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# Minimally invasive endodontics using a new single-file rotary system

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#### Introduction

The long-term retention of root canal treated teeth depends on many factors but it has become evident that the most common reasons for extraction of these teeth are 'large carious lesion' or 'unrestorable tooth', followed by 'tooth fracture', 'periodontal disease' and last of all, 'endodontically related disease' (Ng, Mann and Gulabivala, 2010).

Moreover, it is apparent that remaining structural integrity and the preservation of especially peri-cervical dentine are key factors that determine the long-term prognosis (relating to fracture resistance) in these teeth (Tang, Wu and Smales, 2010). The term peri-cervical dentine was first described by Clark and Khademi (2010) and refers to an area roughly 4mm coronal to the crestal bone and 6mm apical to the crestal bone (Figure 1). According to Herbranson (2014) it appears to be critical dentine for tooth strength and that should be conserved as much as possible to ensure long-term retention of the tooth. It is also the area of the tooth that is often destructed with access burs, Gates Glidden burs and orifice shapers used for coronal enlargement of root canal systems.

The fact that endodontically treated teeth are more prone to fracture is largely due to the structural loss during the shaping phase of endodontic treatment and not to dehydration. Studies show minimal dehydration effects from pulpal removal with similar strength test results between vital and non-vital dentine (Sedgley and Messer, 1992, Papa, Cain and Messer, 1994). Structural loss alone is however not the only cause for increased fracture incidence in teeth. The impact of irrigants, medicaments as well as restorative procedures and even physiological age changes should also be taken in account. Root canal therapy requires effective shaping in order to facilitate irrigation and disinfection of the canals. This should be done in such a conservative manner that the structural integrity of the tooth is respected and dentine is preserved where possible. Peri-cervical dentine preservation has been reported as critical in the long-term survival especially in molars with optimum function (Clark and Khademi, 2010). More advanced treatment options in endodontics (for example magnification and more flexible NiTi instrumentation) has therefore also shifted paradigms to a minimal invasive approach in both access cavity preparation as well as shaping of root canals in order to preserve dentine (Gluskin, Peters and Peters, 2014).

Recently, TruNatomy (Dentsply Sirona), a new generation of rotary files was launched. TruNatomy files are pre-packaged, pre-sterilised rotary instruments, designed to shape root canal systems to a continuously tapering preparation with maximum preservation of peri-cervical dentine. This new file system offers the clinician more simplicity, safety, improved cutting efficiency and mechanical properties compared to previous generations of rotating instruments. In this paper the authors will discuss the design features of the TruNatomy instruments and present case reports to illustrate the clinical application and benefits of these instruments.

### Metallurgy and Design Features

The manufacturing of the instruments begins with a smaller initial wire blank (0.8mm diameter) compared to the 1.1mm diameter of other conventional rotary instruments. The postgrind thermal treatments have been further refined to produce more flexibility. This level of flexibility has been selected to compliment the inherent flexibility of the fluting design and smaller maximum flute diameters.

TruNatomy instruments are manufactured using a postmanufacturing thermal process that produce a file with super-elastic NiTi metal properties. Due to the super-elastic properties of the new wire, the files might appear slightly curved when it is removed from a curved root canal because the metal demonstrates less memory compared to conventional NiTi or M-Wire. The file can either be straightened out if it is placed back in the root canal it will follow the natural shape of the canal. Another advantage of this reduced memory of the files are that in cases with difficult straight-line access it is possible to slightly pre-curve the files to allow easy placement into the canal orifices. All the instruments in the system have a shortened handle of 9.5mm to further improve the straight-line access and placement of the instruments into the root canal systems.

In the case of the TruNatomy Glider and TruNatomy preparation instruments, the largest taper is at the apical extent of the shaping instruments. The instruments are designed to provide approximately the same apical sizing



Figure 1: Peri-cervical dentine.

as the most commonly used instruments. However, they have a reduction or regressive taper as the instrument progresses coronally allowing each instrument to maintain the 0.8mm maximum flute diameter.

The TruNatomy system comprises of an Orifice Modifier, a Glider and three shaping files for different clinical applications. Regardless of the motor selected, all of the TruNatomy instruments are designed to run in continuous rotation at 500 RPM with a torque settings of 1.5 Newton centimeters.

The TruNatomy Orifice Modifier is characterised with a modified triangular cross-section, 7.5mm of active cutting flutes on the 16mm shank and a ISO tip size of 20 with a fixed 0.08 taper. The Orifice Modifier's main function is to modify the canal orifice conservatively whilst still retaining coronal anatomy and to create an ideal receptacle for the introduction, scouting and canal preparation instruments. Compared to the ProTaper SX (Dentsply Sirona) or ProTaper Next XA Opener (Dentsply Sirona) instrument, the TruNatomy Orifice Modifier have several advantages:

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Figure 2: TruNatomy Orifice Modifier (Dentsply Sirona).



Figure 3: TruNatomy Glider (Dentsply Sirona).



Figure 4: TruNatomy Prime shaping file (Dentsply Sirona).



Figure 5: TruNatomy Medium shaping file (Dentsply Sirona).



Figure 6: TruNatomy Small shaping file (Dentsply Sirona).

(1) smaller coronal maximum flute diameter of 0.8mm compared to the 1.2mm of the SX instrument; (2) shorter active cutting flutes distance of 7mm compared to 14.5mm of the SX instrument; (3) Shorter handle of 9.5mm compared to the 11mm handle for the SX instrument. Another difference is in that the Orifice Modifier is used with two to three gentle, smooth apical movements (amplitudes) of 2-5mm into the root canal instead of a backstroke brushing motions that is used for the SX instrument. This protocol results in a more conservative orifice relocation compared to the SX instruments which is more aggressive with an increased risk of over preparation of the coronal aspect.

TruNatomy Glider is available in 21 mm, 25mm and 31 mm lengths. The cross-section is a centered, parallelogram. The instrument has a tip size of ISO 17 with an average taper of 0.02 and 14mm of active cutting flutes. The Glider is designed with a regressive variable taper ensuring that the shank ends up again with a maximum flute diameter of 0.8mm.

For the preparation instruments, there are three different tip-size instruments for development of a final root canal shape. The Prime instrument (red stopper and color band) is the workhorse of the group and is called for in nearly every case. It has a tip size of ISO 26 with an overall decreasing taper that averages at 0.04.

The Medium (green stopper and color band) is used for larger cases and situations where more apical shape is desired. It has a tip size of ISO 36 and a similarly decreasing taper of about 0.03. Each of these shaping instruments have 16mm of cutting blades and are available in 21mm, 25mm and 31mm lengths with an off-centered parallelogram cross-sections.

The Small (yellow stopper and color band) is used for extremely curved canals where the Prime is not able to reach working length with ease or in cases where glide path preparation was very difficult. This instrument has a tip size of ISO 20 and a taper of 0.04.

### Clinical guidelines for the use of TruNatomy instruments

#### 1. Create adequate access

It is always important to prepare a cavity that will ensure adequate access into each root canal system after removal of all the pulp chamber contents. Because TruNatomy files have less memory compared to conventional NiTi or M-Wire instruments, it is possible to slightly prebend the tip of the file to allow easy insertion into a secured canal orifice that fails to have complete straight line access or in cases where patients present with limited mouth opening. Their high fatigue resistance specifically high on the shaft allows their use in a restricted access. The TruNatomy Orifice Modifier is used to create and refine the coronal opening as it transitions into the root canals. The Orifice Modifier is used with two to three gentle, smooth apical movements (amplitudes) of 2-5mm into the root canal. Regardless of the preparation, the TruNatomy Orifice Modifier is recommended to be used in all canal systems.

### 2. Negotiate canals to patency, create a reproducible micro glide path (RMG) and enlarge glide path

With an estimated working length obtained from a preoperative radiograph, a size 08 or 10 K-File is negotiated to patency, in the presence of a viscous chelator. After the establishment of patency (Figure 9), a working length is determined (Figure 10) and the canal is ready for the

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preparation of a RMG, using manual stainless steel instruments (Van der Vyver, 2011). It is recommended to use size 08 or 10 K-Files in a vertical in and out motion with an amplitude of 1mm from working length, and gradually increasing the amplitude to approximately 4mm, as the irregularities are removed from the dentin wall (Van der Vyver, 2011). A "super loose" size 10 K-File is the minimum requirement (Bürklein et al, 2012; Van der Vyver, 2011). To confirm that a reproducible glide path is present, a size 10 K-File is taken to full working length. The file is withdrawn 1mm and should be able to slide back to working length by using only light finger pressure. Thereafter, the file is withdrawn 2mm and should be able to progress to working length, using the same protocol. When the file can be withdrawn 4-5mm and slide back to working length, a RMG is confirmed. After establishment of a RMG it is recommended to enlarge the glide path further to create as macro glide path. The micro glide path can be expanded by using the TruNatomy Glider using three easy amplitudes in a pass. If the Glider instrument does not reach length, remove and clean the instrument, re-irrigate the canal space and then re-insert the instrument for another three-amplitude pass. Repeat this until working length is reached.

### 3. Select the correct TruNatomy file

The following guidelines can be used for TruNatomy file selection.

#### a. TruNatomy Prime File (26/04)(Figure 4)

Any canal where a size 08 and 10 K-File have to be negotiated to working length, followed by preparation of a glide path or where a size 15 K-File fits loose in the canal to working length. This will probably be the case in the majority of root canal systems with an average length and moderate curvatures in the midroot and apical regions.

### b. TruNatomy Medium file (36/03) (Figure 5)

Any canal where a size 20 or 25 K-File fits loose in the canal and is not necessary to negotiate and prepare a glide path with smaller instruments. This will usually include larger diameter, relatively straight root canals. This file can also be used after the Prime file if more shape is desired or if it is felt that not enough infected dentine was removed from the canal.

#### c. TruNatomy Small file (20/04) (Figure 6)

The Small file is mainly used when the Prime 26/04 file does not passively progress apically or when the operator feels unsecure with the Prime file, after the canal was negotiated to patency and a glide path prepared. When this Small file reaches working length, the clinician may accept the canal preparation or alternatively, if more shape is required, to further enlarge the canal with the Prime file. However, in canals with severe apical curvatures, very long root canals or in canals where the glide path preparation was very challenging, the TruNatomy Small file can be used to start root canal preparation with more safety. When this file reaches working length, the clinician may again accept the canal preparation or alternatively, if more shape is required, further enlarge the canal with the Prime file.

### 4. Canal preparation with the TruNatomy preparation files

The selected preparation file in the presence of an irrigation solution (typically sodium hypochlorite), is allowed to passively advance inwards and to progress down the canal upon activation, using three easy amplitudes in a pass until working length is reached. If the selected preparation does not reach length, remove and clean the instrument, re-irrigate the canal space and then re-insert the instrument for another three-amplitude pass. Repeat this until working length is reached and remember to take enough time for the shaping instruments to expand and contract to promote conforming shaping. In addition, sonic activation of irrigating fluids is recommended to enhance cleaning efforts. The authors recommend using the EDDY Endo Irrigation Tip (VDVV) driven by an airscaler (Soniflex LUX 2000L, KAVO).

#### **Case Report 1**

The patient, a 25 year old female, presented with irreversible pulpitis on her maxillary left first premolar that had a history of a previous pulp cap procedure and a large class II composite restoration. Figure 7a shows the preoperative periapical radiograph and orifice modification with the TruNatomy Orifice Modifier).

After glide path preparation with stainless steel K-Files and the TruNatomy Glider (Figure 7b), both root canal systems were prepared with a single TruNatomy Prime instrument (Figure 7c). Two TruNatomy Prime Conform Fit Gutta-Percha cones were placed and the fit confirmed radiograpically (Figure 7d). Figure 7e shows the post-operative result after root canal obturation using the continuous wave of condensation technique (Calamus Dual Obturation Unit, Dentsply Sirona) with AH Plus Root Canal Sealer (Dentsply Sirona) and two TruNatomy Prime Conform Fit Gutta-Percha Points.



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Figure 7(a) Pre-operative periapical radiograph of maxillary left first premolar and orifice modification with the TruNatomy Orifice Modifier; (b) Glide path expansion with the TruNatomy Glider after negotiation with stainless steel K-Files; (c) Root canal preparation with the TruNatomy Prime instrument; (d) Conefit periapical radiograph; (e) Post-operative result after obturation.

#### Case Report 2

The patient, a 58 year old male presented with a non-vital maxillary right second molar. A pre-operative periapical radiograph revealed a very deep, previously placed composite restoration (Figure 8a). After access cavity preparation four root canal systems were detected (two mesiobuccal, distobuccal and palatal). After orifice modification with the TruNatomy Orifice Modifier and glide path preparation with K-Files and the TruNatomy Glider, the four root canals systems were prepared with a single TruNatomy Prime instrument. The fit of four Prime TruNatomy Conform Fit Gutta-Percha Cones were confirmed radiographically



Figure 8(a) Pre-operative periapical radiograph of maxillary right first molar; (b) Conefit periapical radiograph; (c) Post-operative result after obturation, fiber post placement and composite core.

before the root canal systems were obturated (Figure 8b). Figure 8c depicts the post-operative result after obturation of the root canal systems and placement of fiber post and composite core. The clinical procedure of this case can be viewed on the following link or QR code: https://youtu.be/OpIAENoh3b8



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### **Case Report 3**

The patient, a 30 year old female presented with a nonvital maxillary left lateral incisor previously restored with a zirconia crown (Figure 9a). After access cavity preparation, the canal was located and a size 20 K-File was used for length determination (Figure 9b) using and electronic apex locator. The size 20 K-File was loose in the canal it was decided to complete canal preparation with a single TruNatomy Medium instrument. A size Medium TruNatomy Conform Fit Gutta-Percha Cone was placed and the fit confirmed radiographically (Figure 9c). Figure 9d illustrates the post-operative radiograph after the canal was obturated using the continuous wave of condensation technique (Calamus Dual Obturation Unit) with Pulp Canal Sealer (Kerr) and a Medium TruNatomy Conform Fit Gutta-Percha Point. The clinical procedure of this case can be viewed on the following link or QR code: https://youtu.be/sG5paE\_2FN4



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### **Case Report 4**

The patient, a 65 year old male, presented with a nonvital maxillary right second premolar with a history of a previous emergency root canal treatment and placement of calcium hydroxide as an intracanal medicament. The temporary restoration and calcium hydroxide paste was removed before length determination was done using an electronic apex locator and the working length confirmed radiographically. The canals were extremely difficult to negotiate and when the size O8 K-Files that was used for length determination were removed, it was noted that the buccal root canal system presented with an S-Curvature.

