this approach ensures optimal aesthetics, stability and long-term success of the restoration by preserving the natural contours established during the provisional phase.

Placement

The final implant-supported bridge was fabricated. The upper right central was produced with a slightly squarer shape on the mesial proximal area to effectively close the remaining black triangle between the two central incisors.

The bridge was made of zirconia with buccal layering.

This case underscores the importance of a team-oriented approach and the invaluable role of persistent adjustments in achieving optimal results

To achieve the desired aesthetic outcome, dental technician Emma worked closely with the dentist (Figures 20 to 22).

FINAL PRODUCT

The final restoration achieved excellent aesthetic results, characterised by optimal soft tissue contours, harmonious papilla growth and complete closure of the black triangle.

The patient expressed profound satisfaction with the outcome, noting the natural appearance and enhanced smile aesthetics.

The final bridge was made of zirconia with buccal layering.

REFLECTIONS

This complex case presented numerous challenges, particularly in managing the soft tissue and eliminating the black triangle. However, through meticulous planning, precise execution, and unwavering commitment to interdisciplinary collaboration, an exceptional aesthetic outcome was realised.

This case underscores the importance of a team-oriented approach and the invaluable role of persistent adjustments in achieving optimal results.

In addition, it highlights the importance of perfect communication that is needed between the dentist and dental laboratory along the process to achieve this amazing result. [CD](#)

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Aesthetic zone restorations

In this case report, **Julian Conejo** restores the central incisors with new CAD/CAM-fabricated crowns made of feldspar ceramic

The position and the appearance of the incisors in the upper jaw decisively affect whether we consider a smile to be aesthetically pleasing or not (Li et al, 2023; Paranhos et al, 2014). If this centre of the aesthetic zone needs to be treated with restorations, the clinician and dental technician are faced with a particular challenge, including the selection of the dental material. Due to its high aesthetics, feldspar ceramic is the material of choice for demanding cases in the anterior tooth region. Vitablocs CAD/CAM materials have a toothlike appearance (Masek, 1999), are accurate to the Vita shade standard and exhibit a natural shade gradient. Also, they have been clinically proven for 40 years for aesthetic use in the anterior tooth region (Wiedhahn, 2006; Morimoto et al, 2016).

The following case shows how the polychromatic material variant Vitablocs Triluxe forte monolithically meets this aesthetic challenge.

CASE REPORT

A 25-year-old patient came to the clinic because she did not like the all-ceramic crown on UR1 and the VMK crown on UL1. Both crowns appeared unshapely and too big. The incisal edges of the restorations were not harmonious with each other, nor with the contour of the lower lip (Figure 1). In addition, the two restorations did not harmonise with the shade effect of the natural tooth enamel. The all-ceramic crown on UR1 was very opaque and appeared lifeless while the VMK crown on UL1 exhibited the wrong basic tooth shade (Figure 2).



FIGURE 1: Initial situation with disruptive crowns on UL1 and UR1



FIGURE 2: The restoration on UR1 appeared lifeless; UL1 was fabricated in the wrong basic tooth shade



FIGURE 3: The situation after removal of the old crowns, preparation and cleaning of the tooth stumps



DR JULIAN CONEJO

Julian is a dentist and assistant professor at the University of Pennsylvania, School of Dental Medicine, Philadelphia, USA.

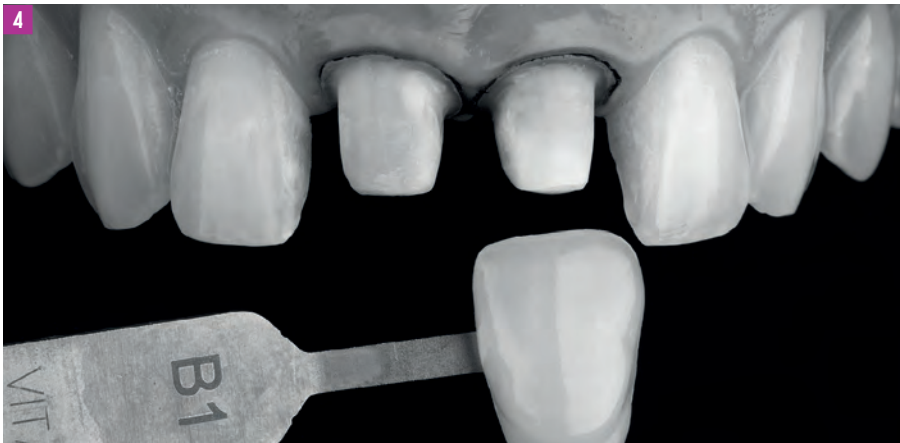


FIGURE 4: The photographic black and white documentation of the selected shade tab

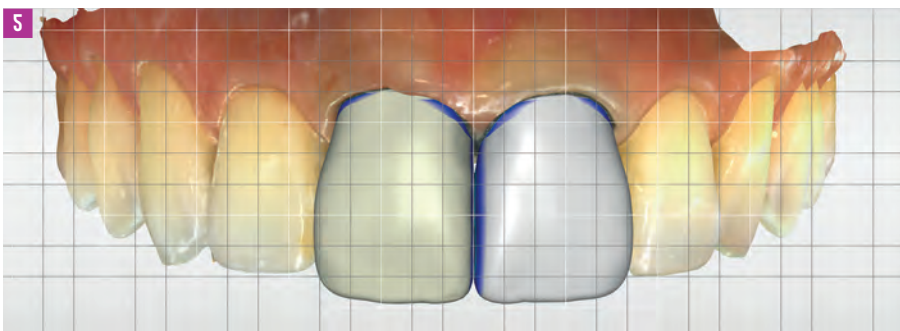


FIGURE 5: The design of the feldspar ceramic crowns in the Cerec 5.1 software



FIGURE 6: During the clinical try-in, the fit was checked on the lumen side with blue silicone



FIGURE 7: Shade effect, morphology and texture harmonised with the natural teeth

Together with the patient, the decision was made to treat the UR1 and UL1 with new CAD/CAM-fabricated crowns made of the feldspar ceramic Vitablocs Triluxe forte.

After local anaesthesia, the old crowns were slit and removed, the stumps were prepared and cleaned (Figure 3). Retraction cords were placed to prepare the situation for the digital impression. The tooth shade B1 was determined with Vita classical A1 – D4, and the corresponding shade tab was photographically documented for the laboratory (Figure 4).

The digital workflow began with intraoral scanning of the dental arches using Primescan, which was used as the basis for creating a digital model in the Cerec 5.1 software (Figure 5). After determination of the preparation margins on UR1 and UL1, the crowns were designed, with monolithic fabrication allowing a slimmer design.

After the two crowns had been nested, they were fabricated simultaneously in the Vita System 3D-Master shade 1M1 (corresponds to B1) in the Cerec MCXL CAD/CAM milling unit. The crowns were separated from the attachments, which were then trimmed. The surfaces were finished using fine diamond instruments and rubber polishers. Only minimal characterisations and the glaze were finally applied using the Vita Akzent Plus stain system.

INTEGRATION AND CONCLUSION

During the clinical try-in, the fit was checked on the lumen side with blue silicone (Figure 6). The practitioner and the patient were satisfied with the result, so the crowns could be conditioned with hydrofluoric acid and silane. Fully adhesive cementation was carried out using the universal bonding system Panavia V5. The right basic shade, the shade gradient and a toothlike effect with natural translucency, opalescence and fluorescence were already integrated in the Vitablocs Triluxe forte blank. This allows a slim, monolithic design that perfectly simulates the shade effect of the natural tooth enamel with minimal characterisations (Figure 7).

In this case, the right block selection in the right shade proved to be the key to an efficient new restoration in the aesthetic zone. 

REFERENCES

 siobhan.hiscott@fmc.co.uk

PRODUCTS USED

Vita Akzent Plus, Vitablocs Triluxe forte, Vita System 3D-Master Vita Primescan, Cerec MC XL Dentsply Sirona Panavia V5 Kuraray Noritake



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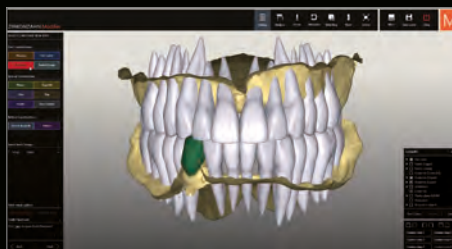
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DIGITAL DENTISTRY

HOMA ZADEH

Immediate implant loading: digital workflow

39



Immediate implants have been shown to deliver highly positive outcomes in a broad range of situations. No significant differences in survival rates have been identified between implants placed using delayed and immediate protocols (Patel et al, 2023). Further advantages can be experienced when a digital workflow is implemented, as the approach has been proven to afford several benefits impacting both the clinician and patient – Homa Zadeh, p39

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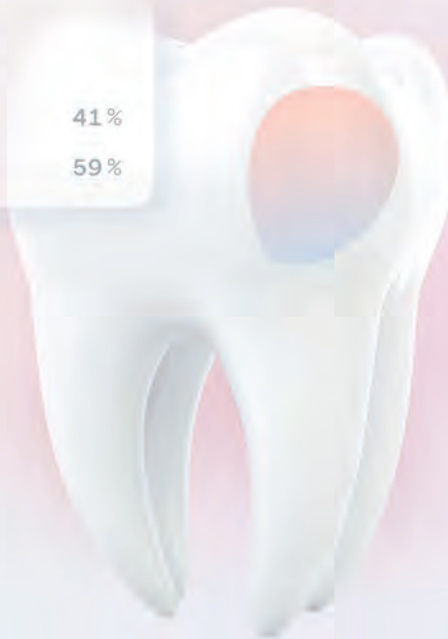
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**DR HOMA ZADEH**

Homa is an internationally renowned periodontist with a private practice limited to periodontology and implant surgery in Southern California. He is a diplomate of the American Board of Periodontology. He received his Doctor of Dental Surgery from USC Ostrow School of Dentistry. He has also completed advanced clinical education in periodontology and earned a PhD in immunology from the University of Connecticut.

ENHANCED CPD

CPD hours: one

GDC development outcome: C

Topic: Digital dentistry

Educational aims and objectives:

To demonstrate the successful outcomes that can be achieved with a combination of immediate protocols with a digital approach.

This article qualifies for one hour of enhanced CPD; answer the questions on page 94 or scan the QR code.



Immediate implants have been shown to deliver highly positive outcomes in a broad range of situations. No significant differences in survival rates have been identified between implants placed using delayed and immediate protocols (Patel et al, 2023).

The literature also supports immediate loading, with research demonstrating high survival rates once again (Rojas-Rojas et al, 2024).

Further advantages can be experienced when a digital workflow is implemented, as the approach has been proven to afford several benefits impacting both the clinician and patient. These include shorter

treatment times, a simpler professional workflow, more efficient lab work and reduced operating costs (Bessadet et al, 2025).

The following case report shows the successful outcomes that can be achieved with a combination of immediate protocols with a digital approach.

CASE REPORT

A 61-year-old female presented with a long history of wearing removable partial dentures in both the maxilla and mandible.

The mandibular partial denture was particularly ill-fitting, making it difficult for her to eat comfortably.



FIGURE 1: Presenting situation



FIGURE 2: Retracted view with dentures removed



FIGURE 3: Upper occlusal view

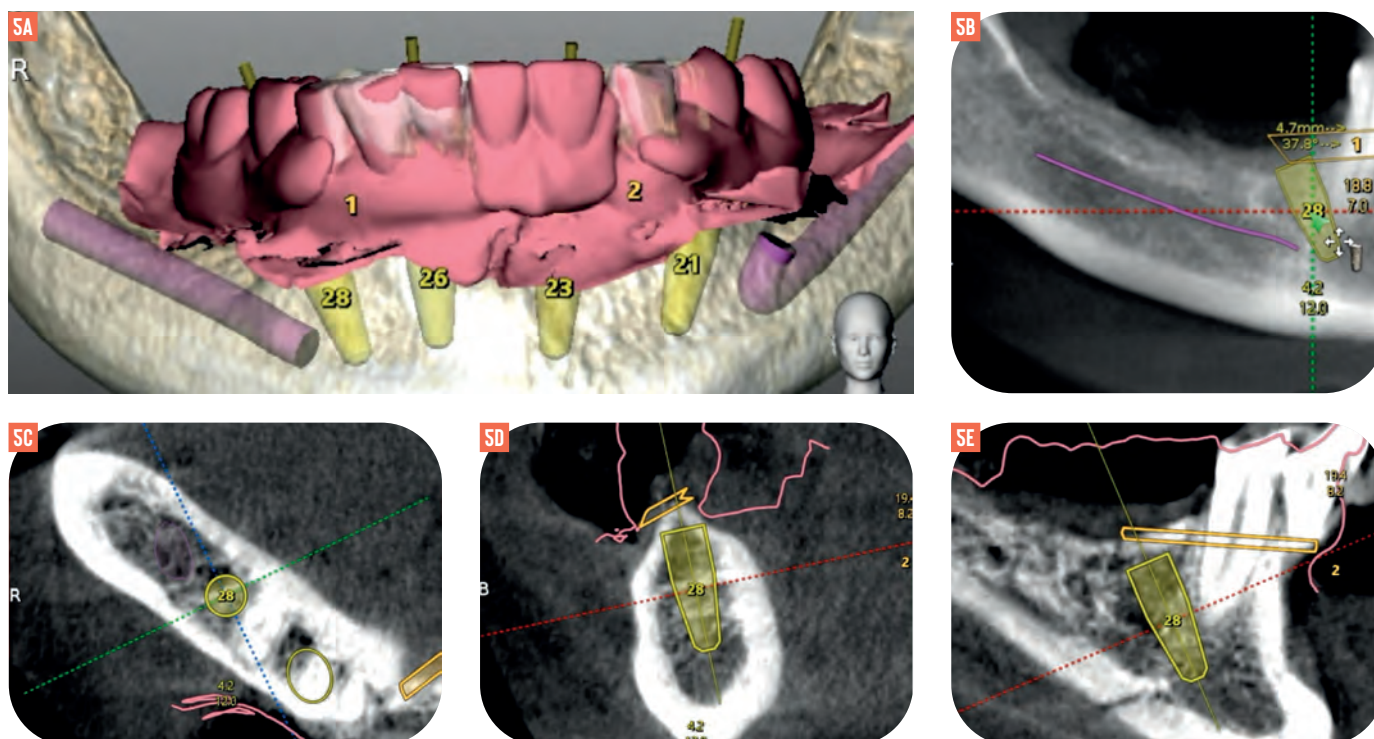


FIGURE 4: Lower occlusal view

Homa Zadeh presents a complex case that required the replacement of an ill-fitting denture to restore the patient's ability to eat properly

Immediate implant loading: digital workflow





FIGURES 5A to 5E: Digital treatment planning

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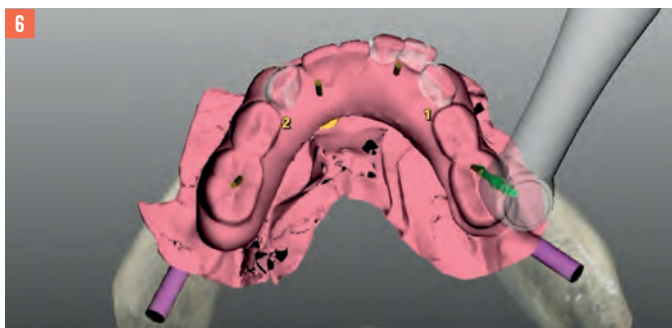


FIGURE 6: Surgical guide design and drilling protocol

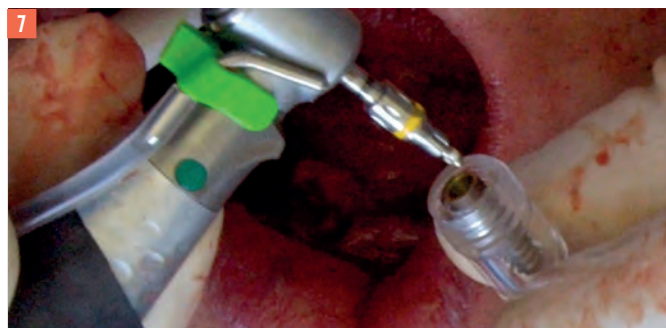


FIGURE 7: Implant placement through surgical guide

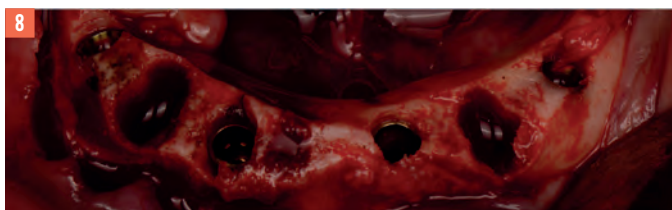


FIGURE 8: Implants placed approximately 1mm subcrestally

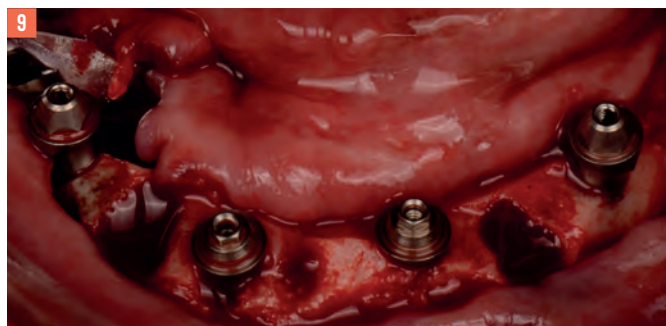


FIGURE 9: MUA placed

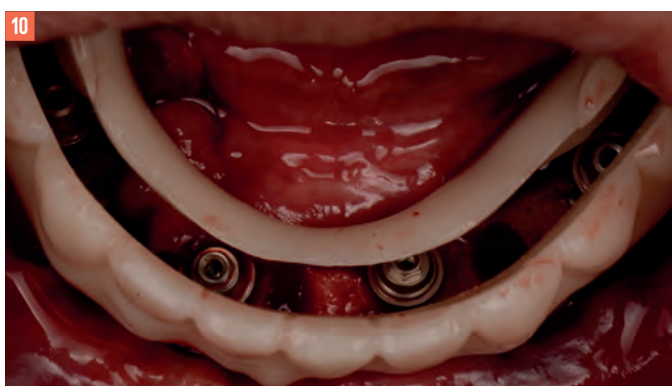


FIGURE 10: MUA guide used to verify positions relative to the prosthesis



FIGURE 11: Flap sutured closed

TREATMENT PLAN

A collaborative treatment plan was developed by a multidisciplinary team, which consisted of two prosthodontists (Fernando Rojas Vizcaya and Kia Karimi) and the periodontist (Homa Zadeh).

