Direct Composite Restorations

Expert insights into direct composite procedures

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Mastering Direct Composite Restorations:
A practical guide by the GC Restorative Advisory Board

Direct composite restorations are a cornerstone of modern dentistry, performed daily by professionals across the globe. As one of the foundational techniques in operative dentistry, it is among the first skills that dental students are taught. While the overall incidence of coronal caries has declined in recent years, numerous indications still call for direct composite restorations—ranging from the replacement of aged restorations to the management of traumatic dental injuries and aesthetic enhancements.

Executing a successful restoration demands more than basic technical know-how. A meticulous dentist, focused on precision, faces numerous challenges: achieving proper isolation, especially in deep cavities; selecting and placing the right matrix; shade matching; forming proper proximal contacts; reproducing natural aesthetics; and executing a flawless finish. Each step requires attention, patience, and finesse.

Though common in daily practice, direct composite restorations are far from routine. Behind their seemingly repetitive nature lies a subtle art – one that blends biology, mechanics, anatomy, material science, and, importantly, practice. Mastery stems from this fusion of science and creativity.

To support this journey, the **GC Restorative Advisory Board** offers this comprehensive guide. Established in 2010 in Leuven, Belgium, the board comprises renowned dental professionals from across Europe and the Middle East. United by a shared mission to advance restorative dentistry, the board convenes annually to explore trends, exchange ideas, and shape the future of dental materials.

Throughout the years, this collaboration has led to substantial innovation – most notably, the development of **Essentia**, a revolutionary composite system that redefined shade selection and set a new benchmark in the field.

At the heart of this guide is a philosophy that clinical excellence should be achievable through simplicity. The cases, insights, and tips gathered here represent the combined experience of the board's members – each offering practical wisdom distilled from years of hands-on clinical work. From step-by-step protocols to subtle refinements, this guide is designed to help you elevate your composite restorations, delivering consistently high-quality outcomes for your patients.

Join GC and the GC Restorative Advisory Board, in mastering the craft of direct composite restorations – with confidence, clarity, and care.

With appreciation,

Restorative Advisory Board

GC Composite Portfolio

Gradia Direct
Gradia Direct marked a significant advancement in offering a high level of aesthetics and durability with cost efficiency in mind

Essentia
A paradigm shift in restorative dentistry finally making layering simple but outstandingly beautiful.

everX Flow
The innovative fibre reinforced flowable composite opened a new world of possibilities bridging the gap between direct and indirect restorations due to its fracture resistance.

2002

2010

2015

2018

2019

2021

G-ænial
G-aenial composites are known for their ease of use, aesthetic qualities, and versatility, suitable for a wide range of restorative procedures. Offering a large shade range and long working time, layering options are endless with this material.

G-ænial universal injectable
This redefined restorative dentistry by proving that an injectable composite could deliver the strength, and beauty once reserved for paste materials, empowering dentists to work more efficiently.

G-ænial A'CHORD
G-ænial A'CHORD enables simplified layering or single shade posterior restorations. Beautiful chameleonic effect, natural fluorescence and superb polishability make this material worth celebrating

Research and Development

GC's composite portfolio is supported by continuous research and development efforts. GC has invested significantly in innovation to improve the properties of its composites. Collaborations with dental professionals such as the GC Restorative Advisory Board, institutions and universities have also played a crucial role in advancing the product offerings.

GC R&D center, Japan

Workflow

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Shade selection

Achieving a seamless, esthetic outcome in composite restorations hinges on precise shade selection. Despite advancements in composite materials, shade selection remains a skill requiring careful attention to detail and a systematic approach.

The Science of Shade Matching

Shade selection is both an art and a science, guided by the principles of colour perception:

Hue: The basic colour of the tooth (e.g., A,B,C, D in the Vita shade guide).

Chroma: The intensity or saturation of the colour. (e.g., A1, A2, A3).

Value: The brightness or lightness of the shade.

For anterior restorations, translucency and opalescence also play significant roles in mimicking natural tooth structure.

Practical Considerations for Shade Selection

1. Lighting Conditions

Use a dental operatory light that mimics natural daylight, ideally in the 5500 Kelvin range. Alternatively, select the shade in natural light when possible. Avoid fluorescent or yellow-tinted lighting, which distorts colour perception.

2. Timing

Perform shade selection before isolating the tooth. Dehydrated teeth appear lighter and less translucent, which can lead to incorrect shade matching.

3. Patient Factors

Remove any brightly coloured makeup or lip stains, as they can affect the perception of shade. Use a neutral background such as a grey bib during the process to avoid external colour interference.

The Button Technique: A Superior Method

The **button technique** is a reliable, clinical method for shade selection that incorporates direct visual and functional evaluation. It ensures accuracy by replicating the exact material, translucency, and thickness to be used in the restoration.

Step-by-Step Process:

Preselect 2–3 shades using a guide. Place unbonded composite „buttons" on the tooth and light-cure them. Evaluate under natural light, then remove the cured samples without altering the surface.

Advantages of the Button Technique

Material-Specific Accuracy: By testing the actual composite, this method accounts for any variations in shade between the guide and the final product.

Time Efficiency: While it requires an additional step, the technique prevents mismatches and the need for subsequent corrections.

Enhanced Patient Communication: Patients can visualize and approve the final shade, increasing satisfaction and trust.

Additional Tips for Optimal Results

Layering Techniques: Match both dentin and enamel shades separately. For example, a translucent enamel shade can overlay an opaque dentin base to replicate natural esthetics.

Polarized Filters: Use a polarized filter to reduce glare and enhance contrast during evaluation.

Documentation: Photograph the shade-matching process to ensure consistency, especially for cases requiring multiple appointments.