A size 08 and 10 K-File was used to secure a reproducible micro glide path before the glide path was expanded using the TruNatomy Glider. It took several passes with the glider before working length was reached in both root canals. Taking into account the fact that glide path preparation was extremely difficult and the fact that the buccal root canal presents with an S-curve (not visible on periapical radiographs), it was decided to complete canal preparation

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Figure 9a) Pre-operative periapical radiograph of maxillary left lateral incisor; (b) Length determination periapical radiograph; (c) Conefit periapical radiograph; (d) Post-operative result after obturation.

with the TruNatomy Small instrument. After canal preparation, two TruNatomy Conform Fit Small Gutta-Percha cones were placed and the fit confirmed radiographically. Again, upon removal of the cone from the buccal root canal, the S-curvature was imprinted on the gutta percha cone. This confirmed that the TruNatomy file maintained the original root canal anatomy. The canals were obturated using the continuous wave of condensation technique (Calamus Dual Obturation Unit) with Pulp Canal Sealer and two Small TruNatomy Conform Fit Gutta-Percha Points. The clinical procedure of this case can be viewed on the following link or QR code: https://youtu.be/FaK0tXqULM8



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Figure 10(a) Pre-operative periapical radiograph of maxillary right second premolar after an previous emergency root canal treatment; (b) Length determination periapical radiograph; (c) S-curvature root canal shape of the buccal root canal imprinted on a size 10 K-File.



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Figure 10(d) Conefit periapical radiograph; (e)TruNatomy Conform Fit Small Gutta-Percha Cone showing that the S-curvature was maintained during root canal preparation; (f) Post-operative result after obturation.

#### **Case Report 5**

The patient, a 71 year old male presented with irreversible pulpitis on his mandibular maxillary right first molar previously restored with a zirconia crown (Figure 11a). An access cavity was prepared and four root canal systems were located followed by length determination using and electronic apex locator. After orifice relocation using the TruNatomy Orifice Modifier a glide path was prepared using stainless steel K-Files and a TruNatomy Glider. Root canal preparation was done with a single TruNatomy Prime instrument. Figure 11b illustrates post-operative radiograph after the canal was obturated using the continuous wave of condensation technique (Calamus Dual Obturation Unit) with Pulp Canal Sealer and four Prime TruNatomy Conform Fit Gutta-Percha Points. Note the conservative coronal root canal preparations in the peri-cervical area. Figure 11c depicts a mesio-angulated view showing the four obturated root canal systems.



Figure 11(a) Pre-operative periapical radiograph of mandibular right first molar; (b) Parallel post-operative periapical radiograph after obturation. Note the conservative coronal root canal preparation shape in the pericervical area; (c) Mesio-angulated view showing the four obturated root canal systems.

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Figure 12(a) Pre-operative periapical radiograph of mandibular right first molar; (b) An axial slice of a high resolution CBCT scan revealed four root canal systems (arrows). Three root canals in the mesial root and one large oval root canal in the distal root; (c) Periapical radiograph taken with a mesio-angulated view to confirm the length determination for the three mesial root canals; (d) Periapical radiograph to confirm the length determination for the distal root canal; (e) Magnified view of the pulp chamber floor. Note the large amount of tooth structure that was still intact after root canal preparation with the TruNatomy Small file; (f) Parallel view of the obturation result. Note the maximum preservation of the root structure in the peri-cervical region of the mesial and distal root canal systems; (g) Mesio-angulated view shows the full extend of the lateral anatomy that was cleaned and obturated.

#### **Case Report 6**

A 45 year old female presented with irreversible pulpitis on her mandibular right first molar (Figure 12a). A pre-operative CBCT scan revealed the presence of a mid-mesial root canal system in the mesial root (Figure 12b). After access cavity preparation, and removal of pulp calcifications in the pulp chamber, the three main root canal systems were located (mesio-lingual, mesio-buccal and distal). The groove between the mesio-lingual and mesio-buccal canals was throughed with a Start-X no 3 tip (Dentsply Sirona) to remove an overlapping dentine ledge, exposing the internal anatomy of the groove. A Micro-debrider (Dentsply Sirona) was used to locate the orifice of the mid-mesial canal. A size 08 C+ File (Dentsply Sirona) was used to negotiate the initial few millimetres of the constricted canal.

Canal orifices were relocated and opened coronally with the TruNatomy Orifice Modifier before the three mesial root canal systems were negotiated to full working length and apical patency. It was noted clinically and on CBCT that the distal root canal system was very wide in a buccal-lingual direction (Figure 12b) and it was possible to place a size 20 K-File to full working length.

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Working lengths were determined by using an electronic apex locator and confirmed radiographically (Figure 12c and 12d). It was noted that the mid-mesial canal join the mesio-lingual canal and the mesio-lingual join withn the mesio-buccal canal in the apical 2mm of the root canal system. A reproducible micro glide path was established in all five root canal systems using a size 08 and 10 K-File before the glide paths were expanded with the TruNatomy Glider.

Taking into account that there was three root canal systems in the mesial root, the authors decided to use the TruNatomy Small file for root canal preparation and maximum preservation of root structure. Figure 12e shows a magnified view of the pulp chamber floor. Note the large amount of tooth structure that was still intact after root canal preparation with the TruNatomy Small file. The distal root canal was prepared with a TruNatomy Medium file.

Root canal irrigation was achieved by using 17% EDTA and heated 3.5 % sodium hypochlorite activated with the EDDY Endo Irrigation Tip (VDW) driven by an airscaler. Obturation of the canals were achieved by using TruNatomy Conform Fit Gutta-Percha cones and TotalFill BC Sealer Highflow (FKG) using the continuous condensation technique. Figure 12f shows a parallel view of the obturation result. Note the maximum preservation of the root structure in the peri-cervical region of the mesial and distal root canal systems. However, the mesio-angulated view (Figure 12g) shows that the full extend of the lateral anatomy that was cleaned and obturated. The clinical procedure of this case can be viewed on the following link or QR code: https://youtu.be/MxVKMc-E2VM



Scan here with smartphone camera

### Conclusion

Respecting original canal anatomy, preserving dentine and therefore maintaining the structural integrity of teeth should form an integral part of root canal shaping and preparation. In this paper the authors illustrate the clinical guidelines, applications and advantages of the recently launched TruNatomy system. With a renewed focus on dentine preservation and benefits like improved performance and efficacy the TruNatomy instruments offer the clinician superior debridement whilst respecting original canal anatomy.

### References

Bürklein, S., Hinschitza, K., Dammaschke, T., Schäfer, E. (2012) Shaping ability and cleaning effectiveness of two single file systems in severely curved root canals of extracted teeth: Reciproc and WaveOne® versus Mtwo and ProTaper. Int Endod J 45: 449-461.

Clark, D. & Khademi, J. (2010). Modern molar endodontic access and directed dentin conservation. Dent Clinics 54: 249-273.

Gluskin. A.H., Peters, C. I. & Peters, O. A. (2014) Minimally invasive endodontics: challenging prevailing paradigms. Br Dent J 216:347-353.

Herbranson E. (2014) Microendodontics? Roots, North America Edition 8(3).

Papa, J., Cain, C. & Messer, H. (1994) Moisture content of vital vs endodontically treated teeth. Dent Traumatol 10: 91-93.

Ng, Y.L., Mann, V., & Gulabivala, K. (2010) Tooth survival following non-surgical root canal treatment: a systematic review of the literature. Int Endod J 43: 171-189.

Sedgley, C. M. & Messer, H. H. (1992) Are endodontically treated teeth more brittle? J of Endod 18: 332-335.

Tang, W., Wu, Y. & Smales, R. J. (2010) Identifying and reducing risks for potential fractures in endodontically treated teeth. J of Endod 36: 609-617.

Van Der Vyver P (2011) WaveOne® Instruments: Clinical application guidelines. Endod Prac 11: 45-54.

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### CLINICAL

### Direct cusp replacement in the molar region using a thermoviscous bulk-fill composite restorative material – a clinical case report

Jürgen Manhart<sup>1</sup>

### Summary

Today, direct composites restorations in posterior teeth are a crucial part of the standard therapy spectrum in modern restorative dentistry. The performance of this treatment method in the masticatory load-bearing posterior region has been conclusively proven in many clinical studies, even for extensive composite restorations with cuspal coverage. These restorations are usually carried out in an elaborate incremental layering technique. Aside from the possibilities that highly esthetic composites offer in the application of polychromatic multiple-layer techniques, there is also a great market demand for the most simple and quick and therefore economical to place bulk-fill composite materials for posterior teeth. A new development in this class of materials is a bulk-fill composite with thermally controlled viscosity behavior.

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#### Introduction

In recent years, the indications for direct resin-based composite restorations were continuously expanded due to improvements in the technology of composite materials and related adhesive systems, as well as an optimization of clinical treatment protocols in adhesive dentistry<sup>1-14</sup>. Today, direct resin bonded composites are becoming first choice for many dental practitioners for the restoration of posterior defects, even extensive cavities in load-bearing areas are considered suitable for the direct adhesive technique<sup>9, 12, 15-17</sup>. The maximum preservation of hard tooth tissues using direct composites as an alternative to indirect onlays and partial crowns is one of the major advantages and key elements when restoring severely damaged teeth with cuspal involvement<sup>2, 9, 18-29</sup>. The replacement of single cusps with direct composite restorations is meanwhile an accepted treatment method and scientifically proven<sup>30</sup>. However, when the replacement of several cusps is needed in very large defects, indirect restorations - requiring additional substance removal in many cases - are still the preferred option for most dentists<sup>9, 17</sup>. Longevity studies on posterior composite restorations including cusp replacement show an acceptable performance and qualify this treatment option as an alternative to conventional indirect restorations in selected clinical cases<sup>16, 31-34</sup>.

To date, incremental layering is considered to be the gold standard for placing light-curing composite materials<sup>35</sup>. Generally, conventional composites are placed in individual layers of maximum 2 mm thickness due to their particular polymerization properties and limited depth of cure. Each increment is polymerized separately for 10 to 40 s, depending on the light intensity of the curing device used, the shade and translucency level of the respective composite paste and the light initiator system of the composite material<sup>36</sup>. Thicker layers of these conventional composites, however,

do not polymerize properly and therefore produce poor mechanical and biological properties<sup>37-39</sup>.

Especially in the case of large-volume posterior cavities, the conventional incremental technique can be a very time-consuming and complicated, technology-sensitive procedure<sup>30</sup>. That is why many dentists are looking for an alternative to this complex multi-layer placement technique, so that direct composites can be processed in less time and thus more economically and at the same time with greater product safety<sup>40,43</sup>. The bulk-fill composites have been developed in recent years in response to this growing demand for more efficiency. Using a simplified application protocol these materials can be placed into cavities in increments of 4 to 5 mm thickness with short polymerization times of 10 to 20 s per increment when a high-intensity curing-light is engaged<sup>36, 40, 44,47</sup>.

Bulk-fill composites are usually offered in two versions that require completely different application technique:

1. Low-viscosity, flowable bulk-fill composites, which flow well onto the cavity floor and the cavity walls and optimally wet the interior line and point angles of the preparations. These flowable bulk-fill composites must be protected on the occlusal surface by an additional capping layer (2 mm thickness) made of a regular hybrid composite which is qualified for load-bearing posterior restorations <sup>30,</sup> <sup>48, 49</sup>, since the flowable bulk-fill composites have a reduced filler content and contain comparatively large fillers in order to lower polymerization stress. As a result, however, they have poorer mechanical and aesthetic properties compared with conventional hybrid composites: for example a lower modulus of elasticity, a reduced wear resistance, an increased surface roughness and an inferior polishability<sup>36,</sup> <sup>50-54</sup>. In addition, the capping layer allows to create the functional contouring of occlusal anatomical structures, as this would be very difficult or even impossible to manage with a flowable composite material.

2. Regular to high-viscosity, sculptable bulk-fill composites that can reach up to the occlusal surface and do not require an additional protective capping layer. Thus, no additional composite material is required.

Bulk-fill composite materials in both viscosity versions allow a single layer thickness of 4-5 mm due to optimized depth of cure. This means that the high-viscosity bulk-fill composites can be used in a single-layer technique in a cavity which depth corresponds at most to the depth of cure of the material. If deeper defects are to be restored or if the flowable bulk-fill composite variants are used, this always requires a two-phase procedure with an additional



Figure 1: Preoperative situation: insufficient old composite restoration with cuspal involvement in a first lower molar.

composite layer. Technically, the present bulk-fill composites that are available for the simplified restoration of posterior teeth are not really bulk-fill materials, because in particular many proximal cavities extend into areas that are deeper than the maximum curing depth of these materials  $(4 - 5 \text{ mm})^{55, 56}$ .

A new approach is taken by the thermoviscous bulk-fill composite VisCalor bulk (VOCO, Cuxhaven). This is a highviscosity composite material at room and body temperature, which is converted to a flowable consistency by heating to a temperature of 68 °C in a composite oven or a special dispenser with heating function (Thermo-Viscous-Technology). In the heated phase, the material flows perfectly onto the cavity walls. Even in narrow and undercut areas of the defect as well as in internal line and point angles, an excellent wetting is observed, and thus facilitates the application of the restorative material into the cavity. VisCalor bulk again reaches body temperature within a short time when it comes to tooth contact and thus returns to the high-viscosity, sculptable state. VisCalor bulk thus combines the flowability of a low-viscosity composite during application with the sculpting ability of a high-viscosity composite within one single restorative composite material. Since the entire cavity can be filled with the same composite material, there is also a time saving compared to combined systems of flowable and sculptable composite materials. VisCalor bulk can be manipulated in layers up to 4 mm thickness. It is available in 4 shades (universal shade, A1, A2, A3). It exhibits a polymerization shrinkage of 1.44 vol.-% with simultaneously low shrinkage stress (4.6 MPa). With a flexural strength of 164 MPa, the material shows a high mechanical stability. VisCalor bulk ensures good color

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Figure 2: Situation after careful removal of the old restoration and cavity preparation. In the area of the distal proximal box, the defect extended clearly subgingival and the distolingual cusp was missing completely.



Figure 3: Application of rubber dam.