The plan involved extracting the remaining mandibular teeth and immediately placing and loading implants. Concurrently, a digital workflow was implemented to design both the provisional mandibular prosthesis and an improved maxillary prosthesis.

To facilitate accurate implant placement and prosthesis delivery, a duplicate of the mandibular prosthesis was 3D printed with an open occlusal design, ensuring correct orientation of the multi-unit abutments.

Additionally, a prosthesis positioning guide was fabricated to aid in proper seating of the mandibular prosthesis, compensating for the loss of anatomic landmarks following flap elevation and bone reduction.

SURGICAL PROCEDURE

The implant surgery and immediate loading was conducted during a live surgery demonstration at the Vista Institute for Therapeutic Innovations.

Osteotomies were performed using dynamic navigation, which provided precise control over implant positioning in accordance with the preoperative plan.

The navigation system tracked jaw position using a navigation tracker placed on the remaining anterior teeth, allowing accurate placement of the posterior implants which were not covered by the tracker.

Subsequently, a second tracker was fixated to the mandibular symphysis to transfer the registration data to a bone-fixated tracker after the extractions.

The implants used were Biohorizons Camlog Tapered Pro Conical, chosen for their deep conical connection, which promotes a secure implant-abutment seal. This allowed

for placement 1-2mm subcrestally to optimise stability.

Straight multi-unit abutments (MUAs) were placed on the anterior implants, while 17-degree angled MUAs were used for the posterior implants. All abutments were torqued to 20Ncm.

Implant positions were then recorded using photogrammetry to ensure precise prosthetic fabrication.

Following implant placement, Biohorizons MUA healing caps were secured, and the surgical site was closed with continuous interlocking PTFE sutures.

An intraoral scan was performed to capture the peri-implant soft tissues.

PROSTHETIC WORKFLOW

To register the occlusion and vertical dimension, the MUA guide was filled with polyvinyl siloxane bite registration material and seated using the prosthesis positioning guide.





FIGURE 12: Provisional prosthetic tried in the mouth



FIGURE 13: Provisional prosthesis in situ



FIGURE 14: Implants uncovered after initial healing

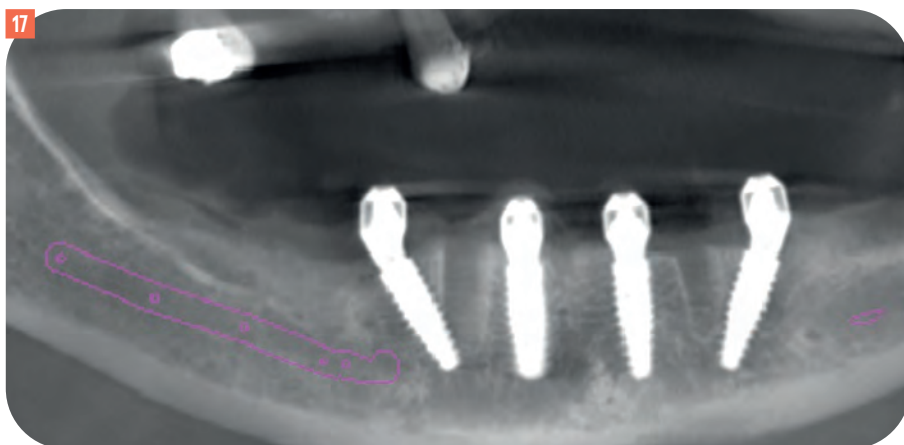


FIGURE 17: Postoperative radiograph



FIGURE 18: Pre and post treatment comparison

Once the material had set, an intraoral scan was taken to capture the bite and vertical dimension. The patient was given a short break while the dental technician designed the provisional prosthesis. The design was reviewed



FIGURE 15: Final prosthesis placed



FIGURE 16: Final prosthesis occlusal view

by the periodontist and prosthodontists, who provided feedback before approving the final STL file. The provisional prosthesis was then 3D printed in Onx Tough 2, a resin reinforced with ceramic for added strength.

The provisional prosthesis was delivered with minimal adjustments, ensuring a comfortable and functional immediate restoration.

POSTOPERATIVE PHASE AND DEFINITIVE PROSTHESIS

The patient was closely monitored throughout the healing period, which proceeded uneventfully. Once osseointegration was confirmed, another intraoral scan was performed to capture the healed peri-implant tissues and to refine the prosthetic design.

A monolithic zirconia prosthesis was then milled and delivered, providing a durable and aesthetic final restoration.

This case highlights the advantages of a fully digital workflow, combining dynamic navigation, photogrammetry, intraoral scanning, 3D printing and an implant with deep conical connection to achieve a predictable and efficient outcome in immediate implant rehabilitation. [🔗](#)

Acknowledgement

Dr Fernando Rojas Vizcaya and Kia Karimi collaborated on this case.

REFERENCES

- Bessadet M, Auduc C, Drancourt N, Nicolas E, El Osta N (2025) Comparative analyses of time efficiency and cost in fabricating fixed implant-supported prostheses in digital, hybrid, and conventional workflows: A systematic review and meta-analysis. *J Prosthet Dent* 133(3): 689-712
- Patel R, Ucer C, Wright S, Khan RS (2023) Differences in dental implant survival between immediate vs. delayed placement: a systematic review and meta-analysis. *Dent J (Basel)* 11(9): 218
- Rojas-Rojas PdP, Gracia-Rojas A, Traboulsi-Garet B, Sánchez-Garcés MÁ, Toledano-Serrabona J, Gay-Escoda C (2024) Immediate loading of post-extraction implants: success and survival rates: a systematic review and meta-analysis. *Applied Sciences* 14(23): 11228

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ENDODONTICS

MARTIN VORSTER & PEET VAN DER VYVER
Root canal shaping: Reciproc Blue

47



The evolution of nickel titanium rotary instrumentation has dramatically improved the efficiency, safety and predictability of root canal preparation. One of the most significant innovations in this space is the development of reciprocating systems. Among them, Reciproc Blue has emerged as a leading single-file reciprocating system – Martin Vorster and Peet van der Vyver, p47

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BCHD MSC PHD
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ENHANCED CPD

CPD hours: one

GDC development outcome: C

Topic: Endodontics

Educational aims and objectives:

To provide an overview of Reciproc Blue, and present a case presentation using the reciprocating files.

This article qualifies for one hour of enhanced CPD; answer the questions on page 94 or scan the QR code.



The evolution of nickel titanium rotary instrumentation has dramatically improved the efficiency, safety and predictability of root canal preparation.

One of the most significant innovations in this space is the development of reciprocating systems. Among them, Reciproc Blue (VDW Dental) has emerged as a leading single-file reciprocating system due to its combination of proprietary blue heat treatment, advanced metallurgy and efficient cutting design.

Designed to simplify canal shaping, Reciproc Blue reduces procedural steps while enhancing safety and flexibility.

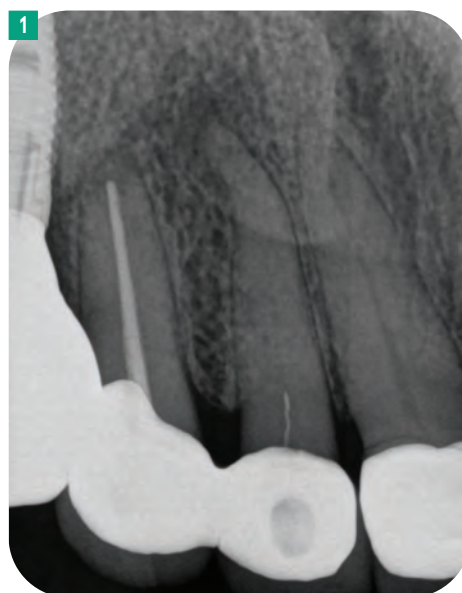


FIGURE 1: Periapical radiograph of maxillary right lateral incisor with a large periapical lesion, canal calcification and evidence of a broken root canal instrument located in the coronal aspect of the root canal system

The Reciproc Blue system comprises three instruments, along with corresponding gutta percha cones and paper points:

1. Reciproc Blue 25
2. Reciproc Blue 40
3. Reciproc Blue 50.

These instruments share a similar design to the original Reciproc series and feature an S-shaped cross-section.

Each file in the system incorporates a regressive taper that begins 3mm from the tip.

Reciproc Blue 25 has a tip diameter of 0.25mm with an 8% taper over the initial 3mm.

The Reciproc Blue 40 has a tip measuring 0.40mm in diameter and a 6% taper over the same length.

Lastly, the Reciproc Blue 50 features a 0.50mm tip diameter with a 5% taper over the first 3mm from the tip (Yared, 2017).

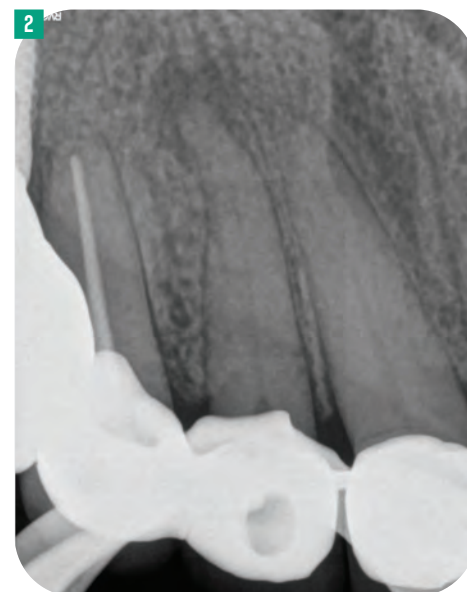


FIGURE 2: Periapical radiograph after removal of the fractured instrument

Martin Vorster and **Peet van der Vyver** discuss Reciproc Blue, presenting an overview and case presentation using the reciprocating files

Root canal shaping: Reciproc Blue





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The integrated apex locator with dynamic accuracy technology on the motor reads the canal measurement signal while the instrument is shaping the canal and activates the auto-reverse function when the major apical foramen is reached

Literature demonstrates enhanced performance and clinical reliability of Reciproc Blue in comparison with similar rotary and reciprocating systems.

METALLURGICAL ADVANCEMENTS AND FRACTURE RESISTANCE

Reciproc Blue undergoes a proprietary heat treatment that imparts a distinct blue colour and significantly enhances its mechanical properties. This heat treatment increases cyclic fatigue resistance by making the file more flexible and reducing the risk of separation (De-Deus et al, 2017).

EFFICIENCY AND SIMPLICITY IN SHAPING

The single-file approach of Reciproc Blue streamlines clinical workflow. Using just one instrument to complete the shaping phase reduces the time of instrumentation.

An increase in cutting efficiency and greater penetration depth was reported when compared to another popular single file system (Plotino et al, 2015).

The reduced number of instruments leads to lower cost, with the single use reducing the chance of cross-contamination (Yared, 2008).

PRESERVATION OF ROOT CANAL ANATOMY AND GLIDE PATH PREPARATION

Maintaining the original canal curvature while effectively removing infected tissue is essential in endodontics.

Reciproc Blue respects the canal anatomy and performs well in curved and narrow canals (Silva et al, 2021). Moreover, its flexible design allows it to reach working length with minimal or even no glide path preparation in certain cases, further reducing preparation time and cost.

According to Yared (2017), only one Reciproc Blue instrument can be used in reciprocation motion to complete the canal preparation without the need for hand filing or creating a glide path in most clinical cases.

Several authors report on the ability to use an M-Wire Reciproc instrument up to the working length without glide path preparation in in-vitro and in-vivo studies (De Deus et al, 2103; Zuolo, Carvalho and De-Deus G, 2015; Rodrigues et al, 2016; Bartols, Robra and Walther, 2017).

The results of these studies show that the M-Wire Reciproc R25 instrument can be used to prepare standard root canal systems without any prior glide path preparation in more than 90% of cases.

Yared (2017) also recommends using only one Reciproc Blue instrument to complete canal preparation without the need for hand filing or creating a glide path in most clinical cases.

A study by De Deus and colleagues (2019) assessed the frequency in which Reciproc Blue R25 instruments reached the full working length of mandibular molar canals (308) on extracted teeth without prior glide path



FIGURE 3A: Reciproc Blue R25 was used for initial canal preparation

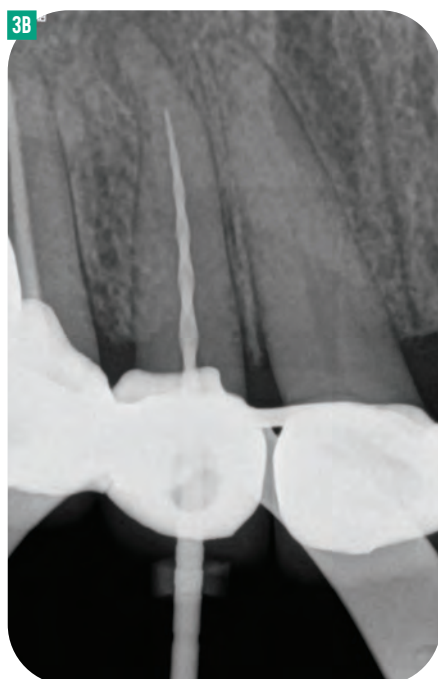


FIGURE 3B: Periapical radiograph confirming the progress of the Reciproc Blue R25 instrument



FIGURE 4A: Reciproc Blue R25 was used to full working length, indicated by the file engaging the auto-reverse mode on the X-Smart Pro+ endodontic motor

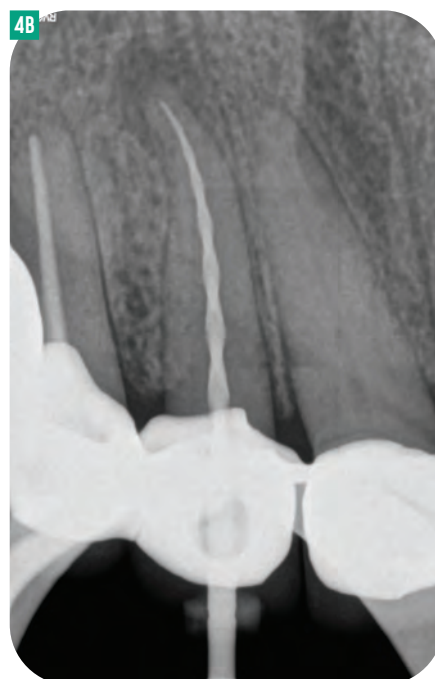


FIGURE 4B: Periapical radiograph confirming the progress of the Reciproc Blue R25 instrument to full working length

preparation. The Reciproc Blue R25 instruments were able to reach the full working length in 304 root canals (98.70%). Reciproc Blue R25 instruments were unable to reach the full working length without a glide path in only four canals out of 308.

Three-dimensional micro-CT images of these four canals revealed that two of these canals presented with apices terminating in extreme abrupt para-foraminal exits and no apparent reasons were found to explain why Reciproc Blue R25 instruments did not reach the full working length in the other two cases.

However, an in-vitro study on extracted maxillary premolar teeth showed that canal preparation with prior glide path still leads to more centred canal preparation with less canal transportation compared to a 'no glide preparation' protocol with Reciproc Blue (Hage et al, 2020).

It is recommended to check patency and create a glide path with hand files or the R-Pilot dedicated glide path instrument for the system when the Reciproc Blue R25 files struggles to progress or stop advancing down the canal (Yared, 2019).

DEBRIS REMOVAL

Reciproc Blue's reciprocating motion mimics a balanced-force technique, reducing apical extrusion of debris associated with postoperative pain (Dincer et al, 2015).

CASE PRESENTATION

The patient, a 50-year-old female, presented with a non-vital maxillary right lateral incisor that had a large periapical lesion. She had a history of a previous attempt at root canal treatment, which was unsuccessful due to canal calcification.

Radiographically, there was also evidence of a broken root canal instrument located in the coronal aspect of the root canal system (Figure 1). The fractured root canal instrument was removed using an ultrasonic instrument (Figure 2).

Canal preparation was then initiated with a Reciproc Blue R25 instrument without any prior canal negotiation with hand instruments or glide path preparation.

Light pressure was applied to the file while employing three slow in-and-out pecking motions without completely pulling the file out of the canal. The file was then removed from the canal to clean its flutes. This protocol was repeated four times as the file advanced to approximately two-thirds of the way down the canal system.

After each pecking cycle, the canal was irrigated with sodium hypochlorite. A periapical radiograph was taken to assess the progress of the instrument at this level (Figure 3).



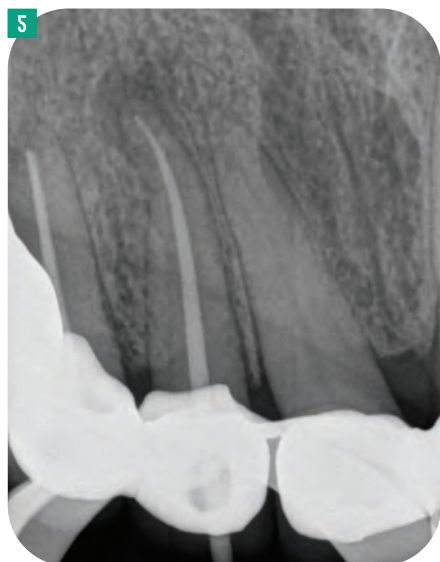


FIGURE 5: Periapical radiograph confirming the fit of the Reciproc Blue R25 ISO size 25 gutta point to full working length

Reciproc Blue offers an efficient, safe and simplified approach to root canal shaping with or without glide path preparation

A size 08 K-file was used to check canal patency before the Reciproc Blue R25 was again used in the same manner as described above until it reached the full working length (Figure 4), indicated by the file engaging the auto-reverse mode on the X-Smart Pro+ endodontic motor.

According to the manufacturer, the integrated apex locator with dynamic accuracy technology on the motor accurately reads the canal measurement signal while the instrument is shaping the canal and activates the auto-reverse function when the major apical foramen is reached.