基本

Fundamentals

Master your rubber dam isolation

by Dr Celine Higton

Dr Higton studied dentistry at King's College London, graduating in 2016 with honours. She is a keen advocate for the use of minimally invasive and adhesive approaches to restorative dentistry and has become a leading educator in this field, especially on the topics of rubber dam isolation and direct composites. In 2023 she was invited to become a member of Bio-Emulation, a group that champions these minimally invasive techniques and that truly aligns with her "raison d'être" in dentistry. In January 2025 she joined the full-time faculty of the University of Pennsylvania as the new director of restorative dentistry. This position has given her the opportunity to apply her zeal for education to the very first stages of dental training. From a post graduate perspective, she has lectured for organisations such as the AARD, the Seattle Study Club, the AACD, the BACD, the ITI and the BDA and has also developed and delivered numerous sell out hands-on courses and virtual webinars both in the UK and internationally. She is passionate about the provision of top-quality dentistry and through the delivery of her post graduate education programmes and her educational role at the University of Pennsylvania she strives to inspire both the dentists of today and of tomorrow to love what they do and to be the very best clinicians that they can possibly be.

Introduction

Achieving quality isolation with rubber dam is a critical first step in direct composite restorations and indeed all adhesive dental procedures. It provides an ideal working environment that directly and positively impacts the quality, longevity, and success of the restoration. Effective isolation with a rubber dam **prevents contamination** from saliva, blood, and moisture, which can interfere with the bonding process and compromise the strength and durability of the composite material. In addition to maintaining a dry field, rubber dam isolation **enhances visibility and access**, allowing for more precise placement and manipulation of the composite resin. Using a rubber dam also protects the patient by **preventing harmful debris**, instruments or chemicals from being aspirated or swallowed, ensuring a safer and more comfortable treatment experience. For the clinician, **it facilitates improved focus and control**, reducing the risk of errors and enabling meticulous work on even the most challenging restorations. Ultimately, rubber dam isolation is **essential for achieving optimal adhesion**, reducing the risk of postoperative sensitivity, and promoting long-term success in direct composite restorations.

1 Equipment

Good quality equipment is essential for effective rubber dam placement.

- Dam that does not tear.
- Forceps that smoothly open the clamp and disengage when needed.
- A frame that adequately grips the dam (the smaller, the better).
- A multi hole punch (5 hole ideal).
- Different floss for different jobs.
- A variety of mouth props…

2 Hole spacing

- Proper hole placement is crucial:
  => too close, the dam won't seal;
  => too far, excess material gathers between teeth.
- A guide ensures accurate and consistent placement.
  A transparent one allows for easy repositioning of holes in cases with crowded teeth.

3 Hole size

- A multi hole punch is essential as correct hole size is critical. If the hole is too big, the dam will not seal. If the hole is too small, the dam is likely to tear.
- This image is just a guide, the holes may still need to be larger/smaller depending on tooth size/shape and type of dam used.

4 Clamp shape

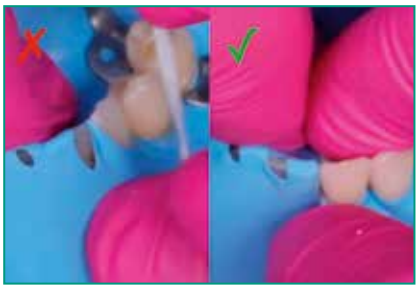
- The clamp must be the correct shape to fit the anchor tooth. Square tooth – square clamp. Asymmetric tooth – asymmetric clamp.
- Aim for 3–4 point contact with a wide tip spread.
  It should avoid the embrasure and papilla.
- A stable clamp engages the tooth's undercut, usually near the CEJ. For subgingival undercuts, downward-facing tips (e.g. W8a) are needed for proper grip.

5 Anchor clamp

- The dam is most often stabilised with an anchor clamp–test it on the anchor tooth for fit and stability. Place it behind the working tooth when possible.
- Quadrant isolation with multiple teeth exposed is the gold standard, ideally isolate from the anchor tooth to the mesial of the ipsilateral canine.

6 Stabilising the dam

- Anchor clamps aren't always needed—ligatures, wedges, or even the dam alone can stabilize it.
- If well flossed and inverted at a good contact point, the dam holds (less reliable on 1st–3rd molars due to tension).
- Ideal for premolar-to-premolar isolation.



7 Flossing the contacts

- To avoid tearing, don't pull the dam straight across the contact—it creates a doubled 'V' shape. this creates 2 thicknesses of dam between the teeth when flossed and leads to tearing.
- Instead, push the dam distally so only one thickness passes through. Ensure to always use waxed floss so it can grip the dam and pull it down.

TIP! Lubricating the underside makes dam placement MUCH easier.

8 Inverting the dam

- Once contacts are flossed, begin inverting the dam interproximally with floss.
- Air dry during inversion to help it stay in place.
- Then use a sickle probe to invert buccal and lingual/palatal surfaces; with the tip of the probe touching the tooth, drag it along the surface, guiding the dam into position. Always drag, never poke into the sulcus.

9 Retracting with ligature

- When working in the cervical third, the dam must be retracted. This can be done with a ligature.
- The ligature should use the double knotted, self tightening technique so it can be secured by pulling on both strands with just one hand.
- The other hand can then use an instrument to guide the ligature into place. It must be tight and buried in the sulcus (except for the knot).

TIP! Secure excess floss to the closest frame corner for added tension.

10 Retracting with clamp & PTFE

- Clamps, like B4 Brinkers, can help retract the dam and soft tissues. PTFE may also be needed for better access.

TIP! Always test that an accessory clamp/ligature can be placed BEFORE placing the rubber dam. It is painful to discover neither can be placed once time has been spent placing the rubber dam.

Selecting the ideal matrix system in restorative dentistry

by Prof. Joseph Sabbagh

Prof. Sabbagh obtained his master's degree in restorative dentistry and his PhD in biomaterials from the Université catholique de Louvain in Belgium. He is Professor, and former head of department and director of master program of restorative dentistry and Endodontics in the Lebanese University and practises in Brussels and Beirut. Prof. Sabbagh is active in clinical and in vitro research, having a particular interest in biomaterials, aesthetic dentistry and endodontics, and has had over 25 scientific papers published in indexed journals. He is a member of various associations and boards.

Introduction

The selection of a matrix band and its proper placement, play an essential role in the success and the longevity of composite restorations.

An ideal matrix system should be **easily inserted and removed**, be sufficiently **rigid to maintain** the contours of the tooth and provide shape to the restoration. Additionally, it should not adhere or react with restorative material and resist the condensation pressure.

