INTERNATIONAL
Dentistry
AFRICAN EDITION

VOL. 9 NO. 5

IN THIS ISSUE

The EQ-V System – Precision, Convenience, Innovation

META® BIOMED

Your choice for Continuous Wave Obturation

EQ-V Pack

- Intuitive handling for smooth, controlled filling
- Soft yet durable needle
- 360° activation ring button for mandible and maxilla

EQ-V Fill

- Ergonomic, lightweight design for maximum comfort
- Long battery life
- Easy to use, outstanding performance

EQ-V Cartridge

- Innovative 360° rotating cartridge system for unparalleled access and precision
- Easily replaceable and disposable

ROOTOR

Electronic Apex Locator

- Accuracy in any root canal conditions
- Colour Display
- Stylish and ergonomic design
- Auto power-off for saving battery life
- Stability and measurement reliability

Pretoria: Patrick: 082 375 3699 - Brandon: 082 555 4406
Johannesburg: Gerhard: 082 373 1548 - Johan: 082 829 6804 - **Port Elizabeth** : Leon: 079 501 5880

012 342 8551

IAD inter-africa dental pty(ltd)

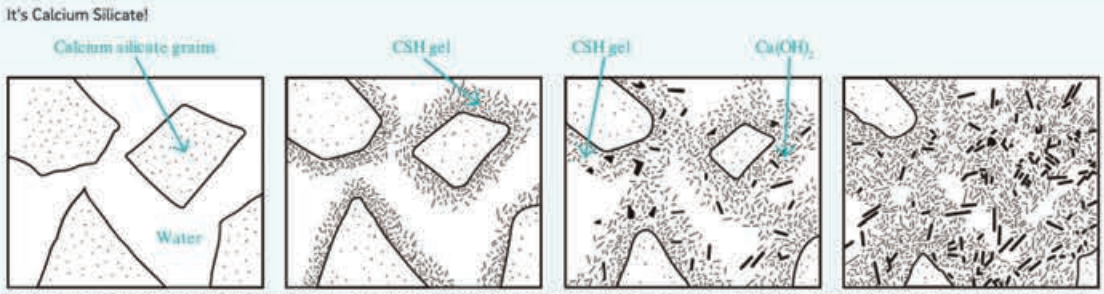
"Passionate about Dentistry!"

CeraSeal

Calcium Silicate-based Bioceramic Root Canal Sealer

Excellent Sealing Ability

- Moisture in the dentinal tubules and Calcium Silicate's chemical reaction produce crystallization of Calcium Hydroxide
- CeraSeal creates a perfect hermetic seal in the root canal
- It prevents the propagation of bacteria
- Ideal for Single-cone obturation technique



Calcium silicate produces CAH (Calcium Aluminate Hydrate) gel and CSH (Calcium Silicate Hydrate) gel by absorbing the moisture from surrounding tissues in the root canal and some crystallization of Calcium Hydroxide ($Ca(OH)_2$).

EQ-S

Cordless Root Canal Irrigant Activator

EQ-S is the most efficient 3D irrigation solution activator available. Its multi-directional active-flow technology strongly and quickly sends irrigant throughout the canal, allowing you to safely and effectively disinfect the canal.

Advantages

- **Active Flow Technology** – Indentations along the tip, combined with a counter-clockwise motion, ensures 3D Active Flow. The unique shape and design of the EQ-S tip create stronger force, which enhances irrigant flow in small canals.
- **Powerful Cleaning** – Using EQ-S with MD-Cleanser ensures better cleaning and disinfection
- **Active Flow Polymer Tip**
  - Less pressure to the apical foramen
  - Easier access to curved canals
  - Perfect interaction with irrigant

www.interafricadental.com - orders.iad@gmail.com - 0861-DENTAL(336825) - (T) 012 342 8551 - (F) 087 809 5940
Address: 1315 Stanza Bopape Street, Hatfield, Pretoria, 0028 I PO BOX 11050, Hatfield, 0028, South Africa

Contents

October/November 2019
Volume 9 No.5

THE DENTAL WAREHOUSE

A HENRY SCHEIN® COMPANY

www.dentalwarehouse.co.za

Johannesburg
Tel: 011 719 9111 • **Fax:** 011 719 9031
Building 2, No 106 16th Road,
Midrand, 1686

Durban
Tel: 031 312 6130
51A Musgrave Park, Musgrave Road,
Berea, Durban, 4001

High performance equipment and advanced technology from The Dental Warehouse

X-MIND TRIUM

The 3D technology that facilitates implant planning with instant volume measurement and bone density assessment.

ACTEON
MINIMALLY
INVASIVE
SOLUTIONS

ACTEON®'s CBCT integrates high performance, state-of-the-art tools to increase diagnostic reliability and improve patient care. With X-Mind® trium and ACTEON® Imaging Suite software, treatment becomes more efficient and safer, less traumatic and therefore less stressful. Bone density around the implant is assessed with a single click, allowing easier clinical decision-making. Its simplified implant planning program generates complete reports in less than a minute.

DCI EDGE SERIES 5

The ergonomic design of DCI's Series 5 dental chairs allows dentists to be in the proper working position regardless of patient size.

DCI Edge

DCI Edge's Series 5 line of dental equipment means efficiency and style, combining advanced technology with extensive industry experience. The Series 5 dental chairs, operatory lights, and delivery systems offer industry leading comfort and ease of use.

the dental warehouse dwhrelyonus

INTERNATIONAL Dentistry AFRICAN EDITION

Vol. 9 No. 5, October/November 2019
ISSN 2226-1567

DESIGN & LAYOUT
C Designz

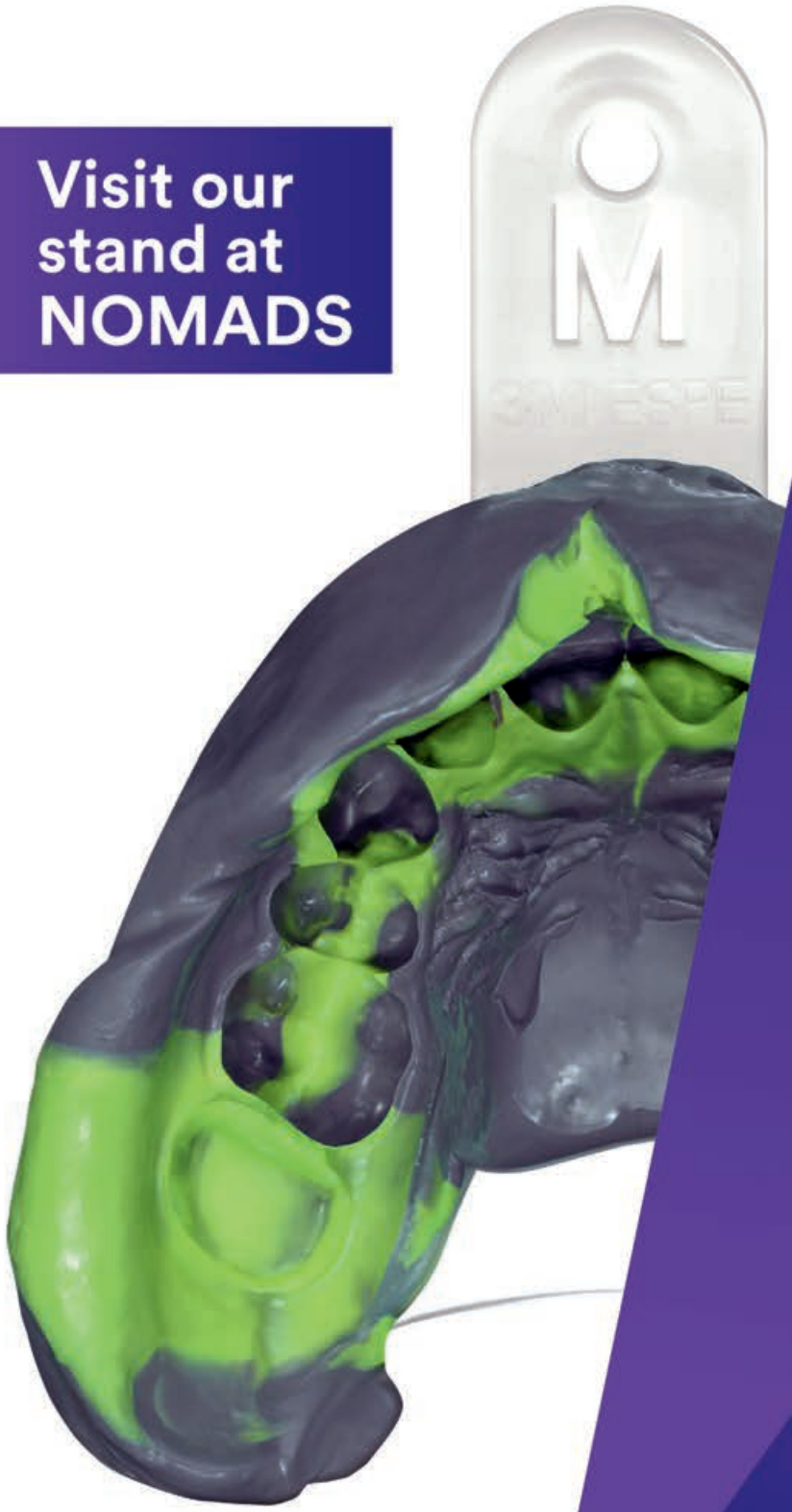
PRINTED BY
Paarl Media Paarl

International Dentistry African Edition is published by Modern Dentistry Media CC,
PO Box 76021 Wendywood 2144 South Africa
Tel: +27 11 702-3195
e-mail: dentsa@iafrica.com
www.moderndentistrymedia.com

Published in association with
FMC DENTISTRY'S INFORMATION CENTRE
abc

3M Science. Applied to Life.™

Visit our stand at NOMADS



The 2 MIN Polyether

3M™ Impregum™ Super Quick
Polyether Impression Material

Capture every detail in 2 minutes? Yes, it can.

It's all a question of chemistry. 3M™ Impregum™ Super Quick – the first true superfast polyether impression material – unites the famous accuracy of polyether with the speed of a VPS. With a short setting time of just two minutes, it is ideal for high-precision single-unit impressions. A significantly improved taste is included as well. Let's make your impression procedure faster and your patients feel more comfortable!

3M.com/Impregum

New generation short fibre-reinforced composite restorations of the posterior dentition

Márk Fráter[1] and András Forster[2]

Finding the ideal material(s) for the restoration of posterior teeth, with the aim of re-establishing the original mastication, has long been a central issue in restorative dentistry. Direct restorations have been widely applied to restore posterior teeth due to their low cost, the smaller amount of healthy tooth substance that has to be removed as compared to indirect restorations, and their acceptable clinical performance[1]. Two main causes of posterior restoration failure have been identified: secondary caries and fracture (either of the restoration or the tooth itself)[2,3]. The later phenomena is a result of multiple factors.

Dental fracture patterns depend on the direction and amount of force applied, and the ability of the tooth to recover from the deformation[4]. Force may be relatively light and repetitive, as in normal mastication, or relatively heavy and repetitive as seen in bruxism, and extremely heavy and sudden in cases of trauma. In the posterior region, forces range from 8 to 880N during normal mastication[5]. Extreme forces can easily lead to crack development in restored teeth, but this can also be true in case of physiological forces applied on the long term. In the "amalgam era"[6] the belief was that the harder the material chosen for restorative purposes, the more chances it had to prevent crack and fracture occurrence. Conversely, according to biomimetic dentistry there is no need for rigid materials. The primary aim is to substitute the missing hard dental tissues (enamel and dentin) with restorative materials closely resembling the natural tissues regarding their mechanical features and properties[7].

According to the early research of Pascal Magne, the ideal materials to replace the brittle, yet stiff enamel should be feldspathic porcelain or highly filled, laboratory composite, whereas the substitution of dentin should be performed with microhybrid composite resin[8]. From the year 2000 several studies emphasised the importance of a third type of tissue (or layer): the dentino-enamel junction (DEJ) (Figure 1)[8,9].

The DEJ has been histologically described as a collagenous interphase between these two bio-mechanically vastly different tissues, partly connecting and unifying them, and partly forming a stress-absorbing layer protecting the underlying elastic

[1] Assistant Professor and acting head of the Department of Operative and Aesthetic Dentistry, University of Szeged., Hungary.
Private practice in Szeged and London, UK

[2] Research fellow, University of Szeged, Hungary.
Prosthodontist, Urban Regeneration Institute in Budapest and the British Hungarian Medical Service.

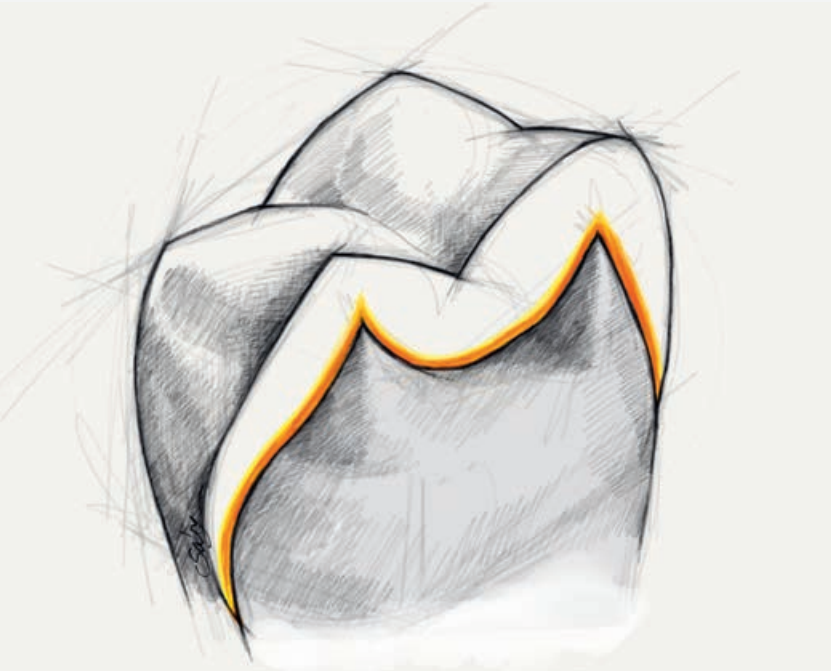


Figure 1: Illustration of a molar showing the natural changes of enamel thickness, the natural histoanatomy of the dentin and the position of the dentino-enamel junction. bIllustration by Dr. Tekla Sáry.

dentin and the vital pulpal tissues. This is the reason why multiple cracks can be seen in the enamel of aged teeth, yet they rarely reach and compromise the supporting dentinal base, therefore usually remain asymptomatic. So far, this latter function of the DEJ has not been successfully mimicked by any restorative material. The excellent biomechanical properties of the DEJ can divert and blunt enamel cracks through considerable plastic deformation, providing a functional shielding mechanism and allowing synergy between enamel and dentin. This is the mechanism that enables right, serving a fundamental function, and when restoring a tooth according to biomimetic principles one should also consider this layer - not only dentin and enamel.

In 2013, a short fibre-reinforced composite (SFRC) (everX Posterior, GC) was introduced to the market with the goal to substitute the missing dentin with a material having a similar behaviour; additionally, the material has clinically shown to be also able to mimic the stress-absorbing properties of the DEJ simultaneously. Fibre-reinforced composites have been used in dentistry for the past 30 years but their true potential and function is just being realised.

The reinforcing effect of the fibre these natural tissues to withstand a lifetime of mastication. Therefore, the DEJ might be considered a specialised tissue type of its own fillers is based on stress transfer from the polymer matrix to the fibres[10], which is influenced by the size of the fibres and the connection between the fibres and the matrix. The actual average size of the glass fibres in the SFRC material is 1-2 mm, thus exceeding the critical fibre length and making stress transfer possible (Figure 2).

Additionally the fibres are silanised and are therefore able to chemically connect to the matrix. As a consequence of these features, the SFRC is able to reinforce the dental structures even in case of extreme loading conditions. Since these fibres show random orientation, they can reduce the polymerisation stress generated by the composite resin in all directions[11,12]. This makes it possible to use the material in layers up to 4mm. However, the in vitro research carried out by the authors has shown that everX Posterior applied in 2-3mm thick layers with oblique layering gave the best results regarding the fracture resistance of posterior molar teeth among the restored groups[13].

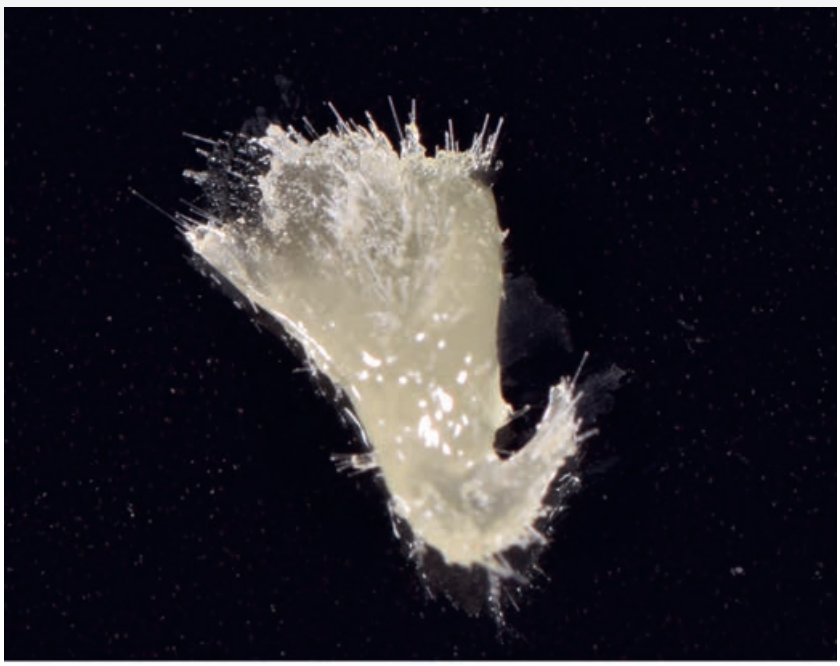


Figure 2: The unique size of the short fibres is visible when the SFRC material is extruded from the unitip.

Furthermore, this technique showed the highest number of repairable fractures once fracture occurred. Thus this technique (2-3 mm thick layers with oblique layering) seems to be the most beneficial.

When following the biomimetic restorative principles, the indications for the usage of everX Posterior are dentin substitution in medium and large cavities in posterior teeth, which means that in practice the surfaces of these modern direct restorations should be made of microhybrid or nanohybrid composite covering the SFRC "dentinal core" in at least 1 mm thickness everywhere.

The other revolutionary indication of SFRC is in case of indirect restorations or repair of damaged restorations. The SFRC material contains a semi-interpenetrating polymer matrix (semi-IPN), which consists of both linear and cross-linked polymer phases. The linear phase can be dissolved if a suitable adhesive resin is added on its surface, thus enabling the reactivation of the material and also true chemical bonding to it[14].

Unfortunately this is not the case with conventional composite resins, because once the active oxygen inhibition layer is lost from their surface, the cross-linked polymers cannot be broken up anymore. This leads to little if any reactivity left for free radical polymerisation bonding and therefore, no actual chemical bonding can take place. This unique structure leads to the fact that if the core build-up is made with the usage of SFRC, this layer will not only act as a stress-absorber and crack stopper interphase, but will also have the ability to chemically adhere to the indirect restoration placed on it, if adhesive cementation is applied. In clinical settings this can be managed with the following steps: first cleaning the surface from any debris or biofilm, and then applying a pure resin bonding agent (eg. GC StickRESIN).

With the above mentioned unique features, everX Posterior brings the restorative possibilities in the posterior region to a new level, and also opens new horizons for future restorative techniques. Therefore it seems justified to state that SFRC materials will shortly change the face of posterior restorative procedures.

perfect®

Replacement for ProTaper Gold

Switch & Save | Wright

THE ONLY DIFFERENCE YOU WILL NOTICE IS THE PRICE!

R399 INCL VAT
Pack of 6

TG6

Features

- New generation of raw material; Advanced technical process
- Shocked Toughness
- 200%-500% Fracture Resistance improved

SX S1 S2 F1 F2 F3 F4 F5

PEREFECT Endo.

Wright MILLNERS

Valid While Stocks Last. Special cannot be used in conjunction with another promotion.

0860 100 200 | @wrightmillners | Wright Millners Dental Suppliers
www.wright-millners.co.za

Pictures used may be for representation only. Errors and omissions exempt

Clinical case report: Restoring tooth 16 according to biomimetic principles with everX Posterior and a GRADIA® PLUS overlay.