The canal was irrigated with 17% EDTA and 3.5% heated sodium hypochlorite and the solutions activated with the Smartlite Pro Endoactivator.

A Reciproc Blue R25 ISO size 25 gutta percha point was placed into the prepared root canal system and fit was confirmed with a periapical radiograph (Figure 5).

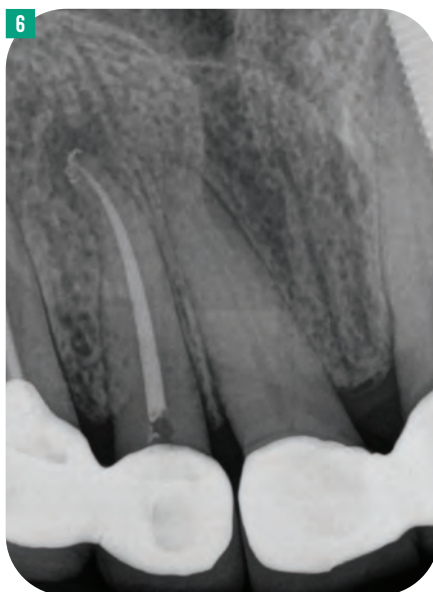


FIGURE 6: Periapical radiograph showing the result after canal obturation

The prepared canal was dried with paper points. Canal obturation was done with Pulp Canal Sealer EWC root canal cement, the gutta percha cone and the Gutta-Smart obturation system using the continuous wave of condensation technique.

Figure 6 depicts the result after canal obturation.

CONCLUSION

Reciproc Blue offers an efficient, safe and simplified approach to root canal shaping with or without glide path preparation.

Its superior fatigue resistance, shaping ability, and preservation of original canal anatomy makes it a valuable tool in both routine and complex endodontic cases. [🔗](#)

Acknowledgement

This article was first printed in *International Dentistry – African Edition* and has been reprinted with permission. Vorster M, Van der Vyver PJ (2025) *Reciproc Blue: Overview and Case Presentation*. *Int Dent Afr Ed* 15(2): 6-10

PRODUCTS USED

X-Smart Pro+, Smartlite Pro Endoactivator, Gutta-Smart Dentsply Sirona
Reciproc Blue VDW Dental
Pulp Canal Sealer EWC Kerr

REFERENCES

- Bartols A, Robra BP, Walther W (2017) The ability of Reciproc instruments to reach full working length without glide path preparation: a clinical retrospective study. *Peer J* 19: 3583
- De-Deus G, Arruda TE, Souza EM, Neves A, Magalhães K, Thuanne E, Fidel RA (2013) The ability of the Reciproc R25 instrument to reach the full root canal working length without a glide path. *Int Endod J* 46: 993-8
- De-Deus G, Silva EJ, Vieira VT, Belladonna FG, Elias CN, Plotino G, Grande NM (2017) Blue thermomechanical treatment optimizes fatigue resistance and flexibility of the Reciproc files. *J Endod* 43(3): 462-466
- Dincer A, Er O, Canakci B (2015) Evaluation of apically extruded debris during root canal retreatment with several NiTi systems. *Int Endod J* 48(12): 1194-1198
- Hage W, Zogheib C, Bukiet F, Sfeir G, Khalil I, Gergi R, Naaman A (2020) Canal transportation and centring ability of Reciproc and Reciproc Blue with or without use of glide path instruments: a CBCT study. *Eur Endod J* 5(2): 118
- Plotino G, Giansiracusa Rubini A, Grande NM, Testarelli L, Gambarini G (2015) Cutting efficiency of Reciproc and WaveOne reciprocating instruments. *J Endod* 41(6): 1007-1010
- Rodrigues E, De-Deus G, Souza E, Silva EJ (2016) Safe mechanical preparation with reciprocation movement without glide path creation: result from a pool of 673 root canals. *Braz Dent J* 27: 22-7
- Silva RV, Alcalde MP, Rodrigues CT, Silveira FF, Duarte MA, Nunes E (2021) Root canal shaping of curved canals by Reciproc Blue system and Pro Taper Gold: a micro-computed tomographic study. *J Clin Exp Dent* 13(2): 112
- Yared G (2008) Canal preparation using only one Ni-Ti rotary instrument: Preliminary observations. *Int Endod J* 41(4): 339-344
- Yared G (2017) Reciproc Blue: the new generation of reciprocation. *Giornale Italiano di Endodonzia* 31(2): 96-101
- Zuolo ML, Carvalho MC, De-Deus G (2015) Negotiability of second mesiobuccal canals in maxillary molars using a reciprocating system. *J Endod* 41: 1913-7

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IMPLANT DENTISTRY

VIRAJ PATEL

Combining delayed and immediate placement

55



SELVARAJ BALAJI

Restoring very thin bone

62



The main challenge in this case arose as the bone was very thin with no cancellous bone in the jaw (only cortical bone). As such, the blood supply for the graft was significantly reduced, which made surgery difficult as it was too thick to place pins into the membrane – Selvaraj Balaji, p62

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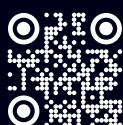
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**DR VIRAJ PATEL**

Having qualified as a dentist in 2012, Viraj underwent hospital training in Maxillofacial and Oral surgery in 2014. He completed the two-year Advanced Implant Dentistry Program at New York University in 2020 and has been working as an implant dentist in private practices across London since. He is a key opinion leader for Biohorizons, Geistlich and Zimvie and lectures internationally.

ENHANCED CPD

CPD hours: one

GDC development outcome: C

Topic: Implant dentistry

Educational aims and objectives:

To present a case requiring different surgical techniques and bone augmentation to deliver an aesthetic outcome in a timely manner. This article qualifies for one hour of enhanced CPD; answer the questions on page 94 or scan the QR code.



There are several clinical techniques available to the modern implant dentist. Immediate protocols have grown in popularity and now offer a safe and effective solution in many situations, affording faster treatment times and enhanced aesthetic outcomes.

Where required, bone grafting with immediate implant placement delivers excellent results. In particular, socket grafting can reduce the amount of horizontal bone loss and enhance soft tissue stability (Seyssens, Eeckhout and Cosyn, 2022).

It is also possible to combine techniques, utilising both immediate and delayed placement in the same case. There are even situations that require the placement of two adjacent implants. In this scenario, it is crucial to have sufficient interproximal space to reduce bone loss and help achieve good aesthetics.

The gap must be large enough for two standard diameter implants, with ideally 3mm between them (Ramanauskaite, Rocuzzo and Schwarz, 2018; Degidi et al, 2008) and a safety zone of 1.5mm between the implants and the neighbouring teeth. That means a minimum gap of approximately 14mm is required to safely and effectively place

two implants in adjacent sites – no matter what placement protocol is selected.

The following case demonstrates the placement of two adjacent implants, each requiring a different surgical approach.

PRESENTATION

A 58-year-old female patient presented looking to improve the aesthetics and function of her dentition.

During a consultation with another clinician, she had been offered conventional implant treatment involving the removal of the UL4 – which had root-filled a retained root – and delayed implant placement. The patient was hesitant to proceed in this way due to the predicted treatment time and expense. Upon presentation, the initial assessment suggested that an immediate implant may be viable for the UL4 site, alongside simultaneous implant placement in the already healed UL5 site.

ASSESSMENT

A comprehensive clinical assessment was conducted. The patient was generally fit and healthy, was taking no medication, had no allergies and maintained fair oral hygiene.



FIGURE 1: Preoperative intraoral image



FIGURE 2: Retained root that has been root filled

Viraj Patel presents a case requiring different surgical techniques and bone augmentation to deliver an aesthetic outcome in a timely manner

Combining delayed and immediate placement



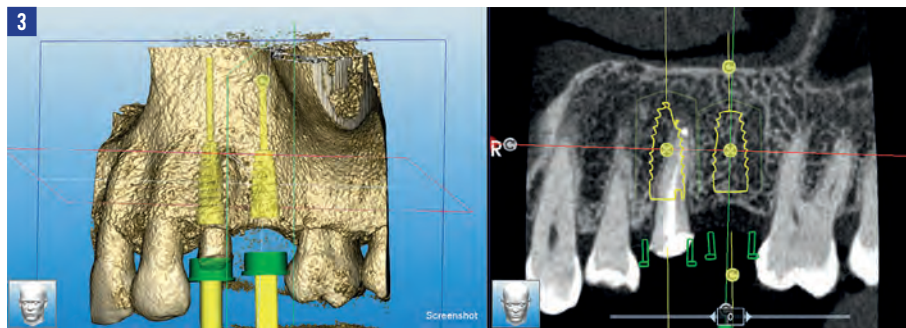


FIGURE 3: CT scan and digital planning for implant placement

The UL5 site, which had been edentulous for approximately seven years, presented with a substantial depression. This made immediate and simultaneous implant placement even more appropriate for the UL4/5, utilising the bone peaks around the UL4 to create a more favourable UL5 implant position and simultaneous augmentation.

Other findings of note were signs of tooth wear on the UL3 and UL6, although these were periodontally sound and completely stable.

OPTIONS DISCUSSED

Aside from no treatment and the conventional delayed implant placement approach already offered to the patient, another option would have been a single implant in the UL5 site and restoration with a cantilever bridge.

The existing tooth wear suggested potential parafunction, which would have put considerable pressure on one implant and the resulting restoration, the professional recommendation was two implants at the UL4 and UL5 sites.

TREATMENT PLANNING

Approximately 15mm of space was available between the distal of the UR3 and mesial of the UR6, which highlighted the importance of absolute accuracy when positioning the implants. Guided surgery was, therefore, indicated as a way of optimising precision.

Treatment was prosthetically-driven and planned using digital software to determine the ideal implant positions and angles. Immediate provisionalisation with a non-functionally loaded custom healing abutment was to be implemented for the UL4 site, to reduce the impact of any parafunction on the implant during healing.

Custom healing abutments are a great tool to support soft tissue in relation to the existing adjacent teeth. A CBCT and intraoral scans were taken and uploaded to the SMOP portal to design the surgical guide as per the clinical plan. These were 3D printed ahead of the surgical appointment.



FIGURE 4: Concavity obvious post extraction

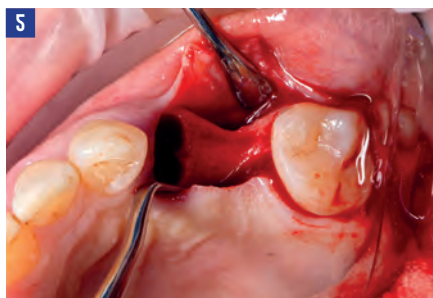


FIGURE 5: Flap raised with a paracrestal incision



FIGURE 6: Surgical guide fitted in the mouth



FIGURES 7A and 7B: Fully guided implant placement



FIGURE 8: Implants placed in palatal root

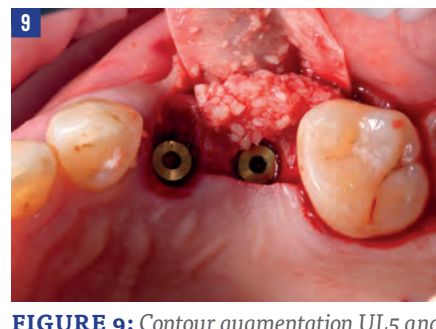


FIGURE 9: Contour augmentation UL5 and jump gap grafting UL4

TREATMENT PROVISION

The UL4 root was extracted as atraumatically as possible. The roots were thin and spindly, and needed to be split to be removed safely. They were sectioned in a mesial-distal direction to leave the buccal and palatal roots separate, reducing the risk of fracture and preserving the

interdental and surrounding bone.

A flap was raised in the UL5 site using a paracrestal incision – vertical incisions were avoided to preserve blood supply to the gingiva, protecting the papilla between the UL6/7 for optimal aesthetic and soft tissue outcomes.

Technically, a flap is not typically needed for

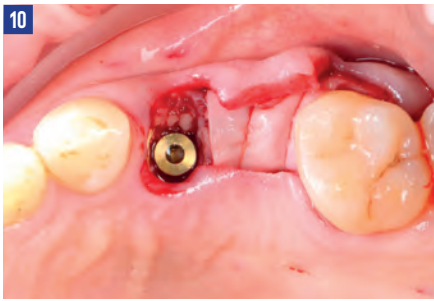


FIGURE 10: Periosteal suture stabilisation of graft



FIGURE 11: Passive tension-free closure obtained



FIGURE 12: Custom healer in UL4 site

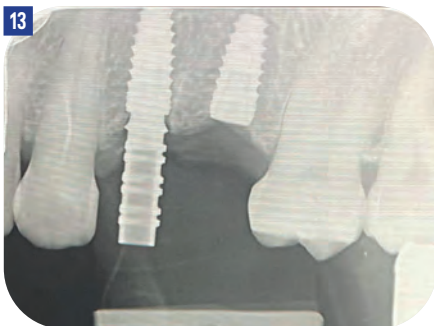


FIGURE 13: Temp cylinder in situ

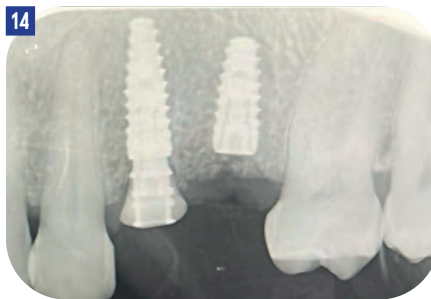


FIGURE 14: Custom healing abutment in situ



FIGURE 15: Three months after implant placement and GBR



FIGURE 16: Uncovered UL5 implant, new buccal bone at least 2mm in width



FIGURE 17: Day of crown fitting



FIGURE 18: Difference between custom and conventional healer

many immediate implant cases. However, the UL5 site needed augmentation and mild atrophy of the ridge was present. The clinician does not advocate flapless procedures for implant placement due to the need to see the underlying ridge and implant following placement.

The surgical guide was then placed in the mouth and the manufacturer's specific drilling sequence followed, increasing the osteotomy in size incrementally.

Two 3.8mm diameter Conelog Progressive-Line implants were placed through the guide, following the plan precisely. The UL4 implant was longer (11mm) to ensure sufficient apical bone was engaged for primary stability, it was also positioned in the palatal root to ensure good engagement with the bone and better bone to implant contact.

A sizable jump gap was noted between the implant and the buccal plate of around 5-6mm. From a biological perspective, the jump gap can be left because the ridge would heal to leave a sufficient buccal plate. However, the literature shows that grafting reduces the amount of bone resorption post implant placement, which was one of the reasons that augmentation was indicated in this case (Liñares et al, 2023).

Another predetermined concern was the amount of remaining bone surrounding an implant after placement. There was less than 2mm of residual bone buccal to the UL5 site once the implant was placed. Monje and colleagues (2023) showed that thin buccal bone at the implant site increases the risk of major dimensional changes, this can have direct implications on the aesthetics and functional outcomes.

Consequently, the bone was contour-augmented, using Mineross Blend (Biohorizons Camlog), which provides a good combination of cortical and cancellous bone for efficient bone turnover and also maintains graft stability in the healing phase. The graft was held in place with a collagen membrane stabilised using resorbable sutures. The custom healing abutment was then placed and torqued (10Ncm) into the UL4 implant



before the wound was approximated and sutured using a non-resorbable 6-0 Prolene suture.

An X-ray was taken immediately postoperatively to confirm that the temporary cylinder was seated correctly and wasn't catching on the socket walls. This image also provided a reference for the custom healing abutment position and ensured that the bone graft material added to the jump gaps wasn't preventing this abutment from fully seating.

REVIEW AND REFLECTIONS

The implant in the UL5 was uncovered three months later to reveal healthy tissues. Three weeks later, the final scan was taken (using a

Trios intraoral scanner) for the fabrication of the definitive crowns.

On the day of crown fits, both abutments were removed and the crowns seated. Due to the UL4 site having a custom healing abutment, which had been supporting our ideal emergence profile, it was much easier to engage this restoration and seat within the already moulded soft tissues.

With regards to the UL5, there was some blanching around the buccal aspect of the crown due to the use of a generic abutment, which does not offer any resemblance to the ideal emergence profile for the final restoration. Regardless, good prosthetic positioning had been achieved to allow for screw-retained restorations in both

implants. The final restorations were fitted as single unit layered zirconia crowns on titanium bases. The patient was delighted with the results.

Upon reflection of this case, a custom healing abutment may have delivered better soft tissue contouring than the generic abutment on the UL5. Healing may have taken longer, but it would have been easily tolerated by the patient and may have resulted in a better biological result with optimised aesthetics.

With regards to the products selected, the Conelog Progressive implant 3.8mm is my go-to for premolar sites. The implant is versatile in its clinical application, suitable for use in healed ridges and fresh sockets, providing good stability for delayed and immediate implant placement protocols. It's an all-in-one implant for me and I love using it.

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FIGURE 19: Adjacent to UL5, blanching on buccal tissue



FIGURE 20: Screw access holes filled



FIGURE 21: Layered zirconia crowns on titanium bases



FIGURE 22: Anterior view of the crowns in situ

REFERENCES

- Degidi M, Novaes AB Jr, Nardi D, Piattelli A (2008) Outcome analysis of immediately placed, immediately restored implants in the esthetic area: the clinical relevance of different interimplant distances. *J Periodontol* 79: 1056-1061
- Liñares A, Dopico J, Magrin G, Blanco J (2023) Critical review on bone grafting during immediate implant placement. *Periodontol 2000* 93: 309-326
- Monje A, Rocuzzo A, Buser D, Wang HL (2023) Influence of buccal bone wall thickness on the peri-implant hard and soft tissue dimensional changes: A systematic review. *Clinical Oral Implants Research* 34: 157-176
- Ramanauskaitė A, Rocuzzo A, Schwarz F (2018) A systematic review on the influence of the horizontal distance between two adjacent implants inserted in the anterior maxilla on the inter-implant mucosa fill. *Clin Oral Impl Res* 29(Suppl 15): 62-70
- Seyssens L, Eeckhout C, Cosyn J (2022) Immediate implant placement with or without socket grafting: A systematic review and meta-analysis. *Clin Implant Dent Relat Res* 24(3): 339-351

PRODUCTS USED

Conelog Progressive-Line,
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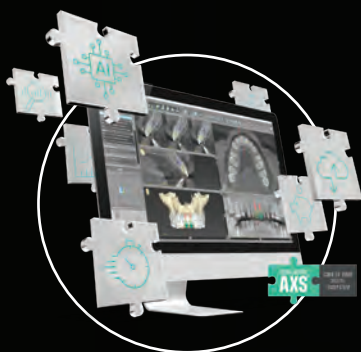
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Zirkonzahn (South Tyrol, Italy) will soon begin the fourth part of its 2025 lecture tour, 'High-tech meets handicraft – optimisation of the digital workflow for the fabrication of full dentures', this time reaching dental technicians and dentists in Birmingham, Cardiff and Southampton from 29 September to 1 October 2025.