The main concern for dentists when placing a direct interproximal posterior composite restoration is to achieve a successful contact point, avoiding food impaction, recurrent caries and periodontal problems [1].

Fig. 1

Fig. 2

Fig. 3

Fig. 4

Different types and sizes of metal (Figure 1) and translucent (Figure 2) matrices are available. They present either in a roll or in bands which are cut to the required size (Figure 1-2), or precut pieces ready for use. Those can come in various shapes such as a sectional matrix (Figure 3) or full matrix, flat or contoured (Figure 4), also called anatomical matrices. They can be self-retained or mechanically retained and are stabilized by a wooden or plastic wedge. A matrix is characterized by its width that varies between 5-10 mm and its thickness between 0.030-0.075mm.

Fig. 5

Fig. 6

The cavity location, size, and depth will dictate the selection of the matrix to be placed. Many studies have shown that the use of sectional matrices with a metal separator (Palodent Plus from Dentsply, or myQuickmat Forte from Polydentia) will ensure an adequate and successful contact point (Figure 5 & 6) [2-4].

(1)-Boksman L. 2010. Matrix systems and the Class II composite resin. Oral Health Journal. Nov -10000395064.
(2)-Loomans B. Comparison of Proximal Contacts of Class II Resin Composite Restorations In Vitro Operative Dentistry 2006 ; 31-6 :688-693.
(3)-Kampouropoulos D, Paximada C, Loukidis M, Kakaboura A. The influence of matrix type on the proximal contact in Class II resin composite restorations. Operative Dentistry. 2010 ;35(4):454-62
(4)-Sekundo C, Frese C, Frankenberger R et al., Direct composite restoration on permanent teeth in Anterior and Posterior region: Recommendations for composite processing. J Adhes Dent. 2024 ; 17(26) 201-212.

Fig. 7

Wedges

The most important function of the wedge is to prevent overhang by providing a firm contact between the matrix and the gingival margin of the preparation. Carefully pick the size and shape of your wedge to be placed in the embrasure space.

Overpressure of a large wedge may cause an indentation in the restoration. A wooden wedge can be compressed with a forceps or pincer or can be modified with a scalpel. Elastic wedges can easily adapt to the contours of the teeth and the interdental space.

Plastic wedges are usually anatomically shaped to provide the pressure in the right location.

Fig. 8

Metal matrices

Metal matrices are frequently utilized due to their sturdiness, which aids in the packing and adaptation of the composite. Additionally, metal can be burnished, allowing for shape alteration using another metal instrument, such as to impart controlled curvature.

Fig. 9

Some matrix systems are pre-mounted and ready to use like the Supermate or Metafix (KerrHawe) (Figure 7 & 8). When the cavity extends more than 2/3 of the bucco-lingual or palatal width of the tooth or shows extensive tooth damage then a matrix holder or a pre mounted matrix system must be used.

Translucent matrices

Translucent matrices are usually used for the restoration of anterior teeth. Blue translucent matrix are also available. Compared to the clear one, they are much easier to see and position (Figure 9). Translucent cervical matrices, available in different sizes, can also be very useful when restoring a cervical lesion (Figure 10).

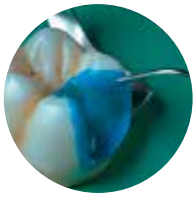
Fig. 10

The benefits of a transparent matrices include the ability to polymerize with light through the matrix and the visual control it provides over the composite inside.

Bonding done right

In direct composite restorations, the **quality** of your bond is very important, it plays a significant role in both the strength and longevity of the restoration. Universal adhesives like G-Premio Bond simplify the bonding protocol without compromising performance. This guide covers how to optimise your bonding protocol for direct composites, ensuring predictable results, minimal sensitivity, and long-term success.

Etching Techniques



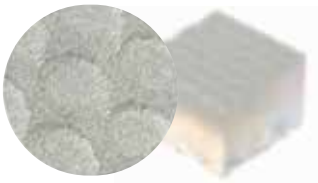
Total etch
enamel (10-15 sec)
& dentin (15 sec)

Selective etch
only enamel phosphoric
acid etch (10-15 sec)

Self etch
no phosphoric acid
on enamel or dentin

Etched enamel

Phosphoric acid will dissolve the superficial aprismatic enamel, exposing the surface of the enamel rods.



surface of enamel
after etching

Etched dentin

Dry dentin
collapsed
collagen fibres

Hydrated dentin
expanded
collagen fibres

surface of the dentin
after etching

Dried out dentin:

- Collagen fibre collapse
- Lack of bonding infiltration
- Post-op sensitivity, hydrolysis & degradation of exposed collagen

Hydrated dentin:

- Collagen fibres are expanded and can be infiltrated properly by the bonding agent

Smear layer

To increase bonding infiltration one must handle the smear layer (debris) caused during the preparation. It can either be removed or modified. By etching the dentin (in total etch) the smear layer is removed. However, to avoid issues related to the etching of the dentin, one might prefer to use the adhesive on the selective etching mode where only the enamel is etched. In this case the adhesive will modify and infiltrate the smear layer at the same time. If desired the smear layer can be also modified by air abrasion before the adhesive application.

GC's expertise in bonding

Both GC's Universal Bonding Systems

- Offer **high bond strength** – for a strong bonding both to tooth & restorations in case of repair
- Contain unique combination of three functional monomers (4-MET, MDP, MDTP), allowing top performance in all situations
- Are **HEMA free** – for higher durability & lower water sorption
- Have an **ergonomic** design – for easy use
- Deliver **precise dispensing** – with a high number of drops per bottle
- **Can be used in all etching modes**: total etch, selective etch and self etch with virtually no post-operative sensitivity
- **Multiple indications: direct restorations, hypersensitivity, repair, indirect restorations, etc.**

G-Premio BOND
One-step
one bottle
adhesive system

G2-Bond Universal
Two-step
two bottle
adhesive system
(primer and bond)

Check out this
Step by Step
if you prefer
a single bottle system

Check out this
Step by Step
if you prefer
a two-step bottle system

技工

Handcraft

Reshaping the anatomy of anterior teeth with direct composites

by Dr Anthony Mak

Dr Mak is a highly skilled dental surgeon and practitioner specializing in dental implants, cosmetic, and restorative dentistry. With years of experience in Sydney's leading dental practices, he now leads „W Dental," a state-of-the-art clinic in Woollahra.