Figure 1: Initial situation showing an MOD composite restoration with a vertical crack inside the filling causing pain for the patient

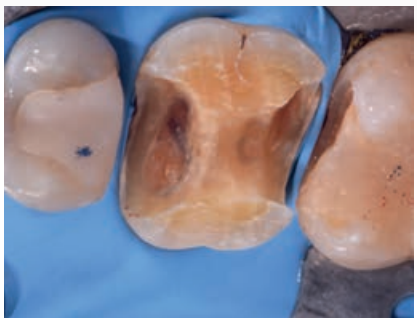


Figure 2: Prepared cavity

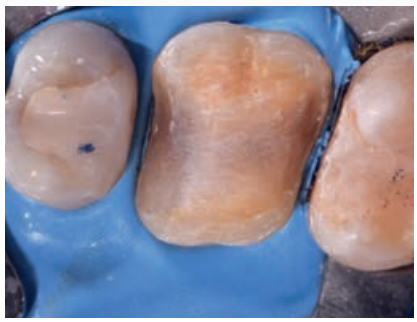


Figure 3: Core build-up with SFRC (everX Posterior, GC)

Figure 4: Situation before impression-taking

Figure 5: GRADIA® PLUS overlay

Figure 6: Before adhesive cementation

Figure 7: After adhesive cementation

After removing an old, cracked MOD composite filling, the form was optimised and the dentin and DEJ were substituted using a SFRC as core build-up. The missing enamel shell was then restored with a GRADIA® PLUS overlay.

IPS e.max®

500 MPa

High strength, high esthetics

Since its introduction, IPS e.max® lithium disilicate has been relied upon for its high strength and high esthetics by clinicians worldwide. Now, after 10 years of continuous quality testing, IPS e.max lithium disilicate has demonstrated an average biaxial flexural strength of 500 MPa*. Due to the material's long-term clinical success and proven record of strength, crowns with only 1 mm material thickness are now possible when adhesively bonded.

The IPS e.max® you know, but even more versatile!

- **Minimally invasive preparation**
- **New translucency options**
- **500 MPa for maximum confidence**

For your next case choose the trusted, most prescribed all-ceramic in the world. IPS e.max... all ceramic – all you need.

IPS e.max®
is now even more versatile!

*Source: R&D Ivoclar Vivadent AG, Schaan, Liechtenstein
**Based on sales figures

ivodent
0860 456 123

ivoclar vivadent®
passion vision innovation

Clinical case report: Restoring tooth 15 with a direct fibre-reinforced composite restoration.

Figure 1: Initial situation showing distal change of transparency indicating caries.

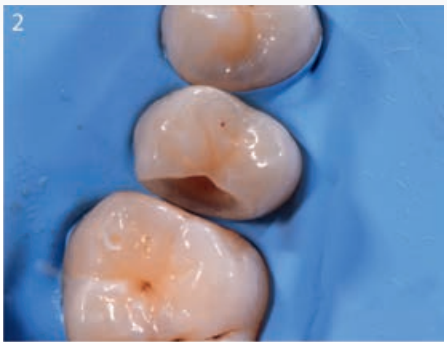


Figure 2: Prepared OD cavity

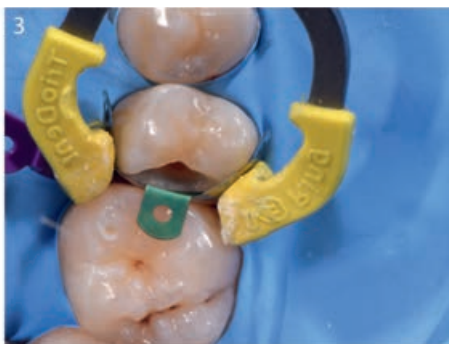


Figure 3: Placing a sectional matrix

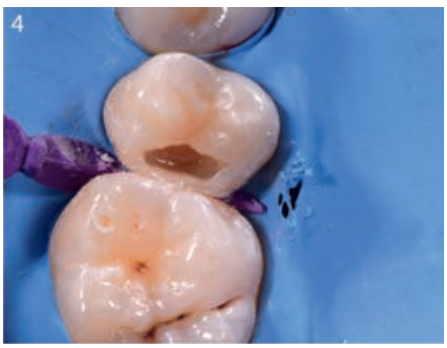


Figure 4: Building up the interproximal wall with a microhybrid composite (Essentia Universal, GC)

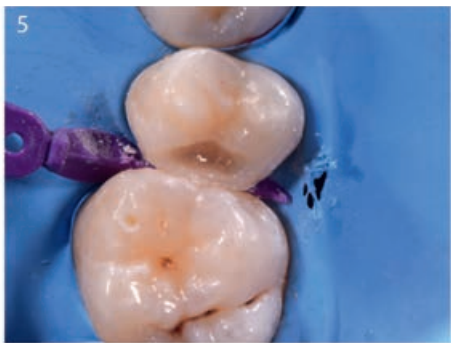


Figure 5: Substituting the missing dentin with a SFRC (everX Posterior, GC)

Figure 6: Final restoration after finishing - SFRC covered with microhybrid composite (Essentia Universal) occlusally

The patient presented with a distal carious lesion on tooth 15. After preparation and cleaning, a matrix was placed and the OD cavity was transformed into a Class I by building up the approximal wall with Essentia Universal composite (GC), according to the centripetal technique. The internal missing dentin was then substituted with a SFRC (everX Posterior, GC) and occlusally covered with a layer of microhybrid composite (Essentia Universal).

References

1. Demarco FF, Correa MB, Cenci MS, Moraes RR, Opdam NJ: Longevity of posterior composite restorations: not only a matter of materials. Dental materials : official publication of the Academy of Dental Materials. 2012;28(1):87-101.

2. Brunthaler A, Konig F, Lucas T, Sperr W, Schedle A: Longevity of direct resin composite restorations in posterior

teeth. Clin Oral Investig. 2003;7(2):63-70.

3. Da Rosa Rodolpho PA, Donassollo TA, Cenci MS, Loguercio AD, Moraes RR, Bronkhorst EM, et al.: 22-Year clinical evaluation of the performance of two posterior composites with different filler characteristics. Dental materials : official publication of the Academy of Dental Materials. 2011;27(10):955-63.

4. Wu Y, Cathro P, Marino V: Fracture resistance and pattern of the upper premolars with obturated canals and restored endodontic occlusal access cavities. Journal of biomedical research. 2010;24(6):474-8.

5. Magne P, Boff LL, Oderich E, Cardoso AC: Computer-aided-design/computer-assistedmanufactured adhesive restoration of molars with a compromised cusp: effect of fiberreinforced immediate dentin sealing and cusp overlap on fatigue strength. Journal of esthetic and restorative dentistry : official publication of the American Academy of Esthetic Dentistry (et al). 2012;24(2):135-46.

6. Magne P: Composite resins and bonded porcelain: the postamalgam era? J Calif Dent Assoc. 2006;34(2):135-47.

7. Schlichting LH, Schlichting KK, Stanley K, Magne M, Magne P: An approach to biomimetics: the natural CAD/CAM restoration: a clinical report. The Journal of prosthetic dentistry. 2014;111(2):107-15.

8. Magne PB, U. Understanding the intact tooth and the biomimetic principle. In: Magne PB, U., editor. Bonded porcelain restorations in the anterior dentition: a biomimetic approach. Chicago: Quintessence Publishing Co. ; 2002. p. 23-55.

9. Bazos P, Magne P: Bio-emulation: biomimetically emulating nature utilizing a histo-anatomic approach; structural analysis. Eur J Esthet Dent. 2011;6(1):8-19.

10. Garoushi S, Mangoush E, Vallittu M, Lassila L: Short fiber reinforced composite: a new alternative for direct onlay restorations. The open dentistry journal. 2013;7:181-5.

11. Garoushi S, Sailynoja E, Vallittu PK, Lassila L: Physical properties and depth of cure of a new short fiber reinforced composite. Dental materials: official publication of the Academy of Dental Materials. 2013;29(8):835-41.

12. Basaran EG, Ayna E, Vallittu PK, Lassila LV: Load bearing capacity of fiber-reinforced and unreinforced composite resin CAD/CAMfabricated fixed dental prostheses. The Journal of prosthetic dentistry. 2013;109(2):88-94.

13. Fráter M, Forster A, Keresztúri M, Braunitzer G, Nagy K. In vitro fracture resistance of molar teeth restored with a short fibre-reinforced composite material. J Dent. 2014 Sep;42(9):1143-50.

14. Frese C, Decker C, Rebholz J, Stucke K, Staehle HJ, Wolff D. Original and repair bond strength of fiber-reinforced composites in vitro. Dent Mater. 2014 Apr;30(4):456-62.

Reprinted with permission from GC get connected

Easy and efficient: Composite resin blocks for the CAD/CAM technique

Hidetaka Sasaki[1]

Composite blocks for CAD/CAM applications are on the rise, particularly for producing small restorations, such as inlays, onlays and occlusal veneers. And quite rightly so, for this type of material has a lot to offer: it exhibits sound mechanical properties combined with an extraordinary grinding accuracy and it is easy and efficient to process in day-to-day procedures.

The following clinical report describes the workflow to create an esthetic single-tooth restoration using the new Tetric CAD® composite block. The blocks are available in two degrees of translucency – HT and MT – and in a variety of shades. They exhibit a pronounced chameleon effect to provide restorations that blend in well with the optical characteristics of the surrounding residual tooth structure. The material can be polished to a high gloss in a few seconds both intraorally and extraorally. In addition, it can be easily repaired intraorally with conventional composite resins.

Clinical case

The pre-op showed a defective amalgam filling on tooth 36 in the lower posterior region. The filling needed replacing (Fig. 1). The indication for a multi-surface inlay was given. It was the patient's wish to have an esthetic, i. e. tooth-coloured restoration. We decided to opt for the Tetric CAD composite blocks. This material is part of the portfolio of Ivoclar Vivadent blocks and is suitable for permanent single-tooth restorations. It is supplied in industrially processed, pre-cured blocks that exhibit superior strength and a higher filler content than direct restoratives. Because they have undergone an industrial polymerization process, shrinkage stress is not an issue with Tetric CAD.

Designing the restoration

Shade selection is performed on the natural dentition, primarily on the neighbouring teeth. We decided to use shade HT A2. The HT blocks are a good choice, particularly when it comes to producing fairly small restorations such as inlays as they provide a pronounced chameleon effect. Once the old amalgam was removed, the tooth was prepared in line with the recommended preparation guidelines (Fig. 2). Then, an optical impression was taken using an intraoral scanner and the inlay was designed in the CAD module (Fig. 3). Subsequently, the restoration was ground from the block.

[1] Dr Hidetaka Sasaki
es Dental Office
1F, 3-9-14 Kudanminami,
Chiyoda-ku
Tokyo
Japan
www.es-dental.net

Figure 1: Preoperative situation: defective amalgam filling on tooth 36.

Figure 2: Prepared tooth.

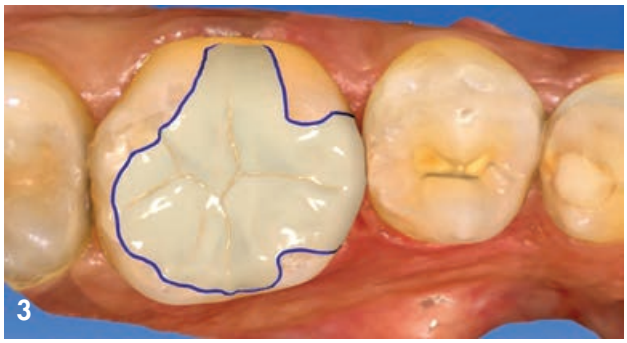


Figure 3: Designing the inlay in the CAD module.

Figure 4: Checking the fit and shade match of the inlay after the grinding process.

Grinding times are considerably shorter for CAD/CAM composite resins compared with other materials. Although the composite is softer to grind, the restoration is not affected by this. It only means that the grinding tools are less quickly worn and offer a long service life, maximizing the cost efficiency of the practice.

Composites are "flexible" materials. Their modulus of elasticity is similar to that of dentin. High flexural strength provides adequate resistance and stability. Given their low brittleness, composites can be ground to exhibit highly homogeneous surfaces and to obtain accurate, thinly tapered margins without loss of strength. Marginal chipping or crack formation are unlikely to occur.

In the present case, a try-in was performed immediately after the grinding process to check the fit of the inlay with the natural residual tooth structure (Fig. 4).

Conditioning the restoration

The attachment point was easy to smooth out with fine-grit diamonds. This was followed by extraoral polishing using composite polishers (e. g. OptraPol®) (Fig. 5). Particularly noteworthy was the speed with which the restoration was polished to a high gloss. It only took a few seconds to achieve a glossy surface (Fig. 6). Composites do not require an additional glaze firing cycle. This has a positive effect on the time resources of the practice.

It is essential to condition and pre-treat the bonding surface correctly. This requires the use of an adhesive system that is appropriate for this type of material to ensure the longevity of the restoration. The manufacturer's instructions should be followed at all times.

In the present case, the bonding surface of the inlay was air-blasted with aluminium oxide (50–100 µm) at a pressure of 1–1.5 bar, followed by thorough rinsing (Fig. 7). The restoration can be cleaned either in an ultrasonic unit or with a steam cleaner. It is recommended to additionally clean the restoration with 70 % ethanol to disinfect it. Pre-treating the restoration in this way is mandatory for Tetric CAD

Figure 5: Extraoral polishing with OptraPol.

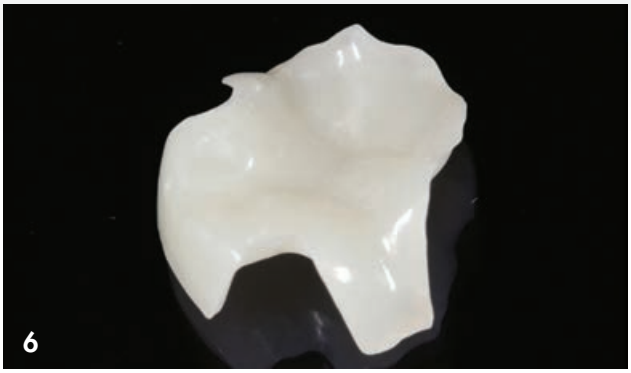


Figure 6: Restoration after high-gloss polishing.

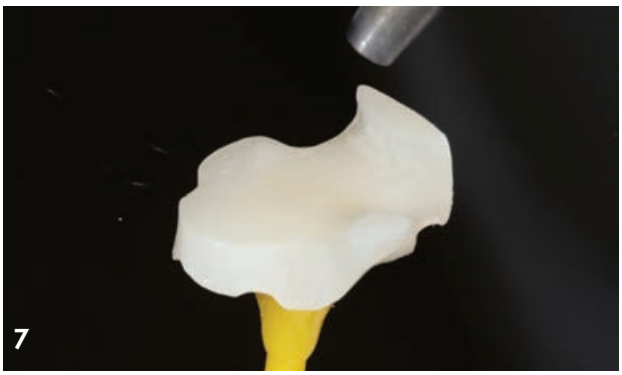


Figure 7: Air-blasting the bonding surface with 50 – 100 µm aluminium oxide at 1 – 1.5 bar; followed by cleaning.

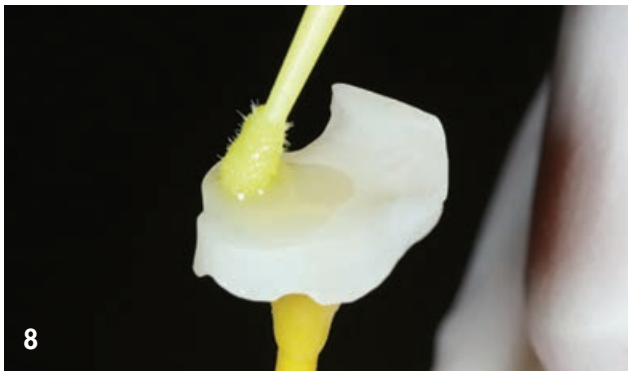


Figure 8: Scrubbing Adhese Universal into the bonding surface for 20 s, followed by drying with air.

because air-blasting increases the surface area and creates a retentive pattern that acts as a basis for the adhesive cementation. Pre-treating therefore ensures a reliable bond between the luting material and the restoration.

To condition the restoration, Adhese® Universal adhesive was applied and scrubbed into the pre-treated bonding surface for 20 seconds using a microbrush (Adhese Universal is also available in the VivaPen® delivery system for direct applications). It is important to observe the recommended agitation time to ensure that the adhesive can penetrate sufficiently (Fig. 8). Excess material is carefully dispersed using compressed oil-free air until a glossy immobile film results. Pooling must be avoided.

It is not necessary to light-cure the adhesive at this point: the adhesive will be cured together with the luting composite when the inlay is placed on the tooth.

Pre-treating the prepared tooth

Adequate isolation of the operating field is required for reliable bonding. The tooth preparation was cleaned and then conditioned, rinsed and dried using a conventional etch & rinse procedure. Adhese Universal adhesive was scrubbed into the tooth structure for 20 seconds and then dispersed (Fig.9). The adhesive was then light cured for 10 seconds using the Bluephase Style curing light (Fig. 10). According to the manufacturer's recommendation, a curing light emitting a light intensity of least 500 mW/cm2 should be used for this step.

Placing the restoration

The inlay was seated using Variolink® Esthetic luting composite. The luting composite was applied directly from the syringe onto the bonding surface and then the inlay

THE DENTAL SOLUTIONS COMPANY™

Dentsply Sirona

Primescan

Redefine your standards of outstanding accuracy and speed: Primescan enables all kinds of treatment, from single tooth to full arch. With Primescan intraoral scanning is now more accurate, faster and easier than ever before.

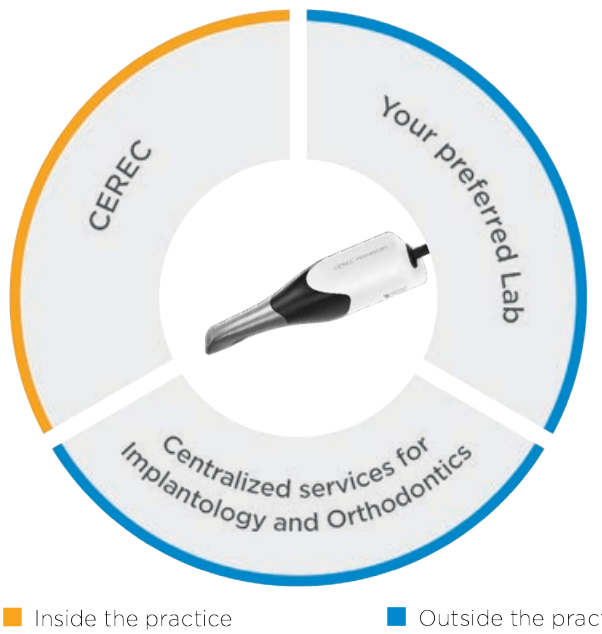
Benefit from all-around satisfaction

An excellent choice for outstanding results: Primescan is your perfect starting point into digital dentistry. No matter how you would like to design your workflows, Primescan is the enabler for efficient digital workflows – both chairside in your practice and with your preferred partners.

Well designed and perfectly compatible: Along with the high-performance intraoral scanner comes the new Acquisition Center. Together, they form a highly effective and most comfortable system – meeting your needs with two individual software configurations:

Primescan AC with Connect Software
Supports your connection to established partners workflows

CEREC Primescan AC with CEREC Software
Supports full chairside workflows for single-visit dentistry



Please call 0100 012 827 to place your order today.

Dentsply Sirona South Africa. Building 11a, Lower Ground Floor, The Woodlands, Woodlands Drive, Woodmead, Sandton, 2191 **www.dentsplysirona.com**

Figure 9: Conditioning the prepared tooth with Adhese Universal for 20 s, followed by drying with air.

Figure 10: Light-curing for 10 s using Bluephase Style.

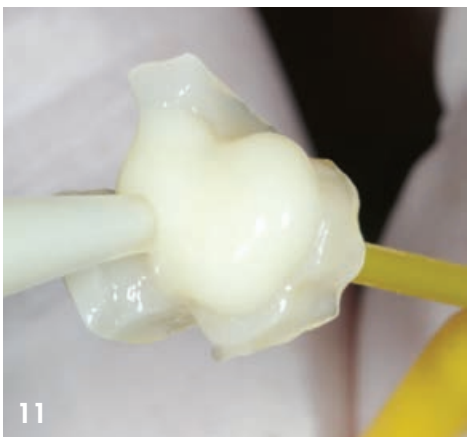


Figure 11: Applying Variolink Esthetic luting composite to the bonding surface.