Figure 4: Placement of a metal matrix band.

stability and stable mechanical properties thanks to low water absorption. The application compule is headed by a narrow, flexible cannula, which perfectly enables direct application of the thermoviscous composite to hard-to-reach and narrow cavity areas.

#### **Clinical Case Presentation**

A 50-year old female patient requested in our dental office the replacement of her composite restoration in tooth 46 (first lower right molar) (Fig. 1). The tooth showed an insufficiently shaped direct composite restoration especially in the areas of the replaced distolingual cusp and distal marginal ridge with lack of a sufficient distal proximal contact which resulted in frequent food impaction with respective negative consequences. During the clinical inspection, the tooth reacted sensitively in the cold test and showed no negative reaction to the percussion test. In consultation with the patient and after an explanation of the possible restorative alternatives and treatment fees, the patient decided on a direct bulk-fill restoration using VisCalor bulk (VOCO GmbH, Cuxhaven).

Treatment started with thoroughly cleaning the affected



Figure 5: Conditioning of enamel and dentin with 35% phosphoric acid.

tooth of external deposits using a fluoride-free prophylaxis paste and a rubber cup. Shade determination was done on the moist tooth prior to the application of rubber dam. After administration of local anesthetics, the old insufficient composite restoration was carefully removed while conserving the remaining hard tissues. After excavation, the cavity was completely prepared and finished with a fine-grit diamond bur. In the area of the distal proximal box, the defect extended clearly subgingival. The distolingual cusp was missing completely and subsequently had to be reconstructed with composite (Fig. 2). The old composite restoration in tooth 47 was refurbished on the mesial surface as it had a nonphysiological contour (Fig. 2). The tooth was subsequently isolated with rubber dam (Fig. 3). A metal matrix was used to delimit the cavity. The matrix band was sealed at the mesial gingival margin using a wooden wedge (Fig. 4). At the distal proximal box, the matrix band was stabilized using a lightcuring provisional composite material (Clip, VOCO GmbH, Cuxhaven). A distal wedge was omitted because of the risk of dislocating the cervical part of the metal band onto the floor of the proximal box (Fig. 5).







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Figure 6: Situation after thoroughly rinsing the conditioning agent and gentle air-drying the cavity avoiding desiccation of the dentin.



Figure 7: Adhesive pretreatment of the dental tissues with the universal adhesive Futurabond M+.



Figure 8: After careful evaporation of the solvent of the adhesive, the bonding was light cured for 10 seconds.

The universal adhesive Futurabond M+ (VOCO) was chosen for the adhesive pretreatment of the dental hard tissue. Futurabond M+ is a state-of-the-art universal one-bottle adhesive that is compatible with all common conditioning techniques and adhesive strategies currently in use (multimode adhesive): the self-etch technique without the use of phosphoric acid and both phosphoric acid-based "etchand-rinse"-conditioning techniques (selective enamel etching with phosphoric acid or complete total-etch pretreatment of enamel and dentin with phosphoric acid). Also in these universal adhesives, the preliminary conditioning of enamel using phosphoric acid (selective enamel etching) results in better adhesion promotion<sup>57-59</sup>. Unlike former traditional selfetch adhesives, the new universal adhesives are insensitive to phosphoric acid etching of dentin<sup>60-64</sup>. The possibility of being able to vary the application protocol at short notice when using these universal adhesives without changing the adhesion promoter reduces the technique sensitivity and gives the necessary freedom to the dentist to react flexibly to different clinical situations (e.g. dentin close to the pulp, risk of bleeding of the adjacent gingiva, etc.).



Figure 9: A shiny cavity surface means evenly sealing dentin and enamel with adhesive.

In this clinical case, the total-etch adhesive pretreatment using phosphoric acid was used. 35% phosphoric acid (Vococid, VOCO GmbH, Cuxhaven) was applied along the enamel margins first for a reaction time of 15 s, followed by an additional conditioning of the dentin for further 15 s (Fig. 5). Subsequently the cavity was washed thoroughly for 20 s with the air-water-spray to remove the acid and precipitation residues. The cavity was then gently air-dried from excessive moisture avoiding desiccation of the dentin (Fig. 6). Ample amounts of the adhesive Futurabond M+ were applied and distributed generously in the area of the cavity using a microbrush (Fig. 7). It must be ensured that all cavity areas are sufficiently covered by the adhesive. After at least 20 seconds of carefully scrubbing the adhesive into the tooth surface, the solvent was carefully evaporated with dry, oil-free compressed air from the bonding agent until a glossy, immobile adhesive film resulted. Then, the bonding agent was subsequently light-cured for 10 seconds (Fig. 8). The result was a shiny cavity surface, evenly covered with adhesive (Fig. 9). This should be carefully checked before placing the restorative material, as any areas of the



Figure 10: The thermoviscous composite VisCalor bulk (VOCO, Cuxhaven) was heated in a composite oven (Caps Warmer, VOCO, Cuxhaven) at 68 °C.

cavity that appear matte are an indication that insufficient amount of adhesive has been applied to those sites. In the worst case, this could result in reduced bond strength of the restoration to these areas and, at the same time, in inadequate dentin sealing, which may lead to persistent postoperative sensitivity in vital teeth. This complication, which often requires the replacement of a newly-made bonded dental restoration, can usually be avoided by a careful adhesive protocol. If such dull-looking areas, not or inferior covered by adhesive, are detected in the visual inspection, additional bonding agent is selectively applied to them to optimize the adhesive layer.

The thermoviscous composite VisCalor bulk (VOCO, Cuxhaven) was heated in a composite oven (Caps Warmer, VOCO, Cuxhaven) at 68 °C (Fig. 10 and 11). The heated composite material was first applied only in a small amount on the floor of the distal proximal box (Fig. 12). The narrow, flexible cannula of the VisCalor bulk compule facilitates direct application of the composite even in hard-to-reach areas and narrow cavity areas (Fig. 11). A



Figure 11: The narrow, flexible cannula of the VisCalor bulk compule facilitates direct application of the composite even in hard-to-reach areas and narrow cavity areas.

special hand instrument (Easy Contact Point, Helmut Zepf Medizintechnik GmbH, Seitingen-Oberflacht) was inserted into the unpolymerized, still plastic composite material to create a physiologically correct formed proximal area with tight contact to the adjacent tooth (Fig. 13). By controlled pressure, the special hand instrument was forced towards the mesial surface of the neighboring tooth, anatomically shaping the metal matrix and simultaneously forming a cervical composite bridge, which stabilizes the matrix after polymerization (20 s, light intensity >  $1.000 \text{ mW/cm}^2$ ) - the instrument is kept in place during light curing (Fig. 14) - and ensures a tight proximal contact (Fig. 15). The formation of physiologically contoured proximal surfaces with tight contacts to neighboring teeth still represents a challenge when placing direct composite restorations. In contrast to amalgam, composites show a certain viscoelastic recovery from distortion, which is often seen as undesirable by the user and complicates the adaptation of matrices to the neighboring tooth by packing pressure <sup>65, 66</sup>. With the next increment of VisCalor bulk the remaining cavity volume (maximum layer thickness 4 mm) was completely filled using the bulk-fill technique (Fig. 16) and the contour of the missing distolingual cusp was sculpted (Fig. 17). The composite material was again polymerized with a high-performance curing light for 20 s (light intensity  $> 1.000 \text{ mW/cm}^2$ ). After removal of the metal matrix band, the restoration was checked for imperfections. Additional 10 s light curing cycles from mesio-lingual, mesio-buccal, disto-lingual and disto-buccal in the region of both proximal boxes, especially at the gingival seat, were executed to ensure that all areas covered before by the metal matrix band experienced sufficient polymerization.

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Figure 12: The heated composite material was first applied only in a small amount on the floor of the distal proximal box.



Figure 13: Shaping of the distal proximal area with a small amount of VisCalor bulk and a special hand instrument.



Figure 14: Light polymerization of the restorative material for 20 s (light intensity > 1.000 mW/cm<sup>2</sup>).



Figure 15: After polymerization, a cervical composite bridge stabilizes the matrix in the distal contact area.

After removal of rubber dam, the fissure relief and the fossae of the occlusal anatomy were finished with a pearshaped fine-grit diamond bur. In the next step of the standard finishing sequence, a point-shaped fine-grit diamond was then used to finish the convexity of the cusps and triangular ridges. After the elimination of occlusal interferences and adjustment of the static and dynamic occlusion, the accessible proximal areas were contoured and prepolished with abrasive disks. The use of diamond-impregnated composite polishers (Dimanto, VOCO, Cuxhaven) achieved a satin matte, lustrous finish on the surface of the restoration. Subsequent high-gloss polishing was completed using the same Dimanto polishers with reduced pressure to optimize the luster of the restorative material. Figure 18 shows the completed direct bulk-fill composite restoration with cusp replacement, reconstructing the original tooth shape with an anatomical and functional occlusal surface, physiological formed proximal contact areas, and an excellent esthetic appearance. To complete the treatment, a fluoride varnish

(Bifluorid 12, VOCO, Cuxhaven) was applied to the affected tooth using a foam pellet.

### Conclusion

Composite-based direct restorative materials will gain in importance in the years to come. These restorations present a scientifically proved, high-quality permanent treatment option for the masticatory load-bearing posterior region and their reliability has been documented in literature<sup>11, 67-73</sup>. The results of a comprehensive review have shown that the annual failure rates of direct posterior composite restorations (2.2%) are not statistically different to amalgam restorations (3.0%)<sup>69</sup>. Even cuspal coverage direct composite restorations are meanwhile used frequently and prove to be a viable alternative to conventional indirect restorations in selected clinical cases<sup>16, 31-34</sup>.

The growing economic pressure on the health care system and, in many cases, a lack of financial means on the part of patients with regard to additional payments adequate to

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Figure 16: With the next increment of VisCalor bulk the remaining cavity volume was completely filled using the bulk-fill technique.



Figure 17: The contour of the missing distolingual cusp was sculpted. The last increment of the composite was again polymerized for 20 s.



Figure 18: Final result: the direct bulk-fill composite restoration with cusp replacement blends in well to the surrounding hard dental tissue.

services are creating a need for reliable, easy-to-use and faster-to-complete and therefore more economical basic posterior restorative treatment options as an alternative to the time-consuming high-end solutions<sup>42</sup>. In addition to the universal hybrid composites, which are available in various shades and levels of opacity, new bulk-fill composites with optimized depth of cure have lately emerged on the market. They are specially designed for use in posterior dentition, where they produce esthetically pleasing restorations. The placement procedure is economically more efficient than that of conventional hybrid composites<sup>74, 75</sup>. Supplementary to low-viscosity and high-viscosity bulk-fill composite materials, the material options in the sector of light-activated direct placement restoratives with increased curing depth were

recently expanded by a bulk-fill composite with thermally controlled viscosity behavior.

#### References

1. Wolff, D., H.J. Staehle, and C. Frese, Komplexe Zahnaufbauten als Alternative zur Überkronung. ZWR, 2015. 124(1): p. 30-34.

2. Hickel, R., et al., Direct composite restorations: extended use in anterior and posterior situations. Clinical Oral Investigations, 2004. 8(2): p. 43-44.

3. Frese, C., D. Wolff, and H. Staehle, Proximal box elevation with resin composite and the dogma of biological width: clinical r2-technique and critical review. Oper Dent, 2014. 39(1): p. 22-31.

4. Frese, C., D. Wolff, and H.J. Staehle, Die R2-Technik: zweiphasige direkte Kompositrestauration. Restaurative



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Versorgung extrem tiefer Kavitäten. Zahnärztliche Mitteilungen, 2014. 104(5): p. 50-59.

5. Frese, C., D. Wolff, and H.J. Staehle, Komplexe Seitenzahnrestaurationen in der R1- und R2-Technik. Schwierige Ausgangssituationen und deren Lösung bei direkter Versorgung mit Kompositmaterialien. DFZ Der Freie Zahnarzt, 2014. 58(12): p. 72-81.

6. Frese, C., et al., Recontouring teeth and closing diastemas with direct composite buildups: a 5-year follow-up. J Dent, 2013. 41(11): p. 979-85.

7. Roggendorf, M.J., et al., Effect of proximal box elevation with resin composite on marginal quality of resin composite inlays in vitro. J Dent, 2012. 40(12): p. 1068-73.

8. Manhart, J. and R. Hickel, "Bulk Fill"-Komposite. Neuartige Einsatztechnik von Kompositen im Seitenzahnbereich. Swiss Dental Journal, 2014. 124(1): p. 19-28.

9. Lynch, C.D., et al., Guidance on posterior resin composites: Academy of Operative Dentistry - European Section. J Dent, 2014. 42(4): p. 377-83.

10. Staehle, H.J., Minimally invasive restorative treatment. J Adhes Dent, 1999. 1(3): p. 267-84.

11. Heintze, S.D. and V. Rousson, Clinical effectiveness of direct class II restorations - a meta-analysis. J Adhes Dent, 2012. 14(5): p. 407-31.

12. Deliperi, S. and D.N. Bardwell, Direct cuspal-coverage posterior resin composite restorations: A case report. Oper Dent, 2006. 31(1): p. 143-50.

13. Frese, C. and H.J. Staehle, Wie invasiv ist minimalinvasiv? Management von Einzelzahnlücken aus konservierender Sicht. DFZ Der Freie Zahnarzt, 2018. 62(3): p. 70-77.

14. Staehle, H.J., Erweiterte Anwendungsgebiete für Komposite. wissen kompakt, 2007. 1: p. 29-38.

15. Demarco, F.F., et al., Longevity of posterior composite restorations: not only a matter of materials. Dent Mater, 2012. 28(1): p. 87-101.

16. Scholtanus, J.D. and M. Ozcan, Clinical longevity of extensive direct composite restorations in amalgam replacement: up to 3.5 years follow-up. J Dent, 2014. 42(11): p. 1404-10.

17. Laegreid, T., et al., Clinical decision making on extensive molar restorations. Oper Dent, 2014. 39(6): p. E231-40.

18. Plotino, G., et al., Fracture resistance of endodontically treated molars restored with extensive composite resin restorations. J Prosthet Dent, 2008. 99(3): p. 225-32.

19. Denehy, G. and D. Cobb, Impression matrix technique for cusp replacement using direct composite resin. J Esthet Restor Dent, 2004. 16(4): p. 227-233.