A graduate of Sydney Boys High School and the University of Sydney, Dr Mak's commitment to excellence earned him multiple accolades, including the Rudolf Gunz University Medal and several distinguished prizes for academic and clinical achievements. Dr Mak has completed extensive postgraduate training, including a diploma in Oral Implants, and has travelled internationally to refine his expertise in implants, orthodontics, and cosmetic dentistry. He is a member of esteemed organizations such as the Australian Dental Association and the American Academy of Cosmetic Dentistry.

His comprehensive knowledge allows him to manage both general and complex dental cases with precision. Dr Mak raises dental health awareness through school visits, aged-care programs, and local events, ensuring his patients and community benefit from improved dental education and care.

Introduction

Reshaping the anatomy of anterior teeth with direct composites is a transformative, **minimally invasive technique** that addresses both aesthetic and functional concerns. This approach is particularly valuable for closing diastemas and enhancing the smile after orthodontic treatment, where many patients remain dissatisfied with the final shape, size, or proportions of their teeth despite proper alignment. Using modern adhesive systems and a **variety of innovative matrices**, dentists can sculpt direct composites to precisely mimic the natural anatomy, texture, and translucency of teeth. These advancements allow for **seamless integration** and customized results, **giving patients the confidence** of a balanced, harmonious smile.

1 Initial view

A young patient has undergone orthodontic alignment of the dentition.

2 After removal of orthodontic appliance

After removal of the orthodontic appliance and polishing of the teeth, there are residual diastemas present at the distal of both upper lateral incisors. Lateral incisors are slightly conical in shape and are not harmonious with the centrals.

To achieve an aesthetic improvement of the smile, the diastemas will be closed, and the laterals reshaped.

3 Scanning of upper jaw & digital wax-up

Due to the patient's young age a direct approach is preferable. The upper jaw is scanned with an intraoral scanner and a digital wax-up is created. The model with the wax-up is printed and used for the creation of a silicone key, that will serve as a guide in creating the palatal shells.

4 Isolation of upper teeth

The upper teeth are isolated using rubber dam and the silicone key is fitted to the palatal side of the upper anterior region.

TIP! Ensure the stability of the silicone key by including at least one tooth to the distal on both sides of the teeth being restored.

5 Creation of palatal shell

The palatal shell of the tooth 22 is created.

TIP! Create the palatal shell by applying a thin layer of composite directly onto the silicon key and then fit the silicon key to the teeth. Double-check the correct position of the silicone key before light-curing.

6 Restoration of buccal and incisal parts

The buccal and incisal parts of the tooth 22 are restored with direct application of G-ænial A'CHORD.

7 Staining

Some staining was placed to mimic the natural neighbouring teeth characteristics.

8 Clinical situation after restoration

The clinical situation after the restoration of the laterals. The polishing was done using the polishing protocol for anterior composite restorations.

TIP! Refer to chapter "Finishing and polishing protocol of anterior composite restorations" for the detailed polishing protocol of anterior composite restorations.

9 The patient's smile after the removal of the rubber dam and rehydration of the teeth. The restorations on the laterals are inconspicuous. The smile harmony is improved.

Restorative composite of choice: G-ænial A'CHORD

Anterior wear management with direct approach

by Prof. Marleen Peumans

Prof. Peumans obtained her degree in Dentistry in 1987 at the Catholic University of Leuven. Thereafter, she followed a 4-year post-graduate program at the Department of Operative Dentistry. She applied herself, especially to the clinical use and the performance of anterior and posterior resin composites, bonded ceramic restorations, fibre-reinforced composite restorations, and bleaching. She took part in numerous clinical studies concerning dentine adhesives, posterior composites, and ceramic veneers/inlays/onlays. In 1997 she obtained the degree of Doctor in Medical Sciences. From 2004 she became Professor at the Catholic University of Leuven.

She has several national and international publications on her name concerning clinical performance of adhesive restorations and bleaching. She is a member of the Bio-Emulation team and the GC Restorative Advisory Board.

Introduction

Generalized tooth wear, caused by factors such as attrition, erosion, and abrasion, can lead to compromised esthetics, function, and patient comfort. Managing this condition requires a balance between restoring the lost structure and preventing further damage. Direct composite restorations provide a **minimally invasive, cost-effective, and esthetically pleasing solution.** With advancements in composite materials and techniques, this approach allows for predictable results, preserving tooth structure while addressing both **functional and cosmetic concerns.**

1 Initial view

A 42-year-old female patient is referred by her dentist because of the presence of broken incisal edges of her upper anterior teeth. The patient asks to improve her smile. The intra-oral pictures show signs of generalized severe tooth wear. The main reason for tooth wear is attrition due to bruxism. The patient is aware of her bruxing behaviour and has worn a night guard for several years. In the lower jaw, one central incisor is missing due to agenesis.

2 Digital impressions

Digital upper and lower jaw impressions are taken.
The bite registration is done in a so-called centric relation.

3 Bite registration

The bite registration is done in a deprogrammed passively retruded position (the so-called centric relation) using an anterior jig made out of composite.
With this composite jig, the bite is opened to the new vertical dimension of occlusion. The final vertical dimension of occlusion is determined by the space required to restore the worn teeth.

4 Mock-up

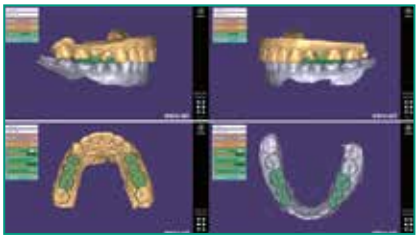
Then a mock up is made using a hard silicone key made on the 3D printed model and a temporary resin (TEMPSMART DC). This gives the dentist and the patient an idea of the new length of the anterior teeth, the incisal line, and the vertical dimension of occlusion.