Figure 12: Inserting and positioning the inlay on the tooth; followed by the removal of excess material.

was seated and retained in position applying light pressure (Fig.11). Variolink Esthetic is particularly well suited for this step because excess material can be removed from the cement line with ease and it does not cause a "buffering effect" as is often the case with harder luting composites (Fig. 12). Tack-curing from all sides for 2 seconds facilitates the clean-up process.

The cement line should be covered with air block gel (e. g. Liquid Strip) to prevent the formation of an oxygen inhibition layer (Fig. 13).

At the final curing stage, the adhesive on the bonding surface and the luting composite are cured togehter (exposure time: 10 seconds per mm of composite and segment). It is recommended to use a curing light that produces a light intensity of at least 1,000 mW/cm2 for this step.

At this stage, the adhesive and the luting composite applied to the bonding surface are polymerized by the light passing through the restoration. In the process, a reliable adhesive bond forms. Upon completion of the light-curing step, Liquid Strip can be rinsed off (Fig. 14).

Finishing and outcome

An occlusal check was carried out and any interferences were removed using fine diamonds. In the present case, final intraoral polishing was performed with the OptraPol polishers (Fig. 15).

This procedure resulted in a highly esthetic single-tooth restoration. Because of the chameleon effect, the inlay blends seamlessly into the surrounding natural tooth structure (Fig. 16).

Pulpotomy Technique

1. Perform pulpotomy treatment.
2. Achieve hemostasis.
3. Place TheraCal PT directly in the pulp chamber, and ensure good adaptation to the cavity walls and margins.
4. Light cure TheraCal PT for 10 seconds. Place desired adhesive, base, and/or restoration following manufacturer's directions for restoring tooth.

TheraCal PT™

PULPOTOMIES. THE THERA WAY.

BISCO

TheraCal PT™

Dual-Cured Resin Modified Calcium Silicate Pulpotomy Treatment

■DUAL-CURED ■EASY APPLICATION ■RADIOPAQUE ■ALKALINE pH

New to the "Thera" family

TheraCal PT is a biocompatible, dual-cured, resin-modified calcium silicate that is used to treat exposed dentin. TheraCal PT maintains tooth vitality by performing as a barrier and protectant of the dental pulpal complex.

TheraCal PT's precise and direct placement allows its use in deep cavity preparations. The dual-cured set permits immediate placement of the restorative material.

TheraCal PT is primarily indicated for:

- **Pulpotomies**: TheraCal PT may be placed after the partial or full removal of the coronal pulp.

And can also be used for:

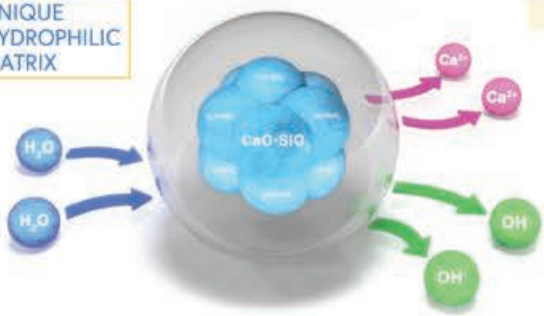
- **Pulp exposures** (direct pulp capping): TheraCal PT may be placed directly on pulp exposures after hemostasis is obtained.
- **Protective liner** (indirect pulp capping) or base under a variety of substrates.

Working Time: Minimum 45 seconds at 35°C

Setting Time: Maximum 5 minutes at 35°C

Time Saver: Complete in 1 office visit

UNIQUE HYDROPHILIC MATRIX



The chemical formulation of TheraCal PT consists of synthetic Portland Cement calcium silicate particles in a hydrophilic matrix which facilitates **calcium release**.*

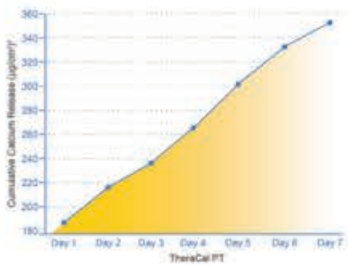
TheraCal PT's **physical properties** resist breakdown and degradation leading to a durable seal.*

Alkaline pH
pH = 11.5 @ 7 days.*

Moisture tolerant
Low water solubility.*

*Data on file.

Cumulative Calcium Release



Radiopacity
TheraCal PT is radiopaque (2.45mm) allowing for easy identification and differentiation from recurrent decay and other restorative materials.

Dale: 071 875 5422
Leon: 071 921 4566
CT / Cole: 063 811 3069
Dbn / Bruce: 071 894 9838
Head Office: 011 483 1881

CONFIDENT CLINICAL
A NEW CONCEPT IN DENTAL EXCELLENCE

Figure 13: Applying Liquid Strip to prevent the formation of an inhibition layer.

Figure 14: Light-curing all segments for 10 s per mm of composite using a Bluephase Style.

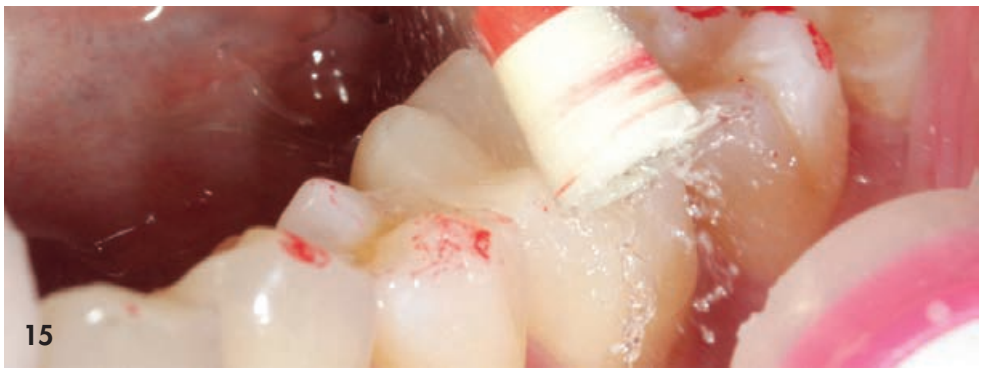


Figure 15: Occlusal check followed by intraoral polishing with OptraPol.

Figure 16: Inlay in situ: great optical integration thanks to chameleon effect.

Conclusion

Highly esthetic permanent single-tooth restorations can be achieved with the composite blocks of the Tetric CAD range in really short times. The guidelines for the adhesive technique need to be observed and a coordinated luting system must be used.

Easy and rapid processing and polishing procedures and the possibility for effecting intraoral repairs, similar to conventional filling composites, enable a highly efficient treatment workflow and increase the efficiency of day-to-day procedures in the dental practice.

Reprinted with permission from Reflect 01/2019

PROGRESSIVE ORTHODONTICS
seminars • supply • software

MCGANN POSTGRADUATE *School of Dentistry*

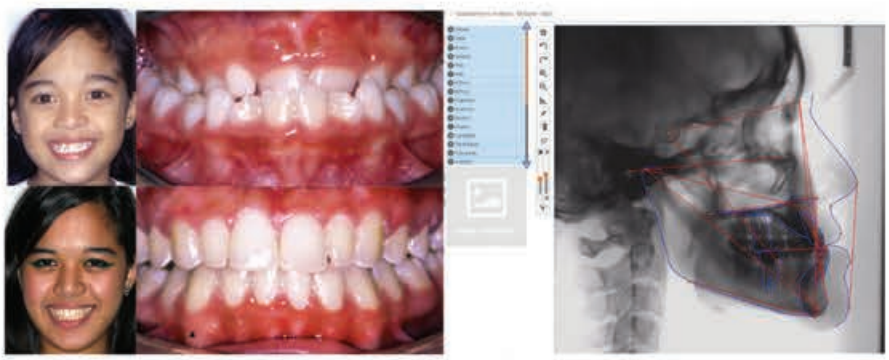
COMPREHENSIVE 2-YEAR ORTHO COURSE

From a Leading USA Continuing Education Center

Since 1984, we have taught thousands of dentists real life knowledge to perform orthodontics successfully on every case. We are proud to bring a modern, comprehensive orthodontic system to South Africa. Since the first Johannesburg class started 8 years ago, the program has grown to larger success. This year, we are offering not only our popular IAT Comprehensive Orthodontics Program, but also two Intro to Orthodontics classes. Don't miss this offering. We will not be starting another local series until 2021.

Our Internet Assisted Training (IAT) program will allow you to get the highest levels of education through a mix of online study (with thousands of cases, videos, exercises and principles), continual communication with your instructor, and 12 days of hands-on training. This format allows even the busiest dentists to learn at the highest levels, with flexible study anytime, anywhere.

LEADER SINCE 1984 in Orthodontic CE



Free SmileStream Orthodontic Software included with full course

Come see what the hype's about at:

20-22 MARCH, 2020
Emperors Palace,
Johannesburg
18 CPDs

NEW!
CLEAR ALIGNER+
Mini Series coming to
Johannesburg in 2020
24 CPDs

limited seats available

WORLD CLASS ORTHO TRAINING IN SOUTH AFRICA

- Progressive Orthodontics and the McGann Postgraduate School of Dentistry are leading US Dental Continuing Education Centers
- **Fully accredited** with 35 years of experience and over 8000 graduates worldwide
- Teaches you how to perform the highest level of orthodontics in your practice
- **Includes hundreds of case studies** and a system of orthodontic principles
- You will be able to do a variety of cases
- **Earn while you learn** with an affordable 17 month payment plan
- **The best support in the industry**:
  - Lifetime Free Retake Policy
  - Clinical support with experienced instructors on your personal cases

HIGH TECH TEACHING

At Progressive, we use technology to give us every advantage in the classroom and the clinic.

- **SmileStream diagnostic software (included free with series):** get the best diagnosis every time
- **Online Case Consulting:** get instructor help anytime
- **Clinical Videos:** help you visualize our concepts

CALL US AT 011 814 3196
to reserve your seat today or receive a free case trial!

UP TO 96 CPD POINTS

ADA C·E·R·P® | Continuing Education Recognition Program

Academy of General Dentistry PACE Program Approval for Continuing Education

posafrica@posortho.net | 011 814 3196 | www.posortho.com

Conservative smile makeover using resin infiltration and microabrasion

Shiraz Khan[1]

Introduction

A patient with severe hypomineralisation defects was offered comprehensive indirect restorative treatment to give a dream smile. This case study demonstrated the advances in minimal intervention dentistry and outlines an ultraconservative approach to improving the patient's smile; but, above all, quality of life.

The dentist's armamentarium has vastly increased in the last decade, with what seems an exponential improvement in technology and materials at dentist's disposal to treat patients.

Use of techniques such as orthodontics, Icon resin infiltration, air abrasion and direct composite restorative techniques, not only provided this patient with an aesthetic result, but also a result that, biologically speaking, cost less, and subsequently will extend the longevity of her teeth. Ultimately, this case fulfils the goals of the 'daughter test', while maximising aesthetics.

As described by Banerjee (2013), minimal intervention dentistry (MID) is a contemporary approach to dentistry that requires ultraconservative operative management of patients. The ethos and philosophy behind this approach aims to keep teeth functional for life (Frencken et al, 2012).

As we are aware the nature of management of caries, broken teeth generally requires some form of loss of tooth tissue. In the example of dental caries, a cavity will present, but the preparation process requires loss of tooth structure to access the lesion, adequately remove bacteria and debris, for a restoration to be placed. Advances in the materials and techniques have made early caries management significantly less intrusive on the tooth's structure.

For instance, the use of air abrasion for cleaning stained fissures, with cavities only just forming in dentine, can be managed in a way without the need for spurious preparation, and the creation of retention and resistance form (Hedge and Khatavkar, 2010).

This has been complemented with parallel advances in adhesive dentistry, which can achieve significant bond strengths to enamel and dentine that has been considered as central to minimally invasive restorative dentistry (Burke et al, 2017).

The process of MID does not only apply to operative management of dental

[1] Dr Shiraz Khan BDS, B(Med) Sc(Hons), MJDFRCS(Eng), PGDip, PG Cert
Private practice, London, UK

Figure 1: Preoperative situation

Figure 2: Pre-restorative orthodontics

Figure 3: Pre-restorative whitening

Figure 4: Split dam isolation due to fixed retainer

Figure 5: Finalisation of isolation with Liquid-Dam

Figure 6: First Icon etch cycle application

Figure 7: Washing and drying of tooth post-etch cycle

caries. The process of being able to improve self-confidence associated with smiling is also a central pillar of any aesthetic dentistry.

Kelleher (2010) summarises the needs to not be driven down cosmetic or aesthetic procedures by patients for improvement in appearance. The subsequent biological cost associated with conventional management strategies for improvement of appearance, such as crowns or veneers, directly opposes the key facet of ensuring teeth remain functional for life.

This does not imply that crown and veneer restorations are not indicated in aesthetic dentistry, but rather, what are the alternative treatment options for improvement in aesthetics for patients.

These should all be presented to the patient in order of biological invasion, relative risks and benefits and appropriate costs. While, as dentists, we are providing a service for patients, as outlined by the 'daughter test', if a provider is unhappy with undertaking a certain treatment modality, refusing treatment should not be considered taboo. Instead, having the patients interest and health should be at the forefront of any treatment plan or proposed treatment options.

Figure 8: Application of Icon Dry (test-drive for infiltration)

Figure 9: Re-etch application for two further cycles with air abrasion

Figure 10: Application of Icon Dry (test-drive for infiltration)

Figure 11: Further etching and air abrasion result

Figure 12: Application of Icon Dry (test-drive for infiltration) showing satisfactory masking

Figure 13: Resin infiltration application

Figure 14: Light curing after three minutes

Figure 15: Re-resin infiltration application, accounting for shrinkage stress

Case Presentation

A 25-year-old female was a self-referring patient who wanted to improve her smile. Having had previous 'smile consultations' the patient was quoted for 10 upper ceramic veneers to guise the appearance of these hypoplastic teeth. She was also keen to have such work done; however, the patient had moved job and the practice was difficult to reach.

Medically, the patient was fit and well, not taking any regular medication, with no known allergies. The patient was also a regular dental attendee and would see the hygienist at routine, six-monthly intervals. The patient would rarely eat sugary snacks, and would mainly consume water.

Extraoral examination was unremarkable with no deviations, clicks or crepitus on opening. The intraoral soft-tissue was unremarkable with no ulcerations/patches or discolourations to note. And the hard-tissue was free from dental caries, mild wear and no fractured teeth.

Diagnosis

The patient was diagnosed with the following:

- Chronic marginal gingivitis
- Retained lower Es with poor prognosis
- Severe generalised enamel hypoplasia
- Orthodontic crowding.

The patient was generally caries free; however, the discussion regarding the lower Es was queried about the long-term prognosis. A decision-making process would be made between the orthodontist and patient regarding space creation, and longevity of these retained lower Es.

Bluephase® G4

The curing light

With intelligent **curing assistant**

Your personal curing assistant detects movement during the light-curing step and helps you achieve reliable curing results.

Efficient Esthetics

Isolate Bond Restore Cure

ivodent Adding value

Tel: 0860 456 123
info@ivodent.co.za
www.ivodentonline.co.za

ivoclar vivadent®
passion vision innovation

Figure 16: Light curing after two minutes

Figure 17: Immediate post-infiltration picture

Figure 18: Application to achromatic composite to restore vestibular defect

Figure 19: Polishing

Figure 20: Immediate postoperative result

Figure 21: Preoperative smile

Figure 22: Postoperative smile

Figure 23: Preoperative (post-orthodontic) retracted anterior uppers

An initial phase of supra and subgingival scaling and prophylaxis would be undertaken prior to any aesthetic-restorative dentistry.

Discussions with the patient

In the patient's words, they were keen to 'improve the appearance of her teeth, mainly the white spots'. The case was presented to the patient with a large screen and discussions of what the 'aesthetic concerns' were. The patient had not previously considered orthodontics; however, would consider pre-restorative orthodontics. Furthermore, the patient was also advised that although veneers are an aggressive treatment strategy, this would be the only method of disguising the white spots.

The discussion then opened up regarding more minimally invasive methods for white spot lesion removal. The patient had never heard of Icon, and initially did not believe this would work. The patient was advised this is a severe case of enamel hypoplasia and the subtle preparation to the enamel surface would likely be required, in the form of air abrasion; however, this would be the most conservative way to manage this case.

Subsequent bonding would also likely be required to fill the defects where the Icon/air abrasion had taken place; however, the patient would be able to mask the lesions without the need for drilling/shaping the teeth for full/part coverage indirect restorations.

Treatment options for the patient

As discussed in the earlier introduction, all of the treatment options are required to be discussed with the patient, including their relative merits and downfalls, in order to

THE DENTAL WAREHOUSE

A HENRY SCHEIN® COMPANY

www.dentalwarehouse.co.za

Johannesburg
Tel: 011 719 9111 • **Fax:** 011 719 9031
Building 2, No 106 16th Road,
Midrand, 1686

Durban
Tel: 031 312 6130
51A Musgrave Park, Musgrave Road,
Berea, Durban, 4001

EDGEENDO®

Same technique. Better file.
Revolutionary Offers

EDGEENDO® FIREWIRE™ NITIFILES are a revolution in rotary files. Fully compatible with the system you already use, but better. Our files surpass all other files in resistance to cyclic fatigue and offer flexability never before experienced in a file. FireWire™ Niti enables **EdgeEndo®** files to not "bounce back". This preserves canal anatomy and dentin while carefully following the canal as they go down smooth and easy. The future of advanced design is here.

R419.00
6 per pack

EDGETAPER
PLATINUM™
HEAT TREATED FIREWIRE™ NITI

FROM
R349.00
3 per pack

EDGEONE
FIRE™
HEAT TREATED FIREWIRE™ NITI

R349.00
3 per pack

EDGETAPER
ENCORE™
HEAT TREATED FIREWIRE™ NITI

R449.00
4 per pack

EDGEGLIDE
PATH™
HEAT TREATED FIREWIRE™ NITI

- Prices valid: End December 2019
- Only one discount applies
- All prices include VAT • While stocks last
- Errors and omissions exempt
- Images used for presentation only

the dental warehouse dwhrelyonus

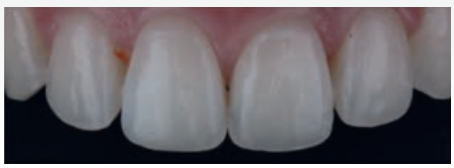


Figure 24: Postoperative retracted anterior upper

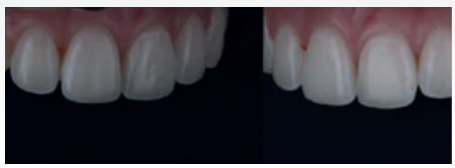


Figure 25: Postoperative retracted upper lateral views

ascertain adequate consent (GDC standards). In this case, we discussed the restorative options in ascending order of level of invasion:

1. Do nothing – although this negates the reason for the patient's appointment
2. Whitening – this will lead to the whitening of the white spots in addition to the natural tooth; therefore, this may worsen the scenario
3. Microabrasion – the is a minimally invasive manner to reduce white spot appearance; however, usually requires very superficial white lesions
4. Icon resin infiltration – this will require fine enamel preparation and several cycles, but would be the least invasive way to get complete blending of the white spot lesions
5. Direct composite restoration – this will require enamel and dentine removal of the white spots for these to be subsequently restored
6. Direct composite veneers – this may still require enamel preparation, but either an application of a base opaque layer to mask the white areas or subtle enamel preparation, or opaque composite application; losing the vitality of the teeth
7. Indirect veneer restorations – although flexibility with material choice, due to longevity, and ability to hold lustre and polish for extended periods of time, porcelain would likely have been the restorative material of choice. This is the most invasive option, and will likely cost the most.

Icon resin infiltration

Enamel hypoplasia and other traumatic dental injuries can appear on teeth as white, yellow or brown discolourations. Hypoplasia is characterised by reduced enamel thickness, pits and opacities, as well as other irregularities. Although the hardness remains intact, there is a large variation in size and severity (Andreasen et al, 1971).

The appearance of white spots occurs due to variation of refractive indices between enamel crystals and the medium inside the porosities (opacities) (Andreasen et al, 1971). The difference between water and air is 1.33 and 1.0, which is sufficient to see a difference in dispersion of light.