20. Brackett, W.W., et al., Effect of restoration size on the clinical performance of posterior "packable" resin composites over 18 months. Oper Dent, 2007. 32(3): p. 212-6.

21. Fennis, W.M., et al., Fatigue resistance of teeth restored with cuspal-coverage composite restorations. Int J Prosthodont, 2004. 17(3): p. 313-7.

22. Segura, A. and R. Riggins, Fracture resistance of four different restorations for cuspal replacement. J Oral Rehabil, 1999. 26(12): p. 928-31.

23. Macpherson, L.C. and B.G. Smith, Replacement of

missing cusps: an in vitro study. J Dent, 1994. 22(2): p. 118-20.

24. Mondelli, R.F., et al., Conservative approach to restore the first molar with extensive destruction: A 30-month follow-up. Quintessence Int, 2013. 44(6): p. 385-91.

25. Kois, D.E., et al., Evaluation of fracture resistance and failure risks of posterior partial coverage restorations. J Esthet Restor Dent, 2013. 25(2): p. 110-22.

26. Kantardzic, I., et al., Influence of cavity design preparation on stress values in maxillary premolar: a finite element analysis. Croat Med J, 2012. 53(6): p. 568-76.

27. Xie, K.X., et al., Fracture resistance of root filled premolar teeth restored with direct composite resin with or without cusp coverage. Int Endod J, 2012. 45(6): p. 524-9.

28. ElAyouti, A., et al., Influence of cusp coverage on the fracture resistance of premolars with endodontic access cavities. Int Endod J, 2011. 44(6): p. 543-9.

29. Kuijs, R.H., et al., A randomized clinical trial of cuspreplacing resin composite restorations: efficiency and short-term effectiveness. Int J Prosthodont, 2006. 19(4): p. 349-54.

30. Federlin, M., et al., Kompositrestaurationen im Seitenzahnbereich. S1-Handlungsempfehlung (Langversion). AWMF-Registernummer: 083–028; Stand: Oktober 2016; gültig bis: Oktober 2021. Deutsche Zahnärztliche Zeitschrift, 2017. 72(1): p. 75-82.

31. Laegreid, T., N.R. Gjerdet, and A.K. Johansson, Extensive composite molar restorations: 3 years clinical evaluation. Acta Odontol Scand, 2012. 70(4): p. 344-52.

32. Deliperi, S. and D.N. Bardwell, Clinical evaluation of direct cuspal coverage with posterior composite resin restorations. J Esthet Restor Dent, 2006. 18(5): p. 256-265.

33. Opdam, N.J., et al., Seven-year clinical evaluation of painful cracked teeth restored with a direct composite restoration. J Endod, 2008. 34(7): p. 808-11.

34. Fennis, W.M., et al., Randomized control trial of composite cuspal restorations: five-year results. J Dent Res, 2014. 93(1): p. 36-41.

35. Park, J., et al., How should composite be layered to reduce shrinkage stress: incremental or bulk filling? Dent Mater, 2008. 24(11): p. 1501-5.

36. Ilie, N. and B. Stawarczyk, Bulk-Fill-Komposite: neue Entwicklungen oder doch herkömmliche Komposite? ZMK, 2014. 30(3): p. 90-97.

37. Tauböck, T.T., Bulk-Fill-Komposite. Wird die Füllungstherapie einfacher, schneller und erfolgreicher? teamwork J Cont Dent Educ, 2013. 16(4): p. 318-323.

38. Ferracane, J.L. and E.H. Greener, The effect of resin formulation on the degree of conversion and mechanical properties of dental restorative resins. J Biomed Mater Res, 1986. 20(1): p. 121-31.

39. Caughman, W.F., et al., Correlation of cytotoxicity, filler loading and curing time of dental composites. Biomaterials, 1991. 12(8): p. 737-40.

40. Manhart, J., Muss es immer Kaviar sein? – Die Frage nach dem Aufwand für Komposite im Seitenzahnbereich. ZMK, 2011. 27(Sonderausgabe März 2011): p. 10-15.

41. Burtscher, P., Von geschichteten Inkrementen zur Vier-



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<sup>1</sup> Schilder H. Cleaning and shaping the root canal. Dent Clin North Am 1974;18:269-96.

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#### MANHART

Millimeter-Bulk-Fill-Technik – Anforderungen an Komposit und Lichthärtung. DZW Die Zahnarzt Woche, 2011. Ausgabe 39/2011(39): p. 6-8.

42. Margeas, R., New Bulk-Fill Material Simplifies Restorations to One Step. Inside Dentistry, 2014. 10(10): p. 86-90.

43. Margeas, R.C., Bulk-Fill Materials: Simplify Restorations, Reduce Chairtime. Compend Contin Educ Dent, 2015. 36(1): p. e1-e4.

44. Czasch, P. and N. Ilie, In vitro comparison of mechanical properties and degree of cure of bulk fill composites. Clin Oral Investig, 2013. 17(1): p. 227-235.

45. Finan, L., et al., The influence of irradiation potential on the degree of conversion and mechanical properties of two bulk-fill flowable RBC base materials. Dent Mater, 2013. 29(8): p. 906-12.

46. Manhart, J., Neues Konzept zum Ersatz von Dentin in der kompositbasierten Seitenzahnversorgung. ZWR Das Deutsche Zahnärzteblatt, 2010. 119(3): p. 118-125.

47. Fleming, G.J., et al., The potential of a resin-composite to be cured to a 4mm depth. Dental Materials, 2008. 24(4): p. 522-529.

48. Ilie, N., A. Kessler, and J. Durner, Influence of various irradiation processes on the mechanical properties and polymerisation kinetics of bulk-fill resin based composites. J Dent, 2013. 41(8): p. 695-702.

49. Ferracane, J., G. Alex, and R. Margeas, Question: Are Bulk-Fill Composites a Good Idea? Inside Dentistry, 2014. 10(10): p. 42-44.

50. Hickel, R., Neueste Komposite - viele Behauptungen. BZB Bayerisches Zahnärzteblatt, 2012. 49(9): p. 50-53.

51. Ilie, N., S. Bucuta, and M. Draenert, Bulk-fill resinbased composites: an in vitro assessment of their mechanical performance. Oper Dent, 2013. 38(6): p. 618-25.

52. Condon, J.R. and J.L. Ferracane, Evaluation of composite wear with a new multi-mode oral wear simulator. Dent Mater, 1996. 12(4): p. 218-26.

53. Condon, J.R. and J.L. Ferracane, In vitro wear of composite with varied cure, filler level, and filler treatment. Journal of Dental Research, 1997. 76(7): p. 1405-1411.

54. Poggio, C., et al., Surface roughness of flowable resin composites eroded by acidic and alcoholic drinks. J Conserv Dent, 2012. 15(2): p. 137-40.

55. Frankenberger, R., et al., Bulk-Fill-Komposite: Mit dicken Schichten einfacher zum Erfolg? Quintessenz, 2012. 65(5): p. 579-584.

56. Frankenberger, R., et al., Die richtige Basisversorgung -Expertenzirkel. Dental Magazin, 2012. 30(1): p. 12-24.

57. de Goes, M.F., M.S. Shinohara, and M.S. Freitas, Performance of a new one-step multi-mode adhesive on etched vs non-etched enamel on bond strength and interfacial morphology. J Adhes Dent, 2014. 16(3): p. 243-50.

58. Hanabusa, M., et al., Bonding effectiveness of a new 'multi-mode' adhesive to enamel and dentine. J Dent, 2012. 40(6): p. 475-84.

59. McLean, D.E., et al., Enamel Bond Strength of New Universal Adhesive Bonding Agents. Oper Dent, 2015. 40(4): p. 410-7.

60. Takamizawa, T., et al., Influence of different etching modes on bond strength and fatigue strength to dentin using universal adhesive systems. Dent Mater, 2016. 32(2): p. e9-21.

61. Wagner, A., et al., Bonding performance of universal adhesives in different etching modes. J Dent, 2014. 42(7): p. 800-7.

62. Lenzi, T.L., et al., Bonding Performance of a Multimode Adhesive to Artificially-induced Caries-affected Primary Dentin. J Adhes Dent, 2015. 17(2): p. 125-31.

63. Loguercio, A.D., et al., A new universal simplified adhesive: 36-Month randomized double-blind clinical trial. J Dent, 2015. 43(9): p. 1083-92.

64. Munoz, M.A., et al., In vitro longevity of bonding properties of universal adhesives to dentin. Oper Dent, 2015. 40(3): p. 282-92.

65. Manhart, J., Eine Alternative zu Amalgam? Hochvisköse stopfbare Komposite: Überblick, Eigenschaften und Verarbeitungshinweise. KONS-Journal, 2001. 3: p. 21-26.

66. Kunzelmann, K.H. and R. Hickel, Klinische Aspekte der Adhäsivtechnik mit plastischen Werkstoffen, in Die Adhäsivtechnologie. Ein Leitfaden für Theorie und Praxis., M. ESPE, Editor. 2001, 3M ESPE: Seefeld, Germany. p. 46-67.

67. Da Rosa Rodolpho, P.A., et al., 22-Year clinical evaluation of the performance of two posterior composites with different filler characteristics. Dent Mater, 2011. 27(10): p. 955-63.

68. van de Sande, F.H., et al., 18-year survival of posterior composite resin restorations with and without glass ionomer cement as base. Dent Mater, 2015. 31(6): p. 669-75.

69. Manhart, J., et al., Review of the clinical survival of direct and indirect restorations in posterior teeth of the permanent dentition. Oper Dent, 2004. 29(5): p. 481-508.

70. Opdam, N.J., et al., Longevity of posterior composite restorations: a systematic review and meta-analysis. J Dent Res, 2014. 93(10): p. 943-9.

71. Opdam, N.J., et al., 12-year survival of composite vs. amalgam restorations. J Dent Res, 2010. 89(10): p. 1063-7.

72. Pallesen, U. and J.W. van Dijken, A randomized controlled 30 years follow up of three conventional resin composites in Class II restorations. Dent Mater, 2015. 31(10): p. 1232-44.

73. Pallesen, U. and J.W. van Dijken, A randomized controlled 27 years follow up of three resin composites in Class II restorations. J Dent, 2015. 43(12): p. 1547-58.

74. Manhart, J., H.Y. Chen, and R. Hickel, Three-year results of a randomized controlled clinical trial of the posterior composite QuiXfil in class I and II cavities. Clin Oral Investig, 2009. 13(3): p. 301-7.

75. Burke, F.J., et al., The current status of materials for posterior composite restorations: the advent of low shrink. Dent Update, 2009. 36(7): p. 401-402.

#### ADVERTORIAL

### Vatech establishes new partner to deliver world-class Dental Imaging to South Africa through SciVision

Value is what you get with Vatech's latest all-inclusive, open-sourced diagnostic and planning software, and a 10-Year CBCT Warranty promotion.

One of the world's leading manufacturers of dental x-ray imaging devices, Vatech, has one goal which is to create technology to make clinicians' and patients' lives better and safer. Known world-wide as a trusted partner for clinicians through exceptional service delivery, the choice of agent is of utmost importance to uphold the same set of values at a high level. For service that is second to none and their focus on education, Vatech approached SciVision Medical to supply, educate, deliver and support their range of imaging technology.

"Accepting the role as agent for the global leader that Vatech is, was not a decision made easily or taken lightly, due to SciVision's specialisation and focus being BIOLASE for more than a decade. We knew the manpower it would require to service South Africa's existing users at the level required by all stakeholders. It soon became clear what a great and ethical brand Vatech is, who are boldly committed to raising the bar in the South African market to that of their international level with sophisticated, smart technology and genuine support to clients and us as their agents. After careful consideration and investigation, we decided to embrace this new partnership fully for the special opportunity and benefits it would bring to the market and existing users," said SciVision CEO, Peter Doubell. "It has been a very busy year in which we have significantly expanded our team of experts at SciVision. Our x-ray team members have received updated and extensive high-level training internationally with Vatech in New York and London, and on-going with some of our team going to Hungary shortly."

The new year and partnership kicked off with a full day CBCT Course at Cape Town's One & Only Hotel to advance understanding and diagnosis of 3D X-Rays with International Clinical Lecturer in Dental & Maxillofacial Radiology, Dr Lee Feinberg from the University of Liverpool. South Africa's new Vatech CBCT dentists have found comfort and value in the in-practice skills training that comes with their CBCT. When deciding to make the radical digital transformation for more accurate diagnosis with CBCT, it's even better to have Vatech's assurance with their 10-year warranties now available. This commitment is offered with all their CBCT's and five years on all their Panoramic X-Ray units sold during 2019 and as an optional extra thereafter.

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#### ADVERTORIAL



Above: Dr Niel De Beer from Waterkloof, Pretoria and his team were one of this year's first users of the new generation low dose CBCT.

#### New innovations

As the only manufacturer that designs and produces all essential parts of the dental imaging system, including userfriendly software, Vatech's dedication has led them to new innovations, allowing doctors to plan less invasive, quicker and safer treatments.

- The world's safest CBCT with the lowest doses and fast scans Green 16
- 2D and 3D images captured and viewed simultaneously with one low dose shot – PaX-i3D Smart
- Flexible, soft and painless digital sensors EzSensor Soft

#### What's next

- EzScan CadCam Scanner by Vatech launching soon.
- More diagnostic education to Vatech users of South Africa, intro workshops and advanced courses hosted by industry experts and international academic institutions.



#### In-practice test drives

To choose the right x-ray unit for you, SciVision invites you to book an in-office one-hour experience of the Vatech x-ray software with an x-ray expert, or to view a unit at a training location.

#### **Trade-ins**

If you're an existing Vatech user of 2D Pans, SciVision invites you to consider a trade-in against one of the new CBCT units with 10-year warranties this year.

#### What users have to say

"As a general practitioner, I've always felt there was something amiss regarding proper diagnosis of my patients' oral health. Conventional digital radiographs are just not good enough for all cases. I decided to invest in a Vatech CBCT from SciVision, and it has transformed my dentistry, especially diagnostics and planning. The training and support I've received from Scivision and Vatech is truly second to none.

Two years ago, prior to the CBCT, I acquired the latest Biolase laser technology from SciVision without hesitation, because of the trust they instilled in me."

#### Dr Niel De Beer 1 Waterkloof, Pretoria

"I love my CBCT! I switched from another brand of 2D Pan to the new smart combination of 2D and 3D by Vatech and wow! I use it so much, even for bitewings which gives way more detail. Implant planning is amazing and I now send STL files to the lab for stents. The jump is like going from fax to email.