5 Restoration upper teeth

Composite build-up of the upper anterior teeth was done using a palato-incisal silicone key and the layering technique (Essentia MD and DE)

6 Result after finishing and polishing

Result after finishing and polishing the restored upper and lower anterior teeth.



Materials of choice:
Essentia & EXACLEAR

7 After build-up

After building up anterior teeth with composite, the new vertical dimension of occlusion is fixed. The patient has now only contact on the anterior teeth. Digital scan of the upper and lower jaw is done in the newly determined vertical dimension of occlusion. It is important to have a good delineation between occlusal marginal ridges of the different premolars and molars.
The time between building up the anterior teeth and the posterior teeth may not be more than 2 weeks to avoid the posterior teeth erupting in this period.

8 Silicone keys and 3D printed model

3D-printed models with wax-up of premolars and molars except for the second upper and lower molars. These latter teeth will function (in combination with the restored canines) as reference points to reposition the transparent silicone key. The reference points on the model and in the mouth must be the same.

9 Press technique

A hard silicone key is created and relined with clear silicone (EXACLEAR). These keys will be used to transfer the situation of the 3D-printed model into the mouth of the patient.
In a first step, teeth 24 and 26 are restored. In a second step, the composite build-up of the 25 takes place.
This protocol is repeated until the key is in complete position.
The composite is light-cured from occlusal throughout the EXACLEAR for 40 seconds on each tooth and additional 20 seconds after the removal of the silicone key.

10 After finishing and polishing

The process is repeated for all other teeth in all quadrants.
Finishing and polishing takes place under standard protocol.

11 Final result

Final result with a nice incisal line. Follow up shows a good performance in clinical function.

Class IV restorations and fractures in the anterior segment

by Assoc. Prof. Bora Korkut

Dr. Korkut graduated from Marmara University, Faculty of Dentistry in 2008. He had the ‚Ph.D.' title in Conservative Dentistry and ‚Specialist' title in Restorative Dentistry fields in 2015. He has been working as an academic member as an Associate Professor at Marmara University, Dentistry Faculty, Department of Restorative Dentistry.

He has many international and national researches and publications about direct aesthetic restorations, tooth wear, tooth bleaching, CAD/CAM restorations, dental magnification, and early diagnosis of caries lesions. He has given many international and national lectures and courses about 'Direct Anterior and Posterior Aesthetic Restorations, ‚CAD/CAM restorations', 'Pre-restorative Approaches', 'Dental Photography' and 'Tooth Bleaching' since 2012.

Dr. Korkut is the author of the 'Esthetic Anterior Composite Restorations' book published by Quintessence Publishing Deutschland in 2025. It was translated in Turkish, Portuguese, and Chinese. He is a member of the Bio-Emulation Group and ‚GC Europe Restorative Advisory Board'.

Introduction

Class IV restorations, which involve the repair of fractures or decay in the anterior teeth, are some of the most challenging restorative procedures in dentistry. Since these restorations are visible when a person smiles, aesthetics play a crucial role alongside function. A successful Class IV restoration must **seamlessly integrate with the patient's natural dentition, replicating not only the tooth's colour but also its translucency, texture, and light-reflective properties.** This level of esthetic integration is essential for patient satisfaction and confidence, as anterior restorations are immediately noticeable. In addition to esthetics, the restorative material must provide strength and durability. Anterior teeth are subjected to **significant biting forces**, especially on the incisal edges. Composite resins, which can be applied in layers, allow the dentist to replicate the tooth's natural layers of enamel and dentin, achieving a blend of strength and beauty. Through **careful layering and shaping**, clinicians can create lifelike restorations that are not only durable but also indistinguishable from the patient's natural teeth. This combination of **esthetics and strength makes composites an ideal choice** for Class IV restorations in the anterior segment, where both appearance and functionality are paramount.

1 Initial view

Initial view of an old crown fracture restoration.

2 Shade selection

Composite shade selection with cross-polarization filter photography technique (G-ænial A'CHORD AO2, A1 and JE shades are selected).

3 Restoration preparation

Removal of old composite restorations and 45° of bevelling on the fracture line. Split-dam was preferred as the restoration was not directly related to the gingiva.
Then the adhesive protocol was applied by selective enamel etching and bonding agent application (G-Premio Bond).

4 Split-dam isolation

Split dam isolation followed by using a silicone index shell as base for the build-up of the palatal shell using G-aenial A'CHORD JE.
The shell was produced on the index as a thin layer using the GC Composite Brush and GC Modeling Liquid, transferred into the mouth, and cured with the D-Light Pro.

5 Placement of metal matrix band

Inter-dental placement of the pre-contoured metal matrix band and producing the interproximal wall using the G-ænial A'CHORD A1 shade. Then curing with the D-Light Pro.

6 Shaping mamelon effects

Placement of the G-ænial A'CHORD AO2 shade at the deepest point of the fracture line to improve the masking ability of the restoration. Then curing with the D-Light Pro.

7 Improve masking ability

Placement of the G-ænial A'CHORD A1 shade above the AO2 shade and shaping the incisal mamelon effects according to the reference tooth (the adjacent central incisor). Then curing with the D-Light Pro.

8 Additive surface layering

Additive surface layering using G-ænial A'CHORD JE shade. Surface morphology was generated using the GC Composite Brush and the GC Modeling Liquid. Then curing with the D-Light Pro.

9 Interdental/labial surface finishing

Interdental surface finishing using GC mid-grit (red-band) metal strip. Labial surface finishing using pre-polisher spiral wheel (DIACOMP® PLUS RA, EVE).

10 Interdental/labial surface polishing

Interdental surface polishing using the Epitex strips. Labial surface polishing using the high-shine polisher spiral wheel (EVE Diacomp Plus) and then the DiaPolisher Paste.

Restorative composite of choice: G-ænial A'CHORD

Perfecting Class V restorations

by Dr Lucile Dahan

Dr Dahan is a private practitioner based in Paris, France, specializing in restorative and prosthetic dentistry. She is a laureate of the Académie Nationale de Chirurgie Dentaire, reflecting her dedication to excellence in dental surgery and patient care. Dr Dahan holds a university diploma in Restorative and Esthetic Dentistry from Marseille, as well as a Master's degree (Master 2) in Materials, with a specialization in Biomaterials. An active member and educator with the „Académie de Dentisterie Adhésive", Dr Dahan is committed to advancing the field of adhesive dentistry and sharing her expertise with other professionals. Her extensive background in both the clinical and material science aspects of dentistry allows her to offer high-quality, innovative care to her patients.