Icon resin infiltration is a process that allows alteration of the refractive index of opaque white spots to RI 1.62, which appears similarly to enamel RI 1.65; thereby leading to masking of white spots (Torres et al, 2011). This does not require removal of the white spot, but instead access to the white lesion and use of a low-viscosity resin, which infiltrates the lesion driven by capillary forces (Meyer-Lueckel and Paris, 2008) and subsequently blends the RI of the white spot to the surrounding enamel. As Kim et al (2011) also found resin-infiltration is a more than suitable treatment approach and modality in masking white spot lesions.

Treatment rationale

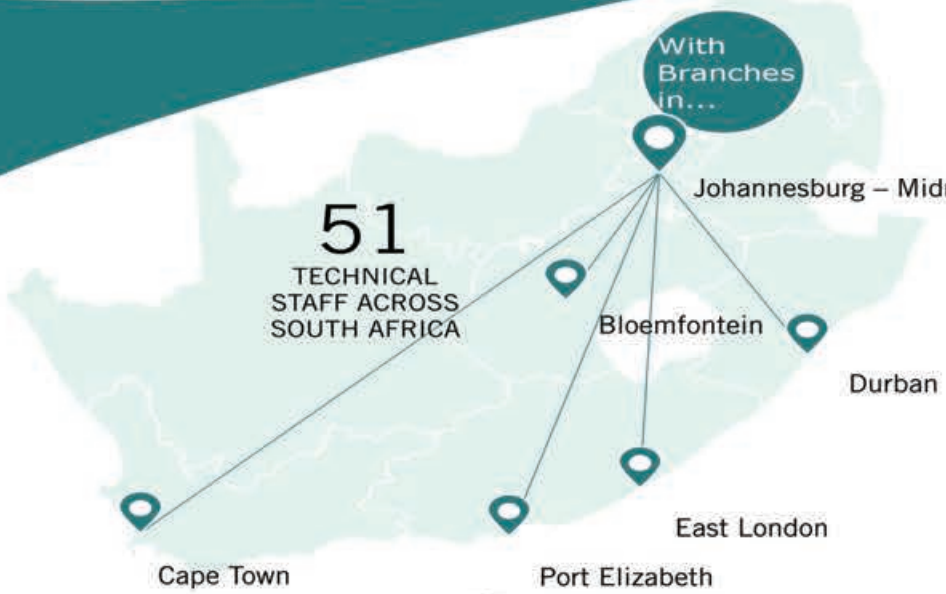
As listed, the options vary greatly in cost, both financially and biologically. The patient was thrilled about having natural looking teeth; however, as part of education, the patient was debating whether veneer restoration would be the treatment modality of choice.

The fundamental core aspect in the decision-making process was not financial, more biological. Adopting the 'daughter test' (Kelleher, 2010) mentality, most practitioners would be happy to minimise intervention on the patient if a suitable aesthetic outcome was achievable.

The patient was advised that likely a combined approach may solve this case in the most conservative method as possible. If the patient was interested in having her teeth aligned, this would provide an optimally aesthetic result without having to over-prepare certain teeth to make the indirect restorations all aligned.

Final treatment plan

1. Full mouth supra and subgingival scaling and prophylaxis
2. Orthodontic alignment (carried out by orthodontist with fixed labial)



AXIM

Ritter®
[THE DENTAL EXPERTS]

quark
innixim

Your Full Service Dental Equipment Solutions Company

dimeda®
SURGICAL INSTRUMENTS

VARIOUS OTHER HIGH QUALITY CAPITAL EQUIPMENT AVAILABLE FROM A COMPANY FOCUSED ON SERVICE

Ghrizinda van Zyl - 082 569 6381 ghrizindav@axim.co.za www.axim.co.za AXIM Dental South Africa

SMILE CLUB

ACTIVE ALIGNERS

BELIEVE THE HYPE

Clear Aligner Therapy is Transforming Dentistry

WHY ACTIVE ALIGNERS?

1. Growth for your practice
2. Affordable for patients
3. Online Course and Accreditation


Upper Arch Before


Upper Arch After


Lower Arch Before


Lower Arch After

@smileclubsa

SMILE CLUB (PTY) LTD
Block 17, Woodmead Business Park
145 Western Services Rd, Woodmead, 2191
Tel: 087 807 8724 - info@smileclub.co.za
www.smileclub.co.za

Become a Provider
www.smileclub.co.za

SMILE CLUB

JOIN US AT NOMADS DAY 2019 AT THE SMILE CLUB LOUNGE

THE SMILE CLUB TEAM WILL BE AT NOMADS DAY 2019

You will have the opportunity to:

- Speak to existing providers and key opinion leaders
- Do the online Active Aligner accreditation course (50% off)
- View live platform demonstrations
- Run through workflows and case submissions
- Ask questions relating to Active Aligners
- On-board as a provider
- See the Active Aligner difference
- Test, demo and scan with two types of intraoral scanners

Attending Nomads 2019

For Nomads Day's 20th Anniversary we will be giving away *20 free Active Aligner cases to Nomads delegates.

50% off your online Active Aligner accreditation course if you're a Nomads Day 2019 delegate.

All registered Nomads Day delegates will receive a coupon code via email for the Active Aligner accreditation course available online at Smile eCademy.
www.smileecademy.com
Online Active Aligner course normally: R 1500 (8 CPD Points)

NOMADS

The South African Society of Endodontics & Aesthetic Dentistry

6-8 November 2019
Kyalami Grand Prix Circuit and International Convention Centre

*Prizes not redeemable for cash
*Subject to completing the Active Aligner accreditation course
*Your patient must be a candidate for Aligner Therapy

@smileclubsa

SMILE CLUB (PTY) LTD
Block 17, Woodmead Business Park
145 Western Services Rd, Woodmead, 2191
Tel: 087 807 8724 - info@smileclub.co.za
www.smileclub.co.za

Figure 26: Before and after standard, monochrome and hyper-contrasted views

Figure 27: Before and after result

3. Whitening
4. Icon resin infiltration and labial bonding UR3-UL3 (to correct concavities post-Icon etch).

Composite bonding

As outlined by Dietschi et al (1995), any restoration from class III to V can adequately satisfy many aesthetic concerns when restored with composite resin. These articles outline the use of varying opacities of composite, dentine and enamel, to recreate natural-looking effects and restorations. Focusing more on this case, the likelihood of requiring such advanced layer techniques may be completely omitted.

There will be sufficient underlying dentine, and enamel, with the exception of the UL1 incisal edge, which may require dentine. Composite bonding can be completed in isolation, without resin-infiltration; however, as outlined above, Icon uses hydrochloric acid to enable subtle, but minimal, enamel erosion that will lead to a defect being created.

This defect will then be covered by composite resin. Therefore, the function of the composite is not to mask the 'remaining' white spot, if any, but rather to create a smooth homogenous surface that fills the void created by the Icon etching (and/or air abrasion).

This is so much the case that the composite chosen will often be achromatic in nature, which subsequently allows the natural tooth colour to shine through the resin material. Although the material has undergone significant advancements in the past two decades, the material, and indeed the bonding, does degrade over time. As outlined by Drummond (2008), the main mode of failure of composite is either degradation of the resin matrix, or the interface between the filler and resin matrix.

Evidence also seems to suggest that failures in less than five years tend to be more technique associated, while those after five years tend to be due to secondary caries, rather than failure of the composite itself. Concomitantly, this reflects the requirement for adequate isolation (Cajazeira et al, 2014) during all adhesive procedures, and effective oral hygiene prior to commencing any restorative dentistry.

This case the composite of choice was Tokuyama Asteria Estillite Composite restorative material. This is a nano-hybrid composite material that not only has excellent filler proportion (82% b/w), but, in the author's experience, has great handling characteristics, and excellent final polish.

By contrast, a study by Moraes et al (2009) describes nano-hybrid composites as having inferior properties to nano-filled composites; however, in a non-load bearing

IMPROVED COMPLIANCE
through a pleasant-tasting solution that ensures unaltered taste sensation and minimal CHX staining.

CITROX®

CURAPROX
PERIOPLUS+

Curaprox Perio Plus + Forte (0.2% Chlorhexidine) is boosted by Citrox and offers the strongest anti-bacterial effect. Ideal for short-term use before and after invasive dental treatment. Recommend to use in combination with Perio Plus+ support toothpaste (SLS FREE) for optimal patient compliance and convenience.

Brought to you by

PRIME DENTAL

www.primedental.co.za

SWISS PREMIUM ORAL CARE

situation such as this case, it is extremely unlikely that the physical properties will play a significant role in long-term success.

Furthermore, using various forms of surface treatments will ensure the composite repair provides, predictable, effective bonding and repair, should there be any fractures (Margareta et al, 2010). This, ultimately, leads to composite being the restorative of choice.

Treatment sequence

The patient undertook supra and subgingival scaling and prophylaxis prior to commencement of treatment. The orthodontic treatment included 14 months of labial (ceramic) fixed braces to improve alignment, relieve crowding and improve gingival level symmetry.

The patient was placed in fixed and removable retention indefinitely. The patient was requested to remove the fixed retainer prior to any bonding/Icon, however, the patient was very anxious during the composite removal of the brackets during the debond procedure, and subsequently requested if this could be left.

The patient then undertook two weeks of home-whitening using 10% carbamide peroxide for seven days, and 16% carbamide peroxide for a subsequent week. The system used in this case was Enlighten. There is importance in ensuring a minimum period of 14 days from cessation of whitening to start of bonding. Not only does the improved value of tooth substrate begin to stabilise but also a statistically significant reduction in bond-strength (Garcia-Godoy et al, 1993).

After two weeks of whitening, followed by two weeks for stabilisation, the patient was booked in for the restorative appointment. A preoperative shade assessment was undertaken with white enamel (WE) from Tokuyama Asteria Estillite composite being a mutually agreed shade match, by patient, dentist and nurse.

The upper premolar-premolar were isolated using Unodent heavy rubber dam. There was a modified split dam approach as the patient kept their bonded retainer on. This was modified using Liquidam. The pellicle of was subsequently removed 4-4 using a slow handpiece and a prophylaxis brush.

The process of resin infiltration occurs as follows. Icon etch contains, 15% hydrochloric acid, which is applied for two-minute intervals. This translates to approximately 50µm enamel removal. The etch is washed for 30 seconds, then Icon Dry an 99% ethanol-based liquid, is placed over the teeth.

This is the most significant aspect of any Icon treatment as it gives the opportunity to review whether the lesion will be adequately masked or not, a test-drive if you will of what the tooth will appear like after resin-infiltration.

In this case, as can be seen by the severe hypoplasia, there will likely be a requirement for subtle enamel preparation to access the white spot. This is repeated for three to four cycles.

If sufficient improvement is not noted, then you would consider adjunctive measures. In this case, the UL1 specifically was treated with air abrasion. This was using 27µm aluminium oxide particles for 30s at pressure of two bar. Then a reapplication of Icon etch was used. After two further cycles of etching and air abrasion, the Icon dry showed satisfactory masking of the white spot lesion.

Therefore, it was time to infiltrate with resin. Resin infiltration requires a two-minute application and agitation on the teeth, followed by a one minute for the resin to remain undisrupted on the teeth. This is followed by excess removal and teeth separation (using floss) and curing for 30 seconds on each tooth. A second application is repeated for two minutes and cured to account for contraction shrinkage.

We are then able to restore the void with composite resin. Here, it is important to stage that the use of composite is not to mask the white spot, rather to fill the void; therefore, the use of an achromatic enamel is sufficient.

In this case Asteria Estillite was used, using WE to fill the voids. This was applied generally 2-2. As research suggests (Wiegand et al, 2011), using adhesive with Icon increases the bond strength. In the authors experience, bottle 2 from Optibond FL is used routinely.

This is subsequently cured for 30 seconds and the labial composite increment is placed. The final increment is cured under an oxygen barrier medium to remove the oxygen inhibition layers and optimised stability and hardness (Strnad et al, 2015). In this case, liquid strip (Ivoclar Vivadent) was used. Finally, a combination of Soflex discs (3M ESPE) and Astropol were used (Ivoclar Vivadent) as these have also proven to have the smoothest topography under SEM (Marghalani, 2010).

Conclusion and reflection

MID is proving to provide dentists alternative skills under their armamentarium. However, the most significant point, is these additional techniques are proving to allow the teeth incur less biological cost, while maximising their longevity.

While this case demonstrates a fair result, the treatment had surpassed all patient expectations. The key in this case is long-term evaluation, and to consider how this case will fair in 12 months, five years and 10 years.

However, a significant advantage is that composite can be stably repaired, added and subtracted; therefore, rendering this the treatment of choice in this 25-year old female patient. Although this was not an absolutely perfect result, the patient was delighted with the treatment, as she was managed in an ultraconservative manner.

The patient undertook supra- and subgingival scaling and prophylaxis prior to commencement of treatment.

Although composite bonding was undertaken, what is shown by this case is the relevance of the infiltration of the white lesions, and not removal, which led to masking of all the white spots. The composite was merely adjunctive to reduce the concavities created by HCl etching. Therefore, this case demonstrates the power of Icon Resin infiltration.

Advances in adhesion, composite technology and resin infiltration approaches, not only make this a feasible treatment option, but rather, the treatment option of choice in such cases; and, ultimately, would be what we would consider as suitable treatment if this patient was any clinician's daughter.

References

Andreasen JO, Sundstrom B, Ravn JJ (1971) The effect of traumatic injuries to primary teeth on their permanent successors. I. A clinical and histologic study of 117 injured permanent teeth. Scandinavian Journal of Dental Research 79: 219-83

Bannerjee A (2013) Minimal intervention dentistry: part 7. Minimally invasive operative caries management: rationale and techniques. British Dental Journal (214): 107-111

Burke FJT, Lawson A, Green DJB, Mackenzie L (2017) What's New in Dentine Bonding?: Universal Adhesives. Dental Update 44: 328-340

Cajazeira MR, De Saboia TM, Maia LC (2014) Influence of the operatory field isolation technique on tooth-coloured direct dental restorations. American Dental Journal 27: 155-159

Dietschi D (1995) Free-hand composite resin restorations: a key to anterior aesthetics. Practical periodontics and aesthetic dentistry. PPAD 7(7): 15-25; quiz 27

Dietschi, D (2001) Layering concepts in anterior composite restorations. Journal of Adhesive Dentistry 3(1): 71-80 Drummond JL (2008) Degradation, fatigue, and failure of resin dental composite materials. Journal of Dental Research 87(8): 710-719

Frencken JE, Mathilde PC, Manton DJ, Leal SC, Gordan VV, Eden E (2012) Minimal Intervention Dentistry (MID) for managing dental caries – a review: report of a FDI task group. International Dental Journal 62(5): 223-243

Garcia-Godoy F, Dodge WW, Donohue M, O'quinn JA (1993) Composite resin bond strength after enamel bleaching. Operative Dentistry 18: 144-144

Hegde VS, Khatavkar RA (2010) A new dimension to conservative dentistry: Air abrasion. Journal of conservative dentistry JCD 13(1): 4

Kelleher MGD (2010) The 'Daughter Test' in Aesthetic ('Esthetic') or Cosmetic Dentistry. Dental Update 37(1): 5-11 Kim S, Kim EY, Jeong TS, Kim JW (2011) The evaluation of resin infiltration for masking labial enamel white spot lesions. International journal of paediatric dentistry 21(4): 241-248

Marghalani HY (2015) Effect of finishing/ polishing systems on the surface roughness of novel posterior composites. J Esthet Restor Dent 22(2): 127-138

Meyer-Lueckel H, Paris S (2008) Improved resin infiltration of natural caries lesions. Journal of Dental Research 87: 1112–1116 Moraes RR, Goncalves LS, Lancellotti AC, Consani S, Correrr-Spbrinho L, Sinhoreti MA (2009) Nanohybrid Resin Composites: Nanofiller Loaded Materials or Traditional Micohybrid Resins? Operative Dentistry 34-5: 551-557.

Rinastiti M, Özcan M, Siswomihardjo W, Busscher HJ (2010) Immediate repair bond strengths of microhybrid, nanohybrid and nanofilled composites after different surface treatments. Journal of Dentistry 38(1): 29-38

Strnad G, Kovacs M, Andras E, Beresescu L (2015) Effect of curing, finishing and polishing techniques on microhardness of composite restorative materials. Procedia Technology 19: 233-238

Torres CRG, Borges AB, Torres LMS, Gomes IS, Simões de Oliveira R (2011) Effect of caries infiltration technique and fluoride therapy on the colour masking of white spot lesions. Journal of Dentistry 39(3): 202-207

Wiegand A, Stawarczyk B, Kolakovic M, Hämmerle CHF, Attin T, Schmidlin PR (2011) Adhesive performance of a caries infiltrant on sound and demineralised enamel. Journal of Dentistry 39(2): 117-121

Reprinted with permission from Aesthetic Dentistry Today August 2019

ADVERTORIAL

How digital dentistry benefits dental professionals and patients

Over the past few years, dentistry has experienced tremendous advancements: health care innovations, such as the advent of digital dental techniques and the introduction of new materials and methods have helped change the way in which dentistry is performed. Without question, the digitalisation in dentistry also leads to a lot of questions from dental professionals. Is it affordable? What exactly is needed? How can it be integrated into the practice workflow? What is the best solution for the individual needs of my practice? There are many different starting points with digital dentistry and it is up to the dental practitioner to decide if or where he wants to start and stop.

"Dental practices can pick and choose digital equipment or software to suit them," said Leigh Spamer, Sales and Marketing Director of The Dental Warehouse, one of the leading South African based distributors of high-quality health care solutions to dental professionals in private practice and state health facilities. "At The Dental Warehouse, our mission is to help dental practitioners and dental laboratories identify the right equipment for their individual needs and to smoothly integrate it into their practice workflow through the training, education and technical services we offer."

Intraoral scanners, for example, allow a complete digital workflow in the dental practice – and between the practice and the dental laboratory of choice. Their functions have expanded, the precision increased. Modern scanners can do more than just collect data; they offer a high potential in processing data and therefore provide important analysis and diagnostic options on the virtual model, a real-time presentation of the model during impression taking, data fusion with other digital data sets (DVT/CT), easy archiving of the digital models and an improved, facilitated communication with the patient still in the dental chair about the planned treatment. The data recorded in the mouth can be processed directly. Time-consuming work steps such as the setting time of the impression, disinfection and dispatch are eliminated. Today's intraoral scanners have become smaller and easier to handle. Customer requirements, such as full arch scanning, caries detection or authentic colour, can be integrated.

The Dental Warehouse
Building 2 – 106 16th Road,
Midrand 1686, South Africa

"In our fast-moving and service-oriented world, patients increasingly demand for aesthetic oral health care and a comfortable and short stay in the practice," explained Ms. Spamer. "With intraoral scanning, dental professionals can offer higher treatment comfort and accuracy. As it is time-saving in comparison to conventional impression taking, dental professionals and patients can benefit from same day dentistry with strong, accurate, and aesthetic crowns, bridges, inlays, and onlays ready in only a few hours."

CAD/CAM milling machines differ in design, application, and milling technology. In addition, there are chair-side and lab-side CAD/CAM milling machines. With chair-side systems, the preparations are scanned intraorally and the restoration is fabricated directly in the dental practice. Lab-side systems combine the high competence of the dental technician with digital technologies. In dentistry, milling machines are used to process a variety of materials. Whether metal alloys, titanium, all-ceramics, zirconium oxide or polymer-based materials, almost all dental materials can be processed. The advantages compared to conventional processing are precision, reproducibility and efficiency. With the automation of manufacturing processes, a consistently high quality can be achieved for a wide range of materials available.

3D printers are a veritable trend in dental practices and laboratories. According to a Markets and Markets research, the global dental 3D printing market was valued at 1.39 billion in 2017 and is projected to grow at a CAGR of 23.2 % during the forecast period, to reach to USD 5.06 billion by 2023. Currently, the most popular functions for dental 3D printers are steriolithography (SLA) and digital light processing (DLP). With SLA technology, a laser beam functions as a light source. DLP technology is a projector. 3D printing is one of the most economical production processes. In addition, 3D printing can already be used for many other applications in dental laboratories, such as for impression trays, implant drilling templates, models for aligner therapy and gingival masks. Suitable materials are available for the various indications. New or improved materials are continually being launched onto the market - often specially adapted to the printer models of the respective manufacturer.

"There are numerous options to establish or expand digital dentistry activities through CAD/CAM systems that are tailor-made for the dental practice workflow and the dental laboratory – from portable, wireless chairside scanners, powerful design software, compact chairside milling machines, and the new 3D printers," said Ms. Spamer. "Our customers can rely on us to help them find the right solution to meaningfully enhance their business and clinical outcomes."