Lecturer DT Lorenzo Pelizzari (instructor and CAD/CAM expert at Zirkonzahn) will present state-of-the-art methods and techniques for the creation of functional and aesthetically pleasing full dentures as an alternative to implant-supported prostheses. Indeed, even if minimally invasive procedures are becoming increasingly important, there are still patients who need a complete restoration after total tooth loss.

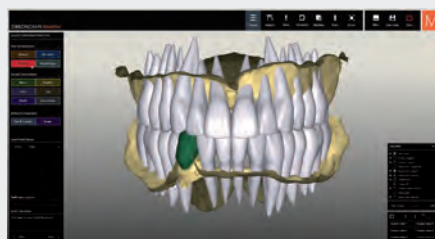
Participants will be guided through the challenges faced when creating a full denture with 28 teeth, considering the different initial patient situations: whether

the patient is edentulous or wearing existing prostheses in good or poor condition, the lecture will provide insights into the tailored approaches needed for optimal results.

TECHNOLOGIES AND MATERIALS

The process of creating high-quality dentures also involves digital technologies and correct materials. For this reason, the lecture will introduce new PMMA-based, nearly monomer-free resins and will demonstrate how digital solutions with automated set-up functions can simplify tooth placement and gingiva creation, ensuring an efficient, accurate and optimised workflow. Furthermore, participants will benefit from hands-on demonstrations of bonding teeth to denture bases using an innovative protocol based on the principle of cold welding.

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Restoring very thin bone

Selvaraj Balaji presents a challenging case in which hard and soft tissue augmentation was required to facilitate the placement of four dental implants in the mandible

A 63-year-old male patient was referred to the practice with missing LR5, LR6, LR7 and LL4, LL6. He had severe bone loss, and previous dentists had refused to place dental implants due to very thin bone and a resorbed mandible.

A CT scan was taken, confirming very narrow and thin bone, which would make implant placement a challenge. Additionally, a soft tissue defect in the form of a thin biotype was identified. A number of failing restorations were also identified in the upper teeth that needed to be addressed.

TREATMENT PLANNING

The treatment options were discussed with the patient, including doing nothing, which was not advised in this case as a restored dentition would significantly improve his quality of life.

In order to address all of the patients' missing teeth, the treatment plan needed to include a way to increase bone and soft tissue volume around the LL5 in order to place implants in the LL4 and LL6.

Bone and soft tissue augmentation were anticipated in the lower right region using the sausage technique in preparation for two dental implants. Aside from this, there were two main treatment options that aimed to address the complication of the LL5, these were:

1. Extract the LL5 in order to facilitate the use of the sausage technique in the lower left region, in preparation for dental implant placement



FIGURE 1: Initial presentation



FIGURE 2: Pre-treatment right lateral



FIGURE 3: Pre-treatment left lateral

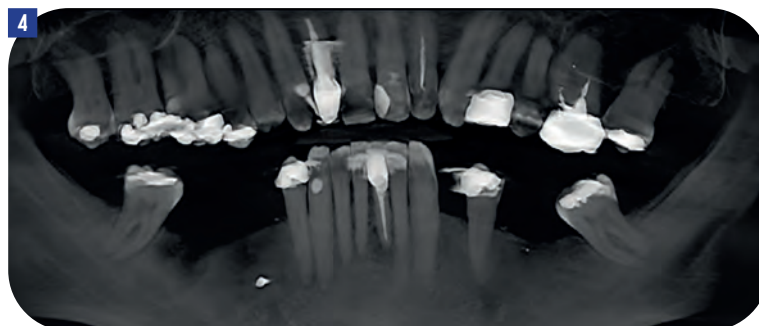


FIGURE 4: Preoperative OPG



DR SELVARAJ BALAJI
BDS MFDS
RCPS(GLA) MFD
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RCS(ENG)

Selvaraj is the principal dentist of The Gallery Dental Group, which is made up of Meadow Walk Dental Practice and The Gallery Dental & Implant Centre. Selvaraj is also the founder of the Academy of Soft and Hard Tissue Augmentation (ASHA) and runs courses, lectures and study clubs in the UK and around Europe for aspiring implant dentists. Visit www.ashaclub.co.uk for details.

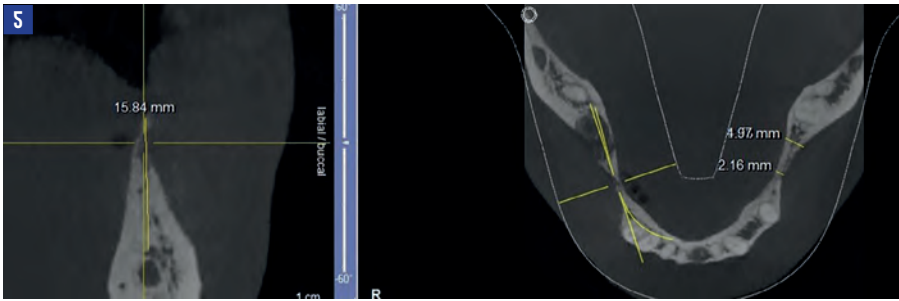


FIGURE 5: Preoperative CT



FIGURE 6: Lower left flap opened



FIGURE 8: First layer of membrane placed around LL5

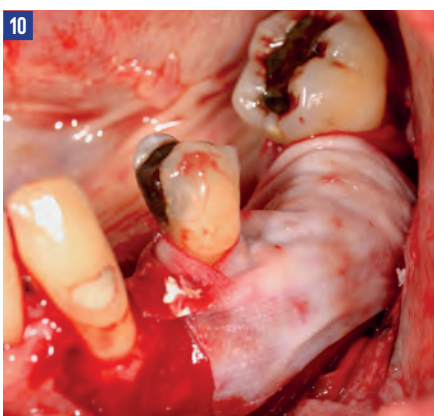


FIGURE 10: Second layer of membrane placed around LL5

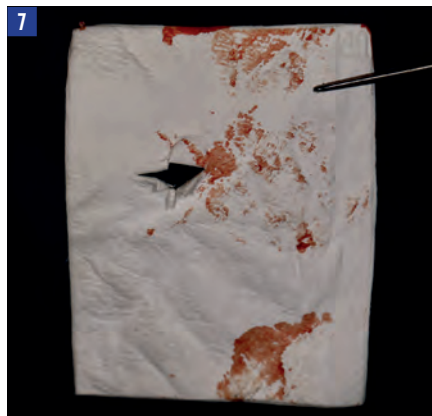


FIGURE 7: Hole in membrane for LL5

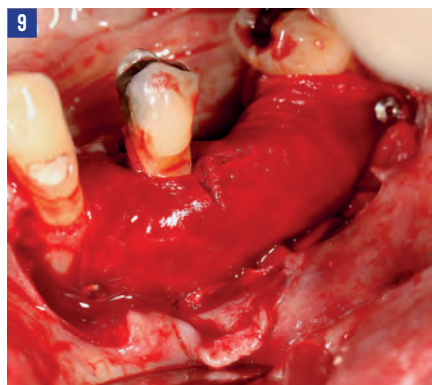


FIGURE 9: Buccal pins placed to secure membrane



FIGURE 11: Flap closed using lingual advancement technique

2. Keep the LL5 and perform bone and soft tissue augmentation using the 'poncho technique', allowing us to retain as much of the natural dentition as possible, whilst still facilitating the placement of two dental implants to replace the missing LL4 and LL6. Each of these treatment options were explained to the patient, and any questions or concerns he had were addressed. The patient provided informed consent to treatment option two, as this would enable him to keep as many of his natural teeth as possible, whilst still improving function and aesthetics.

FIRST TREATMENT PHASE

Surgery on both the lower left and lower right sides were performed on the same day. A mixture of 40% xenograft and 60% autogenous bone (harvested from the patient) was prepared for the bone grafts, alongside a resorbable collagen membrane to secure the graft material in place. Flaps were raised in the lower left and lower right regions to facilitate bone and soft tissue augmentation.

In order to address the bone loss around the LL5, the 'poncho technique' was used. This technique involved making a hole in the membrane to accommodate the LL5. Once in place, the lingual pin was placed, and the bone graft material was applied using a layering technique placed buccally. Next, the buccal pin was placed in the membrane to secure the graft. A second layer of collagen membrane was placed around the neck of the LL5 to give further stability to the bone graft.

The lower right area was then treated using the sausage technique in which the xenograft and autogenous bone mixture was placed, covered with the collagen membrane, and secured with master pins. This technique aims to immobilise the graft and improve long-term stability. The lingual advancement flap technique was then performed on both sides, along with buccal flap advancement using mucoperio elastic technique to gain passive soft tissue closure and facilitate a tension-free closure for the best aesthetic results. Following surgery, the patient was sent home with standard oral hygiene instructions.

SECOND TREATMENT PHASE

Six months later, the site was reopened to place dental implants. Good, healthy bone was revealed with sufficient height and width for the placement of two implants in the lower right, and two implants in the lower left region.

Two months later, the soft tissue was reassessed. The pre-existing thin biotype and surgeries necessitated a free gingival graft to increase the gingival width and the amount of



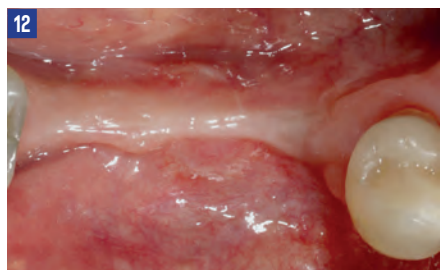


FIGURE 12: Lower right initial situation



FIGURE 13: Lower right flap opened and bone graft material placed

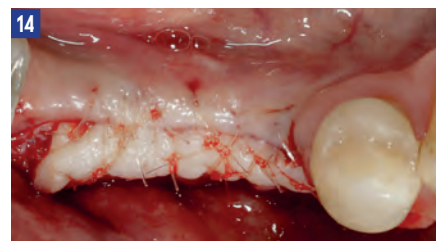


FIGURE 14: Lower right soft tissue graft placed

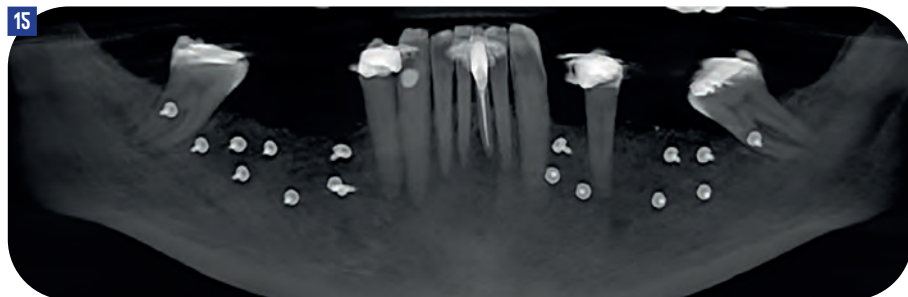


FIGURE 15: Post bone and soft tissue augmentation OPG



FIGURE 17: Lower right dental implants placed



FIGURE 18: Dental implants exposed



FIGURE 19: Crowns placed

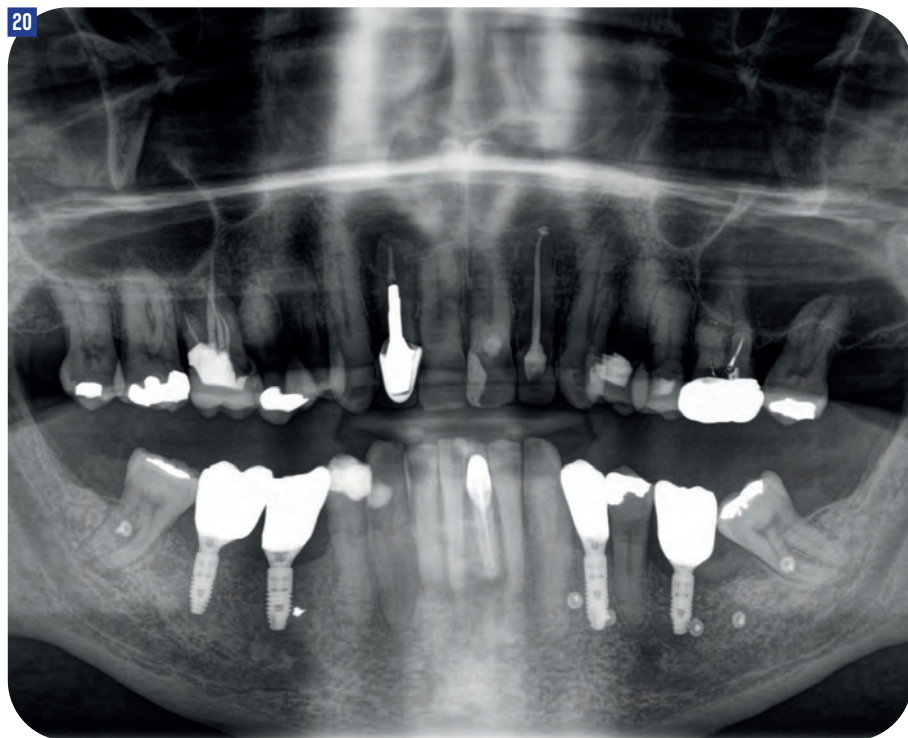


FIGURE 20: Final outcome OPG

keratinised mucosa. This was harvested from the palate. At the recipient site, a split thickness flap was raised and apically repositioned. The graft material was placed on top of the periosteum and left to mature for three months.

After a further two months, the dental implants were exposed and restored with four crowns.

DISCUSSION

The main challenge in this case arose as the bone was very thin with no cancellous bone in the jaw (only cortical bone). As such, the blood supply for the graft was significantly reduced, which made surgery difficult as it was too thick to place pins into the membrane.

The presence of LL5 between the two missing lower left teeth added a further complication. A decision had to be made about whether to remove the LL5 in order to make surgery easier, or to keep the tooth to help maintain bone and the remaining natural dentition. Ultimately, we decided to keep the LL5 and place bone and soft tissue graft around it as this was deemed best for the patient. [©](#)



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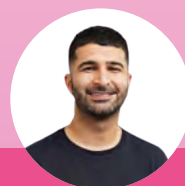
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ORALHEALTH

NEESHA PATEL
The oral-brain axis

69



IAIN CHAPPLE
Q&A: principles for oral health

74



Studies show a strong association between periodontal disease and dementia, with both conditions sharing common inflammatory markers and biological pathways. Understanding this link is crucial as both diseases disproportionately affect older adults – Neesha Patel, p69

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

To explore the potential connection between dementia and periodontal disease and outline the common inflammatory and microbiological processes that underline these disorders. Practical implications for dental professionals in promoting periodontal care to support systemic and cognitive health will also be discussed.

This article qualifies for one hour of enhanced CPD; answer the questions on page 94 or scan the QR code.



Dementia is at the forefront of global public health challenges, with approximately 10 million new cases diagnosed worldwide every year, according to World Health Organization (WHO). As a clinical syndrome, it is characterised by a gradual deterioration of cognitive skills including language, spatial perception, memory, orientation, learning capacity and mathematical reasoning affecting the older generation (WHO, 2022).

In 2019, an estimated 57 million people worldwide were living with dementia, of which Alzheimer's and other types of dementia are the most common forms (Livingston et al, 2020).

This number is expected to triple by 2050, highlighting the increasing burden of dementia and related disorders (Livingston et al, 2020).

Studies show a strong association between periodontal disease and dementia, with both conditions sharing common inflammatory markers and biological pathways. Understanding this link is crucial as both diseases disproportionately affect older adults, increasing their susceptibility to systemic and cognitive decline.

More importantly, since periodontal disease is largely preventable and can be managed through early intervention and oral health management, addressing this may offer a modifiable pathway to mitigate dementia risk or its progression rate.

This article will explore the potential connection between dementia and periodontal disease and outline the common inflammatory and microbiological processes that underline these disorders by examining epidemiological and clinical evidence supporting the associations. Practical implications for dental professionals in promoting periodontal care to support systemic and cognitive health will also be discussed.

PATHOPHYSIOLOGY: A SHARED INFLAMMATORY PATHWAY

Periodontal disease is a chronic oral biofilm-mediated infection, which leads to a progressive

destruction of the periodontium and even tooth loss if left untreated.

While the oral health impact of periodontitis is well-established in dentistry, its systematic effects are gaining significant focus due to emerging evidence linking chronic oral infections to a range of systemic health conditions.

Of particular significance is the emerging concept of oral-brain axis that describes the bidirectional link between periodontal health and the brain, where dysbiosis or imbalances in oral microbiota can influence brain functions and vice versa (Narengaowa et al, 2021).

Biological pathways linking shared-inflammatory response between periodontitis and neurodegenerative conditions like dementia is central to this understanding.

Research shows pro-inflammatory cytokines which are characteristic of periodontal disease such as interleukin-1 β (IL-1 β), interleukin-6 (IL-6), and tumour necrosis factor-alpha (TNF- α), are released into the bloodstream in adults with compromised periodontal health (Singhrao et al, 2014). This activates pathways that contribute to a pro-inflammatory environment in the brain and is linked to a range of cognitive dysfunctions including Alzheimer's disease (Sayedmoalemi and Saied-Moallemi, 2025).

Similarly, Alzheimer's disease is now understood to have significant inflammatory and microbial components with evidence of periodontal pathogens such as *Porphyromonas gingivalis* in the brains of individuals with Alzheimer's disease (Kanagasalingam et al, 2020).

While the precise role of *P. gingivalis* in the development of Alzheimer's and its underlying mechanisms are still being established, these findings support the relation between chronic oral infections and the development of neurodegenerative processes.