Introduction

Class V restorations target cervical lesions in the gingival third of the buccal or lingual surfaces of teeth, resulting from caries, cervical abrasion, erosion, or abfraction. Restoring these lesions is crucial for reinforcing tooth structure, managing hypersensitivity, and preventing progression.

The challenges in Class V restorations stem from the **need to bond to both enamel and dentin**. Composite resins are the preferred material due to their esthetic qualities and strong adhesion when using modern adhesive systems. Selective etching improves bond durability by enhancing mechanical interlocking with enamel and **forming a stable hybrid layer with dentin**.

Employing incremental layering techniques can reduce polymerization shrinkage and internal stress on bonded interfaces. Overall, successful Class V restorations rely on **meticulous attention to bonding techniques** and material handling, leading to long-term esthetic and functional outcomes tailored to the cervical region.

1 Initial situation

The patient presents with cervical wear lesions on teeth 14 and 15. The absence of clear boundaries between healthy tissue and the lesion, lack of occlusal wear facets, and striations at the lesion's base suggest a mixed origin of erosion and abrasion.

2 Isolation

For good isolation, an alternative techniques involve using a mouth retractor, a Teflon cord slipped into the sulcus, and liquid damming in interdental spaces was used here

3 Preparation

The cervical wear lesion exposes sclerotic dentin, which has a hypermineralized layer that is acid-resistant and hinders quality bonding. To enhance adhesion, mechanically reduce the thickness of this hypermineralized layer using a fine-grain round bur.

4 Bevelling

Creating a long enamel bevel with a coarse flame bur improves the optical transition between the natural tooth structure and the composite resin.

5 Sand-blasting

Sand-blasting with aluminum oxide, whether dry or wet, cleans surfaces and smooths sharp angles, thereby improving adhesion without compromising bond strength.

Rubber dam isolation: the gold standard

When rubber dam isolation can be placed in a correct manner, it's the most effective and practical way to isolate.
It offers the highest level of security in moisture control and it makes the rest of the procedure more comfortable.
When its placement becomes extremely challenging, other methods, as shown in this case, offer a good alternative.

6 Etching enamel

Selective etching with 37% phosphoric acid around the enamel margin of the lesion enhances restoration longevity by reducing bacterial percolation.

7 Adhesive system

Since sclerotic dentin is more mineralized than healthy dentin, it has a higher hydroxyapatite content, making acid etching unnecessary and preserving the hydroxyapatite for stronger bonding. In this case, G-Premio BOND by GC is used. The adhesive is applied by vigorously rubbing a microbrush on the lesion surface for 10 seconds, followed by drying for 10 seconds and light curing for another 10-20 seconds.

8 Restoring Dentin

For older patients with translucent teeth, a warm shade with low opacity, like A3.5 from the G-ænial Anterior range, is ideal. The everX Dentine can also be used when the patient presents with a mid-opacity A2 shade.