Mini-implants: a viable alternative for complex clinical situations - a clinical case report

Sepehr Zarrine[1]

Introduction

The patient, a 66-year-old lady in good health and with a thin mandibular ridge. Her main complaint was the poor retention of the prosthesis, causing her pain and discomfort when chewing properly while eating. The same retention problem would also make her very uncomfortable at social events, as she was afraid of the prosthesis slipping when she laughed. (Figures 1 and 2)

Treatment Planning

During the treatment planning with the use of Straumann® Mini Implants, two main situations have to be considered. The first situation is when there is enough bone and keratinized gingiva for the surgery to be performed in a flapless and minimally invasive approach. The second situation is when the patient does not have ideal anatomical conditions. In this case an open flap surgical approach must be considered to properly visualize the anatomical situation. This patient presented with thin mandibular bone overall. Mini-implants are the ideal solution for such situations with low bone width. Although ridge augmentation could restore the ridge volume, it would considerably increase surgical morbidity, costs and treatment time. A CBCT exam was conducted to allow a more accurate assessment of the anatomical conditions. This indicated that the open flap approach would be the safest route for this patient and also revealed the ideal implant positions.

Surgical procedure

After a crestal incision preserving keratinized gingiva, the flap was carefully raised for proper visualization of bone contours (Figure 3). The drilling protocol started with the osteotomy, to a depth of 6mm, with the needle drill, and was followed by the use of parallel posts to check the three-dimensional orientation of the implant. After confirming the right axis, the osteotomy with the needle drill was completed up to the full implant length. At this point it was possible to determine the bone quality, which was perceived as very hard. Therefore, the implant bed preparation continued with the use of a pilot drill (Ø 2.2mm) at full depth to reduce potential bone compression during implant placement. The parallel posts were used again for final orientation assessment (Figures 4&5). The implant insertion started with the vial cap that comes attached to the Optiloc® retention system. The vial caps are released at a torque of 5Ncm. The implants were then placed in their final position using the ratchet (Figure 6). All four implants reached primary stability at around 50Ncm, enabling immediate loading of the implants with the prosthesis.

[1] Sepehr Zarrine DDS
Oral surgeon. Exclusive private implantology practice (Saint Dié, France).

dr.zarrine@gmail.com
www.surgitechstudies.fr

Figure 1: Thin mandibular bone ridge

Figure 2

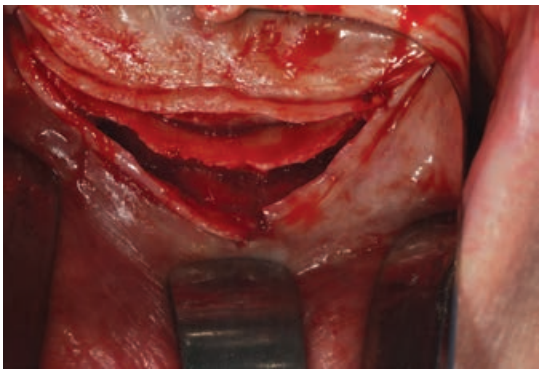


Figure 3: Open flap

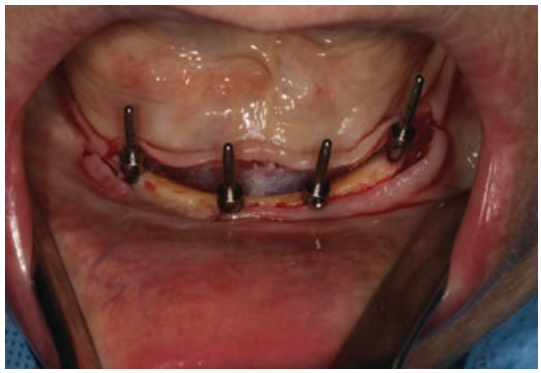


Figure 4: Parallel pins

Figure 5: Checking implant bed with prosthesis

Figure 6: Mini Implants inserted

Prosthetic procedure

Immediately after the surgery, impression caps were snapped onto the implants (Optiloc®) (Figure 7), and the prosthesis was used as an impression tray as it is also possible to obtain the occlusal information this way. A standard master cast was created using the Mini Implants' respective analogs (Figure 8). Instead of chairside, it was decided to carry out the pick-up procedure in the laboratory, making sure that the housings and inserts were properly set. The prosthesis is then meticulously polished and finished to minimize plaque adherence (Figure 9). Due to unusual post-op swelling, the prosthesis could not be properly seated on the same day, but after five days the swelling had returned to normal and the prosthesis was seated without patient discomfort or soft tissue disturbance.

Figure 7: Forming/fixing matrices placed on implants for impression taking

Figure 8: Analogs with master cast

Figure 9: Finalized prosthesis

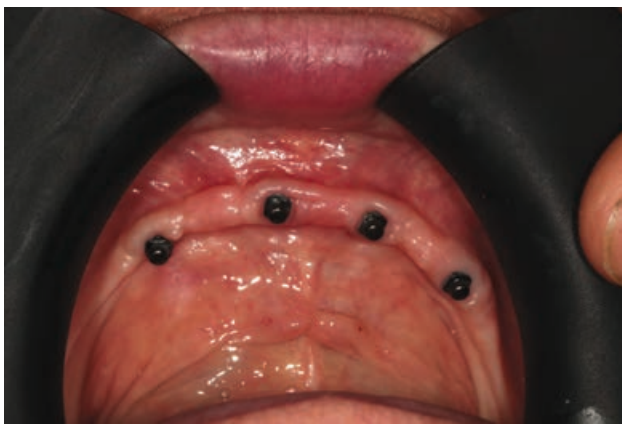


Figure 10: After three months of healing time

Final result

This case shows a good outcome for the management of an edentulous situation, with four Straumann® Mini Implants inserted in the lower jaw and with early loading. After three months, the control x-ray showed healthy osseointegration of the mini-implants, as well as good gingival healing (Figure 10). At this stage the yellow retention inserts (light retention force) were replaced with green retention inserts (medium retention force), giving the patient more confidence to enjoy his meals.

Conclusion

The practitioner was satisfied with the surgical procedure and treatment outcome with the Mini Implants. The surgery was comfortable for the patient as the treatment was finalized fairly quickly, in a single surgery and without bone augmentation. The patient was satisfied with the esthetic outcome and now enjoys a regular diet, which was not possible before due to the poor retention with a conventional denture and soft tissue discomfort. The Mini Implant System has proven to be a good alternative to bone augmentation and will be the preferred option specially for edentulous patients with a difficult anatomic situation.

Reprinted with permission from Starget

Clear aligner treatment has transformed my practice

Marc Sher

Looking back to when I cut my first class 1 restoration in dental school, to the way I approach my treatments roughly 12 years later, is a rather incredible evolution. From being focused on "the tooth" and making the "the tooth" my primary concern, to an almost complete reverse, where "the tooth" now becomes the last thing I treat. Clear aligner treatment has opened my eyes to the powerful, and undeniable, forces of teeth against each other.

When two objects act on each other with both equal and opposite forces, those objects remain stable. Change the direction of the force to no longer being equal or opposite and there is no longer stability. This is essentially Newton's first law, and its application in Dentistry is profoundly obvious. When two teeth are aligned vertically from each other, and the force of biting is applied, those two teeth will remain in a stable, non-erosive state. As soon as the vertical angulation changes in one of the teeth - even by a few degrees - we see erosion and destruction over time. We see this in many forms, namely abfraction, clefting, recession, cuspal wear, fractures, erosion of enamel etc. What I am alluding to is the importance of having a correct occlusion, which we, as clinicians, may only be able to achieve with the introduction of orthodontics in our practices. We know and we see that malocclusions will destroy the teeth, the gums, the bone, the TMJ, the muscles and most importantly, the dentistry that we place every day.

Understanding that good arch width and arch form and balanced inter-cuspation and vertical alignment teeth will bring about long lasting stable dentistry, has transformed my treatment approach to every patient I see. While I used to believe that aligning teeth was all about aesthetics, I now realise it is part of a much bigger treatment approach .

It is understandable that clear aligner treatment is the fastest growing sector in the dental industry globally. More and more patients are demanding this treatment and with the advent and advancement of digital orthodontic software and hardware, this is now becoming accessible to the appropriately accredited general dentist. Over 5 years ago I began doing clear aligner treatments. Starting on cases that were simple and easy and slowly advancing to more complex cases. I now incorporate aligner therapy into all my treatment plans where possible. I have and always will refer complex orthodontic cases to my specialist colleagues and do not claim to be able to treat every malocclusion. However, the option to do aligner treatment before starting any aesthetic case - be it with composite or ceramics - is now available to me through clear aligners.

Marc Sher, BChD
Private Practice,
Cape Town,
South Africa
marc@drmarcsher.co.za

I have experienced working with different aligner companies in South Africa and in 2019 was introduced to Active Aligners, distributed through Smile Club. Smile Club and the FullContour team in the USA offer a complete package when it comes to entering the aligner workspace. They receive digital or analogue impressions, review and advise on each case, offer full treatment planning with all the movement protocols built in, as well as deliver on quality materials and packaging that the patient receives, with detailed explanations and instructions on treatments. Working with them has boosted my overall aligner success and case load. Plus, there is the "wow" factor for the patients. Having a 3D intra-oral scanner and being able to show each patient their mouth in full colour and detail is a significant practice builder. Being able to show the patients a digital mock-up of the their treatment with before and after pictures is invaluable.

I have always been excited by new technology and try and embrace change as it arrives. I have also learnt that patients will thank you for it. They tell their friends and family and help you grow your practice. We live in a rapidly changing and evolving world, and nowhere have I experienced this more than in the field of Dentistry. Gone are the days where we as dentists are simply drilling and filling teeth. We must evolve to treating the entire oro-facial region and we must now understand the mechanisms of this region in detail. Since my journey into aligner therapy I have begun to grasp these concepts. It has opened new avenues and I keep learning every day.

Posterior occlusal veneers in the dental practice

Diether Reusch[1] and Jan Strüder[2]

The book titled "Porcelain Laminate Veneers" by David A. Garber, Ronald E. Goldstein and Ronald A. Feinmann has had a great influence on the prosthetic and restorative methods developed by the authors. Based on the resounding success of the adhesive technique, a minimally invasive approach evolved for the reconstruction of teeth.

In 1990 "Westerburger Kontakte", a private postgraduate dental training institute, offered the first course on ceramic crowns, inlays and veneers. Today, as was the case almost 30 years ago, it is still considered quite an amazing feat that ceramics can be used in the same way as gold alloys. A study conducted by A. Krummel, A. Garling, M. Sasse and M. Kern at the Christian-Albrechts-Universitaet Kiel (University of Kiel) showed that occlusal veneers in the posterior region with a minimum thickness of 0.3 to 0.6 mm offer a very promising treatment solution. In our dental practice, we restore posterior teeth with occlusal veneers or partial crowns. These restorations measuring 0.5 to 7.0 mm in thickness are made of monolithic IPS Empress or LS2 and they are cemented with the adhesive technique. In anterior teeth, we use adhesively bonded monolithic 360° veneers, partial crowns or laminate veneers measuring 0.3 to 0.5mm in thickness. In contrast to gold, which deforms quite easily and metal-ceramic solutions, which can fracture, most all-ceramic materials are virtually indestructible. Therefore, these materials fulfil exceptionally high standards in terms of the static and the dynamic occlusion.

Diagnosis and treatment planning

As a result of parafunctional habits and biocorrosion the front teeth of our 23-year-old patient showed considerable attrition. The palatal enamel in the upper jaw had been completely worn away (Figs 1 and 2). Hardly any of the occlusal enamel remained on the posterior teeth.

[1] Dr Diether Reusch
[2] Jan Strüder, Dentist
Praxis für Zahnmedizin
Neustrasse 30
56457 Westerburg
Germany

Paul Gerd Lenze, MDT
Sascha Fasel, DT
Synthese Dentallabor
56457 Westerburg
Germany

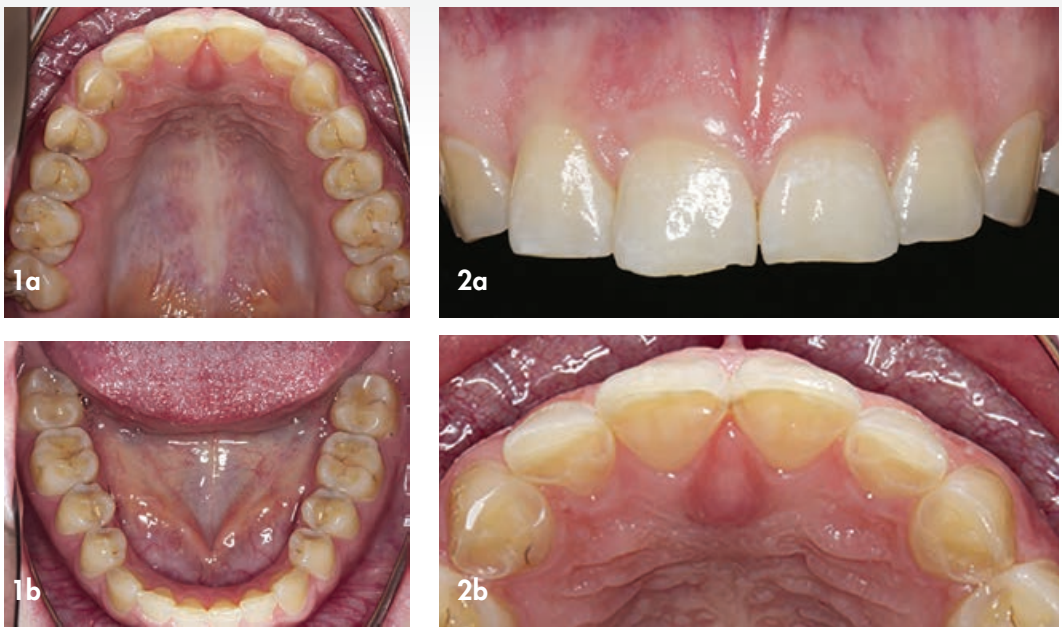


Figure 1 and 2 – Initial situation. Loss of tooth length and palatal enamel.

Functional analysis, wax-up and preparation planning

The upper jaw model was articulated according to skull-related orientation principles. The joint-related orientation was used for the lower jaw. The lower jaw movements were recorded in order to program the articulator. A diagnostic wax-up was produced on the duplicate models (Fig. 3). The aim was to raise the vertical height to the level required for the reconstruction of the front teeth ("logical" tooth shape). The length of the anterior teeth was established with a mock-up, which was used to test the phonetic, functional and esthetic parameters. As far as the lateral movements were concerned, our objective was to achieve immediate disclusion of the posterior teeth. Any interfering cusps were relocated. As a guide for the appropriate functional preparation, the dental technician marked the original location of the working cusps (red lines) and the non-supporting cusps (green lines) on the buccal surface of the teeth. Markings were made on the gingiva of the model to indicate the new position of the cusps and spaces. A mould of the duplicate wax-ups was made using a thermoforming process. A temporary composite resin was filled in the moulds, which were placed on the teeth. Once the material had set, the moulds were removed. Together with the patient we were then able to evaluate the planned changes in terms of phonetics, function and esthetics (Fig. 4) before the teeth were actually prepared.

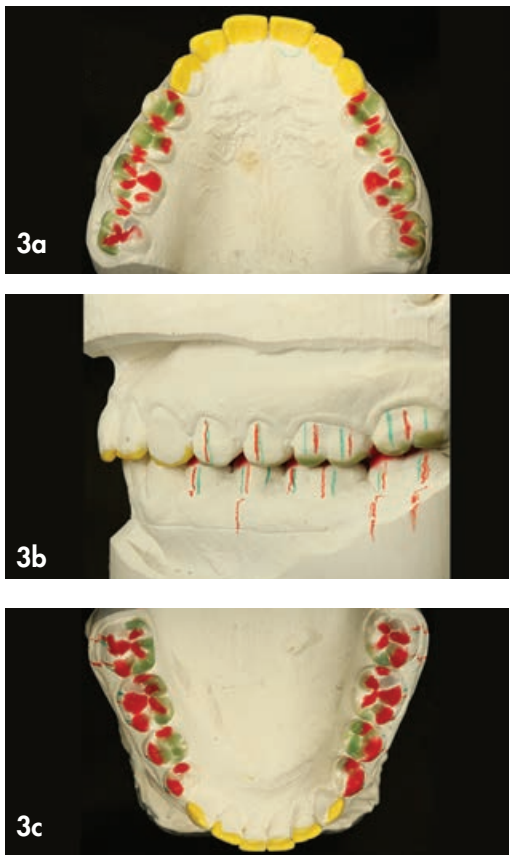


Figure 3: Diagnostic wax-up.

Figure 4: Mock-up made of provisional composite resin.

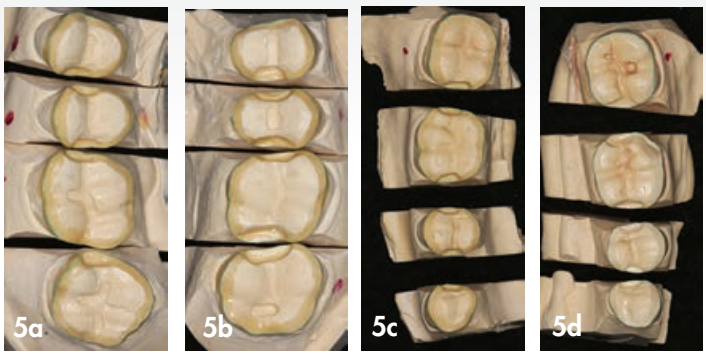


Figure 5: Models of prepared posterior teeth.

1st treatment phase: temporary upper posterior restoration and permanent lower posterior restoration

The posterior teeth in the upper and lower jaw were prepared, and the models (Fig. 5) were mounted in the articulator on the basis of the obtained facebow and centric relation data. The support pin was adjusted in accordance with the planned vertical dimension. The lower posterior teeth were waxed up with the help of an occlusal plane plate. Next, the wax crowns were invested and reproduced with ceramic. The crowns were placed using an adhesive cementation technique (self-etch technique, Adhese® Universal, Variolink® and Monobond® Etch & Prime).

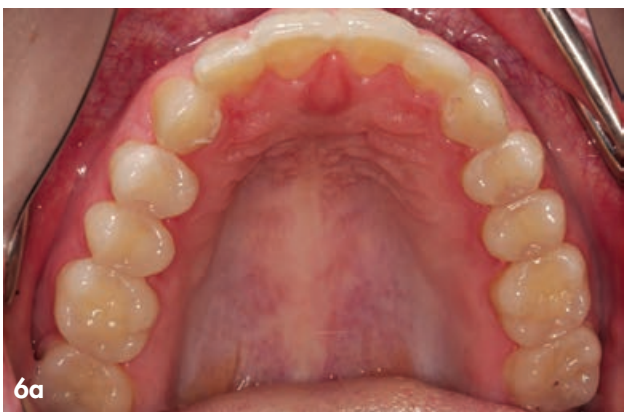
We placed an indirect temporary restoration made of composite resin in the upper posterior jaw. The unprepared anterior teeth were provisionally treated with an adhesively bonded composite resin mock-up (Fig. 6). The upper dental arch was slightly expanded towards the buccal aspect and the anterior teeth were lengthened. The restorations featured the vertical dimension and cusp positions that were determined by means of the mockup. Small adjustments were made in the upper temporary restoration by means of splint therapy.

2nd treatment phase: permanent upper and lower anterior restorations

Preparation and fabrication of the temporary restorations

The upper and lower anterior teeth were prepared on the basis of minimally invasive principles (Figs 7 and 8).

Step 1: A "dual-grit" diamond was used to mark the depth to which the incisal edge needed to be removed through the adhesively bonded mock- up (generally 1.0 to 1.5 mm).



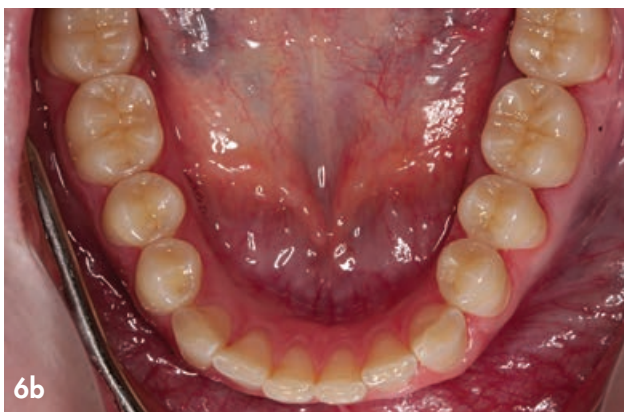


Figure 6: Upper and lower anterior teeth: lengthened with composite resin; upper posterior teeth with provisional restorations; lower posterior teeth with permanent partial crowns (characterized).