Evidence also suggests Herpes simplex virus type 1 (HSV-1) may contribute to the pathogenesis of Alzheimer's disease through mechanisms such as oxidative stress, dysfunction of the mitochondria

Neesha Patel explores periodontal disease and dementia, outlining the common inflammatory and microbiological processes as well as practical implications for promoting periodontal care to support systemic and cognitive health

The oral-brain axis

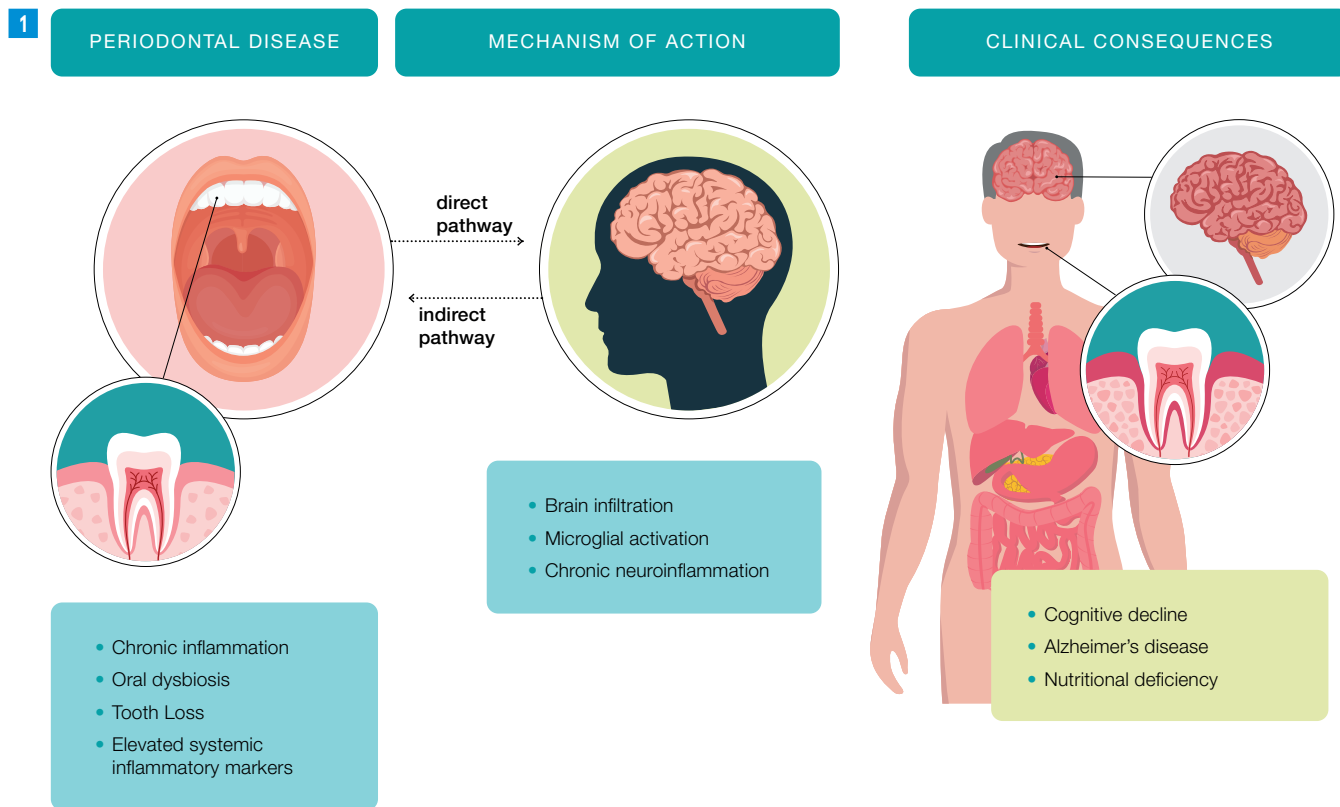


FIGURE 1: Dementia and periodontal health

and initiation of chronic inflammatory response. Moreover, HSV-1 may act synergistically with periodontal pathogens, further exacerbating cognitive decline (Teixeira et al, 2017).

MICROBIAL MECHANISM AND NEUROINFLAMMATION

Microbial mechanism exploring the role of oral pathogens provide insight into the direct and indirect biological pathways linking periodontal disease and dementia.

Emerging evidence highlights the spread of periodontal pathogens from the oral cavity to the central nervous systems, crossing the blood-brain barrier through hematogenous spread (via the bloodstream), and through neural pathways (via cranial nerves) (Li et al, 2022).

Once in the brain, these pathogens can directly affect the brain tissue, triggering an immune response, releasing neurotoxic mediators, causing inflammation and damaging neurons.

A number of reviews have identified neuroinflammation induced by periodontal pathogens such as *P. gingivalis* as a factor for the development and progression of Alzheimer's disease (Olsen, 2021; Shawkatova et al, 2025).

Studies also highlight wider systemic inflammation triggered by periodontal infections

as indirect mechanisms that exacerbate neurodegenerative conditions (Seyedmoalemi and Saied-Moallemi, 2025). For example, chronic periodontitis causes elevation of key inflammatory markers such as C-reactive protein (CRP) and interleukin-6 (IL-6) in the bloodstream (Shen et al, 2019).

Such pro-inflammatory cytokines, which are commonly found in periodontal disease, can prime the brain's immune cells (ie microglia), making them more reactive to inflammatory stimuli. This makes the cells more susceptible to aggravated neurodegeneration and subsequent dementia, even in the absence of direct bacterial invasion of the brain (Teixeira et al, 2017).

EPIDEMIOLOGICAL EVIDENCE

A number of longitudinal and cross-sectional studies have identified associations between periodontal disease and cognitive decline.

Elevated levels of periodontal disease antibodies have been detected in individuals years before the onset of cognitive symptoms, indicating that periodontal destruction may precede and subsequently contribute to the risk of dementia onset and progression (Sparks et al, 2012).

In addition, a recent systematic review has identified a strong association between

periodontal disease severity and dementia with a higher Alzheimer's dementia risks in adults with severe periodontitis (Kim and Han, 2025).

The risk increasing effect of periodontal disease is found to be high even among individuals with otherwise healthy behaviours, including those who never smoked or consumed alcohol, highlighting the importance of early periodontal intervention in management of dementia risk (Choi et al, 2019).

Other studies identify tooth loss, which is a marker of periodontal disease severity, and its association to dementia risk. A dose-dependent relation between tooth loss and cognitive decline has been established with a 1.1% increased dementia risk and 1.4% increase in cognitive decline for each tooth lost (Qi et al, 2021).

Although, the exact reason for this association is unclear, tooth loss may indicate a history of chronic oral inflammation and infection, which contributes to a sustained systemic inflammatory burden over time.

In addition, tooth loss also affects diet, nutrition and social engagement, all of which are recognised risks for cognitive decline (Cerutti-Kopplin et al, 201). Therefore, preserving periodontal health may serve as important mediating factor for reducing dementia risk.

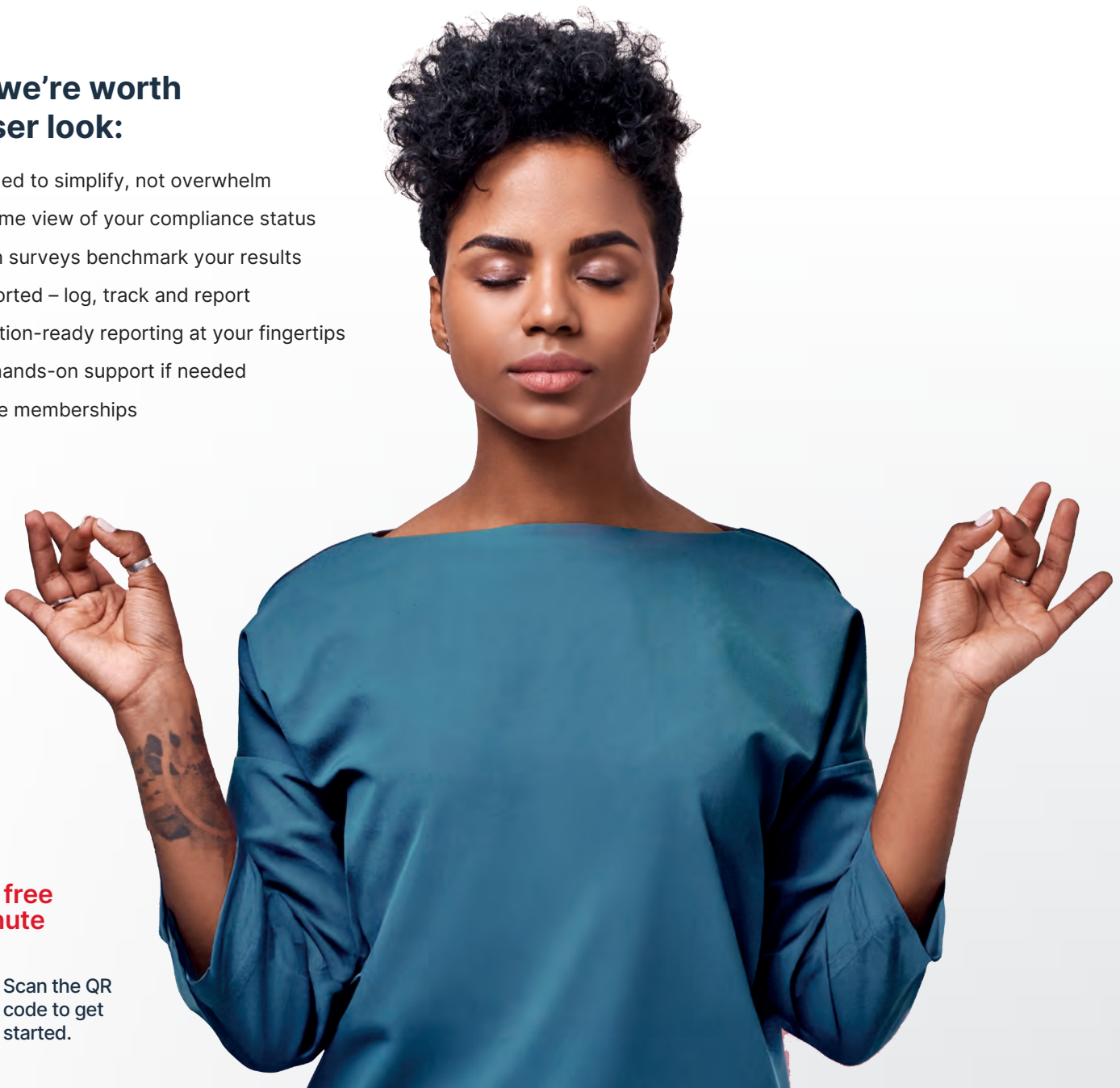
Moreover, preventive periodontal care may



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also decrease mortality risks in older adults with dementia, highlighting the broader benefits of oral health care in ageing populations (Cho et al, 2024).

CLINICAL AND PUBLIC HEALTH IMPLICATIONS

The growing body of evidence linking periodontal disease and dementia care has significant implication for both public health practice and clinical dentistry.

With an increasingly ageing population and growing rates of dementia globally and in the UK, delivering timely intervention by identifying modifiable risk factors remains critical. Therefore, addressing periodontal health and offering timely support and treatment could offer practical strategies for supporting healthy ageing and reducing the risk of dementia onset and progression.

Preventive therapy for periodontal care, including routine oral hygiene assessment, regular scale and polishing and effective home care routine remains critical for management of periodontal disease.

These treatment approaches not only improve oral health, but they can also lead to reduction of systemic inflammation and microbiological load associated to dementia related cognitive decline. Furthermore, reduction in periodontal disease risk and severity, along with the retention of natural dentition, may also facilitate adequate nutrition intake essential for managing general health and wellbeing in older adults.

A shared-responsibility strategy involving multidisciplinary care remains critical. As oral health is often identified as low priority in the broader management of dementia and deferred until issues arise, difficulties in accessing preventive and timely care is common. This reactive approach can increase the risk of avoidable oral issues, discomfort and functional decline.

Collaborative strategies involving dental professionals along with general practitioners, carers and memory clinic team are essential for a more proactive management of oral health.

In individuals with dementia, tailored preventive strategies can support ongoing oral function, reduce dental pain and minimise risks of acute dental issues that are more difficult to manage in more advanced disease stages.

Equally, early identification of at-risk patients and offering timely periodontal care management may offer useful long-term benefits for both oral and cognitive health in patients.

CONCLUSION

The link between periodontal disease and dementia is a significant area of scientific investigation and clinical interest that bridges

oral and neurological health. The shared inflammatory and microbiological pathways underscore the importance of offering comprehensive solutions to manage systemic inflammation through oral health care.

As the evidence base exploring the dementia-oral health nexus continues to emerge, it is important for the dental team to recognise periodontal diseases as a systemic inflammatory disorder with neurocognitive implications.

Dental care professionals are uniquely positioned to identify early signs of cognitive decline, deliver tailored care and support multidisciplinary collaboration to manage oral health in patients.

By prioritising preventive oral health care strategies, dental practitioners can contribute to meaningful efforts to reduce the disease burden of dementia in individuals and the society. 

REFERENCES

- Cerutti-Kopplin D, Feine J, Padilha DM, de Souza RF, Ahmadi M, Rompré P, Booiij L, Emami E (2016) Tooth loss increases the risk of diminished cognitive function: a systematic review and meta-analysis. *JDR Clin Transl Res* 1(1): 10-19
- Cho HA, Kim BR, Shin H (2024) Association of periodontal disease treatment with mortality in patients with dementia: a population-based retrospective cohort study (2002-2018). *Sci Rep* 14: 5243
- Choi S, Kim K, Chang J, Kim SM, Kim SJ, Cho HJ, Park SM (2019) Association of chronic periodontitis with Alzheimer's disease or vascular dementia. *J Am Geriatr Soc* 67: 1234-1239
- Kanagasigam S, Chukkappalli SS, Welbury R, Singhrao SK (2020) Porphyromonas gingivalis is a strong risk factor for Alzheimer's disease. *J Alzheimers Dis Rep* 4(1): 501-511
- Kim DH, Han GS (2025) Periodontitis as a risk factor for dementia: a systematic review and meta-analysis. *J Evid Based Dent Pract* 25(2): 102094
- Livingston G, Huntley J, Sommerlad A, Ames D, Ballard C, Banerjee S, Brayne C, Burns A, Cohen-Mansfield J, Cooper C, Costafreda SG, Dias A, Fox N, Gitlin LN, Howard R, Kales HC, Kivimäki M, Larson EB, Ogunniyi A, Orgeta V, Ritchie K, Rockwood K, Sampson EL, Samus Q, Schneider LS, Selbæk G, Teri L, Mukadam N (2020) Dementia prevention, intervention, and care: 2020 report of the Lancet Commission. *Lancet* 5(12): e661-e712
- Li X, Kiprowska M, Kansara T, Kansara P, Li P (2022) Neuroinflammation: a distal consequence of periodontitis. *J Dent Res* 101(12): 1441-1449
- Narengaowa, Kong W, Lan F, Awan UF, Qing H, Ni J (2021) The oral-gut-brain axis: the influence of microbes in Alzheimer's disease. *Front Cell Neurosci* 15: 633735
- Olsen I (2021) Porphyromonas gingivalis-induced neuroinflammation in Alzheimer's disease. *Front Neurosci* 15: 691016
- Seyedmoalemi MA, Saied-Moallelemi Z (2025) Association between periodontitis and Alzheimer's disease: a narrative review. *IBRO Neurosci Rep* 18: 360-365
- Shawkatova I, Durmanova V, Javor J (2025) Alzheimer's disease and Porphyromonas gingivalis: exploring the links. *Life* 15: 96
- Shen X, Niu L, Wang Y, et al (2019) Inflammatory markers in Alzheimer's disease and mild cognitive impairment: a meta-analysis and systematic review of 170 studies. *J Neurol Neurosurg Psychiatry* 90: 590-598
- Singhrao SK, Harding A, Simmons T, Robinson S, Kesavalu L, Crean S (2014) Oral inflammation, tooth loss, risk factors, and association with progression of Alzheimer's disease. *J Alzheimers Dis* 42(3): 723-737
- Sparks Stein P, Steffen MJ, Smith C, Jicha G, Ebersole JL, Abner E, Dawson D 3rd (2012) Serum antibodies to periodontal pathogens are a risk factor for Alzheimer's disease. *Alzheimers Dement* 8(3): 196-203
- Teixeira FB, Saito MT, Matheus FC, Prediger RD, Yamada ES, Maia CSF, Lima RR (2017) Periodontitis and Alzheimer's disease: a possible comorbidity between oral chronic inflammatory condition and neuroinflammation. *Front Aging Neurosci* 9: 327
- Qi X, Zhu Z, Plassman BL, Wu B (2021) Dose-response meta-analysis on tooth loss with the risk of cognitive impairment and dementia. *J Am Med Dir Assoc* 22(10): 2039-2045
- WHO (2025) Dementia. World Health Organization. Available at: www.who.int/news-room/fact-sheets/detail/dementia (Accessed: 23 July 2025)
- WHO (2022) International Classification of Diseases 11th Revision (ICD-11). World Health Organization. Available at: <https://www.who.int/standards/classifications/classification-of-diseases> (Accessed: 23 July 2025)



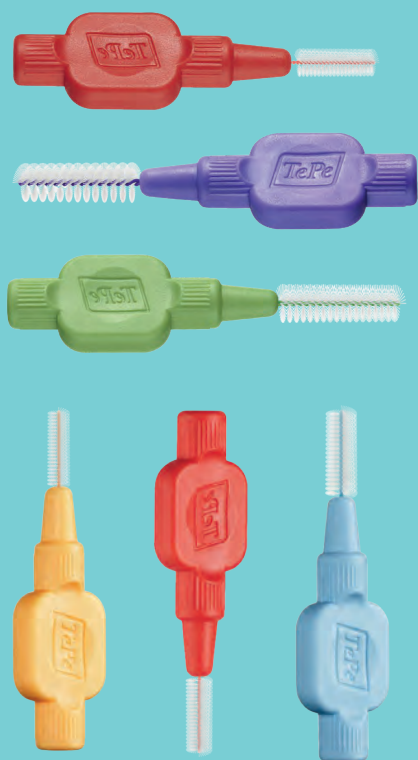


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Q&A WITH...