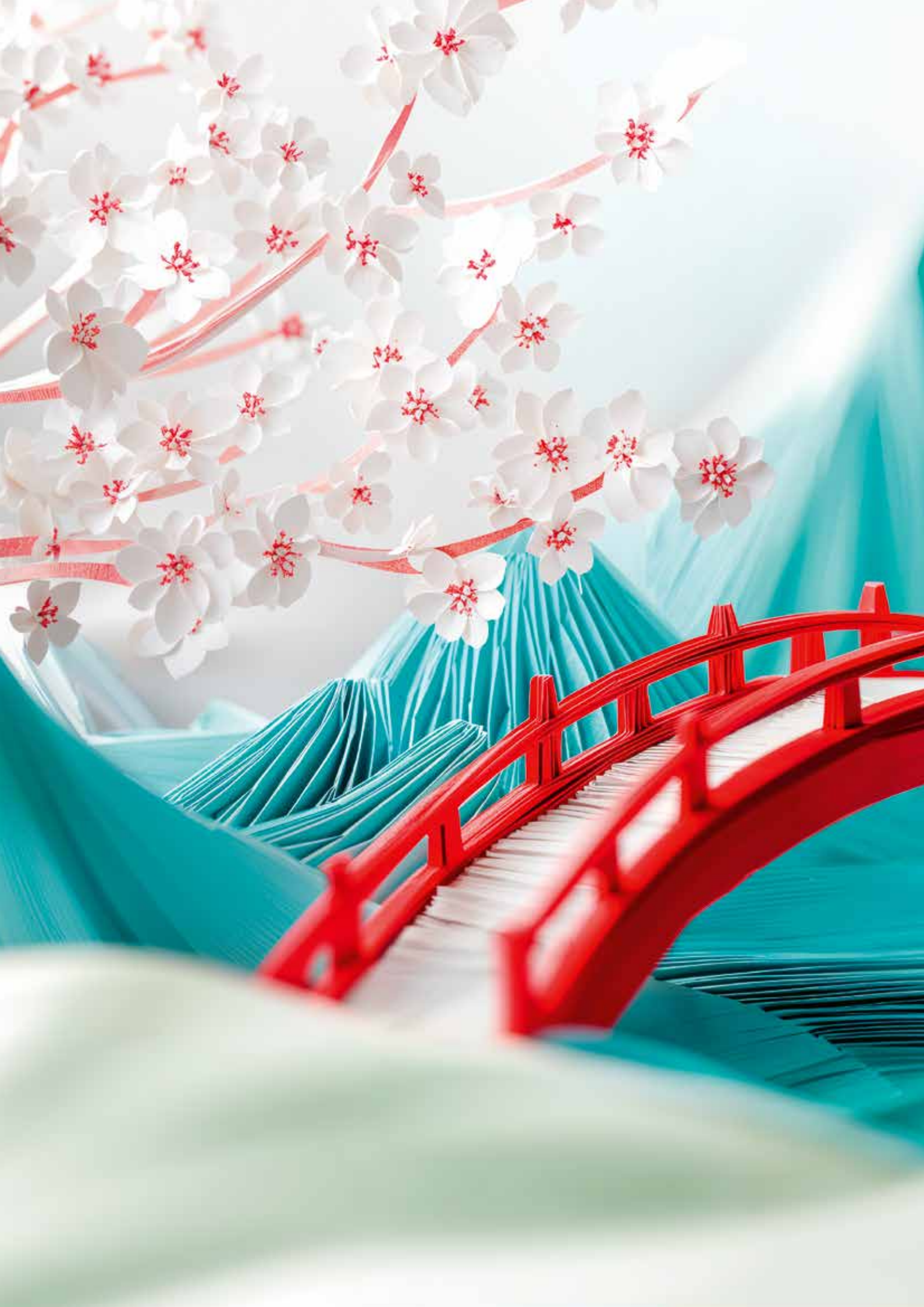
9 Restoring Enamel

If the lesion is small; it can be fully restored with dentin. For larger lesions, a stratified approach is necessary. The final layer, made of enamel composite, provides the restoration's brightness. For grey teeth, the G-ænial Anterior TE will yield excellent results, while for brighter teeth, the G-ænial Anterior JE is recommended.

10 Polishing

Light Cure with Glycerin Gel – Prevents the oxygen-inhibited layer and keeps polishing tools clean. Release Teflon Cord – Use a fine diamond flame bur; leaves sulcus open for easier gingival polishing. Abrasive Disc Polish – Discs (e.g. Pop 3M™ Sof-Lex™) refine proximal contours and polish the facial margin. Final Polish – Use silicone cups, then finish with a brush and paste or modern wheels (e.g. Spiral Sof-Lex™ Diamond Polishing Spiral).

Restorative composite of choice: G-Premio BOND, everX Flow and G-ænial Anterior



強さ

Strength

Class II restorations

by Dr Mindaugas Kudelis

Dr Kudelis is an internationally recognised dentist and lecturer, specialising in composite restorations, guided implant surgery, digital dentistry, and indirect techniques. He is known for his hands-on teaching style, with a strong focus on clinical skill and practical application. Dr Kudelis is also a member of the Bio-Emulation group, a global collective of clinicians dedicated to biomimetic and minimally invasive restorative dentistry.

He earned his Master's degree in Dentistry from the Lithuanian University of Health Sciences in 2013, qualifying as a general dentist. In 2012, he participated in the Erasmus programme at the University of Helsinki. Since then, he has been working in a small, family-run practice in Vilnius, continuing to build his clinical expertise. In addition to his practice, he teaches with RIPE Global, a cloud-based dental education platform focused on direct posterior composite restorations. He regularly delivers lectures, workshops, and webinars both locally and internationally.

Introduction

Class II direct composite restorations play a pivotal role in contemporary restorative dentistry. As one of the **most commonly performed procedures**, they address carious lesions located on the proximal surfaces of posterior teeth, particularly molars and premolars. The importance of these restorations extends beyond mere cavity repair; they significantly **contribute to the overall health and longevity of teeth, preserving tooth structure and function**.

The growing preference for direct composites is attributed to their excellent aesthetic properties, enabling dentists to restore teeth in a manner that closely resembles natural dentition. This is particularly crucial in an era where patients are increasingly concerned about the appearance of their smiles. Additionally, advancements in adhesive technology and composite materials have improved the effectiveness and durability of these restorations, ensuring they can withstand the considerable forces exerted during mastication. Moreover, Class II direct composite restorations support the principles of minimally invasive dentistry by allowing for conservative cavity preparations that maximize the preservation of healthy tooth structure.

This approach not only **enhances the restorative process** but also **promotes patient comfort and satisfaction**. As such, mastering the techniques involved in Class II direct composite restorations is essential for dental professionals seeking to provide high-quality, patient-centred care.

1 Pre-operation

Patient presented with an old filling, sensitivity to stimulus and poor interproximal shape of a filling that was impeding a proper hygiene.

2 Preparation of cavity

After local anaesthetic the initial preparation of a cavity is done without a rubber dam application. This helps visualise the cavity margins thus facilitating in decision making process on isolation and matrixing.

TIP! Always add wooden wedges at the start of the prep

Benefits:
- Separation
- Wedge selection
- Papilla retraction
- Less tissue trauma and bleeding
- Creating space for rubber dam

3 Rubberdam

After initial opening, a rubber dam isolation is mandatory.
A better visual control of the operative field will lead to a better prep design and cleaner dentin removal.

4 Aquacare-Aluminum oxide & Sylc

The preparation is finalised with Aquacare-Aluminum oxide for enamel margins and Sylc for dentin.

TIP! Always add wooden wedges when prepping under rubber dam isolation.
To prevent rubber dam damage - always place protective wedges while using drills and air abrasion.

5 Matrixing

Matrixing, usually the trickiest part of the procedure. A lot of care should be taken to choose a correct size of the matrix. Usually, clinicians pick the right height first, then depending on the space available, the correct curvature should be chosen.

6 Buildup

First layer of buildup is always dentin, followed by proximal wall buildup. For proximal wall buildup, heated composite with combination of flowables is used in this case. After one side is filled, the matrix is carefully removed to allow for more separation force on another side and less likely open contact.

7 Occlusal increments

After the proximal walls are build up, class II is converted into a class I that can be filled in a cusp-by-cusp approach.

8 Mirror finish

The goal is to have a nice, mirror finish proximal walls, that would not need any adjustment interproximally.

9 Polish

Composite excess is removed and restoration polished while rubberdam is still on to help with access to the field.

10 Final adjustments

Final polishing is done after occlusal adjustment. If the matrix height is picked correctly - there should be little to no adjustments to be made on the marginal ridges.

TIP! **Never leave heavy occlusal contacts on proximal ridges of a restoration. Composite as other metalfree restorative materials are brittle by nature, having unsupported material in the proximal area might lead to an early cracking of a proximal wall.**

Restorative composite of choice:
G-ænial Universal injectable

Preserving pulp vitality in deep cavity cases

by Dr Georg Benjamin

Dr Benjamin is a private dentist based in Berlin, Germany, with a clinical focus on microscopic endodontics, direct post-endodontic restorations, and vital pulp therapy.