EDENTULOUS PATIENTS

Straumann® Pro Arch Edentulous Solutions > Removable

Straumann® Mini Implant System

Mini Implant. Maximum trust.

SLA®

SCIENTIFIC EVIDENCE

High and consistent survival rates are documented in several long-time studies.

Roxolid®

PROVEN QUALITY

The successful use of Roxolid®, our high-strength implant material, is documented in numerous clinical studies.

DURABILITY & EFFICIENCY

The space-saving design of Optiloc® provides excellent wear resistance and reduces maintenance.

Contact your local Straumann representative or visit **www.straumann.com/mini-implants.**

A0009/en/A/00 08/18

Straumann Group South Africa
15 Huising Street
Somerset West
Cape Town, 7130
Phone +27 21 850 0823

straumann

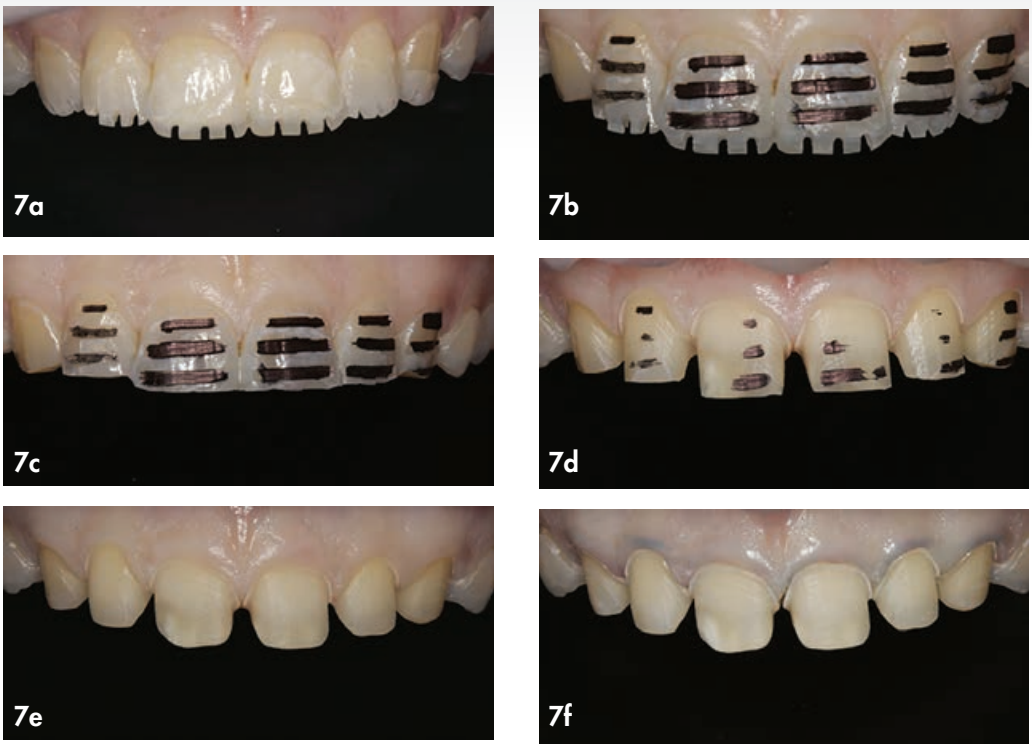


Figure 7: The individual minimally invasive preparation steps in the upper anterior teeth.

Step 2: A special grinder was used to apply 0.5 mm horizontal depth markings on the facial surface of the teeth through the mock-up. The grooves were marked with an insoluble fine liner.

Step 3: The incisal edges were removed. For this purpose, the "dual-grit" diamond was inclined towards the palatal aspect at an angle of about 30°.

Step 4: The proximal parts of the teeth were removed with a "dual-grit" diamond (0.3 mm) or a flame-shaped bur (014).

Step 5: The mock-up was removed and the labial enamel was cut away until the markings were no longer visible. The cervical areas of the teeth were prepared along the gingival margin. The palatal preparation depth was between 0.3 and 0.5 mm. In the areas where the enamel loss on the palatal surface extended beyond the tubercle, we prepared the teeth for a 360° veneer. This was done to prevent palatal fractures from occurring.

Step 6: Before we finely contoured the margins, we placed a #000 retraction cord. The teeth were prepared with a red contra-angle handpiece at reduced speed (40,000 rpm) up to the level of the retracted gingiva. This preparation step can be done with air cooling.

Figure 8: Completed preparation of the upper and lower anterior teeth (partial preparation).

A silicone matrix, which was produced on the basis of the diagnostic wax-up, was filled with hydrocolloid. Alternatively, the thermoforming method could have been

THE ONLY REASON NOT TO USE ADMIRA FUSION COULD BE YOU.

New: pure ceramic for direct fillings.

Nothing but impressive advantages:

1) No classic monomers, no residual monomers!
2) Unrivalled low level of polymerisation shrinkage!
3) Universal range of applications and completely familiar handling!

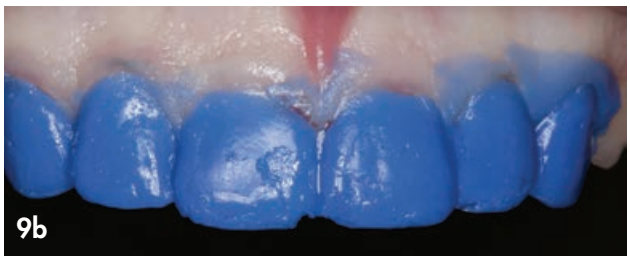
Maybe you can now tell us your reason not to use Admira Fusion – if you can find one.

THE DENTAL WAREHOUSE
A Henry Schein Company
www.dentalwarehouse.co.za

VOCO Distribution Partner in South Africa · Toll Free 0800 111 796

VOCO GmbH · Germany · www.admira-fusion.dental

VOCO
THE DENTALISTS



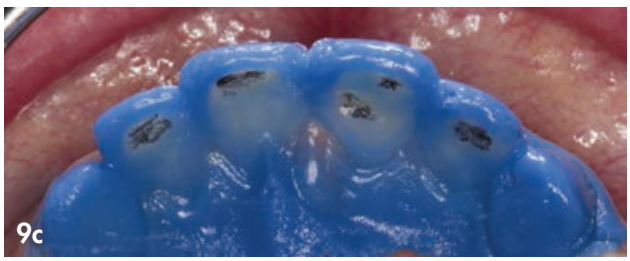


Figure 9: Examination of the prepared teeth using hydrocolloid.

Figure 10: Wax-up for the examination of the phonetics, function and esthetics.

used to make a mould of the wax-up, which would have been filled with silicone impression material. This enabled us to check whether or not we had removed enough of the tooth structure (Fig. 9). If the hydrocolloid is less than 0.3 mm thick, the tooth structure that needs to be further reduced is marked with a wax pencil.

After this impression step, a model was produced with a fast-setting stone (Whip Mix Snap-Stone) in order to check the prepared surfaces. The silicone matrix (diagnostic wax-up) was given to a specialized dental assistant who fabricated the indirect provisional restorations.

Preparation of the lower front teeth and fabrication of the model

The lower front teeth were prepared and checked in the same way as the upper front teeth. The preparation depth was not to exceed 0.3 mm. Before the impressions were taken, a #0 cord (soaked with ViscoStat Clear, Ultradent) was placed over the #000 cord. It was removed shortly before the impression material was inserted. The #000 cord keeps the sulcus open and dry during the impression taking process. We took an overall impression and two partial impressions for the reconstruction of the individual teeth. The articulator was programmed with all the necessary movement data of the lower jaw.

Wax-up for the examination of the phonetics, function and esthetics

The dental technician produced a wax-up of the front teeth using an esthetic wax. This allowed the dental technician, the dentist and the patient to jointly examine the phonetic, functional and esthetic properties of the restoration (Fig. 10). The adjustments were made with the consent of the patient. Subsequently, the wax-up was invested and then the restoration was pressed.

Determination of the tooth colour and fabrication of the crowns

The final appearance of very thin veneers and crowns is considerably dependent on the colour of the remaining tooth

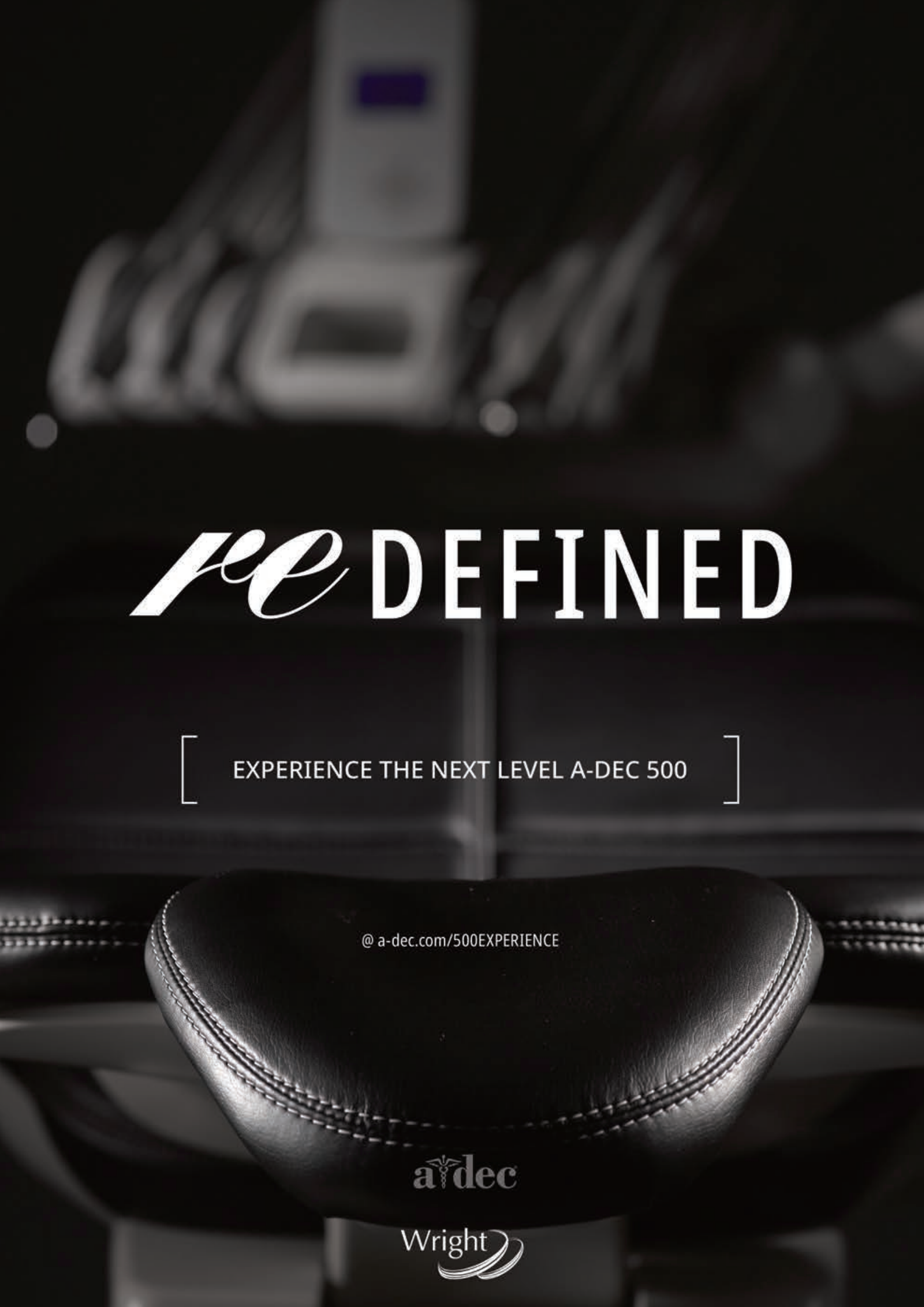

reDEFINED
EXPERIENCE THE NEXT LEVEL A-DEC 500
@ a-dec.com/500EXPERIENCE
a-dec
Wright

Figure 11: Try-in of the restoration after the stains firing cycle.

Figure 12: Adhesive cementation of the restorations in the upper anterior jaw.

structure. Therefore, the colour of every single prepared tooth was determined. Furthermore, the dental technician produced individual dies with the corresponding shade in the dental lab (IPS Natural Die Material).

The lab-fabricated crowns were characterized before they were tried in. This allowed the phonetic, functional and esthetic properties of the teeth to be checked and documented by means of photographs taken with a smartphone. After the necessary adjustments had been made, the restorations were glaze fired. The completed restorations (360° veneers/partial crowns) measured between 0.3 and 0.5 mm in thickness (Fig. 11).

Adhesive cementation

If possible, a rubber dam should be used to establish a dry working field for the adhesive cementation technique. Alternatively, a #00 retraction cord should be placed in the sulcus before the cementation procedure in order to make the preparation margin easily accessible (Fig. 12). In the present case, the neighbouring teeth were isolated with Teflon tape. We usually place the crowns in pairs. In this case, after etching with 37 % phosphoric acid, the entire preparation was shown to be located in the enamel tooth structure. Dentin was visible in individual areas, where it had been exposed due to the parafunctional habits of the patient.

The upper and lower front teeth as well as the lower posterior teeth were permanently restored. A few minor adjustments still needed to be made on the occlusal surfaces of the temporary upper restoration.

3rd treatment phase: permanent upper posterior restoration

We removed the indirect restorations in the upper posterior region and took impressions of both jaws. A centric jaw relation record was made using thermoplastic sticks (GC Bite Compound, GC). The upper jaw model was positioned in the articulator on the basis of an arbitrary facebow record. With the help of the two thermoplastic bite records, the lower jaw model was mounted in the articulator in a joint-related orientation.

Application of ReFu wax

We fabricated the upper partial crowns with ReFu wax (Reference Function wax, Keydent). Initially, this wax was very hard. As a result, we were able to check the contact points after the placement of the crowns with the help of Shimstock contact foil. In the oral environment, the wax became softer. We asked our patient to make certain forceful movements, some of which simulated parafunctions (Fig. 13). If a cusp interfered, this was shown on the chewing surface and the necessary adjustments could be made. Subsequently, the waxed-up models were invested and the monolithic partial crowns were fabricated using lithium disilicate (IPS e. max Press) in the press technique. The restorations were characterized and glazed (Fig. 14). No adjustments were necessary after the restorations had been adhesively bonded. The thickness of the posterior partial crowns measured about 0.5 mm on average.

IPS e.max®

ZirCAD

Prime

Redefining all-ceramics – featuring Gradient Technology:
High-end esthetics and 1200 MPa for all indications*

All ceramic, all you need.

zircadprime.ipsemax.com

* ranging from single tooth crowns to 14-unit bridges

ivodent
Adding value

Tel: 0860 456 123
info@ivodent.co.za
www.ivodentonline.co.za

ivoclar vivadent:
passion vision innovation

Figure 13: Examination of the static and dynamic occlusion with ReFu wax.

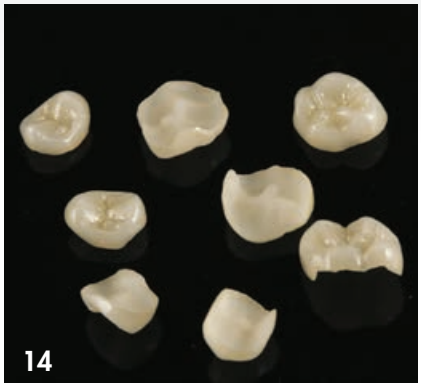


Figure 14: The pressed ceramic restorations prior to placement.

Figure 15: Ceramic partial crowns seated with the adhesive technique.

Adhesive cementation

A rubber dam was placed and the neighbouring teeth were protected with Teflon tape. Then the posterior partial crowns were seated in pairs on the prepared upper teeth using the adhesive cementation technique (Fig. 15). After the restorations had been cemented in the patient's mouth, we checked the dynamic occlusion with the help of Occlusal Indicator Wax (Kerr) (Fig. 16). The wax did not show any premature occlusal contacts.

Brux Checker foil

The patient was given a Brux Checker foil and instructed to use it for two nights (Fig. 17). This allowed us to make sure and record that the restorations were free from any interference during sleep and bruxing. In most cases, no subsequent grinding adjustments are necessary.

Summary

Minimally invasive restorations measuring 0.3 to 0.6 mm in thickness placed with the adhesive technique have shown to be a reliable treatment option in our practice. We have been working with the described method since 1993. Particularly in young patients showing a substantial loss of enamel, we know of no other comparable long-lasting and

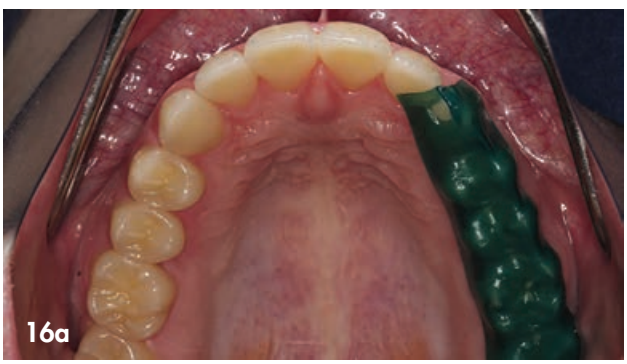


Figure 16: Examination of the dynamic occlusion using an occlusal indicator wax.

WHY 4Ddigital?

4D DIGITAL
CREATE THE FUTURE

If you're ready to incorporate digital dentistry into your practice, you're probably wondering how to get started. What do you need to buy first, which technologies do you add from there and which company can assist you throughout your digital journey.

It can all seem a bit daunting, but with the right guidance, you can seamlessly intergrate technologies such as scanners, mills, 3Dprinters and CBCT units into your workflow.

Converting to a digital workflow is an exciting time for a dental practice. Technologies such as scanners, mills and 3D printers help to improve efficiencies, enhance the patient experience and give you the ability to offer same-day dentistry. Knowing what you need to invest in will help make your move to the digital world a smooth one, and 4Ddigital can assist you all the way on your digital journey.

www.4ddigital.co.za
Tel: 011 483 1881 / 073 871 0911

3shape ASIGA

imes-icore
Competence in CNC & DENTAL-Solutions

sisma

SprintRay

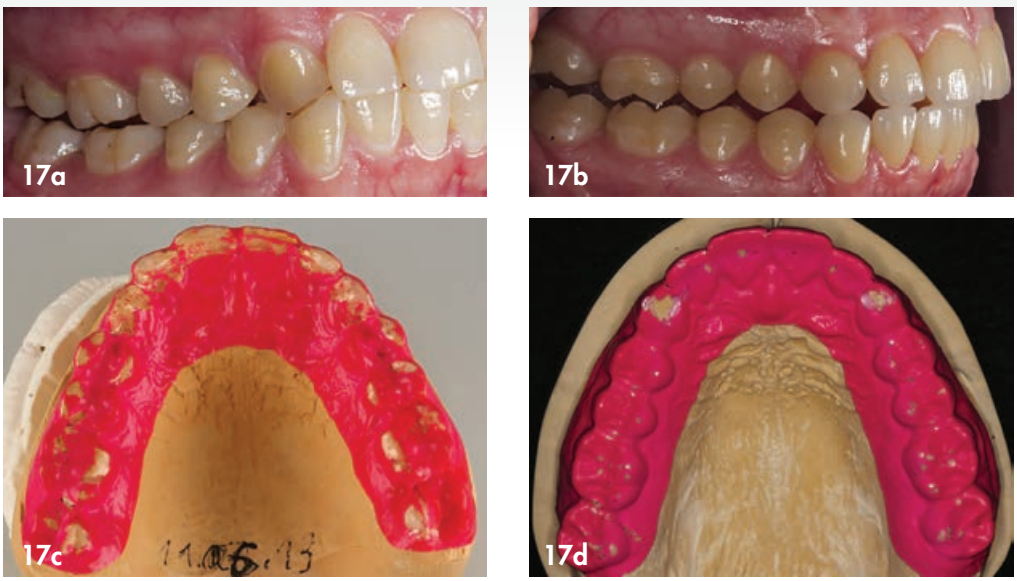


Figure 17: Brux Checker foil (left: initial situation; right: after the restorative treatment).

minimally invasive treatment approach.