IAIN CHAPPLE



PRINCIPLES FOR ORAL HEALTH

Q. WHAT WAS THE AIM OF THE PRINCIPLES FOR ORAL HEALTH (POH) REPORT, LED BY SEPA, AND WHAT DOES IT MEAN FOR DENTAL PROFESSIONALS?

A. The POH report had a number of aims. Perhaps the most important was to share the evidence base from the EFP's S3-level clinical guideline on stages I-III periodontitis in a digestible form for oral healthcare professionals, to help them implement care pathways within their own dental practices simply and easily. It also highlighted the vital need to move towards a more preventive approach to care, rather than an interventional treatment driven approach, achieving this by helping provide information for patient education and awareness of self-care strategies. There was also a key need to address misunderstandings on the use of adjunctive antiseptics and antimicrobial mouthrinses, both for professionals, but also importantly for our patients and members of the public.

Q. CAN YOU SUMMARISE THE FINDINGS OF THE REPORT?

A. The five key findings were that:

1. Certain antiseptic agents, when used as adjuncts to mechanical plaque removal, which remains the bedrock of care, can be effective in further reducing gingival inflammation and dental biofilm levels
2. Specific antiseptics have been shown to be able to help in the management of gingival inflammation and in preventing the recurrence of successfully treated periodontitis during supportive periodontal care
3. Antiseptics are generally safe, but side effects can arise with their use and oral healthcare professionals need to be aware of these

We need to move to personalised care and manage each periodontal patient as an individual

4. Care must be taken when recommending antiseptic agents in specific groups, such as children under seven-years old who generally may not be able to control their swallowing reflexes, in pregnant or lactating women and in those who have or currently abuse alcohol. In these groups, such agents should generally not be advised
5. Not all people will benefit from the use of adjunctive antiseptics, and it is important to identify those who may do, and not to recommend or prescribe indiscriminately.

Q. WHERE DO YOU SEE THE FUTURE HEADING FOR PERIODONTAL DISEASE IN THE UK?

A. The UK is starting to get to grips with the need for time and resources to manage periodontal diseases effectively. Indeed, the NHS in England already produced an 'Avoidance of doubt' document that sets out the need to motivate and engage patients in self-care and prevention, and if successful, additional funding is made available to complete steps two, three and four of care. This is a huge change since the S3-level guideline published by the EFP in 2020 and an important outcome from that work.

Q. TELL US MORE ABOUT THE ROLE THAT ANTISEPTICS PLAY IN THE PREVENTION OF PERIODONTITIS

A. Antiseptics can in some patients help to prevent the recurrence of periodontitis during supportive periodontal care (step four) by reducing both gingival inflammation levels and levels of plaque biofilm. There is also evidence in specific patients of benefit during treatment, again by facilitating biofilm control.

Q. ACCORDING TO YOU, WHAT'S THE ONE-KEY TAKEAWAY ABOUT THE MANAGEMENT OF PERIODONTAL DISEASE?

A. That we need to move to personalised care and manage each patient as an individual. Therefore, if the patient is trying to improve their homecare and trying to engage, but inflammation and biofilm levels are not under control, then we should consider adjunctive approaches such as antiseptics to help them get on top of their plaque control and gingival

inflammation. More information is available at principlesfororalhealth.com.

Q. DO YOU FEEL THAT THE CONCLUSIONS OF THE POH REPORT COULD SOMEHOW BE APPLIED TO PERI-IMPLANT DISEASES TOO?

A. I don't think the findings of the POH report can be applied to peri-implant diseases. No, because we need to consider different literature and evidence, and the POH initiative did not address peri-implant diseases.

Q. CONSIDERING THAT ORAL ANTISEPTICS HELP TO TREAT GINGIVITIS AND THAT UNTREATED GINGIVITIS MAY LEAD TO PERIODONTITIS, CAN WE ASSUME THAT ANTISEPTICS ALSO HELP IN THE PRIMARY PREVENTION OF PERIODONTITIS?

A. Yes, it was shown in the EFP's workshop on prevention held in 2015 that the primary prevention of periodontitis is managing gingivitis, so however we achieve that is relevant.

Q. WHERE DOES FAKE NEWS AGAINST ANTISEPTICS COME FROM? CAN YOU SHED SOME LIGHT ON WHAT IS TRUE AND WHAT IS FAKE REGARDING THEIR COADJUVANT USE?

A. There is always fake news, especially on social media, and we must be very careful to assess the evidence systematically and to look at the quantum and quality of the evidence. Evidence also changes all the time so we must keep up to date. Historically, it was not there for chemical adjuncts and there were unfounded claims they may cause oral cancer, for example. Those claims have been disproven by careful studies and systematically and objectively reviewing the literature, and the efficacy has been shown now in many studies.

Q. BESIDES YOU, WHO WERE THE EXPERTS BEHIND THE SCIENTIFIC PHASE OF THE POH INITIATIVE?

A. I was lucky to be in excellent company by working with colleagues as Henrik Dommisch (Germany), Bahar Eren Kuruere (Turkey), Ricardo Fischer (Brazil), Elena Figuero (Spain), Marjolaine Gosset (France), Filippo Graziani (Italy), David Herrera (Spain), Rhiannon Jones (UK), Ana Molina (Spain), Panos Papapanou (USA), Simone Ruzario (UK), Beatriz de Tapia (Spain), Nicola West (UK) and Paula Matesanz, who was also the scientific coordinator of the project. 

PRACTICAL USE OF ANTISEPTICS IN PERIODONTAL CARE

To watch the POH-related webinar 'Practical use of antiseptics in periodontal care: an EFP guideline-based approach', visit principlesfororalhealth.com/experts-talks-16th-may.

PRINCIPLES FOR ORAL HEALTH

Perio experts back mouthwash as critical tool for oral health

The evidence is in – the use of mouthwash in addition to brushing could be the best wide-spectrum option for helping patients maintain their oral health. That's according to new research from a worldwide panel of periodontal specialists, published by the SEPA Foundation as part of a new report and initiative titled *Principles for Oral Health*.

The research concludes that antiseptic mouthwashes – and those containing essential oils in particular – are a highly effective addition to daily brushing, helping to manage gingivitis and periodontitis and to prevent disease recurring.

The *Principles for Oral Health* report, presented at Europerio 11 in Vienna, supports a wider initiative that hopes to shift the focus of the dental and periodontist communities more firmly onto prevention. Pulling perspectives from 14 international experts, including Dr David Herrera, Dr Filippo Graziani and the UK's Professor Iain Chapple, it aims to offer clinicians updated, evidence-based guidance for both oral health professionals and the public, aligning with the latest European clinical guidelines.

The authors emphasise that antiseptic agents – especially when used alongside twice-daily brushing with fluoride toothpaste and interdental cleaning – are effective, safe, and cost-efficient in reducing gum inflammation and plaque build-up.

The *Principles for Oral Health* report states that mouthwashes are safe for the general population but stops short of advocating blanket use, pointing out that not every patient will need to use them routinely. It outlines clinical considerations for their targeted use – especially in patients with specific risk factors such as persistent gingival inflammation despite good brushing, particularly hard to reach areas of anatomy, or other systemic conditions.

Mouthwash 'an addition'

Professor Chapple pointed out that the recommendation of mouthwash is specifically made in addition to regular brushing.

He explained: 'Mechanical plaque control is fundamentally important. That's our bedrock, and that remains the case. The profession has very much been against chemical agents in the past, seeing it as an excuse or an alternative to brushing that's not going to be as effective.'

'But with the research coming out, and a better understanding of genetics in particular, it's now clear that a significant proportion of the population are never going to get the levels of oral hygiene that they need for stability. So what do we do? Throw them on the scrapheap? No – we've got to give alternatives and chemical agents in toothpaste and mouth rinses are a really, really important way of doing that.'

Antiseptic mouthwash – the recommendations

The report concludes that antiseptic mouthwashes are effective and safe for the general population when used properly. They are most effective as an adjunct to brushing and interdental cleaning – not a substitute. However, not every patient will need them and their recommendation should be targeted.

When to recommend:

- Persistent gum inflammation despite brushing (eg >10% bleeding on probing)
- Difficulty accessing certain areas with a toothbrush due to:
 - Tooth crowding
 - Orthodontic appliances or overhanging restorations
 - Dental implants or complex prosthodontics
- Anatomical factors that trap plaque (eg root grooves, enamel pearls)
- Chronic health conditions like diabetes or immune compromise
- Frailty or older age
- Limited dexterity or motivation to maintain hygiene routines.

Use with caution:

- Children under seven or individuals with poor swallowing control
- Pregnant or breastfeeding women (due to limited safety data)
- People with a history of alcohol misuse (avoid alcohol-based formulas)
- Patients with chronic oral mucosal conditions or dry mouth.

The *Principles for Oral Health* report and initiative is sponsored by Listerine. Find out more about the work at principlesfororalhealth.com.

PAT LANGLEY PROVIDES AN UPDATE ON WHAT'S CHANGED AND WHAT EVERY DENTAL TEAM NEEDS TO KNOW ABOUT HEALTHCARE WASTE



PAT LANGLEY

Pat is clinical director at FMC and founder of Dentistry Compliance.

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HEALTHCARE WASTE ESSENTIALS

The update to HTM 07-01 (the safe and sustainable management of healthcare waste) published in 2023 might not have topped your summer reading list – but it probably should! It brings big changes to how healthcare waste is managed in dental settings, with new expectations around sustainability, infection risk and waste segregation.

If you're thinking that sounds complex, you're not alone. But with the right understanding – and the right systems – it doesn't have to be overwhelming.

FROM UNIVERSAL TO RISK-BASED

Until fairly recently, dental practices managed all aspects of infection control, including the management of clinical waste under the principle of universal precautions: assume every patient may be infectious, and treat their waste accordingly. But HTM 07-01 (2023) moves towards a much more risk-based approach. That means waste should only be classified as infectious if it's from a patient with a known or suspected infection.

For patients assessed as not infectious, risk-based segregation is key. Items contaminated with bodily fluids from a patient who does not have a known or suspected infection may now be classed

as offensive waste and should go into tiger-striped bags. Other items – such as clean packaging or uncontaminated waste – may be suitable for domestic or even recyclable waste streams.

This shift reduces unnecessary hazardous waste, but it also requires clear documentation, careful segregation and a team that understands the difference.

INFECTION RISK IS STILL REAL

Many infections can be undiagnosed, asymptomatic or unreported. So HTM 07-01 doesn't mean you drop your guard, it means you risk assess.

That's why up-to-date medical histories, ongoing team training, and a culture of vigilance are more vital than ever.

STORAGE, SHARPS, AND SUSTAINABILITY

The latest guidance also reinforces some familiar messages:

- Don't overfill bags – seal them using the swan neck method
- Store waste securely, away from patient areas
- Label all bags and containers with the correct EWC codes.

But perhaps the biggest change is in mindset. HTM 07-01 puts sustainability front and centre. Practices are expected to reduce single-use plastics where possible and increase the use of reusable alternatives that are autoclavable.

PRACTICAL SUPPORT WHEN IT MATTERS

Yes, there's a lot to take in – but that's exactly why we created Dentistry Compliance. Designed to simplify, not overwhelm, our platform gives you:

- A live, at-a-glance view of your practice's compliance status
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It's practical, intuitive and built for busy practices – so you can focus more on your patients, and less on paperwork. [CD](https://www.dentistrycompliance.co.uk)





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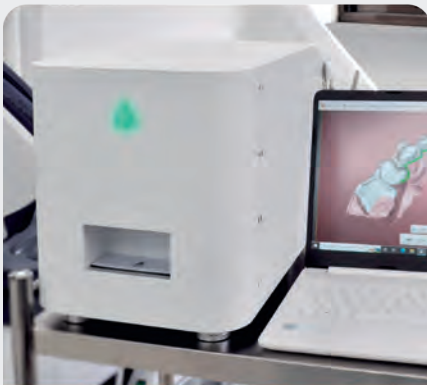


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YOAT Wire Bender is available from Trycare. For more information, call John Lancaster on 07977 279462 or email orthodontics@trycare.co.uk.



INTRODUCING YOAT WIRE BENDER

In the world of orthodontics, precision and efficiency are critical to your outputs. The process of bending wires to fit the unique dental anatomy of each patient has traditionally been a labour-intensive and time-consuming task. However, with advancements in technology, innovative solutions are emerging to streamline this process.

One groundbreaking innovation is the YOAT Wire Bender II Robot. This state-of-the-art robotic wire bender has revolutionised orthodontic wire bending, offering unparalleled precision, consistency, and efficiency.

TRANSFORMING ORTHODONTIC PRACTICES

The YOAT Wire Bender II Robot is an advanced robotic system designed specifically for bending fixed orthodontic retainers. Utilising cutting-edge technology, this robot automates the wire bending process, ensuring each wire is crafted to exact specifications with minimal manual intervention.

The robot is equipped with sophisticated software and mechanical components that allow it to produce highly accurate and consistent bends, tailored to the specific needs of each patient.

One of the standout features of the YOAT Wire Bender II Robot is its precision. The robot uses advanced algorithms and high-resolution sensors to measure and bend wires with remarkable accuracy.

This level of precision ensures that each wire fits perfectly, 100% passive, reducing the need for adjustments and improving the overall effectiveness of orthodontic treatments.

Manual wire bending can result in slight variations from wire to wire, which can affect the consistency of orthodontic treatment. The YOAT Wire Bender II Robot eliminates this issue by automating the process, ensuring each wire is bent to the exact specifications every time. This consistency is crucial for achieving predictable and reliable treatment outcomes.

The automation provided by the YOAT Wire Bender II Robot significantly reduces the time required for wire bending. This efficiency allows orthodontic practices to increase their productivity, handle more patients, and ultimately improve their bottom line. A patient can be debonded and have a fixed retainer created in the same visit. Saving chairside time and appointments for the patient.

Every patient's dental anatomy is unique, and the YOAT Wire Bender II Robot excels in customisation. The robot can be programmed to bend wires according to specific treatment plans, ensuring that each patient receives a personalised approach. This capability enhances the quality of care and contributes to better patient satisfaction.

SEAMLESS INTEGRATION

The YOAT Wire Bender II Robot is designed with a user-friendly interface that makes it easy for orthodontic staff to operate. The intuitive software allows users to input specifications, adjust settings and monitor the bending process with ease. This accessibility ensures that the technology can be seamlessly integrated into any orthodontic practice.

Built with high-quality materials and robust engineering, the YOAT Wire Bender II Robot is designed to withstand the demands of a busy orthodontic practice. Its reliable performance ensures that it can handle continuous use without compromising on accuracy or efficiency.

The introduction of the YOAT Wire Bender II Robot is set to have a profound impact on orthodontic practices. By automating the wire bending process, orthodontists can focus more on patient care and less on manual tasks. The increased efficiency and consistency also contribute to improved treatment outcomes and higher patient satisfaction. Additionally, the robot's ability to produce precise and customised fixed retainers enhances the overall quality of orthodontic care. 

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ORTHODONTICS

JACK MILGATE

Orthodontic digital workflow

82



BJÖRN LUDWIG

Q&A: TADs, AI and aligners

86



The priceless improvement in the patient's smile, particularly given her young age and the significant impact of appearance favouring the adolescent's confidence underscores the importance of our treatment plan – Jack Milgate, p82

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**DR JACK MILGATE**

Jack is a dentist and owner of Barwon Heads Dental in Victoria, Australia. With more than 12 years of experience, he's committed to providing top-quality dental care using digital technology. He holds a dental degree and a master's in public dental health from La Trobe University. He is a key opinion leader for Align Technology.

ENHANCED CPD

CPD hours: one

GDC development outcome: C

Topic: Orthodontics

Educational aims and objectives:

To demonstrate an orthodontic and restorative solution for a young patient utilising a digital dental pathway.

This article qualifies for one hour of enhanced CPD; answer the questions on page 94 or scan the QR code.



As a general dentist, I see potential patients walk into my practice with all sorts of oral health issues every day. Most of them are not aware of all that is happening inside their mouths and generally come to see me for issues that are obvious to what they see in front of a mirror or when they are in discomfort and pain.

We are traditionally trained to attend to the prospective patient's chief complaint, and many clinicians have a hard time communicating other important findings. Those findings often stay between the clinician and assistant and are kept on paper or your practice management software for months, even years, without being addressed until the next emergency visit.

Sometimes, the clinician feels uncomfortable adding other procedures to the treatment plan, fearing that they will be labelled as an individual trying to upsell treatment.

As a professional, I have learned to remove biases and assumptions about the person in the dental chair.

I show all the evidence and offer comprehensive treatment plans based on the individual's perceived needs to provide function and aesthetics with long-term solutions, not just repair.

To present evidence and deliver comprehensive education, I leverage the power of technology, specifically Itero scanners.

These devices equip me with the tools to not only attract potential patients to my practice but also help me to create digital records for diagnosis, educate patients for informed decision-making, plan, design, treat and monitor their progress throughout their journey (Figure 1).

This emphasis on technology underscores the evolution of dental practice and its benefits for both professionals and patients.

DIGITAL SOLUTIONS

In late 2022, a 14-year-old female patient visited my practice for a new patient exam. Her main concern was the noticeable gaps in the upper arch next to the central incisors. Her older sister had been a patient of mine the previous year, and I had successfully created a build-up for a missing left upper lateral incisor and reshaped with a veneer the right upper canine that had moved into the missing position (Figure 2).

The family expected me to replicate the procedure to address her chief complaint.

Using the advanced tools and features of the Itero scanners, I could confidently and systematically conduct a customised consult and treat this patient, helping facilitate a high-quality outcome.

Scan

In my clinic, we routinely scan every prospective new patient and periodically every established patient. This practice was implemented for the following reasons:

- The practice generates a digital file in just a few minutes as part of oral health records, which helps monitor existing or new clinical findings over time
- The clinician and assistant can record more clinical findings into the practice management software, enabling quality control given the information provided through visualisations about the size, colour, texture and position of concerns in teeth and soft tissues, which are visible on a screen to all stakeholders at once
- The clinician can show patients a detailed view of the identified findings, which improves communication during consults – oral hygiene, dental anomalies, dental conditions, and clinical findings related to soft tissues, occlusion, and alignment.