In my drive to "hi-tec" my practice to be able to deliver better treatments to my patients, I go to SciVision. After purchase of my Vatech PaX-i3D Smart CBCT and Biolase All-Tissue Waterlase and Epic X Diode Laser, I have to sing their praises on quality products, comprehensive training and service delivery with good "old school" morals." **Dr Bryan Sher I Green Point, Cape Town** 

# vatech

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#### CLINICAL

### Conventional and immediate loading with screw-retained crowns using a chairside workflow

Luis Cuadrado de Vicente,<sup>1</sup> Cristina Cuadrado Canals,<sup>2</sup> Andrea Sánchez Becerra,<sup>3</sup> Luis Cuadrado Canals<sup>4</sup>

Thanks to the extreme accuracy of modern intraoral scanners, excellent design software and reliable production systems, restoring an implant with a chairside model is now a reliable treatment with numerous advantages for the patient. The same day solution with final materials produces excellent implant crowns in a chairside environment.

Modern implantology is headed in the direction of the emerging concept of immediacy. This comprises different treatment protocols aimed at providing the patient with minimally invasive surgery and, where possible, a same day temporary restoration.

A reliable implant system, from the nanomolecular level to a complete restorative portfolio, is mandatory to provide this treatment. The core of the treatment is a full digital workflow, starting with optical impressions recorded with an intraoral scanner. To provide the same day treatments, the chairside model is mandatory. A digital intraoral impression and the corresponding design and production software and hardware enables the treatment team to obtain high-quality temporary or final restorations on the same day, without the use of a model.

The key elements of this immediate treatment are the implant placement, digital IO impressions, and the immediate design of the crown, which is then sent to a milling machine to produce the implant crown on a final, non-temporary, material. Pushing the boundaries of the "one abutment, one-time" concept, providing the final implant crown



Figure 1.

<sup>1</sup> Luis Cuadrado de Vicente, MD, DMD Plastic, reconstructive and esthetic surgeon. Director of Clinical Training Center i2 Implantología. Director of Postgraduate Training Program in Implantology UDIMA, University of Madrid. Member of AO, EAO, SEI, SECIB, SECPRE, ITI. Practice in oral implantology, extraoral and reconstructive surgery, Madrid, Spain.

<sup>2</sup> Cristina Cuadrado Canals, MD Master in Advanced Oral Implantology by European University of Madrid. Professor, degree in Clinical Implantology, University UDIMA.

<sup>3</sup> Andrea Sánchez, MD University degree in Clinical Implantology, University UDIMA, Spain.

<sup>4</sup> Luis Cuadrado Canals, Student, Faculty of Dentistry, European University of Madrid, Spain.

#### CLINICAL





Figure 3.



Figure 5.



Figure 7.



Figure 9.

different chairside approaches were applied.

On the upper maxilla, a conventional, delayed protocol was employed, and involved the placement of a Straumann®

Figure 2.



Figure 4.



Figure 6.



Figure 8.

on the immediate loaded implant offers many advantages for the treatment team and the patient.

Accordingly, we present a clinical case where two





Figure 11.

BLT implant, a two-month healing period and, finally, the recording of optical impressions with a 3Shape TRIOS3 IO scanner for the subsequent design and production of the final crown.

During the same treatment period, in the mandible, an immediate loading protocol was employed for a just placed Straumann® BLT implant. Optical impressions with the 3Shape TRIOS3 were also immediately recorded and sent to the computer with the chairside Trios Design Studio software to produce an immediate crown on a final material.

To provide this chairside model, the new Screw-Retained Crown module for Straumann<sup>®</sup> in 3Shape's Design Studio software was used to design the implant crown on Straumann<sup>®</sup> Variobase<sup>®</sup>. This software provides the proven connection with the Straumann<sup>®</sup> CARES<sup>®</sup> C series chairside milling unit, allowing the design software to be connected directly to the CAM module of the C series.

CARES® C series is a robust and compact 4-axis wet



Figure 12.

Figure 10.

milling and grinding equipment for in-house processing, especially designed to provide reliable and predictable precision when milling glass ceramics and hybrid materials. It comes equipped with intelligent 4- axis technology and improves the daily practice routine in terms of efficiency and productivity.

In this particular case, the new Straumann® n!ce® blocks were milled on the C series to obtain the final crowns. n!ce® material is a new high-tech, glassceramic solution that delivers fast, esthetic single tooth restorations. It can be milled, polished and seated, with no need for crystallization firing.

We selected a final material based on the case characteristics, with a minimally invasive approach, and provided the patient with a screw-retained crown on the same day to obtain excellent healing and shorten treatment time.

#### Treatment planning

A Straumann<sup>®</sup> BLT Regular Neck, Roxolid<sup>®</sup>, Ø 4.1x12mm implant was placed at position #15. As insertion torque values and ISQ levels were not optimal for immediate loading, a delayed protocol with healing cap was selected.

Two months later, a panoramic x-ray showed an excellent situation for the BLT implant and correct healing of the #36 area (Fig. 1).

Following a chairside protocol, it was decided to load #15 and provide an implant treatment with immediate loading at #36 on the same day. This involved the design of two screw-retained crowns with the Trios Design Studio software, and their production in n!ce<sup>®</sup> material on the C series milling unit.



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Figure 15.





Figure 19.



Figure 14.



Figure 16.



Figure 18.





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Figure 22.

rigule 21.



Figure 23.



Figure 25.



Figure 27.



Figure 24.



Figure 26.

#### Surgical procedure

Under local anesthesia, a flapless implant surgery technique was performed at position #36. Due to the quality of the bone, staged drilling with continuous saline irrigation was performed in order to obtain a proper, safe insertion torque (Figs. 2-7). One implant (Straumann<sup>®</sup> BLT, Regular Neck, Roxolid<sup>®</sup>, Ø 4.8x10mm) was placed, and a torque of 42 Ncm was applied (Figs. 8-11).

The ISQ level was determined with the Osstell unit. After connecting the Type 54 Smartpeg, a score of 82 was



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Figure 31.

obtained (Fig. 12). The decision to employ an immediate loading protocol has to take account of the surgeon's personal experience and skills, insertion torque, ISQ levels and medical and dental characteristics of the patient. In this case, all these parameters were evaluated as excellent, and the immediate loading protocol was selected.

A Straumann<sup>®</sup> BLT scanbody was connected at implant level at both #15 and #36. An optical impression was obtained with the 3Shape TRIOS3 intraoral scanner after selecting the Screw-Retained Crown indication for Straumann<sup>®</sup> BLT implants on the Design Studio order form (Figs. 13, 14).

Five scans were needed: lower jaw without the scanbody (emergence profile scan), lower jaw with the scanbody, upper jaw without the scanbody, upper jaw with the scanbody and, finally, the occlusion (Figs. 15-20).

During the prosthetic procedure, healing caps were placed to maintain the gingiva in position.

#### **Prosthetic procedure**

The SRC module of Trios Design Studio software is designed to be easy to use. Once the scanning steps are completed, the best fit between the virtual scanbody and the intraoral scanbody was determined using the three-point matching function, thus creating a digital model with the implant in its correct position (Figs. 21-22).

Once the alignment was approved, the next step was to use an auto-crown tool where the software created a suggested ideal crown. The software has different and excellent tools to shape and improve this initial autodesign (Figs. 23-24). After the crown is designed, the appropriate Variobase® is selected and the emergence profile designed. We chose the Straumann® RC H3.5 GH 1.0 Ti-Base (Figs. 25-27).

After the emergence profile design, a final sculpt step was done with automatic tools, adjusting the contact points and the occlusion in order to make the final adjustments to the full restoration (Figs. 28-29). The screw hole was established, and the crown was correctly placed and oriented in the virtual block (Figs. 30-31).

The computer was connected directly to the C series milling unit so that, after placing the n!ce<sup>®</sup> block in the holder, the milling of the crown could be started. After approximately 20 minutes, the crown was milled, including the screw hole







Figure 34.

and the connection to the Variobase® (Figs. 32-35).

Once the crown was ready, the selected Variobase<sup>®</sup> was cemented in the correct orientation in relation to the crowns.



Figure 36.



Figure 38.



Figure 33.



Figure 35.

The crowns were stained and polished manually, and the whole process was finished about one hour after scanning (Figs. 36-39).



Figure 37.



Figure 39.





Figure 41.



Figure 42.



Figure 43.



#### Figure 44.

Returning to the patient, the healing caps were removed, and the crowns were placed. Occlusion was checked and contacts were inspected (Figs. 40-43). Screw holes were sealed with PTFE and a temporary filling material.

#### **Treatment outcome**

The patient and dentist were completely satisfied with the final result regarding esthetics, health and function. The overall treatment time per crown was about one hour from surgery to final crown delivery.

In this case the "same day crown" and "one abutment, onetime" concepts could be pushed to the limits in a simple and predictable manner thanks to a proven chairside workflow.

The patient returned for a check-up one week later and was very satisfied with the esthetic and functional outcomes of the treatment (Fig. 44).

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#### ADVERTORIAL

### The Dental Warehouse expands its offerings for White Dental Beauty with the launch of CompoSite

The professional composite system offers a custom palette tailored to whitening and restorative cases.

The Dental Warehouse announced today the launch of their professional CompoSite system, designed to restore healthy smiles in every day practice. CompoSite is part of the White Dental Beauty portfolio, renowned for providing high quality, innovative, and clinically reinforced products. With accreditation and education by StyleItaliano, a community of skilled dental practitioners who contribute their ideas to bring more simplicity and predictability into everyday dental procedures, CompoSite is a dedicated restorative system, including an intelligent flowable composite, backed by invaluable teaching methods.

"Comprising of nine syringes in total, CompoSite was born from the #whiteology vision that dentists should be able to offer their patients the smile they deserve, using minimally invasive, predictable, and repeatable results," said Leigh Spamer, Sales and Marketing Director of The Dental Warehouse. Driven by patient demand for a brighter, whiter smile, CompoSite offers five shades of white, in addition to two flowables, an enamel and a posterior.

The CompoSite system consists of the following:

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### Preoperative digital planning

Florin Cofar<sup>1</sup> and Eric van Dooren<sup>2</sup>

Digital planning and preparation provides a high level of reliability in implant-prosthetic procedures. Preliminary virtual simulation of the surgical intervention can provide the necessary confidence and certainty to carry out the actual surgery with peace of mind. Two dental professionals describe their procedure.

Every workflow begins with an information gathering exercise. If a digital workflow is followed, the information consists of data that can be processed by the software being used. Our prosthetics team employs a photo-video protocol to examine the esthetic-functional relationship between the smile, dental situation and face of the patient. In addition to conventional photographic documentation and video sequences, we use digital volume tomography (DVT) and intraoral scans in the assessment of implant prosthetics cases. By merging all the information gathered we obtain what we call a "digital clone". These amalgamated data sets enable us to plan all steps in a virtual treatment suite as if we were working on a clone of the patient. Below we present our procedure, using the example of an implant prosthetic single-tooth restoration.

#### Creating a digital clone

The process begins by obtaining a high-quality portrait photograph, a DVT and an STL file (Figs 1 to 3). In the case presented here, tooth 12 can no longer be preserved and needs to be replaced with an implant prosthetic restoration. Designing the prosthetic restoration forms the first stage of the implant planning sequence. In the present case, the shape of the existing tooth should be maintained. If an analogue workflow is followed, the premise for the implant is the extraction of the tooth. This scenario also forms the first step in the digital procedure described here - however, the tooth is "only" extracted virtually. We can extract the tooth digitally to design e.g. the future alveolar cavity (emergence profile) and generate an optimized emergence profile. An alveolar model is required for:

1) designing the drill template (navigated implant insertion) and

2) fabricating a temporary restoration / abutment prior to the surgical intervention. We only ever use copies of the data files. The original data sets remain untouched. Several methods can be employed to perform the virtual tooth extraction. In our opinion, the most effective approach is to use the "Provisional Pontic" CAD process and to design the alveolar cavity to have an optimum shape. You should always work on two levels when executing this step. The working scan represents the first level. The

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Figure 1: Portrait image prior to the intervention.

original scan with the tooth represents the second level in this scenario.

#### Implant prosthetic planning

The implant crown is designed (virtual wax-up). In the present case, the tooth being replaced serves as the template. The crown reflects the position and proportions of the original tooth. A copy of the scan file is again used as working file on which the virtual tooth extraction is performed. This allows us to go back to the original data and compare it with the working file. We define the ideal implant placement position and design the peri-implant soft tissue contours on the screen to provide an adequate emergence profile (Fig. 4). We then prepare a drill template for safe transfer of the implant position to the oral cavity. Even though most dentists are familiar with this procedure, we will briefly address the fundamentals: Basically, three data sets are required for preparing a drill template:

1) a scan showing the digitally extracted tooth,



Figure 2: DVT data set in the software program.



Figure 3: Surface scan of the preoperative situation.

2) a data file of the DVT, and

3) a scan showing the CAD design of the tooth being treated; in the present case, this means the original scan with the existing tooth.

At the next step, we simulate the surgical procedure on the screen. The implant is inserted digitally and then a template of the procedure is exported. The conditions of the alveolar bone can be assessed to determine the bone's fitness for the planned procedure. If necessary, the alveolar bone may be adjusted, for instance by planning a bone transplant. Alternatively, a compromise may be made and it may be preferable to opt for a cemented restoration or a change in the design instead. We take all the major decisions at the virtual implant insertion stage. The details can then be transferred to the clinical situation by means of the drill template. The position of the implant is established with the help of the wax-up (3 to 4 mm deeper). The implant angle and position should be selected so that the available bone structure can be used to optimum effect, without deviating too much from

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Figure 4: Virtual extraction of the tooth in need of Figure 5: Designing the drill template. treatment.



Figure 6: Digitally designed alveolar cavity with scan body.

the specifications of the prosthetic restoration. In this case, the aim is to provide a screw-retained restoration. We are still using our "digital clone" to plan these steps. Once the preparatory steps have been completed, the drill template is printed (Fig. 5). In addition, the STL file of the implant model including the optimized alveolar cavity design and digital scan body (Fig. 6) are prepared to design the temporary restoration.