Note

The manufacturer does not recommend that IPS e.max Press and IPS e.max CAD are used in patients with bruxism. Nevertheless, our experience has shown that if all the functional and parafunctional aspects are properly considered, no complications are to be expected in bruxers.

Reprinted with permission from Reflect 01/2019

WHITE DENTAL BEAUTY

THE PERFECT COMPLIMENT

FROM WHITE DENTAL BEAUTY

WHITE DENTAL BEAUTY

PROFESSIONAL COMPOSITE SYSTEM

WHITEN AND RESTORE THE WHITE DENTAL BEAUTY WAY

Designed to help restore healthy smiles in every day practice, White Dental Beauty systems satisfy the increased patient demand for whiter smiles with predictable, repeatable smile enhancing treatments.

WHITE DENTAL BEAUTY **TOOTH WHITENING**

- 4 choices of strength: 6% HP, 16% CP, 10% CP, 5% CP mild
- Featuring the Novon formula, PH alkalinity accelerator to boost the whitening effect
- Eco friendly and biodegradable packaging

WHITE DENTAL BEAUTY PROFESSIONAL **COMPOSITE**

- 5 choices of Universal Si shades: ***Si*** 0, ***Si*** 0.5, ***Si*** 1, ***Si*** 2, ***Si*** 3
- Enamel, Posterior and 2 flowable shades specifically selected to create the optimum composite system
- Developed with optimum viscosity for excellent handling

EDUCATED BY STYLE ITALIANO SHADE GUIDES

Monaldo Saracinelli

Murad Akhundov

Louis Hardan

THE DENTAL WAREHOUSE

A HENRY SCHEIN® COMPANY

www.dentalwarehouse.co.za

EDUCATED & ACCREDITED BY STYLE ITALIANO

TOLLFREE: 0800 111 796

Aesthetics & function – a no prep direct composite case

Monaldo Saracinelli[1]

Modern restorative dentistry is based on the principles of adhesion and minimal invasiveness. Today's composite materials represent a viable long-term solution, not just as a sealing material, or front or rear restoration, but as a fully-functional restoration.
Until recently the best esthetic outcomes were achieved through complex, time consuming, layering protocols, using many different composite mass combinations, which was rather unpredictable and unteachable.
In this article, I want to propose a simplified method to dramatically improve your success rate. Federica, 32 years old, is a very nice young lady, but she doesn't smile.

Operative techniques and aesthetic composites are today a perfect choice in no prep approaches, thanks to their increasingly sophisticated optical and mechanical properties. Their longevity/price ratio makes them a fantastic solution for many patients, and their dentists.

Figure 1: The patient had agenesis of the upper lateral incisors, and the space was closed with an orthodontic treatment. So her canines were moved to replace the lateral incisors, and premolars to replace the canines.

Figure 2: In this picture, you can see the occlusal situation.

[1] Monaldo Saracinelli

Figure 3: Federica also complained about her canines being too yellow, so as a first step, we have to achieve a better, meaning whiter shade. Remember that patients, today, strongly believe that white means healthy.

Figure 4: We chose a home whitening protocol using a 10% carbamide peroxide bleaching gel.

Figure 5: This is the outcome after a hygiene session and two weeks of home bleaching treatment.

Figure 6: Now that the color issue is solved, we have to focus on function.

Figure 7: As you can see from pictures 6 and 7, we don't have appropriate anterior and left lateral guidance for disclusion.

Figure 8: Nor we have a right lateral guide.

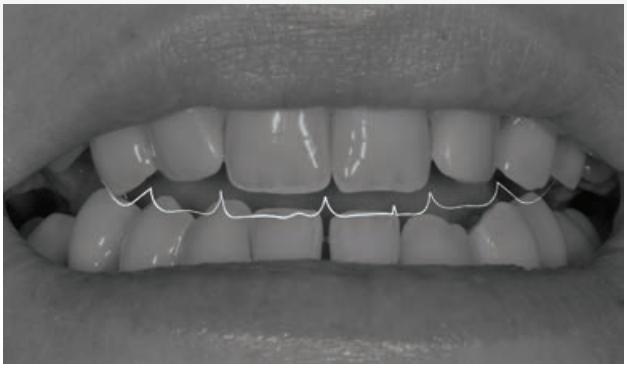


Figure 9: Above all, our goal is to both change color and shape, while also restoring function. On the other hand, we don't want to prepare the teeth to preserve all sound tissue. This no prep approach maximizes biological preservation of teeth and provides a large area for optimal adhesion on the enamel.

Figure 10: First of all I suggest you select a couple of fresh composite buttons that match the original color quite well, trying to imagine the amount of material you'll need, to better understand the opacity and color saturation of the future restoration.

Figure 11: The brand new White Dental Beauty CompoSite system features smart-hybrid, chemical bulk fill and intelligent flowable composites.

Figure 12: The buttons you see in the picture are 2 of the 5 specifically selected dentine shades (Si 0.5 and 1). Remember to select the shade before isolating with the rubber dam not to dehydrate the teeth.

Figure 13: Curing the composite buttons is crucial, because sometimes the photo-activator inside it can change the final color, meaning the actual outcome.

Figure 14: Sometimes taking a picture can also help us in color selection.

Planmeca ProMax® 3D Plus

Extended excellence

Planmeca Ultra Low Dose™ 3D imaging

The **Planmeca Ultra Low Dose™** imaging protocol enables 3D imaging with a comparable patient dose to 2D panoramic imaging.

Easy motion artefact correction

The **Planmeca CALM™** movement correction algorithm cancels the effects of patient movement in 3D images with a push of a button.

Efficient metal artefact reduction

The **Planmeca ARA™** artefact removal algorithm efficiently removes shadows and streaks caused by metal artefacts from 3D images.

Premium image quality

All Planmeca 3D units offer the very best in image quality – offering crystal-clear images at optimal patient doses.

Find more info!

www.planmeca.com

ivodent PLANMECA

Planmeca Southern Africa Adriaan van der Spuy • tel. 076 821 6239 • email: adriaan.vds@planmeca.com

Figure 15: Use a 5500°K light source, such as the Styleitaliano Smile Lite, with the chair light off, to have the most accurate color perception.

Figure 16: As we'll be working with and adhesive system, it is mandatory to operate in a well isolated and clean operative field. Isolation included all teeth from the second right premolar to the left one.

Figure 17: The old composite restorations on the canines were removed, revealing their natural shape.

Figure 18: As a first step, we used a total etching protocol with 37% orthophosphoric acid, and a universal bonding agent on all the 6 teeth.

Figure 19: We placed a palatal translucent composite layer on the centrals and canines to lengthen the teeth. On the other hand, we only used a dentine mass on the premolars to better imitate the opacity of the future canines.

Figure 20: The palatal excess material will be removed during the finishing procedure.

WE KNOW ENDO.

MAILLEFER

TruNatomy™
Endodontic Files

An innovative, efficient and complete root canal treatment solution, that offers a superior performance, debridement and debris removal, with an increased respects the natural anatomy of the canal while preserving structural integrity.

TruNatomy™

TruNatomy is part of a long tradition of successful Maillefer and Dentsply Sirona endodontic treatment solutions. This tradition includes recognized brands such as ProTaper, WaveOne, X-Smart and Propex, all known and trusted around the world for their reliability and performance.

Place your order now with your territory representative or call 0860 444 330

THE DENTAL SOLUTIONS COMPANY™

Dentsply Sirona South Africa
Building 11a, Lower Ground Floor, The Woodlands
Woodlands Drive, Woodmead, Sandton, 2191
Tel: 0860 444 330 www.dentsplysirona.com

Dentsply Sirona

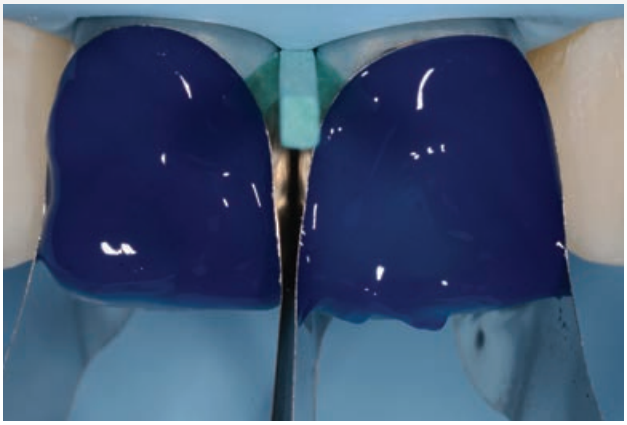


Figure 21: The Unica matrix (Polydentia) allows every clinician to achieve a very predictable and simple shape control.

Figure 22: These matrices can be used throughout all the different adhesive and layering steps.

Figure 23: For the first layer we used a single 0.5 dentine shade layer, to also model the inner mamelon anatomy.

Figure 24: A thin space for the final enamel layer helps in adding optical depth to the restorations.

Figure 25: The final restorations immediately improved the patient's smile, by "very good and simple means of restoring aesthetics".

Figure 26: The patient's happy, beautiful smile.

Conclusions

The White Dental Beauty CompoSite kit is ideal for modelling and shaping thanks to its low sensitivity to ambient light, but still easy to handle in spite of its high fill content. White Dental Beauty CompoSite is durable, and highly polishable, and is also invisible thanks to its natural fluorescence and high color stability resulting in amazing long-term aesthetics.

Figure 27: The final result, our patient's happiness and satisfaction.

References

1. Vichi A, Fraioli A, Davidson CL, Ferrari M. Influence of thickness on color in
multilayering technique. Dent Mater 2007;23: 1854-1859.

2. Devoto W, Saracinelli M, Manauta J. Composite in everyday practice: how to choose the right material and simplify application techniques in the anterior teeth. Our J Esthet Dent 2010;5: 102-124.

3. Paolone G, Orsini G, Manauta J, Devoto W, Putignano A. Composite shade guides and color matching. Int J Esthet Dent 2014;9: 164-182.

Case planning for the implant-borne fixed partial denture

Sascha Hein[1]

Introduction

Planning and designing implant borne fixed partial dentures (FPDs) of various sizes, and varying degree of complication, is a common task in the modern dental laboratory.

While this relatively new treatment choice has improved the lives of literally millions of patients around the world, certain complications and challenges have unfortunately also arisen. Bone and tissue loss, prosthetically incorrect fixture placement together with a high smile line, peri-implantitis, as well as certain aesthetic and phonetic demands, are probably the most common features contributing to complication.

Tooth loss results in bone loss (Figure 1). A careful assessment of lip line will identify patients who might accept a 'pink' tissue compromise but one must beware of the patients who lift their lip and study ridge morphology because they will be dissatisfied with a compromise despite their inability to show such an area upon the highest of smiles. One must also remember that patients can be educated – 'provide the advantage and disadvantages of treatment and allow your patient to decide'.

Vascularised free flaps, autogenous block/onlay/particulate grafts, xenografts and soft tissue grafts, are some viable options to offer improvement, however, a rule of thumb is that the ridge can be improved in a horizontal but not a vertical direction. In many cases these deficiencies can only be addressed by means of restorative dentistry. These technical and clinical challenges often translate directly into certain functional as well aesthetic issues. An adequate restoration needs to achieve a satisfactory compromise between the aesthetic demands of our patients, as well as practical and functional aspects, such as access for oral hygiene, which in a study by Serino and Strome (2009) was found to be the major contributing factor to peri-implantitis.

No matter how large or complex the case might be, my standard approach to case planning and design for any implant PFM treatment is always the same.

Pre-operative evaluation and wax up

Usually, case planning begins with assessing the horizontal and vertical space that's available and routinely there is either too much space or not enough. In the more likely event that not enough space is available, I try and fit the teeth in, either by setting them up straight, which can result in a very long and narrow look, or by sticking with the correct tooth size and proportion, and accept a slightly crooked set up, which can

[1] Sascha Hein MDT,
Senior lecturer, Polyklinik für Zahnärztliche Prothetik
Goethe-Universität FrankfurtGoethe-Universität, Frankfurt
Germany

Figure 1: Pre-op situation of a challenging case

Figure 2: The initial wax-up which was used for the provisional

Figures 3 and 4: The provisional during the first try-in. Despite its initial promising appearance the design didn't work aesthetically. The tooth type that was chosen was too skinny for the case

Figures 5 and 6: The second approach incorporated the slightly bulbous look of the patient's canines, which was more suitable

look quite natural (Figure 2). It is possible that the patient's teeth were originally somewhat crowded so a return to that situation will be perceived as normal.

Smile prototyping using a fixed provisional

When such a daring design needs to be proposed it is best to do so with means of a provisional that accurately reflects the wax up and also properly projects the final outcome in terms of shape, size and position of the new teeth (Figure 3). This is a useful strategy to design the patient's new smile in a more integrated way, to adequately address what is wanted and what is possible. One shouldn't be too apprehensive of aesthetic disapproval at this stage since it is only normal to find that something might look really good on the model, but that it then doesn't work aesthetically in situ when the patients facial features are present. In the first case presented in this article, the initial wax up pointed towards quiet strongly extruded laterals and normally positioned centrals.

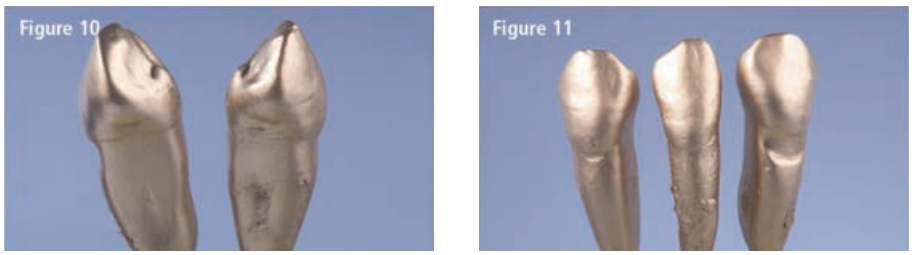
Both, the wax up and subsequently the first provisional, looked promising but it didn't suit in situ (Figure 4). Although the overall direction was certainly right, the tooth type that was chosen was too 'skinny' in comparison to the patient's

Figures 7-9: After verification of the provisional, it was duplicated in wax and served for the planning wax-up. Note the natural curvature and anatomical detail, which at this stage needs to be absolutely accurate

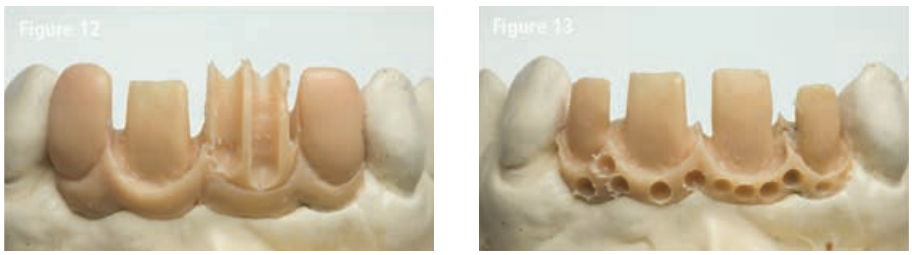
rather bulbous looking canines. The second provisional needed to emulate this feature (Figure 5). Once the provisional was approved (Figure 6), it was duplicated and served as the third wax-up on the master model, which was subsequently used to make the final PFM framework (Figures 7, 8 and 9).

Anatomical support and correct framework design

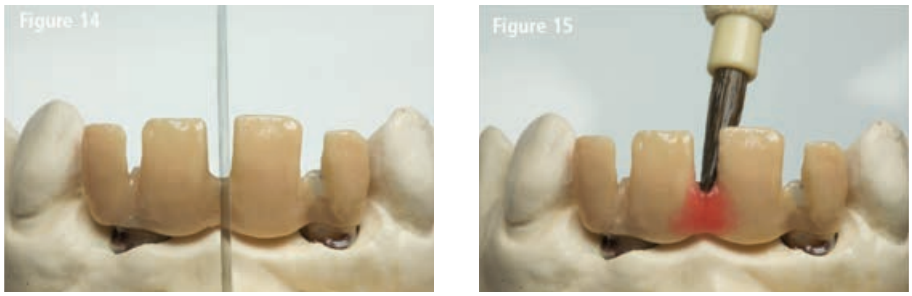
Implant fixed partial dentures (FPDs) show a higher frequency of veneer fracture than conventional FPDs (Pjetursson et al, 2004; Tan et al, 2004). Not many aspects of implant superstructure design have been so frequently discussed than the importance of anatomical support. And



Figures 10 and 11: The study of nature is a constant endeavour. We have a large collection of extracted teeth that we frequently consult during buil-up and contouring



Figures 12 and 13: The framework is cut back out of the full wax-up using reduction grooves, to determine the ideal anatomical support



Figures 14 and 15: Old, traditional methods usually work the best. The framework is cut and joined passively using GC Pattern Resin

Carestream DENTAL

BUNDLE DEAL

BUY

CS3600 scanner
+ Laptop

Enter the next era of intraoral scanning with the CS 3600 intraoral scanner and CS ScanFlow software. Proven accuracy. Open files. Unlimited workflow capacity.

CS8100 3D 8x9
+ Careprotect
+ PC
+ Medical grade monitor

Whether you are the user or the patient, the CS 8100 3D makes image acquisition quick and simple, with intuitive interface, face-to-face design and accessible to patients of all sizes and individuals in wheelchairs.
Ultra-compact unit easily fits in tight spaces

And Receive a **RVG5200 Sensor** **FREE**

Call us today for more information on this amazing deal!
0860 100 200

Wright MILLNERS

Terms & Conditions Apply.
Discount cannot be used in conjunction with another discount. Pictures used may be for representation only. E&OE. While Stocks Last

0860 100 200 | @wrightmillners | Wright Millners Dental Suppliers | www.wright-millners.co.za

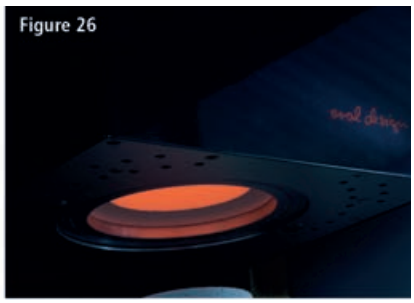
Figure 16: The connectors should be positioned in the lower third of the framework just above the gingiva, with emphasis on horizontal support rather than vertical expansion. This will not only allow for a durable design but also for natural looking interdental separation

Figure 17: The already trimmed and seated PFM framework after gold bonder application (Aurofilm Metalor)

Figures 18-20: A soft tissue mask aids to determine the position of the pink and white areas

Figures 21 and 22: An index is used for the first build up, in order to stick as closely as possible with the design of the prototype

Figures 23 and 24: The soft tissue mask is removed and the gingival area is then polychromatically layered



Figures 25 and 26: Proper firing is essential with any implant borne restoration. The Dekema Oral Design edition is equipped with a stone muffle for increased heat penetration, which ensures through fusion of the ceramic

WORLD'S
NO.1
DENTURE CARE
BRAND*

gsk

SUPER
COREGA

DENTURE CARE

EAT, SPEAK AND SMILE WITH CONFIDENCE

* Value Retail Sales data for GSK-branded denture care products, 12 months ending February 2019.
GlaxoSmithKline Consumer Healthcare South Africa (Pty) LTD. 57 Sloane Street, Bryanston, 2021
Refer to carton for instructions of use.

For any product safety issues contact GSK Consumer on +27 11 745 6001.
CHZAF/CHPOLD/0004/19

Figure 27: Following the method from beginning to end ensures that the ceramic is properly supported by the framework

Figure 28: Note the congruency between wax up and final result

Figure 30: The implant borne fixed partial denture (FPD) before try-in

yet, inadequate anatomical support is still often found to be the main reason for fracture related failure of implant-borne restorations (Shirakura et al, 2009). One of the most effective ways of achieving ideal anatomical support is by using the actual wax up for the final framework by evenly cutting it back, with the aid of reduction grooves, in the same way a tooth would be prepared in the mouth (Figures 12 and 13). Ideally the connectors for any bridgework should be positioned in the lower third of the framework towards the gingiva, with strong horizontal reinforcement rather than vertical expansion (Ubassy, 2008)(Figure 16). This will not only allow for a durable design but also for realistic interdental separation. After all, the trick with any bridgework is to make it look as if it is made of single units.