Jack Milgate provides an orthodontic and restorative solution for a young patient and discusses digital dental pathways and how they are modernising visualisation, designs and clinical outcomes

Orthodontic digital workflow

Diagnose

Based on the patient's dental history and radiographic findings, I diagnosed that she was congenitally missing the upper lateral incisors (Figure 3).

Since the launch of the Align Oral Health Suite, our practice has leveraged this solution to address not only the chief complaints but also to demonstrate the findings and discuss treatment options while the patient is in the dental chair.

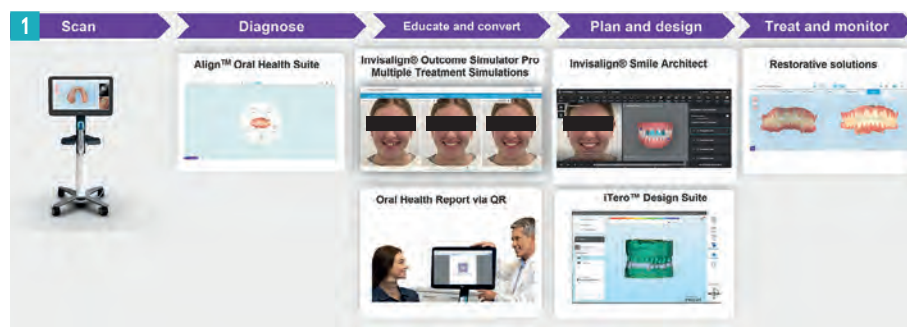


FIGURE 1: Align Technology's digital workflow

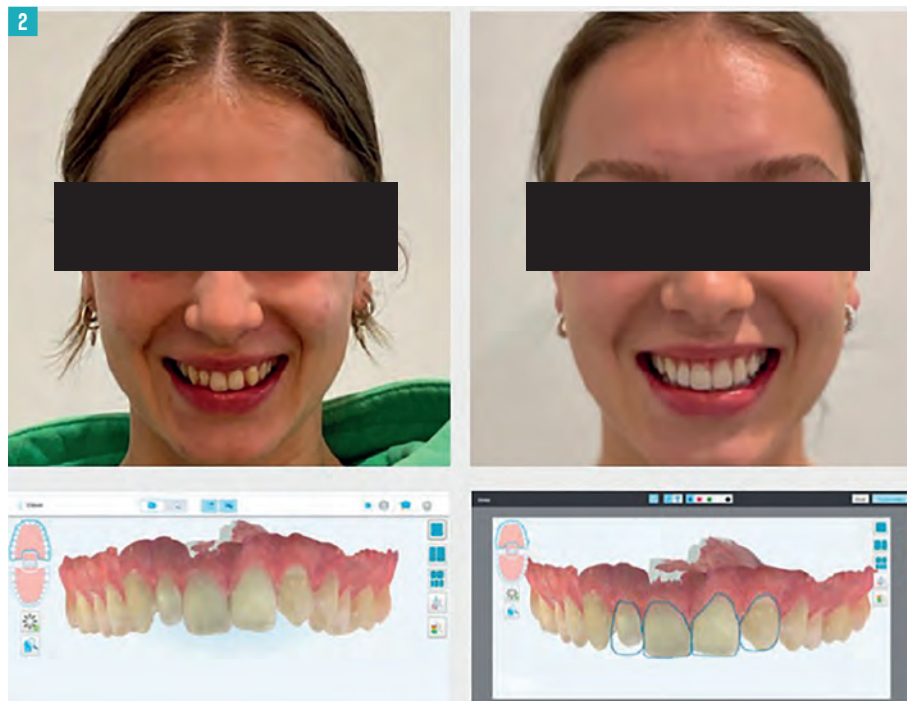


FIGURE 2: The patient's sibling with a congenitally missing upper left lateral incisor. The upper left canine had moved naturally into the missing tooth. On the contralateral side, the pegged upper right lateral incisor was reshaped to harmonise the smile



FIGURE 3A: Initial photographs

When patients of record return for periodic annual or semi-annual visits, we also use the suite to compare how dental conditions and treatments have evolved. This is particularly useful in instilling a sense of quality control in our clinicians and creating engagement and accountability among patients.

Dental providers and patients should work as a team to promote optimal outcomes. And when treatments fail, or directions are not being followed accordingly, I found it helpful to use these records to find root causes and correct the course. As a result, a more transparent and trusting dynamic between dentist and patient is established, and both patients and doctors will win by realising more efficient treatments when indications are followed as prescribed.

Communicate, educate and convert

When I informed the patient's mother that her daughter had congenitally missing upper lateral incisors, she was surprised. I discussed treatment options, and the mother was leaning toward a reshaping of the upper teeth or composite build-ups.

I had offered teeth movement with Invisalign aligners to open space for the missing lateral incisors and then restore with cantilever bridges on both sides since this patient was still growing and was too young for dental implants.

The parent was not excited about this option. I suspected they did not understand my words, so I decided to run a simulation with the Invisalign Outcome Simulator Pro that includes an in-face visualisation and multiple treatment simulations (MTS) (Figure 4).

In my experience, it is often difficult for patients to visualise what we are verbally communicating. Not only do we tend to use technical language, but we also make assumptions about the knowledge and understanding level of the person sitting in the dental chair and the parents. Often, these patients are afraid to express that they did not understand or make us feel they understood our message. Then they go home and don't come back because the treatment plans offered were not clear to them, or they did not find the value for what they think they are getting.

The simulation was quickly created and helped the patient and mother understand my goals and options and facilitated a conversation. From Figure 4, on the far left, we have the initial state; in the middle, I showed them what her smile could look like after moving her teeth with Invisalign aligners, and on the far right, they could envision how we could move her teeth and also include restorative options in a minimally invasive manner with the Invisalign Smile Architect software. This was an option to help us





FIGURE 3B: Initial panoramic radiographic

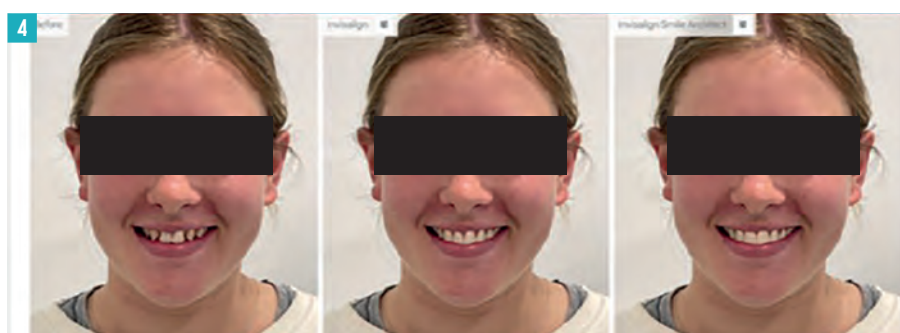


FIGURE 4: Invisalign Outcome Simulator Pro shows the in-face simulation with multiple treatment simulations (MTS). The before on the far left, the simulation with Invisalign aligners only in the centre, and the simulation combining the Invisalign aligners and the Smile Architect software solution on the far right

save as much healthy dental tissue as possible while opening the gaps for dental implants once she gets older, given her continued growth and development.

With this feature, I can customise the simulations with 3D controls and mark missing teeth, unmovable teeth and restorations, showing the patients the customisation of their treatment.

The simulations supported the mother and daughter's decision to pursue a comprehensive approach using Invisalign aligners and bilateral cantilever bridges.

Lastly, while demonstrating the visualisations and simulations within the Align Oral Health Suite, we captured images and made annotations in the Itero scan report conveniently available via a QR code. This helps capture clinical findings and make them easily accessible for the family to review with other family members who need to be informed of my diagnosis and treatment plans.

Plan

My treatment plan included an orthodontic and restorative solution using the Invisalign Smile Architect software (Figure 5). We shared the

simulations and the approved treatment plan to help her to visualise how we planned the final position and restorations to look like.

Treat and monitor

I scanned the patient to monitor treatment progress using the Align Oral Health Suite during the tooth movement phase with Invisalign aligners. The simultaneous display of the 3D model, the integrated intraoral camera and the Itero near infra-red imaging (NIRI) technology images also helped to monitor if any interproximal caries lesions above the gingiva emerged throughout treatment (Figure 6).

The patient completed treatment with Invisalign aligners after 52 upper and 45 lower aligners. At the last position, I scanned the patient and designed the bilateral cantilever bridges using the Itero Design Suite powered by Exocad software (Figures 7 and 8). This solution not only makes my practice more efficient but also saves the practice and patient extra visits, elevating everyone's experience.

In addition, keeping simple procedures in-house has resulted in a cost-effective approach for my practice, as well as improved experience for our patients.

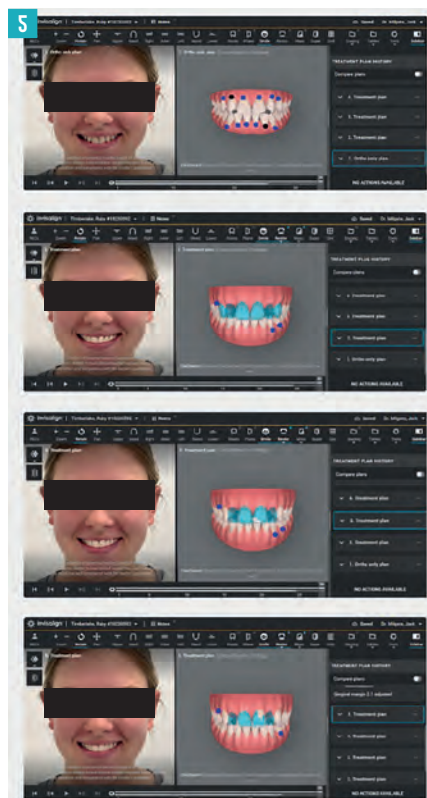


FIGURE 5: Treatment options were generated with Invisalign Smile Architect, which includes tooth movement with aligners and restorative options for the congenitally missing upper lateral incisors

A fixed wire retainer was placed in the mandible, and a Vivera retainer was created for the upper arch.

The Align Oral Health Suite assists me in showing the patient and her parents the before and the after as proof of all the work completed in 12 months. Once the patient reaches the end of her development and growth in a few years, we will assess her case for dental implants (Figure 9).

EFFICIENCY AND POTENTIAL FOR PRACTICE GROWTH

Working with the Itero scanners and Invisalign aligners can enable time savings and improved quality of records. We can complete the scan of both arches very quickly, and then use multiple features, such as the Align Oral Health Suite, to communicate with patients and discuss treatment options. The ability to run simulations to help patients envision how treatments may look is enough reason to establish a digital workflow.

Moreover, we can design splints and temporary and fixed prostheses that can be printed in the practice, helping with practice

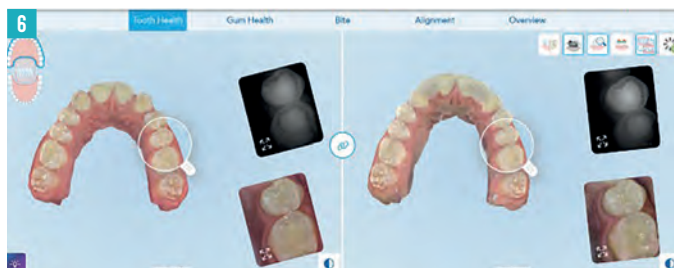


FIGURE 6: The Align Oral Health Suite allowed for monitoring of emergence of interproximal caries lesions above the gingiva throughout treatment



FIGURE 8: Views from the Itero Design Suite software, showcasing the design of two cantilever bridges to replace the missing upper lateral incisors



FIGURE 10: Photographs and scan from final position and views after placing the cantilever bridges

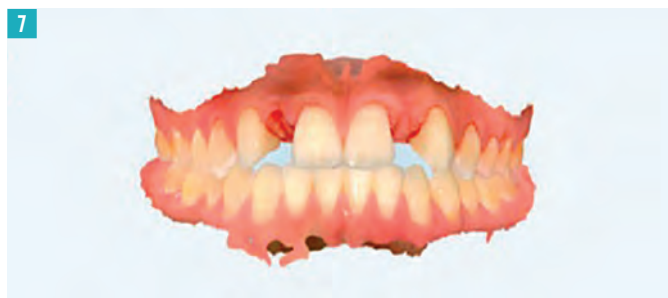


FIGURE 7: Frontal view of the last position after treatment with Invisalign aligners

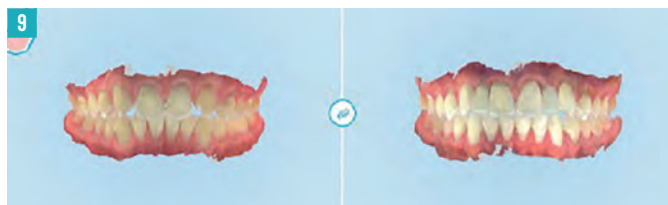


FIGURE 9: The historical compare view helps to showcase before and after treatment view from different angles



FIGURE 11: Initial frontal photograph contrasting with the last position and after placing the bilateral cantilever bridges

efficiency. This enhances the patient experience since it allows for chairside solutions on the same day.

When examining this clinical case, this patient came in for a new patient exam, a cleaning, and a build-up. The scanner proved a great value in communicating the patient's dental needs and our proposed functional and aesthetic solution. This treatment, designed to last for years, provides a reliable interim until the patient is ready for dental implants.

The priceless improvement in the patient's smile, particularly given her young age and the significant impact of appearance favouring

the adolescent's confidence underscores the importance of our treatment plan (Figure 10 and 11).

When analysing the number of procedures, they went from three to four procedures with a \$9,000 incremental revenue. However, the most important indicator to me was the family's trust and the clinical outcome. This fulfils me as a professional and validates my practice's reputation in our community. As a result, families like this one put out a good word for my practice, and that helps us have a sound pool of new patient consults and established patients coming into my clinic.

General dentists have in Itero scanners a valuable device that will help build patient understanding and trust in their diagnosis and treatment recommendations. The efficiency of treating multiple oral health needs digitally, can help you to offer simple time-saving same-day solutions increasing the experience of patients and the capacity of your clinics. [🔗](#)

PRODUCTS USED

Itero, Invisalign Align Technology



Q&A

WITH...

BJÖRN LUDWIG



BRITISH ORTHODONTIC CONFERENCE

Professor Ludwig will be speaking at the British Orthodontic Conference, which takes place from 24 to 26 September at the ICC Wales. For more information, visit www.bos.org.uk.



TADS, AI AND ALIGNERS

Q. YOUR WORK HAS ADVANCED THE USE OF TEMPORARY ANCHORAGE DEVICES (TADS) IN ORTHODONTICS. HOW HAVE YOU SEEN THEIR ROLE EVOLVE IN CLINICAL PRACTICE OVER THE YEARS?

A. When I first started using TADs, they were seen more or less as a last resort – something you'd try when nothing else worked. Today, they're part of everyday biomechanics. With digital planning and guided insertion, they've become more predictable and accessible, even for younger colleagues.

We've definitely moved from improvisation to precision. That said, I personally use them a bit less now. I've become more selective and a bit more conservative – sometimes the classic 'low-tech' mechanics still do the job just fine.

Q. YOUR RESEARCH OFTEN INTEGRATES 3D IMAGING AND DIGITAL WORKFLOWS. HOW DO THESE TECHNOLOGIES ENHANCE PATIENT OUTCOMES IN ORTHODONTICS?

A. Digital tools like 3D imaging have changed everything – diagnosis, treatment planning, force application. We're more precise, and patients benefit from faster, more targeted treatments with fewer side effects.

But, at the same time, we have to stay grounded. Not every case needs a fully digital plan, and we shouldn't forget the evidence-based basics. Sometimes, the simplest approach is still the best – and we need to be honest about that.

Q. HOW DO YOU FORESEE THE INTEGRATION OF DIGITAL TECHNOLOGIES SHAPING THE FUTURE OF ORTHODONTIC TREATMENT?

A. We're still at the beginning. AI, fully guided mechanics, custom appliances – they're getting better fast. But they won't replace us. They're tools to make us better, not substitutes. In the end, good judgment and experience still matter most.

Q. YOUR RECENT WORK INCLUDES THE 'CANINE-FIRST' APPROACH FOR MANAGING IMPACTED MAXILLARY CANINES WITH ALIGNERS AND TADS. COULD YOU ELABORATE ON THE BENEFITS OF THIS METHOD?

A. The main idea is to simplify a difficult situation. By focusing on the impacted canine first – with skeletal anchorage and clear biomechanics – we can avoid

bulky auxiliaries and help aligners do their job more effectively later.

It works really well in many cases, but not all. It's important to stay patient-centred, not appliance-centred. The method should serve the patient, not the other way around.

Q. YOU'VE BEEN INVOLVED IN NUMEROUS INTERNATIONAL COLLABORATIONS. HOW DO THESE EXPERIENCES INFLUENCE YOUR APPROACH TO ORTHODONTIC TREATMENT AND RESEARCH?

A. Working with international colleagues is incredibly enriching. It opens your mind, challenges your habits, and keeps you humble. There's never just one 'right' way to treat a case. Collaborating like this keeps the specialty evolving – and keeps me personally motivated.

Q. YOU'VE AUTHORED AND EDITED SEVERAL INFLUENTIAL BOOKS IN ORTHODONTICS. HOW DO YOU BALANCE CLINICAL PRACTICE WITH YOUR ACADEMIC AND EDITORIAL RESPONSIBILITIES?

A. I wouldn't say I've mastered the balance! But I really enjoy both sides. Clinical work gives me questions, and the academic work helps me look for answers. I try to stay curious, and that keeps everything in motion.

Q. COULD YOU GIVE US A GLIMPSE INTO YOUR SESSION AT BOC 2025?

A. I'll be talking about combining skeletal anchorage with aligners – especially for complex cases like impacted canines.

It's a very clinical lecture, with lots of videos, practical tips, and real-life workflows. But I'll also highlight that high-tech alone isn't everything.

We shouldn't forget our roots – basic mechanics, handmade wire bending, the stuff that still works.

So, it's really a mix: high-tech, low-tech and honest, real-world orthodontics... with a few imperfections, just like in everyday life.