#### Designing the temporary restoration

The virtual implant model (Fig. 6) is imported into the construction software to design the abutment and/or temporary restoration. The crown-abutment interface should be placed in an optimum position in the previously prepared alveolar cavity. The Ti base has been defined at the time when the implant depth was determined during the implant planning step. In the present case, the implant has a depth of 3 to 4 mm. The optimum length of the Ti base is therefore 1.5 mm.

The temporary restoration is placed on a Ti base with free

rotation to prevent potential problems caused by the implant index position.

Whether a screw-retained or cemented restoration is chosen is at the discretion of the dentist. We tend to prefer screw-retained restorations. However, the ultimate decision about which restoration to use can only be made at the point when the surgical intervention is planned. Whether the prosthetic restoration is made in one piece or as a hybrid crown is also at the discretion of the dentist. Hybrid restorations are normally preferred in esthetically demanding situations and onepiece restorations in the posterior region.

#### Surgical phase

All the items required for the surgical intervention have been prepared and are now ready for use: This includes the printed drill template (Fig. 7) and the temporary implant restoration (Fig. 8). Tooth 12 is now extracted atraumatically in the "real world" (Fig. 9). Immediately afterwards, the fit of the drill template is checked in the oral cavity and the implant is inserted according to the drill protocol (Fig. 10).



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Figure 8: Immediate temporary restoration.



Figure 9: Atraumatic tooth extraction.



Figure 10: Implant insertion (NP implant, MIS) with drill template.



Figure 11: Drill template and implant after insertion.

This is followed by the augmentative measures planned in advance and finally, the temporary crown is screwed on (Figs 11 and 12).

#### **Prosthetic restoration**

After a healing phase of at least eight weeks, the temporary



Figure 12: Temporary restoration after the surgical intervention.

restoration is removed and the design is copied. This is the first time in the entire procedure that the actual scan body is used (Fig. 13). The scan body assists in recording the position of the implant. This position corresponds to the originally planned position and also reflects the implant index position. This method ensures the accuracy of the

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Figure 13: Clinical situation with scan body.



Figure 14: Implant prosthetic restoration.



Figure 15: Close-up of the final situation.



Figure 16: Portrait image after completion of the restoration.

restoration procedure. The transgingival areas have already been formed at the time of the temporary restoration. In the present case, the thickness of the gingival tissue should be additionally increased. For the final restoration, a Ti base of the same length as the one for the temporary restoration is used. This time, however, the base features an anti-rotation lock. A large selection of materials is available for the final restoration. We normally use hybrid restorations for the restoration of single implants. Here, the restoration consists of a monolithic zirconium oxide abutment (Zenostar) and a monolithic multi-shaded all-ceramic crown (IPS e.max ZirCAD MT Multi). The restoration is characterized with stains and completed without any shape modifications (Figs 14 to 16).

#### Conclusion

Errors can be avoided by planning the intervention on a "digital clone" and preparing any auxiliary and therapeutic devices ahead of the actual surgical procedure. If this approach is used, suboptimal implant placement – both prosthetically and surgically – can be detected and corrected in advance. In addition, necessary augmentative measures are already evident at the planning stage and can be prepared accordingly. This way, "surprises" during the intervention on the patient can be avoided as far as possible. This brings a high level of reliability and certainty to the treatment process.

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#### CLINICAL

# Lasers in dentistry: gingivectomy by diode laser

Nikhil Sethi<sup>1</sup>

Lasers in dentistry can be divided into two main types: soft tissue lasers and hard tissue lasers. The laser used in this case is the Gemini 810 + 980 diode laser (Ultradent).

The main use of the laser in this case was to scallop the gingival margin of a primary canine to match the contralateral adult canine. It was also a valuable tool for providing haemostasis for the resulting composite addition to the cervical area.

#### **Case presentation**

A 42-year-old gentleman attended the practice with a primary upper left canine that had undergone significant cervical wear. Despite the number of years the primary tooth had been present, it was not mobile, and therefore there was no reason to replace it.

The patient was not happy with the colour of his tooth, and the difference in gum height compared to the contralateral permanent canine (Figure 1).



<sup>1</sup> Dr Nikhil Sethi Private Practice, London, UK

Figure 1.



Figure 2.

#### Treatment plan

After bone sounding, it was determined that the cervical margin could be relocated 1.5mm apically without risk of encroaching the biological width. The treatment plan was ordered to correct the gingival discrepancy, and then restore the tooth with composite resin to camouflage, giving the appearance of a permanent canine.

It was also decided to replace the composites on the central incisors to improve aesthetics and close the black triangles.

#### Treatment

Using the laser in gingivectomy mode, the gingival margin was carefully scalloped 1.5mm apically following a similar gingival scallop of the adjacent teeth (Figure 2).

This was extremely quick and effective with the added

benefit of rapid haemostasis and creation of a coagulum, which reduced the risk of gingival crevicular fluid contaminating the field of isolation (Figure 3).

Gingival isolation was reinforced by using some Ultra-Pak retraction cord triple O (Ultradent) (Figure 4). After sandblasting and following a self-etching adhesive protocol (after enamel selective etching and rinsing), the tooth was then restored, producing a camouflage effect, copying the right permanent canine.

#### Six-month review

At the six-month review, excellent gingival symmetry and acceptable aesthetics were achieved (Figure 5). It was observed that the canine was far more similar to the contralateral tooth.







Figure 4.





Figure 5.

Additionally, the black triangle situation was improved by moving the contact point on the central incisor composite additions to within 5mm of the bone crest (using the principles of Tarnow et al).

#### Conclusion

A primary observation of interest was the rapid response of healing following use of the laser. In an incredibly short space of time, the patient showed remarkable change.

In summary, the laser was the perfect tool for scalloping

the gingival margin with precision, accelerating healing with the added benefit of rapid haemostasis.

Introducing a laser at our practice has allowed a faster process when considering adhesive dental procedures such as composite bonding at the gingival level owing to the ability to create a clean field of isolation after cutting with its instant haemostasis.

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#### CLINICAL

# Glass ionomers: the material of choice in paediatric dentistry?

Thomas Trentesaux,<sup>1</sup> Caroline Leverd,<sup>2</sup> Mathilde Laumaille,<sup>3</sup> Marion Jayet,<sup>4</sup> Caroline Delfosse<sup>5</sup>

The range of indications for glass ionomers in paediatric dentistry is extremely varied (early childhood caries, deep carious lesions on mature and immature teeth, etc.). Review of these materials that have undergone significant technical advances.

Although in France, glass ionomer cements (GIC) are mainly used by dentists to lute prosthetic pieces, it must be noted that they are less commonly used as a restorative material. In 2012, 56% of restorations were made from composites in comparison with 17% from glass ionomers<sup>1</sup>. According to the report by the French National Agency for Medical Product Safety (Agence Nationale de Sécurité du Médicament et des produits de santé, ANSM) of April 2015, 100% of dentists in France were using composites in 2012, compared with 40% using glass ionomers, which represent 15-25% of direct restorations<sup>2</sup>. These glass ionomers (GI) still suffer from a poor reputation. This reputation stems from the first glass ionomers developed in the 1970s by Wilson and Kent, as a result of their low resistance to flexion and abrasion. These were low viscosity Gls. Slow maturation and stabilization of moisture exchanges were required to achieve properties close to those of composites after one year. They have since undergone significant improvements and are now an excellent alternative to amalgam. Amalgam should now only be used as an exception, in particular for use in deciduous dentition (last resort use)<sup>3</sup>. Gls can also be a substitute for composites which, on a biological level, can pose a certain number of risks. Therefore, although usage restrictions may exist in some clinical situations, their indications are numerous when treating early childhood caries, deep carious lesions in mature and immature teeth, mineralisation defects, interceptive treatment and so on.

#### Composition and classification

Gls are composed of a mix of organic acids (polyacrylic acid, tartaric acid and itaconic acid) and fluoroaluminosilicate glass particles. The use of the first low-viscosity Gls was quickly abandoned due to their weak mechanical properties and great sensitivity to the moist conditions of the mouth. New Gls then started to appear on the market. Some Gls have been modified with the addition of resin (RMGI), others are condensable after modification of the liquid/ powder ratio and the particle size (high-viscosity GI - HVGI). The addition of freeze-dried polyacrylic acid to the powder makes it less sensitive to osmosis<sup>1</sup>. One last family (sometimes classified in the HVGI family) is strengthened with very small fillers (< 4 µm), which accelerate the setting of

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Figure 1: Glass ionomer with a shiny appearance once placed in the cavity.



Figure 2: Progressive gelation of glass ionomer. It can be shaped when it turns matt.

the matrix (high-density glass ionomers - HDGI) (table 1). For both HVGIs and HDGIs, a coating is used to markedly increase the long-term mechanical properties (impregnated protected GI). This treatment comprises a nanofilled selfadhesive resin that combines extreme hydrophilic properties with very low viscosity. It compensates for the microporosity of GI<sup>4</sup> which is thus protected from desiccation and occlusal microtrauma for several months. Hence, GI can mature in optimised conditions<sup>1</sup>. GIs, which have long required handmixing of the powder and liquid, are today presented in a capsule, which saves time, is easier to use and improves the quality of the mixture.

#### An acid-base reaction

During the first phase, the H+ ions of the acid attack the surface of the glass particles, liberating in particular the calcium and aluminium ions. The ion release is facilitated by the tartaric acid which forms complexes between them. A polysalt is thus created that hardens gradually<sup>5</sup>. It should be noted that in a clinical setting, the GI has a glossy appearance during this phase. Humidity must be controlled, as this reticulation phenomenon is not stable. The mechanical properties would therefore be altered by desiccation or, in contrast, by excessive moisture addition. The GI should not be manipulated during this phase in order not to disturb the chemical bond. Phase two entails gelation of the material. It becomes matt, at which point it can be shaped (Fig. 1 and 2). The total time of the procedure is around three minutes, but this can vary depending on the type of GI and the manufacturer. Phase three entails maturation of the material.

LVGIs required almost one year to reach the mechanical properties of a composite. This time has been reduced to a few hours for the latest generation of GIs.

#### Unique and numerous properties

One of the main benefits of these materials is their natural adhesion to dental tissues. This adhesion takes place through the ionic reaction of the carboxylate groups on the polyacid molecules with the phosphate ions from the tooth surface<sup>4</sup> and with the charged positive ions of the hydroxyapatite. An interfacial ion-exchange layer is formed. In clinical practice, this intrinsic adhesion obviates the need to use an adhesive. Nevertheless, in order to improve micro-mechanical adhesion, the use of a conditioner is recommended for treating the tooth surface. The latter reduces surface tension, eliminates the smear layer and partially demineralises the dentinal tubules. The wetting of the glass ionomer will be improved. This surface treatment is composed of a polyacrylic acid with concentrations between 10 and 20% for an application time of 10 to 20 seconds, depending on the dilution. This conditioner has become redundant for the latest generation of glass ionomers HDGI, which is intrinsically more acidic and does not require this usage. However, this information should be treated with care, as although the adhesion values remain comparable in the short term, this is not the case after six months, especially since the conditioner contributes to a reinforcement of the seal<sup>6</sup>. In contrast, its use is truly recommended when placing Gl-based sealants in order to ensure their longevity. An excellent seal, which is an essential

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Figure 3: Preparation for glass ionomer presenting a secondary cavity to ensure a maximum base.



Figure 4: Placement of a Lumicontrast® sectional matrix (Polydentia).

factor in avoiding pulp inflammation, is also ensured by low levels of polymerisation shrinkage. In addition, the incomplete opening of the tubules by the conditioner limits the occurrence of post-operative hypersensitivity. This seal, combined with the physicochemical properties of the materials, leads to remineralisation of the tooth<sup>7</sup>. GIs are therefore biocompatible and bioactive materials thanks to the release of fluoride, in particular during the first months after their placement, which provides them anti-caries properties.

#### But what about the true mechanical qualities?

These have significantly increased with the arrival of impregnated, protected HVGI, especially due to the increase in the number of fillers and the variability of their size.

The placement of a thin protective coating (35 to 40 µm) increases the Gl's hardness and resistance to wear, while also protecting it from moisture contamination<sup>8</sup>. Studies comparing amalgam restorations with Gl restorations on deciduous teeth have demonstrated similar survival rates over two years<sup>9</sup>. Randomised clinical studies comparing restorations on permanent or deciduous teeth showed that there is no significant difference between the survival rates of HVGI and amalgam for periods over six years<sup>10</sup>. Other studies showed similar results when posterior restorations with composite and glass ionomer were compared over four years<sup>11</sup>.

The results of these studies justify the use of GIs for occlusal cavities, cervical lesions and small-sized proximal restorations. One six-year study examining the restoration of 1,231 Class II cavities in deciduous teeth presented a success rate of 97.42%<sup>12</sup>. However, creating larger proximal cavities or mesial-occlusal-distal cavities increased the risk of fractures<sup>13</sup>. Restoring cavities in direct contact with heavy occlusal forces alters the durability of the restoration and explains the contraindication against restoring the cusp with this type of material. As far as placing sealants is concerned, Liu demonstrated that there is no difference at 24 months in the ability of a composite resin and a GI to prevent the occurrence of sulcus caries<sup>14</sup>. Mickenautsch evidenced in a systematic review of the literature that there are no significant differences in terms of preventing carious lesions at 48 months in comparison with a composite resinbased sealant, which is often considered as the reference<sup>15</sup>.

Additional studies should be conducted to confirm these results over a longer term.

In order to improve the clinical longevity of restorations, two elements in particular should be considered: cavity preparation and the use of a coating. Soft cavities with rounded angles are sought to prioritise saving tissue that, however, present sufficient base to favour the occurrence secondary caries, in particular on primary deciduous molars, which have a strong cervical constriction (Fig. 3).

The use of a coating increases the mechanical properties of the GI <sup>4, 16</sup>. Its use is nevertheless disputed in deciduous teeth. In fact, when their presence in the mouth is limited, it can be prudent in terms of biocompatibility to avoid the use of surface resin when the restorative material does not contain it. In this case, it can be replaced by a cocoa butter type of product (GC), which means humidity can be controlled during the first maturation phases.



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Figure 5: Material required to place a sealant using the press finger technique (glass ionomer, Fuji Triage®, GC).

Figure 6: Pre-operative view of 36.



Figure 7: Cleaning of the sulcus.



Figure 8: Application of cavity conditioner (GC) for 10 seconds, gentle rinsing and drying.



Figure 9: Placement of Fuji Triage<sup>®</sup> (GC).