Framework preparation and veneering

Once the framework has been cast and the fit verified, the reduction amount as well as the anatomical support are checked yet again, with the help of a number of indexes. A gold bonder (Metalor Aurofilm) is applied to improve bonding strength and to add a warm chroma to the restoration (Figure 17). A soft tissue mask is made, covering the framework, to guide which areas need to be opaqued pink and which white, and also to assist during build up (Figures 18 and 19). In order to stick as closely with the prototype as possible, a lingual index is used for the dentine build up (Figure 21). After the traditional cut-back all attention is dedicated to achieving a natural build up while staying within the anatomical boundaries (Figure 22). Once this has been done the soft tissue mask is removed and a number of gingiva powders are applied in order to imitate the missing tissue and to conceal the defect in that area (Figures 23 and 24).

Firing and finish

As discussed, in order to address the higher frequency of

PROGRESS DENTAL LABORATORY
SIXTY YEARS OF SERVICE

VITALLIUM®

Call Johann or Grigor: 011 483 2908 / 011 728 6713

Figures 31-34: An individual result like this one can is characterised by the shape, size, rotation and shade of the restoration. These parameters need to be carefully refined step by step, in order to keep the unpredictability of the outcome at a minimum

veneer fracture on implant FPD's vs. conventional FPD's, anatomical support is one remedy, proper firing of the ceramic to ensure homologous fusion of the ceramic, is another (Figures 25-28). My protocol is to fire any implant restoration about 10 degrees higher (910°C/creation classic) with an increased holding time as well, especially for the first bake. It is necessary to frequently check the furnace calibration as well as the vacuum to ensure constant results.

Final integration

Once the implant prosthesis is glazed and polished (dark matter, Uniques) it is ready for try-in (Figure 30). This is part of the usual procedure to make sure everything is

Figure 35: The second case presented in a similar way to the first. Note the inflammatory response the implants prior to restoration

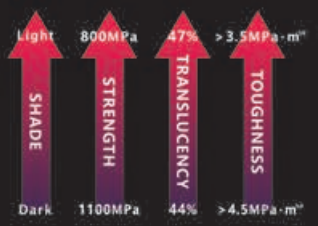
Figure 36: The second, refined provisional in situ to determine the aesthetic direction of the treatment. Note gingival blanching in the region of tooth UR2 and high smile line

EXPLORE

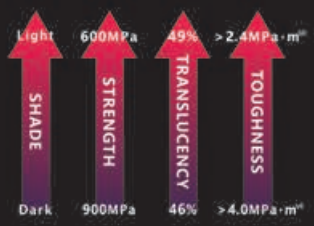
art with us

NEW GENERATION MULTILAYER

FUNCTIONAL EXPLORE



ESTHETIC EXPLORE



UPCERA

...where art meets science

dentalworld

CADCAM

Solutions

Upcera Certification

FDA ISO CE

(021) 461-4857/1501

www.dentalworld.co.za

Figures 37 and 38: The rotation of the teeth was chosen more for aesthetics reasons rather than space-related discrepancies
Figures 39 and 40: In fact, the amount of available space was actually too much. A non-invasive platinum foil veneer pictured on the model during fabrication and semi seated in situ, was used to close the gap
Figures 41 and 42: The final result presents a good compromise, as is often the case with many implant borne restorations, when a lot of bone and tissue loss preceded the commencement of treatment
Figures 43 and 44: Preoperative view of the third case. Traumatic injury and massive amounts of bone loss were the result of a car crash. The patient presented after a number of bone grafts had already been performed to improve the situation. Note high smile line

on track. During the try-in stage the other parameters that can't be finalised including contact points, occlusion, tissue compression, shade and access for hygiene are assessed. A patient might mention that they want natural looking teeth during the shade take appointment, but what they often really mean is that they want them white or at least much lighter than their own remaining dentition. Getting the shade of a restoration wrong is regarded as a major alteration vs. smaller shade and shape alterations that can be done in the surgery, where we have a ceramic studio set-up. It is important that the appointment regime accommodates for this possibility. Understanding and communication between the clinical team and the laboratory is a major ingredient for successful management.

Acknowledgement

I would like to thank Dr Brendon Joyce and his team at West Perth Prosthodontics for all their dedication and help as well as my staff, Tina and Paul for their support.

References

Pjetursson BE, Tan K, Lang NP, Braegger U, Egger M, Zwahlen M (2004) A systematic review of the survival and complication rates of fixed partial dentures (FPDs) after an observation period of at least 5 years. Implant supported FPD's. Clin Oral Impl Res 15: 625-642

Serino G, Stroem C (2009) Peri-implantitis in partially endentulous patients: association with adequate plaque

BRUSH 1 FLOSS

G·U·M®

3 RINSE 2

#HEALTHYSMILES 123

Perio • Ortho • Staining • Halitosis • Dry Mouth

Specialist oral care solutions for every step

@ivodentSA 0860 456 123 HEALTHY GUMS. HEALTHY LIFE.®

Figures 45-47: Precise planning is essential in order to deal with the complexity of the defect and to determine the best possible compromise

Figures 48-49: The planning mask in comparison to the final FPD. Accurate projection of the outcome is one thing, precise reproduction another

control. Clin Oral Impl Res 20: 169-174

Shirakura A, Lee H, Geminiani A, Ercoli C, Feng C (2009) The influence of veneering porcelain thickness of all-ceramic and metal ceramic crowns on failure resistance after cyclic loading. The Journal of Prosthetic Dentistry 101(2): 119-127

Tan K, Pjetursson BE, Lang NP, Chan ESY (2004) A systematic review of the survival and complication rates of fixed partial dentures (FPDs) after an observation period of at least 5 years. III. Conventional FPD's. Clin Oral Impl Res 15: 654-666

Ubassy G (2008) Trucs et Astuces. Teamwork Media srl 182-185

Reprinted with permission from Laboratory September 2019

Figures 50-52: The final result in situ. Trying to conceal a uni-lateral bone defect is a difficult undertaking. When designing any implant borne FPD it is also of critical importance to provide easy access for hygiene and not just to consider merely aesthetics aspects

NOMADS

THE SOUTH AFRICAN SOCIETY OF ENDODONTICS AND AESTHETIC DENTISTRY

BE ON THE GRID - ACCELERATE YOUR CLINICAL SKILLS AT NOMADSDAY 2019

NOMADSDAY 2019

SPEAKERS

Maxim Belograd
UKRAINE

Miguel Martins
PORTUGAL

Jan Paulics
SWEDEN

James A. Wealleans
AUSTRALIA

Peet van der Vyver
SOUTH AFRICA

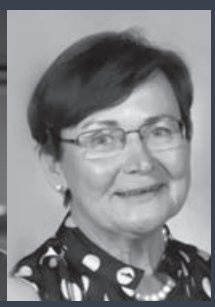
Andre van Zyl
SOUTH AFRICA

Howard Gluckman
SOUTH AFRICA

Rhoodie Garrana
SOUTH AFRICA

Mark Sham
UNITED KINGDOM

Jaco van der Sandt
SOUTH AFRICA



Liz Meyer
SOUTH AFRICA

WEDNESDAY 6TH - THURSDAY 7TH - FRIDAY 8TH NOVEMBER 2019

KYALAMI GRAND PRIX CIRCUIT & INTERNATIONAL CONFERENCE CENTRE

REGISTRATION NOW OPEN - VISIT
www.nomadsday.com

Lasers in dentistry – a clinical case of tooth restoration

Nikhil Sethi[1]

A 32-year-old gentleman attended the practice presenting with sensitivity and food packing from a large cavity on the upper right side. He had been told by another clinician that his UR7 was extensively decayed and required extraction.

Upon examination, it was discovered that the patient had an extensive cavity that was heavily carious and very close to the pulp. The tooth was responding with a slightly exaggerated response to cold vitality testing, suggesting pulpits.

The radiograph showed a deep distal radiolucency close to the pulp; however, there was a good amount of tooth tissue seen before reaching the level of the crestal bone. This suggested that if the soft tissue was reduced, there may be a chance the tooth could be saved.

Two treatment options were discussed with the patient:

- Extract the tooth
- Reduce the soft tissue by means of a surgical bur and then refine with the Gemini laser. This would be followed by placement of an intermediate core composite filling, which would overlay the cusps. Following this the vitality of the tooth would be monitored for one to two years before preparations for a ceramic crown. This treatment option would allow for the completion of root canal treatment, should symptoms/ radiographic signs appear suggesting loss of vitality.

The patient was keen to save the tooth.

Preparation

Before caries removal was started, the bulk of the soft tissue was resected with a surgical bur. Care was taken not to carry this procedure out too close to the tooth, as the access to the UR7 was very tricky, and precise control could not be guaranteed.

Tissue reduction was then refined in a precise manner using the Gemini laser in gingivectomy mode on a dual wavelength. This mode allowed for precision cutting with the added benefit of instant haemostasis.

Additionally, this procedure rapidly allowed for a clear field of access. Usually, without the laser, this treatment would involve either a surgical flap, or involve considerable time waiting for haemostasis after resection using pressure. Instead, the Gemini laser allowed for precision cutting and haemostasis in just three to four minutes (Figure 1).

Next steps

Next the rubber dam was placed. This was aided by the Gemini laser, which allowed for ideal isolation, which was initially deemed unlikely. A good field of isolation was further created using tertiary PTFE tape and auxiliary isolating agents such as opal dam (Figure 2). Caries removal was then completed and the clean cavity was seen to be extremely close to the pulp (Figure 3).

[1] Dr Nikhil Sethi
Private Practice, London, UK

Oral-B®

Brush like a Pro.

NEW

ORAL HEALTH CENTRE

EXCLUSIVE TO WRIGHT MILLNERS

GENTLE ON TEETH AND GUMS,

TOUGH ON EVERYTHING IN BETWEEN.

INVIGORATE YOUR GUMS WITH OXYJET TECHNOLOGY.

Wright MILLNERS

Figure 1: Precision cutting with the Gemini laser

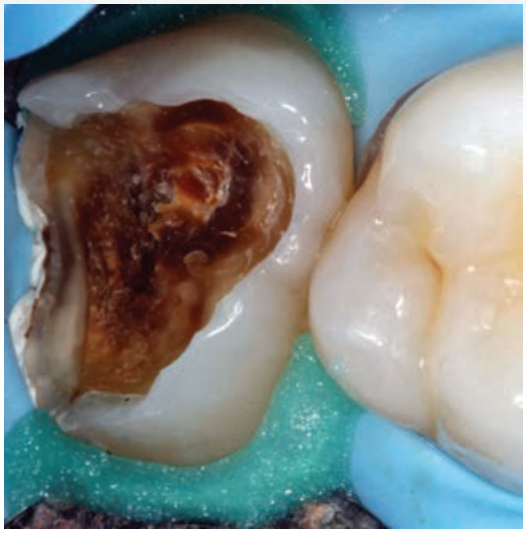


Figure 2: Creating a good field of isolation

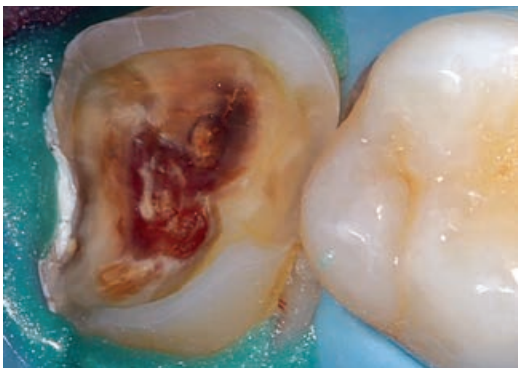


Figure 3: Cleaned cavity very close to the pulp

Figure 4: A desirable outcome was achieved

At this point, it was clear this was a case with a strong possibility for root canal treatment. Rather than just place a core filling and leave thin walls in occlusion which may fracture, it was decided to follow the techniques described by Didier Diestchi and Ricardo Ammanato to reduce cusps which were thinner than 1mm and plan to build up with a composite direct overlay.

This formed the core filling, and subsequent vitality could be monitored with low risk of cusp/wall fracture over the following two to four years. This provided a solid structure that was functional in occlusion and could be easily converted into preparation for a future ceramic/metal ceramic crown.

Final steps

This technique provided an opportunity to save a tooth without the need for a surgical flap. Bone sounding was completed to ensure the resulting margin was 3mm from the crestal bone and the patient was made aware of the possible need to lengthen the crown in the future if there were concerns with retention.

Whilst the outcome of the initial overlay composite was not ideal aesthetically, a desirable outcome was achieved, which reduced fracture risk and provided the opportunity to monitor vitality over the following one to two years (before crowning) (Figure 4).

Conclusion

A primary observation of interest was the rapid response of healing following use of the Gemini laser. The final photo was taken only five days after the procedure, and shows remarkable change.

The patient reported very little discomfort, apart from feeling stiff (from keeping open so wide) due to the fact he has a very small opening.

In summary, the Gemini laser was the perfect tool for soft tissue removal and reshaping, accelerating healing and tissue regeneration.

Reprinted with permission by Private Dentistry May 2019.

CPD QUESTIONNAIRE 9.5.1

Article: New generation short fibre-reinforced composite restorations of the posterior dentition. Fráter, Forster, page 6

1. *Which statement is correct: Direct restorations have been widely applied to restore posterior teeth due to:*

a The smaller amount of healthy tooth substance that has to be removed as compared to indirect restorations
b Their acceptable clinical performance
c Their low cost
d All of the above
e None of the above

2. *According to the authors, during normal mastication, forces range from:*

a 500 -to 700N
b 80 to 800N
c 70 to 150N

3. *Which statement is correct: According to the early research of Pascal Magne, the substitution of dentin should be performed with:*

a Feldspathic porcelain
b Highly filled, laboratory composite
c Microhybrid composite resin

4. *The actual average size of the glass fibres in the short fibre-reinforced composite (SFRC) described by the authors is:*

a 1-2mm
b 0.5-1mm
c 2-3mm
d 3-4mm

5. *In the case described, the patient presented with:*

a A buccal carious lesion on tooth 15
b A proximal carious lesion on tooth 15
c A distal carious lesion on tooth 15

Article: Conservative smile makeover using resin infiltration and microabrasion. Khan, page 22

6. *The use of which method does the author describe for cleaning stained fissures, with cavities only just forming in dentine:*

a Air polishing
b Air abrasion
c Bur

7. *In the case described, with what was the patient diagnosed:*

a Chronic marginal gingivitis
b Orthodontic crowding
c Severe generalised enamel hypoplasia
d All of the above
e None of the above

8. *What treatment option for the patient was not offered?*

a Direct composite restoration
b Indirect veneer restorations
c Crowns
d Microabrasion

9. *Which statement is correct: According to the author, evidence suggests that:*

a Failures in less than five years tend to be more technique associated
b Failures in less than five years tend to be due to secondary caries
c Failures after five years tend to be more technique associated

10. *Which statement is correct: The orthodontic treatment included:*

a 14 weeks of labial (ceramic) fixed braces to improve alignment, relieve crowding and improve gingival level symmetry
b 24 months of labial (ceramic) fixed braces to improve alignment, relieve crowding and improve gingival level symmetry
c 6 months of labial (ceramic) fixed braces to improve alignment, relieve crowding and improve gingival level symmetry
d 14 months of labial (ceramic) fixed braces to improve alignment, relieve crowding and improve gingival level symmetry

APPLEDENTAL

iTENA
CLINICAL PRODUCTS

20:1 Implant contra angle

- Max speed:2,000rpm
- Max Torque:70N.cm
- External spray with fiber op
- 25,000lux
- Push button

R7,999.99

1:5 Fiber Optic Contra Angle

- Inner water,1:5 increasing
- Max speed:200,000r/min
- Noise:≤65dB

R6,999.99

Total Cem

R2,499.00 3x8g

+1 free 8gm syr R 999

ADVANTAGES

- All in one! Etching + Primer + Bonding + Cement
- Exceptional bonding strength: to enamel: 20MPa to dentine: 15MPa
- No post-operative sensitivities
- Extremely thin film thickness (10 µm)

INDICATIONS

- Self-adhesive to enamel, dentine, metal, ceramic, porcelain, zirconium & composites
- For post, crown, bridge, inlay & onlay cementation

PIOON

Piooner of the Intelligent Dental Lasers

The World's First Smart Soft Tissue Dental Laser

R59,700.00

- Powerful : 7W / 16W WaveLength (810nm / 980nm)
- 3 Modalities : Preset Procedures, Customization and Favorites (quick and expert mode)
- Easy and Safe : 45 Protocols offer great safety in any dental procedures
- Intuitive Interface : Fast Selection of Treatment with Procedure Tutorial Guide
- Innovative : Compact, Ultra High-Resolution Touch Display
- Quality : 5 years Warranty of Laser Module, 3 years on unit

KZN Dental Suppliers

Email: sales@kzndental.co.za | www.kzndental.co.za | Tel: 031 312 8234 / 309 8234 | T&C's APPLY. E&OE EXEMP

CPD QUESTIONNAIRE 9.5.2

Article: Posterior occlusal veneers in the dental practice. Reusch, Strüder, page 40

11. The study conducted by A. Krummel et al showed that occlusal veneers in the posterior region with a minimum thickness of:

a 0.3 to 0.6 mm offer a very promising treatment solution
b 0.2 to 0.5 mm offer a very promising treatment solution
c 0.2 to 0.4 mm offer a very promising treatment solution

12. In the case described, the front teeth of the 23-year-old patient showed considerable attrition as a result of.:

a Biocorrosion
b Parafunctional habits.
c Neither of the above
e Both of the above

13. The completed restorations consisted of:

a 360^0 veneers
b Partial crowns
c 360^0 veneers / Partial crowns

14. According to the authors, in the case described, the final appearance of very thin veneers and crowns is considerably dependent on the colour of the remaining tooth structure:

a True
b False

5. To ensure that the restorations were free from any interference during sleep and bruxing, the patient was given a Brux Checker foil and instructed to use it for:

a 3 nights
b 2 nights
c 1 night
d. 4 nights

Article: Case planning for the implant-borne fixed partial denture. Hein, page 62

16. According to the author:

a The ridge can be improved in a horizontal direction
b The ridge can be improved in a vertical direction
c The ridge can be improved in either a horizontal or a vertical direction

17. Which statement is correct?

a Implant fixed partial dentures (FPDs) show a higher frequency of veneer fracture than conventional FPDs
b Conventional FPDs show a higher frequency of veneer fracture than implant fixed partial dentures (FPDs)
c Neither of the above

18. According to Ubassy, 2008, the connectors for any bridgework should be positioned in the lower third of the framework towards the gingiva with:

a Strong horizontal reinforcement rather than vertical expansion
b Vertical expansion rather than strong horizontal reinforcement
c Neither of the above

19. The author states that one remedy to address the higher frequency of veneer fracture on implant FPDs vs conventional FPDs. His protocol is:

a To fire any implant restoration about 10 degrees higher
b To fire any implant restoration about 10 degrees lower
c To fire any implant restoration about 20 degrees higher

20. What type of bonding agent was applied to improve bonding strength and to add a warm chroma to the restoration:

a An ethanol/water-based adhesive
b A gold based bonding agent
c Neither of the above

Under the patronage of His Highness Sheikh

Hamdan bin Rashid Al Maktoum

Deputy Ruler of Dubai, Minister of Finance and President of the Dubai Health Authority

24th UAE International Dental Conference & Arab Dental Exhibition

إيدك®

AEEDC DUBAI

2020

4 - 6 February

"LEADING THE DENTAL WORLD TO NEW HORIZONS"

aeedc.com

Organised by

Strategic Partner

Supported by

INDEX® Conferences & Exhibitions Organisation Est.

INDEX Holding Headquarters | Road # D-62, Opposite Nad Al Hamar | P.O. Box: 13636, Dubai, UAE

Tel: +971 4 520 8888 | Fax: +971 4 338 4193 | E-mail: info@aeedc.com | Website: index.ae

Positions Available

Dental Equipment for Sale

Strong like rock

Wide restorative indications
Easier than ever to apply
Amazing aesthetics
Start injecting!

G-ænial® Universal Injectable from GC

High-strength restorative composite

Exclusive Distributor

THE DENTAL WAREHOUSE

A HENRY SCHEIN® COMPANY

www.dentalwarehouse.co.za

TOLLFREE: 0800 111 796

GC

What are your patients **not telling you**?

50% of sensitivity sufferers **don't report** their pain.[1]

Be the one to ease their pain in an instant* with **Colgate® Sensitive Pro-Relief**

Screen every patient for sensitivity

Provide instant* relief to patients who need it

Recommend lasting† relief with 2X daily brushing

Clinically proven‡ occlusion with Pro-Argin® technology

*For instant relief, apply as directed to the sensitive tooth and gently massage for 1 minute.
†Lasting relief with continued 2X daily brushing.

References: 1. Colgate-Palmolive. Market research through Zapera.

Colgate®