Q. WHY SHOULD SOMEONE NOT MISS YOUR PRESENTATION?

A. Because besides some research, real clinical stuff, and a mix of high- and low-tech tricks, people usually enjoy my charmingly broken German-English, which, apparently, is entertaining enough to make it worth attending! **CD**

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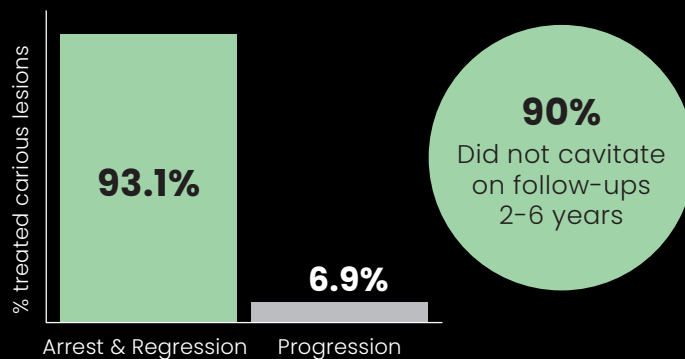
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¹ Godenzi D et al. J Am Dent Assoc. 2023;S0002-8177 (23)00416-6
*Long-term clinical study in public pediatric dental clinic in Chur, Switzerland

TWO CASE REPORTS DEMONSTRATING BIOMIMETIC, NON-INVASIVE CARIES MANAGEMENT WITH CURODONT™ REPAIR BY vVARDIS

GUIDED ENAMEL REGENERATION

Traditional management of early carious lesions often involves a passive ‘watch-and-wait’ approach until cavitation occurs, at which point invasive treatment is required. However, biomimetic treatments now offer clinicians the ability to intervene earlier, preserving natural tooth structure and improving patient outcomes.

CURODONT™ REPAIR, based on self-assembling peptide technology (P11-4), creates a 3D matrix within the lesion body, guiding hydroxyapatite formation using calcium and phosphate from the patients’ saliva. This approach promotes remineralisation without drilling, discomfort, or anaesthesia, making it ideal for both aesthetic and structural enamel remineralisation. The following cases (provided by Dr Giovanni Sammarco, Cariologia Clinica, 2025) demonstrate how CURODONT™ REPAIR can successfully arrest and reverse early lesions, offering patients a biologically sound alternative to traditional restorations.

CASE ONE: POST-ORTHODONTIC WHITE SPOT LESION MANAGEMENT

A 25-year-old male presented with a concern from white discoloration on the maxillary anterior teeth following fixed orthodontic treatment.

White spot lesions were visible on the labial surfaces of UL1 and UL2 (Figure 1a). The lesions evident both wet and dry.

Initial enamel caries (ICDAS Score 2) on UL1 and UL2, attributed to inadequate plaque control during orthodontic treatment were diagnosed. One in-surgery

application of CURODONT™ REPAIR was performed. The patient was also prescribed CURODONT™ PROTECT for at-home use twice weekly at bedtime. At the 16-month follow-up, the lesions showed a reduction in both size and opacity, indicating effective caries regression and aesthetic improvement (Figure 1b). The patient reported high satisfaction.

CASE TWO: EARLY INTERPROXIMAL LESION IN A HIGH CARIES-RISK PATIENT

Incidental finding during routine recall of a 28-year-old female patient with high caries risk. Bitewing radiograph revealed a radiolucent lesion on the distal surface of LL5 and mesial surface of LL6 (Figure 2a).

Initial distal enamel lesion (E2) was diagnosed on LL5, and moderate mesial dentine lesion on LL6.

CURODONT™ REPAIR was applied to LL5 and LL6. The patient was prescribed CURODONT™ PROTECT twice weekly.

At seven-month follow-up, the lesion showed signs of arrest and reduced radiolucency (Figure 2b), indicating enamel regeneration.

CLINICAL TAKEAWAY

These cases demonstrate how CURODONT™ REPAIR can effectively treat both early caries white-spot lesions and interproximal lesions in patients. By avoiding drilling, local anaesthetic and discomfort, this approach reduces patient anxiety and enhances trust. It also supports true biological healing through Guided Enamel Regeneration, preserving enamel rather than replacing it. [GO](#)



FIGURE 1A: Before – white spot lesions on UL1 and UL2



FIGURE 1B: After – 16-month follow-up showing significant reduction in size and appearance of the white spot lesions



FIGURE 2A: Before – radiolucent lesion on distal LL5 and mesial of LL6



FIGURE 2B: After – seven-month follow-up showing radiographic improvement

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The user-friendly system offers internal and external cleaning in a record 10 seconds per cycle. Hence, downtime is reduced hugely with its non-stop loading abilities, processing one handpiece while the next is being prepared for a streamlined sterilisation workflow.

Cost and time efficiency is augmented due to W&H's guarantee of high-quality maintenance with controlled spray technology, prolonging the lifespan of expensive and valuable handpieces.

The Assistina Twin also promotes patient- and user-safety as the closed system inhibits aerosol release. Additionally, the product is easy to use for all dental professionals with fast and simple assembly and removal of instruments using the efficient release button.

The Assistina Twin from W&H is fast to process, and reliable in performance, transforming handpiece maintenance seamlessly.

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POSTER PRIZE AT BSSPD 2025 Schottlander

From an entry of 26 posters, the winner of the Schottlander poster prize at BSSPD 2025 was Bethany Revert from St George's University Hospitals NHS Trust for her poster 'Surgical management and dental rehabilitation of a Brown's tumour in the anterior maxilla'.

The case report described the multidisciplinary care of a rare case of a Brown's tumour located in the anterior maxilla, occurring as a side effect of secondary hyperparathyroidism. Dr Brian Schottlander is pictured with Bethany Revert and Dr Shiyana Eliyas.

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Synea Fusion from W&H is a range of high-performance straight and contra-angle handpieces that offer uncompromising efficiency alongside maximum user-comfort.

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Curaprox is a cutting-edge electric toothbrush that bridges innovative technology with a sleek Swiss design. It offers seven cleaning modes and three specialised brush heads to better support patients in finding the most suitable setting, ensuring comfort and compliance.

Each brush head utilises ultra-fine Curen filaments at 84,000 brush movements per minute for the perfect mix of cleaning power and gentleness, keeping the teeth and gingivae healthy without causing discomfort. Combined with the 60-minute battery life and travel compatibility, the Hydrosonic Pro can help patients maintain optimal oral health at home and abroad.

Tailor the daily oral hygiene routine to the patient by recommending the Hydrosonic Pro today.

To arrange a practice educational meeting with your Curaden development manager email sales@curaden.co.uk.

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NEW AI-POWERED DENTAL IMAGING SOFTWARE

Planmeca

With built-in AI-powered features available as standard, Planmeca Romexis version 7 takes dental imaging up a notch.

Including AI-powered 3D imaging tools that provide an excellent visual representation of the case for patient education, and CBCT images and intraoral scans that automatically fit together with the help of AI.

Routine tasks are automated, which means less time spent on the computer and more time with patients.

Romexis 7 revolutionises implant planning with a fully automated workflow that provides plan proposals with minimal user input in as little as nine seconds. Implant guide design becomes easier and faster too. The area for the surgical guide is automatically identified and defined, generating a guide outline that users can easily refine.

And if all that's not enough, a virtual assistant is available to answer questions and provide step-by-step instructions.

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Zirkonzahn

With Ice Plus, Zirkonzahn launches a new zirconia developed specifically for high-performance, metal-free primary structures.

This new material is ideal for reduced frameworks and is characterised by an exceptionally high flexural strength of approximately 1,650 MPa (without HIP) or up to 1,900 MPa (with HIP). This makes Ice Plus a safe choice even for complex and heavily loaded restorations such as implant-supported restorations or large-span bridges.

Thanks to the outstanding mechanical strength, the material ensures maximum load-bearing capacity while allowing for an elegant, delicate design of restorations.

Ice Plus also stands out for its versatility: using Zirkonzahn's Fusion Powder, a secondary structure made of zirconia can be bonded directly onto a primary structure made of Ice Plus. This represents a significant advancement in the fabrication of aesthetically demanding, fully ceramic hybrid restorations without any metal components.

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THE INVISIBLE DIFFERENCE

A-dec

If you have ever heard the phrase 'it's not always what you see that matters, it's what you do not see that make all the difference' you may have thought what does that even mean. When manufacturing dental equipment, it means the meticulous way A-dec designs, engineers, and tests its products, going above and beyond the usual industry standards. You can find it in the hand-finished materials, the in-house manufacturing, and the rigorous testing that truly gives dental professionals peace of mind. These are the invisible differences, the subtle innovations and details that contribute to A-dec's well-deserved reputation for outstanding reliability, performance, and comfort.

Take, for instance, A-dec's newly introduced 10-year warranty on core equipment. This isn't just a bold statement; it showcases the confidence behind their chairs, stools, delivery systems, and lights that are built to last. The real magic is in the unseen elements: pressure-mapped armrests, proprietary tubing extrusions, smart software platforms, and antimicrobial finishes that enhance everyday performance without making a fuss about it.

The new A-dec 500 Pro package and A-dec+ platform seamlessly integrate smart technology and remote diagnostics into practice workflows, while every surface, material, and mechanism is selected for durability, reliability, and user-friendliness. This hidden quality not only supports dentists but also safeguards patients, enhances ergonomics, and guarantees long-term value. For practices that seek more than just what meets the eye, A-dec is the reliable partner that quietly delivers.

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GENERAL DENTISTRY CD/SEPTEMBER/GHILA/PAGE 15

1. Which substances commonly found in e-cigarette aerosols are considered toxic or carcinogenic?
 - ☐ a. Only nicotine and water vapor
 - ☐ b. Formaldehyde, acrolein, heavy metals and volatile organic compounds
 - ☐ c. Carbon monoxide only
 - ☐ d. Only vegetable glycerine and flavourings
2. What cardiovascular effect does nicotine have?
 - ☐ a. Decreases heart rate by blocking beta receptors
 - ☐ b. Activates β -adrenergic receptors leading to increased heart rate and cardiac workload
 - ☐ c. Directly improves endothelial function and wound healing
 - ☐ d. Reduces sympathetic nervous system activity
3. Which of the following has been identified as a gateway consequence of youth e-cigarette use?
 - ☐ a. Lower risk of future smoking
 - ☐ b. Improved respiratory function
 - ☐ c. Increased likelihood of future combustible cigarette use
 - ☐ d. Reduced exposure to nicotine overall
4. Which of the following best describes the respiratory effects linked to propylene glycol exposure?
 - ☐ a. Propylene glycol inhalation is proven safe
 - ☐ b. Causes reversible airway dilation
 - ☐ c. Associated with wheezing, chest tightness, dry cough and throat irritation
 - ☐ d. Improves lung function in asthma patients

AESTHETIC DENTISTRY CD/SEPTEMBER/SUGGETT/PAGE 27

1. What was the primary aesthetic challenge in this case?
 - ☐ a. Colour mismatch in the posterior molars
 - ☐ b. Presence of a large buccal soft tissue defect and black triangle in the anterior maxilla
 - ☐ c. Poor occlusion in the lower arch
 - ☐ d. Excess keratinised tissue around existing implants
2. Which type of graft was used twice during treatment?
 - ☐ a. Free gingival graft
 - ☐ b. Allograft collagen membrane
 - ☐ c. CTG harvested from palate and tuberosity
 - ☐ d. Xenograft dermal matrix
3. Why was titanium chosen for the custom abutment in the final restoration?
 - ☐ a. It allows for better colour matching under zirconia
 - ☐ b. It is less expensive than zirconia
 - ☐ c. It is biocompatible and promotes tissue attachment and long-term stability
 - ☐ d. It requires no CAD/CAM technology
4. What was the primary purpose of the temporary cantilevered bridge in this treatment?
 - ☐ a. To function as a long-term prosthesis
 - ☐ b. To create occlusal vertical dimension
 - ☐ c. To shape and condition the soft tissue and emergence profile
 - ☐ d. To stabilise surrounding teeth during orthodontic movement

DIGITAL DENTISTRY CD/SEPTEMBER/ZADEH/PAGE 39

1. According to Patel et al (2023), how do survival rates compare between implants placed using delayed and immediate protocols?
 - ☐ a. Immediate protocols rates are significantly lower
 - ☐ b. Immediate protocols rates are significantly higher
 - ☐ c. Delayed protocols have double the survival rate of immediate protocols
 - ☐ d. There is no significant difference in survival rates
2. What is an advantage of using a digital workflow for implant procedures, according to the author?
 - ☐ a. Longer treatment times
 - ☐ b. More complex laboratory work
 - ☐ c. Reduced operating costs
 - ☐ d. Increased need for manual adjustments
3. In the case report, what was the primary purpose of 3D printing a duplicate of the mandibular prosthesis with an open occlusal design?
 - ☐ a. To reduce the weight of the prosthesis
 - ☐ b. To ensure correct orientation of the multi-unit abutments
 - ☐ c. To improve the patient's speech immediately after surgery
 - ☐ d. To strengthen the final zirconia restoration
4. During implant surgery, why was a navigation tracker placed on the remaining anterior teeth?
 - ☐ a. To stabilise the surgical instruments
 - ☐ b. To measure the patient's bite force
 - ☐ c. To allow accurate placement of posterior implants
 - ☐ d. To monitor intraoperative healing

ENDODONTICS CD/SEPTEMBER/VORSTER/PAGE 47

1. What is one of the main benefits of the proprietary heat treatment applied to Reciproc Blue instruments?
 - ☐ a. It reduces the cost of the instrument
 - ☐ b. It increases cyclic fatigue resistance and flexibility
 - ☐ c. It eliminates the need for irrigation during treatment
 - ☐ d. It automatically determines the working length
2. Which of the following describes the tip diameter and taper of the Reciproc Blue 40 instrument?
 - ☐ a. 0.25mm tip with 8% taper
 - ☐ b. 0.50mm tip with 5% taper
 - ☐ c. 0.40mm tip with 6% taper
 - ☐ d. 0.35mm tip with 7% taper
3. How often was the Reciproc Blue R25 able to reach full working length without prior glide path preparation in extracted mandibular molar canals?
 - ☐ a. 100% of canals
 - ☐ b. 98.7% of canals
 - ☐ c. 90% of canals
 - ☐ d. 85% of canals
4. What is an advantage of using the single-file Reciproc Blue system in clinical practice?
 - ☐ a. Requires multiple hand files for shaping
 - ☐ b. Increases apical extrusion of debris
 - ☐ c. Reduces instrumentation time and simplifies workflow
 - ☐ d. Eliminates the need for irrigation

IMPLANT DENTISTRY CD/SEPTEMBER/PATEL/PAGE 55

1. According to the author, what is the ideal distance required between two adjacent implants to minimise bone loss and support good aesthetics?
 - ☐ a. 1.5mm
 - ☐ b. 2mm
 - ☐ c. 3mm
 - ☐ d. 5mm
2. In cases where two adjacent implants are planned, what is the minimum total horizontal space generally required to accommodate them safely?
 - ☐ a. 10mm
 - ☐ b. 12mm
 - ☐ c. 14mm
 - ☐ d. 16mm
3. Why was guided surgery indicated in this clinical case?
 - ☐ a. To avoid the need for any radiographic scans
 - ☐ b. To improve accuracy in implant positioning due to limited space
 - ☐ c. Because the patient requested it
 - ☐ d. To reduce cost and surgical time
4. What was noted as a possible benefit of using a custom healing abutment at the UL5 site instead of a generic one?
 - ☐ a. Faster osseointegration
 - ☐ b. Better soft tissue contour and emergence profile
 - ☐ c. Eliminated the need for bone grafting
 - ☐ d. Reduced overall treatment time significantly

ORAL HEALTH CD/SEPTEMBER/PATEL/PAGE 69

1. According to the World Health Organization (WHO), how many new cases of dementia are diagnosed worldwide each year?
 - ☐ a. One million
 - ☐ b. Five million
 - ☐ c. 10 million
 - ☐ d. 20 million
2. By what factor is the number of people living with dementia worldwide expected to increase by 2050?
 - ☐ a. Double
 - ☐ b. Triple
 - ☐ c. Quadruple
 - ☐ d. Remain the same
3. What pathogen has been identified in the brain tissue of individuals with Alzheimer's disease, supporting the oral-brain axis theory?
 - ☐ a. Candida albicans
 - ☐ b. Herpes simplex virus type 2 (HSV-2)
 - ☐ c. Porphyromonas gingivalis
 - ☐ d. Staphylococcus aureus
4. What has epidemiological evidence suggested about tooth loss and dementia?
 - ☐ a. No relationship exists between tooth loss and cognitive decline
 - ☐ b. Tooth loss reduces the brain's inflammatory response
 - ☐ c. Each tooth lost is linked to a measurable increase in dementia risk
 - ☐ d. People with tooth loss are less likely to have Alzheimer's

ORTHODONTICS CD/SEPTEMBER/MILGATE/PAGE 82

1. According to the author, what is a common reason some clinical findings remain unaddressed for long periods?
 - ☐ a. Patients refuse to pay for treatment
 - ☐ b. Clinicians only treat what is visible in radiographs
 - ☐ c. Findings stay on paper or practice software without being communicated to patients
 - ☐ d. Assistants forget to add them to the records
2. Which technology is highlighted throughout the article as a key tool for diagnosis, education, planning and monitoring?
 - ☐ a. CBCT scanners
 - ☐ b. Itero scanners
 - ☐ c. Panoramic radiography
 - ☐ d. Intraoral photography only
3. What primary diagnosis was made for the 14-year-old female patient?
 - ☐ a. Severe crowding of the lower incisors
 - ☐ b. Impacted canines
 - ☐ c. Congenitally missing upper lateral incisors
 - ☐ d. Tooth decay on upper premolars
4. Why is it important for dentists to show patients visualisations of their clinical findings during consults, according to the author?
 - ☐ a. It guarantees the patient will accept the first treatment plan offered
 - ☐ b. It improves communication, helping patients understand oral hygiene, anomalies and conditions
 - ☐ c. It allows dentists to reduce the number of procedures needed
 - ☐ d. It ensures the patient does not ask any questions

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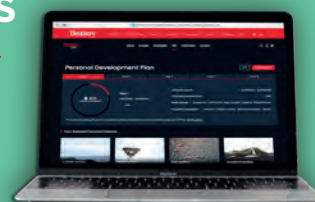


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