Figure 10: Application of cocoa butter on the tip of the index finger



Figure 11: Pressing the index Figure 12: Post-operative view. finger onto the occlusal surface of 36 to ensure that the GI penetrates into the pits and fissures. Removal of excess.



#### **Clinical indications**

The spectrum of indications of GIs in paediatric dentistry is extremely varied: sealants, restorations of cervical lesions, temporary or permanent anterior restorations (choice of shade varies depending on the manufacturer), restorations of occlusal cavities, small proximal cavities<sup>17</sup>, pulp protection and treatment of deep carious lesions, structural defects <sup>18</sup>, traumas, and so on. Their use is indicated both for deciduous dentition and immature or mature permanent dentition. Condensable glass ionomers are an excellent alternative to amalgam<sup>19</sup>, and also to composites in terms of biocompatibility. Although the material is reputed to possess low technique-sensitivity, operating protocols must be followed. Indeed, many failures stem from noncompliance with the working time, a poor choice of matrix, poorly adapted preparation or injection of an inadequate amount of material leading to air bubbles or issues with the seal. Humidity must also be controlled to guarantee that restorations will last. The use of a dam is optional but, as well as controlling humidity, using one provides greater comfort to both the young patient and the practitioner. The quality of the matrix is crucial for the success of the restoration (Fig. 4).

Figures 5 to 12 show the placement of a sealant on 36 using Fuji Triage from GC with the press finger technique. The latter enables the material to penetrate into pits and fissures thanks to controlled pressure on the occlusal surface.

#### Conclusion

Glass ionomers should take on an increasingly significant role in our treatment strategies. Long criticised for their lack of mechanical strength and their poor aesthetic qualities, the latest generations of GIs (high-viscosity GIs and highdensity Gls, associated with a surface treatment) are excellent alternatives to amalgam or composite resins. These biocompatible materials can be used for impermeable, durable restorations that limit the recurrence of caries. They perfectly meet the challenges of minimally invasive dentistry, save dental tissue and preserve pulp vitality.


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### Key points

- Glass ionomers are biocompatible materials that are intrinsicly adhesive.
- Using a coating improves the mechanical and aesthetic qualities.
- Glass ionomers have multiple indications, both in deciduous and permanent teeth.
- Glass ionomers constitute, depending on the clinical situation, an alternative to both amalgam and composites.
- The press finger technique can be used to seal pits and sulci quickly.

#### References

1. Blique M. Restaurations partielles directes : les ciments verre ionomère. In Médecine buccodentaire conservatrice et restauratrice. Espace ID. Concepts. 2014. 176p.

2. Agence Nationale de Sécurité du Médicament et des produits de santé. Le mercure des amalgames dentaires. Actualisation des données. Avril 2015. 93p.

3. Agence Nationale de Sécurité du Médicament et des produits de santé. Le mercure des amalgames dentaires. Recommandations, à l'attention des professionnels

de santé, à respecter lors de l'utilisation des amalgames dentaires. Décembre 2014. 4p.

4. Lohbauer U et al. Strength and wear resistance of a dental glass ionomer cement with a novel nanofilled resin coating. Am J Dent 2011 ; 24 (2) : 124-128.

5. Dursun E. Les ciments verres ionomères à haute viscosité. Partie 1 - Présentation, composition et propriétés. Biomatériaux cliniques 2016 ; 1 (1) : 26-32.

6. Hoshida S et al. Effect of conditioning and aging on the bond strenght an interfacial morphology of glassionomer cement bonded to dentin. J Adhes Dent 2015;

17 (2) : 141-146.

7. Kuhn E, Chibinski AC, Reis A, Wambier DS. The role of glass ionomer cement on the remineralization of infected dentin : an in vivo study. Pediatr Dent 2014 ;

36 (4) : 118-124.

8. Basso M et al. Glassionomer cement for permanent dental restorations : a 48-months, multi-centre, prospective clinical trial. Stoma Edu J 2015 ; 2 (1) : 25-35.

9. de Amorim RG et al. Amalgam and ART restorations in

children : a controlled clinical trial. Clin Oral Investig 2014 ; 18 (1) : 117-124.

10. Mickenautsch S, Yengopal V. Failure rate of atraumatic restorative treatment using high-viscosity glassionomer cement compared to that of conventional amalgam

restorative treatment in primary and permanent teeth : a systematic review update – II. J Minim Interv Dent 2012 ; 5 : 213-72.

11. Gurgan S et al. Four-year randomized clinical trial to evaluate the clinical performance of a glass ionomer restorative system. Oper Dent 2015 ; 40 (2) : 134-143

12. Webman M et al. A retrospective study of the 3-year survival rate of resin-modified glass-ionomer cement class II restorations in primary molars. J of Clin Ped Dent

2016;40(1):8-13.

13. Klinke T et al. Clinical performance during 48 months of two current glass ionomer restorative systems with coatings : a randomized clinical trial in the field.

Trials 2016 ; 17 (1) : 239.

 Bao Ying Liu, Xiao Y, Hung Chu C, Chin Man LO
 Glass ionomer ART sealant and fluoride-releasing resin sealant in fissure caries prevention -results from a randomized clinical trial. BMC Oral Health 2014; 14:54.

15. Mickenautsch S, Yengopal V. Caries-preventive effect of high viscosity glass ionomer and resin-based fissure sealants on permanent teeth : a systematic review of

clinical trials. PLoS One 2016 ; 11 (1) : e0146512.

16. Diem VT et al. The effect of a nano-filled resin coating on the 3-year clinical performance of a conventional highviscosity glass-ionomer cement. Clin Oral Investig

2014 ; 18 (3) : 753-759.

17. Dursun E et al. Restaurations aux ciments verre ionomère (CVI). In Fiches pratiques d'odontologie pédiatrique. Ed. Cdp. 2014. 347p.

18. Fragelli CM et al. Molar incisor hypomineralization (MIH) conservative treatment management to restore affected teeth. Braz Oral Res 2015 ; 29 (1) : 1-7.

19. Hilgert L et al. Is hight-viscosity glass-ionomer cement a successor to amalgam for treating primary molars ? Dental materials 2014 ; 30 (10) : 1172-1178.

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- BISCO has, on file, the calcium release data for Theracal LC,
   Gandotfi MG, Siboni F, Prati C. Chemical-physical properties of TheraCal, a novel light-ourable MTA-like material for pulp capping, International Endodontic Journal. 2012 Jun;45(8):571-9. 3. BISCO, Inc. data on file.

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### CLINICAL

## Alignment of anterior teeth before minimally invasive veneers to treat microdontic laterals

Thomas Sealey<sup>1</sup>

<sup>1</sup> Dr Thomas Sealey, BChD (2006), MMedEd, MSc Endo Private Practice, Essex, UK



Figure 1: Full face - pre-operative.

### **Case Report**

The patient was a 30-year-old female in good health who presented to the practice requesting smile enhancement.

It was decided to improve the alignment of her teeth with cosmetically-focused fixed upper and lower orthodontics followed by feldspathic veneers on her upper lateral teeth. Orthodontic planning of the final position of her lateral teeth allowed for a truly minimally invasive approach.

### **Presenting complaint**

Her main complaints were that of uneven upper and lower teeth with gaps present. After full discussion and time spent looking at pictures of her smile, she decided that it was the imbrication of her teeth that she did not like the appearance of, in addition to being displeased by her smaller and spaced upper lateral teeth.

### Diagnosis

A full clinical examination was completed, including all normal periodontal examinations and radiographs. There was nothing abnormal to report. Oral hygiene was considered poor at initial consult and hygiene therapy was recommended. There were no concerning social factors.

The upper left central tooth (UL1) had a small fracture of the mesioincisal edge. She was Angle class 1 on the left and class 3 in the right (Angle, 1899). She had microdontic upper lateral teeth. Her lower anterior teeth had minor crowding and her upper teeth had

### CLINICAL



Figure 2: Frontal smile view.



Figure 3: Right lateral smile view



Figure 4: Left lateral smile view



Figure 5: Frontal retracted view, teeth in occlusion



Figure 6: Right lateral retracted



Figure 7: Left lateral retracted



Figure 8: Right lateral retracted view, teeth slightly parted



Figure 9: Left lateral retracted view, teeth slightly parted



Figure 10: Anterior close-up view 1:1.5

minor rotations and protrusive/retrusive positioning from the ideal arch shape.

### **Treatment planning**

Aims of the treatment were to improve the alignment of the anterior upper and lower teeth and address the microdontic lateral teeth. In addition, options for the small fractured edge of UL1 were considered.

The options for the alignment were:

1. Referral to a specialist orthodontist for comprehensive orthodontic therapy to correct the posterior malalignment

and return the patient to a class 1 position with normalised overjet and overbite

- 2. Accept the position of the posterior teeth and align only the teeth in the aesthetic zone
  - a) Fixed labial
  - b) Fixed lingual
  - c) Removable clear aligners.

The options to address the microdontic lateral teeth and the fractured UL1:

- 1. Composite bonding
- 2. Ceramic veneer.

### SEALEY



Figure 11: Right lateral close-up view 1:1.5



Figure 12: Left lateral close-up view 1:1.5



Figure 13: Upper occlusal view



Figure 14: Lower occlusal view

#### Treatment planning considerations

In all treatment planning, the treatment choice is dependent on the diagnosis and there is often a hierarchy of treatment options that should be pursued in a logical order, starting with the least invasive until a satisfactory outcome is achieved.

Research has shown that this treatment cascade is an appropriate approach, as often patients are pleased with the outcome and decide against further restorative treatment (Joiner, 2006). With that in mind, it was decided to complete external tooth whitening before orthodontic treatment began.

The aim was to assess the improvement of the tooth colour and then to re-evaluate the patient's expectations before tooth alignment was completed and before proceeding to alternative and more invasive options.

On 31 October 2012, the EU Council Directive (2011) came into force in the UK. It sets out who can use what strength of product when performing tooth whitening. This directive states that the use of tooth whitening or bleaching products containing more than 0.1% and up to 6% hydrogen peroxide present or released from other compounds or mixtures in these products is safe for use when prescribed by a registered dental professional.

The patient completed a three-week course of home tooth whitening using 16% carbamide peroxide.

When she returned, composite material was placed on her lateral teeth and shaped. The patient was then allowed time to assess the changes to her smile before deciding how to proceed with her treatment planning.

The patient decided that she indeed still wanted to continue with alignment of her upper and lower teeth.

After considering all the options, longevity of materials, treatment costs (now and in the future), advantages, disadvantages, risks and alternatives; she decided upon alignment of her upper teeth with fixed orthodontics, alignment of her lower teeth with removable clear aligners, followed by ceramic veneers on her upper lateral teeth and a composite repair to her fractured incisal edge UL1.





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- Anterior & posterior restorations
- Composite veneer
- Diastema closure
- Composite/ porcelain repair

### Diastema Closure





Case courtesy of Toshio Kanamura, DDS

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### **Radiographs**



Figure 15: Right intraoral bitewing radiograph



Figure 16: Left intraoral bitewing radiograph



Figure 17: Upper right central intraoral periapical radiograph



Figure 18: Upper left central intraoral periapical radiograph



Figure 19: Lower central intraoral periapical radiograph

### **Treatment process**

Fixed labial brackets were placed on the patient's upper teeth and a 0.014 nickel titanium wire was secured with elastics. The movement of the teeth was monitored and after only eight weeks they had been positioned correctly with symmetrical spacing around the lateral teeth.

By blocking the bracket slot on the lateral teeth and jumping the orthodontic wire over the bracket, I was also able to retrocline the upper lateral teeth as far as the occlusion would allow. This placed them in a more retrusive position to provide more space facially for the planned final ceramics.

An alignment company fabricated four lower transparent sequential positioners to properly align the lower anterior teeth. Interproximal reduction was completed to the requested specifications with interproximal finishing strips, using wooden wedges to protect the gingiva (Rossouw and Tortorella, 2003).

Fluoride varnish was then applied. Each aligner was worn for two weeks, meaning a treatment period of eight weeks for both the upper and lower teeth.

After tooth alignment (Figures 20 and 21), an indirect fixed-wire retainer was constructed and cemented to the lingual surface of the lower anterior teeth using flowable composite and normal etch and bond protocol. A temporary removable upper retainer was made to retain the upper teeth.

At this stage, we reassessed the patient's expectations





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### Preparation



Figure 20: Eight-week tooth alignment Figure 21: Eight-week tooth alignment Figure 22: Cross-polarised shade photo frontal view



occlusal view





Figure 23: Wax-up



grooves



Figure 24: Gürel technique reduction Figure 25: Preparation upper left lateral tooth



Figure 26: Retraction cord pre-impression Figure 27: Veneers on model



Figure 29: Isolation for acid etching



Figure 32: Light activation of cement





Figure 30: Dry-try of veneer upper right Figure 31: Adhesive protocol lateral tooth



scalpel





Figure 33: Finishing of margins with Figure 34: Finishing of margins with brownie point



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Figure 35: Finishing of interproximal areas with finishing strip



Figure 36: Margins visualised before rubber dam removal

and she still felt that further improvements were needed. All options were again discussed.

We were of the opinion that to achieve an excellent aesthetic and tailor the colour-blend to the natural tooth, a direct composite approach should be used, or alternatively we could continue as planned using an in-direct ceramic veneer on her upper lateral teeth.

We discussed the differences in these materials, the increased maintenance of the composite restorations versus the increase preparation for the ceramic veneers, and the patient confirmed that she still wanted to proceed with the ceramic option.

Before the day of treatment, a wax-up for the planned final shape of the upper lateral teeth was completed in office using an additive technique (Figure 23). Custom silicone stents and guides were made to help direct the preparation following a minimally invasive protocol. Shade-matching photos were taken at the very beginning of the appointment as tooth dehydration will quickly change the appearance of a tooth and affect the colour-match detrimentally. Photography with cross-polarised filters while using custom composite shade tabs and a Vita shade guide helps with the shade determination and communication with the ceramist (Figure 22).

The Gürel (2003) reduction technique was used to ensure that only necessary tooth removal was completed to allow for the adequate thickness of veneer ceramic. Acrylic was placed over the lateral teeth using a stent taken from the wax-up. A depth-gauged diamond bur was used to remove 0.5mm of the facial-surface of the planned veneer position.

Pencil was used to mark the depths of these grooves before the acrylic was removed (Figure 24). Reduction only to the pencil marks was completed, ensuring the entire preparation was contained within enamel (Figure 25). The double retraction cord technique was used and an impression taken (Figure 26).

To maximise the beauty of the underlying colour of the natural tooth and create a new enamel skin to simply reshape the facial of these lateral teeth, it was decided to use a feldspathic ceramic for its excellent colour properties and external texture that the ceramist can place (Figure 27).

On the day of cementation, the temporary veneers were removed and the feldspathic veneers checked. The ceramic work was exceptional and a perfect fit.

The teeth were first isolated with an inverted rubber dam to prevent sulcular fluid contamination and the teeth individually clamped to retract the dam and expose the restorative margins.

The neighbouring teeth were protected by placement of a metal matrix strip and then sandblasted to remove any biofilm to increase micromechanical retention, followed by a short total etch of only 10 seconds (Figures 28 and 29).

The veneers were again tried-in to ensure that the rubber dam and the clamp placement did not interfere with the passive seating of these delicate feldspathic veneers (Figure 30).

After try-in, the veneers were conditioned with a 9.6% hydrofluoric acid etch for 60 seconds as per the material preparation guidelines followed by a cleaning product to remove any salts and phosphate molecule contamination. The fitting surface was then silanated and pre-loaded with a light-cure resin-cement (Variolink Esthetic, Ivoclar Vivadent).

The restorations were left in a covered restoration tray until ready for use.



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An adhesive bonding system (Adhese Universal, Ivolcar Vivadent) was then applied to the teeth. The mild selfetching adhesive creates a more stable and durable bonding interface, as there is only partial demineralisation of any exposed dentine and consequent bonding to the hydroxyapatite crystal that remains (Walter et al, 2011) (Figure 31). The restorations were then individually placed and agitated into position and lightcured for one second. The quick-cure allows easy clean-up of the margins before being fully cured under an oxygen inhibiting gel (Figure 32).

This gentle technique allows very easy clean-up and is much kinder to the gums as you don't get the cement stuck in-between the teeth etc. The margins were refined with a scalpel before being polished with a brownie and greenie before and after rubber dam removal (Figures 33 and 34). Composite interproximal finishing strips were used to clean the margins at the mesial and distal (Figure 35).

Due to the excellent soft tissue retraction of the rubber dam, the margins were easily visible and were able to be assessed with magnification to ensure a smooth transition from ceramic to tooth (Figure 36).

A fixed-wire retainer was then placed on the palatal surfaces of the upper teeth using flowable composite and normal etch and bond protocol.

After rubber dam removal, all occlusal and excursive movement were recreated and the restorations assessed for any interferences.

#### Discussion

Both the patient and clinician were very satisfied with the final result. The crowding has been eliminated and th indirect feldspathic veneers on both lateral teeth blend seamlessly with the natural teeth and are almost undetectable.

Regular review and six-monthly top-up tooth whitening will ensure the colour-blend and lustre of these teeth is maintained.

On such a young patient a minimally invasive approach is always followed where possible and we ensure that full consent is gained with absolute understanding of the proposed treatment options.

By following a protocol of aligning first and then home tooth whitening, we can sometimes reach the patient expectations without further intervention. This is the best scenario as we have achieved the patient desired goals without having to touch a tooth with a drill.

When the patient desires further intervention, it is advantageous to be able to show them the step-by-step photographic process of each of the type of treatments, be it



Figure 37: Full face

composite veneers or minimal preparation ceramic veneers. Taking the time to properly document and catalogue these cases can be very consuming, but ultimately is a fantastic tool to help educate the better understanding of our patients.

One can feel very confident that patients can fully understand the treatment they are having and there are no surprises along the way by approaching the planning of every case in this manner.

During treatment planning, it is important to manage patients' cosmetic expectations. By doing this sooner than later, it can save the patient from more costs and often more destructive procedures.

Cosmetic orthodontic solutions are an invaluable tool in our armamentarium to align patients' front teeth in a predictable and minimally invasive manner that can achieve drastic smile transformations with very little risk to the health of the patient's teeth.

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Figure 38: Frontal smile view



Figure 39: Right lateral smile view



Figure 40: Left lateral smile view



Figure 41: Frontal retracted view, teeth in occlusion



Figure 42: Right lateral retracted view



Figure 43: Left lateral retracted view



Figure 44: Frontal retracted view, teeth slightly parted



Figure 45: Right lateral retracted view



Figure 46: Left lateral retracted view



Figure 47: Anterior close-up view 1:1.5



Figure 48: Right lateral close-up view 1:1.5



Figure 49: Left lateral close-up view 1:1.5

### References

Angle EH (1899) Classification of malocclusion. Dental Cosmos 4: 248-264

Joiner A (2006) The bleaching of teeth: A review of the literature. J Dent 34: 412-419

EU Council Directive (2011) Council directive 2011/84/ EU. Official Journal of the European Union

Gold SI, Hasselgren G (1992) Peripheral inflammatory root resorption: a review of the literature with case reports. J Clin Periodontol 19(8): 523-534 Rossouw PE, Tortorella A (2003) Enamel reduction procedures in orthodontic treatment. J Can Dent Assoc 69(6): 378-383

Gürel G (2003) The Science and Art of Porcelain Laminate Veneers. Chicago, Illinois, USA: Quintessence Publishing

Walter R, Swift EJ Jr, Boushell LW, Braswell K (2011) Enamel and dentin bond strengths of a new self-etch adhesive system. J Esthet Restor Dent 23(6): 390-396

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Figure 50: Upper Occlusal view



Figure 51: Lower Occlusal view

### CLINICAL

# Minimally invasive veneers with hybrid ceramics

Andreas Kurbad<sup>1</sup>

Aesthetic corrections with veneers should be minimally invasive and limited to the enamel and, despite the thin layer thickness in the mouth, develop a natural play of shade and light. The multichromatic CAD/CAM hybrid ceramic blank VITA Enamic MultiColor (VITA Zahnfabrik) has an integrated shade and translucency gradient with six finely graduated layers. The natural appearance of the tooth can be reconstructed almost at the touch of a button. Characterisation with stains can usually be omitted. The dual ceramic-polymer network structure of the hybrid ceramic allows narrow wall thicknesses of up to 0.2 millimeters, while remaining very edge-stable. These are the best conditions for restoring two upper middle incisors, as shown in this case report.

### The aesthetic challenge

A 45-year-old female patient presented in the office and was dissatisfied with the aesthetic effect of her front teeth. The middle incisors had presumably lost incisal edge contour and length, due to abrasive and erosive processes. In addition, the anterior teeth were clearly discolored.



<sup>1</sup> Dr Andreas Kurbad Private practice focussing on cosmetic dentistry and implantology, Viersen, Germany.

Figure 1: Initial situation: Erosion and abrasion led to a shortened incisor and the loss of the morphology of teeth URI and URI.







Figure 3: With a transparent silicone key and light-curing composite, the mock-up was fabricated intraorally.



Figure 4: The mock-up corresponded to the aesthetic expectations of the patient.

The patient wished to restore a natural appearance to these teeth using minimallyinvasive therapy. For targeted therapy, the situation was scanned with the Cerec Omnicam, and photos were taken. The Smile Designer Pro software simulated the extension of the incisal edge and the recontouring of the morphology. On this basis, a clinical mock-up was created which satisfied all participants.

### CAD/CAM-supported fabrication

The mock-up was scanned intraorally to be included in the virtual design in the CEREC software as a biogeneric copy. Due to the vestibular loss of substance on teeth UR1 and UL 1, the preparation was performed in a very minimally invasive manner with a micro chamfer, applied in the cervical area. The clinical situation was now rescanned so



Figure 5: The minimally invasive preparation during the application of a micro chamfer in the cervical area.



Figure 6: The clinical situation was scanned with the Cerec Omnicam.

### KURBAD





Figure 8: With the Cerec Smile Design Application, the restorations can be evaluated together with the lips.

Figure 7: The design of the hybrid ceramic veneer in the Cerec software.

that the virtual construction of the veneers and their CAD/ CAM-based fabrication could take place. When working with rotating diamond tools, the focus was mainly on the surface texture. Finally, the veneers were polished to a high gloss and were incorporated in the same session.

### Seating and final results

After clinical try-in, the two restorations were fully adhesively incorporated. The dominant feldspar ceramic network (86 wt%) of the hybrid ceramic veneer was etched in a proven manner with hydrofluoric acid and



Figure 9: The sheer veneers made of VITA Enamic MultiColor immediately after grinding out.



Figure 11: A simple high-gloss polish was enough to finish the restorations.



Figure 10: The incorporation of texture and morphology with the rotating diamond tool.



Figure 12: The finished veneers just before the clinical try-in.



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Figure 13: Conditioning with hydrofluoric acid creates a microretentive surface.



Figure 14: A light-curing one-component adhesive was applied to the tooth surfaces.



Figure 15: Both veneers integrated completely and naturally into the aesthetic zone.



Figure 16: Result: The curve of the incisal edges harmonised with the curve of the lips.

then silanised. The conditioning of the enamel was carried out with phosphoric acid and a light-curing singlecomponent adhesive. After incorporation with a shadematched composite cement, the hybrid ceramic veneers fit harmoniously into the aesthetic zone. Thanks to the rapid production without any crystallisation or sintering firing and the integrated shade gradient, the two central incisors could be efficiently and aesthetically restored. The patient was highly satisfied with the minimally invasive and fast result.

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### CPD QUESTIONNAIRE 9.4.1

### Article: Minimally invasive endodontics using a new single-file rotary system. Van der Vyver et al, page 6

- 1. Peri cervical dentine refers to the following:
- a 6mm coronal to the crestal bone and 4mm apical to the crestal bone
- b 3mm coronal to the crestal bone and 6mm apical to the crestal bone
- c 4mm coronal to the crestal bone and 6mm apical to the crestal bone
- d 6mm coronal to the crestal bone and 2mm apical to the crestal bone

#### 2. The most common reason(s) for the loss of teeth are:

- a Large carious lesions
- b Unrestorable teeth
- c Tooth fracture
- d Endodontically related disease
- e All of the above
- 3. True or False:

Fracture following endodontic treatment is largely due to dehydration resulting from a root canal treatment

- a True
- b False
- 4. True or False:

Fracture following endodontic treatment is largely due to structural loss after root canal treatment

- a True b False
- TruNatomy (Dentsply Sirona) has which of the following unique design features:
- a Decreased flexibility resulting from enhanced heat treated metal alloy
- b The instrument has increased memory compared to NiTi and M-Wire instruments
- c An increased handle length for easier access into the canal
- d A regressive taper coronally, allowing each instrument a maximum flute diameter of 0.8mm

#### Article: Minimally invasive endodontics using a new single-file rotary system. Van der Vyver et al, page 6

- 6) The TruNatomy consists of the following instruments:
- a Orifice Modifier b Glider
- c Prime, Medium and Small shaping files
- d All of the above
- 7. Compared to the ProTaper SX file the TruNatomy Orifice Modifier has the following advantage(s):
- a A smaller coronal maximum flute diameter
- b An increased handle length
- c Longer active cutting flutes d None of the above
- When selecting the correct Prime TruNatomy file (26/04) for shaping canals the following guideline should be followed:
- a The Prime instrument should be used in selected cases only
- b A glide path have been negotiated using size 10 and 15 K-Files
- c Canals in which a size 20 K-File fits loose and no further glide path is needed
- d In large, straight canals
- When selecting the correct Medium TruNatomy file (36/03) for shaping canals the following guideline should be followed:
- a The Medium instrument should be used in most cases
- b In cases where a size 10 and 15 size K-File was required to prepare a glide path
- c Canals in which an ISI size 20 or 25 K-File fits loose and no further glide path is needed
- d In narrow, curved canals

#### When selecting the correct Small TruNatomy file (20/04) for shaping canals the following guideline should be followed:

- a In cases where the Prime file does not progress apically
- b The Small instrument should be used in most cases
- c Canals in which an ISI size 20 or 25 K-File fits loose and no further glide path is needed
- d In large, straight canals



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## Article: Direct cusp replacement in the molar region using a thermoviscous bulk-fill composite restorative material – a clinical case report. Manhart, page 22

- 11. The use of what is one of the major advantages and key elements when restoring severely damaged teeth with cuspal involvement.
- a Direct composites indirect onlays
- b Partial crowns
- c Indirect onlays
- 12. According to the author, bulk-fill composite materials in both viscosity versions allow a single layer thickness of:
- a 2-3 mm due to optimized depth of cure.
- b 4-5 mm due to optimized depth of cure.
- c 5-6 mm due to optimized depth of cure.
- 13. The material described in the paper shows a high mechanical stability, with a flexural strength of:
- a 134 MPa
- b 164 MPa
- c 193.6 MPa
- d 263 MPa

#### 14. Which statement is correct?

- a The new universal adhesives are insensitive to phosphoric acid etching of dentin
- b The new universal adhesives are sensitive to phosphoric acid etching of dentin
- 5. Which statement is correct? The results of a comprehensive review have shown that:
- a The annual failure rates of direct posterior composite restorations are statistically different to amalgam restorations
- b The annual failure rates of direct posterior composite restorations are not statistically different to amalgam restorations.

### Article: Glass ionomers: the material of choice in paediatric dentistry? Trentesaux et al, page 76

#### 16. Which statement is correct: In 2012

- a 17% of restorations were made from composites in comparison with 56% from glass ionomers
- b 40% of restorations were made from composites in comparison with 25% from glass ionomers
- c 56% of restorations were made from composites in comparison with 17% from glass ionomers

#### 17. What, according to the authors, is one of the main benefits of GIs?

- a They are today presented in a capsule, which saves time
- b Their natural adhesion to dental tissues
- c They are an excellent alternative to amalgam.
- The use of a conditioner is recommended for treating the tooth surface for which reasons:
- a Elimination of the smear layer b Reduction surface tension
- c Partial demineralisation of the dentinal tubules
- d None of the above e All of the above

### 19. The reason for many failures stemming from the use of GIs include:

- a Poorly adapted preparation b A poor choice of matrix
- c Non-compliance with the working time
- d All of the above e None of the above

### 20. Which statement is correct? In the case described, the sealant was placed using:

- a A syringe
- b The press finger technique



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Melanie Savvides has worked in the Dental Industry for the last 32 years and was the MD of one of the largest Dental supply companies in South Africa. She has travelled around the world through dentistry, attending numerous courses, workshops and events.

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