He is the founder of „Zahnarztpraxis Kofferdam", a referral-based private practice dedicated to endodontics and vital pulp therapy (www.kofferdam.org).

Georg studied dentistry at the University of Würzburg, Germany, and participated in the Erasmus exchange program at Umeå University, Sweden, graduating in 2010. His passion for education and clinical excellence led him to collaborate with Prof. Till Dammaschke as co-author of the German and Dutch book "Die Vitalerhaltung der Pulpa", a key resource on pulp preservation.

Today, he is an international lecturer and educator on topics including rubber dam isolation, pulpotomy, endodontics, posterior matrixing, and direct composite restorations.

In addition to his clinical and academic work, Georg is widely recognized in the German dental community as the creator and host of the country's first dental podcast, „Saure Zähne" (www.saurezaehne.de), which has become a go-to resource for dental professionals.

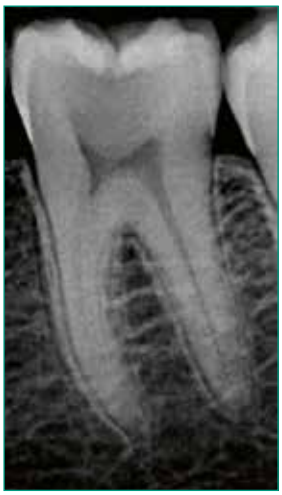
Throughout his career, he has had the privilege of working alongside leading experts such as Dr. Martin Gollner in Bayreuth before establishing his own practice in 2022.

Introduction

Preserving pulp vitality in deep carious lesions is a crucial aspect of modern dentistry, focusing on maintaining the **health and functionality of the tooth's pulp** tissue while addressing extensive decay. Deep caries, where decay reaches close to the pulp, presents a significant challenge as it can easily lead to inflammation, infection, or even the death of the pulp if not managed carefully. **Vital pulp therapy (VPT) techniques**, including indirect pulp capping, direct pulp capping, and pulpotomy, are at the forefront of these preservation efforts. They aim to **stimulate reparative dentin formation**, control inflammation, and create an environment that supports the natural healing potential of the pulp. **Understanding the pathophysiology of caries progression** and the pulp's defence mechanisms is essential to selecting the most appropriate VPT strategy. **Factors such as accurate diagnosis, the extent of bacterial invasion, and the choice of biocompatible materials** play a critical role in achieving successful outcomes. Through advancements in biomaterials, such as calcium silicate-based cements, and techniques rooted in minimal intervention, preserving pulp vitality has become a viable and preferred approach, promoting longer-lasting, natural tooth retention, and reducing the need for extensive endodontic treatment.

1 Pre-treatment

Patient was revered with a deep primary decay and the question was what kind of treatment is optimal in this case.



2 X-ray

On the X-ray we can see that the caries is very close to the pulp. The patient itself is asymptomatic, and the pulp responds normal to cold testing
Caries removal was advised and in case of a pulp exposure we would go for vital pulp treatment.

3 Preparation

The original anatomy of this tooth is very nice, so it was decided to keep as much of the original structure and close the gap with an injectable flow to prepare the tooth for injection moulding technique.

4 Transparent silicone

An impression of the original anatomy was taken using a transparent silicone. The two tooth to the mesial and distal for a better adaptation were also included.

5 Soft carious tissue

Removal of soft carious tissue

6 Disinfection

For disinfection I used 2% NaOCl - studies have shown that the disinfection improves the vitality of the pulp.
Also, studies show that NaoCl does not interfere with universal bonding agents.

7 Indirect pulp cap

The indirect pulp cap was placed on the dentin.
I used a calcium silicate here, but a glass ionomer would also have been possible.

8 Coving calcium silicate

After selective etching and bonding with G-Premio BOND, the calcium silicate was covered with a layer of everX Flow. Everything is prepared for injection moulding technique.

9 Final restoration

Final restoration using the stamp technique and G-ænial Universal Injectable, polishing was done with EVE composite polishers.

10 Recall after 8 months

At the 8th month, a recall was done. We see some wear at the margins, but the anatomy could be preserved.
The tooth reacts normal to cold testing and the next recall is in one year.

Restorative composite of choice:
G-ænial Universal injectable & everX Flow

Post-endodontic treatment direct restorations

by Dr Kaplan Sheudzen

Dr Sheudzhen is a highly trained dental professional with extensive education and expertise in both endodontics and aesthetic restorative dentistry. He earned his Doctor of Dental Surgery (DDS) degree from Kuban State Medical University in 2010, followed by a clinical internship completed at the same institution in 2011. Committed to continual learning and refinement of his skills, Dr Sheudzhen has trained with several international leaders in advanced dental techniques.

Dr Sheudzhen has undergone specialized training in aesthetic and restorative procedures through courses led by experts such as Dr Paulo Monteiro, Dr Bernard Touati, and Dr Jason Smithson, focusing on minimally invasive and high-quality aesthetic restorations. Additionally, he has developed a strong foundation in endodontics through a series of in-depth courses with Dr Mikhail Solomonov, covering various aspects from modern microbiology to orthopedics-related endodontic techniques, further enhancing his expertise.

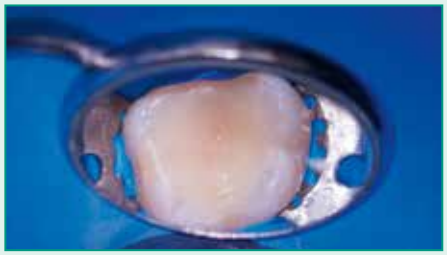
Currently, Dr Sheudzhen focuses on a microscopic approach to restorative dentistry, endodontics, and apical microsurgery. He also specializes in dental ergonomics and is the co-founder of VisionTeam, an educational initiative offering training programs and courses on ergonomic principles in dental practice. His multidisciplinary expertise allows him to provide precise, patient-centred care, integrating advanced techniques with ergonomic efficiency.

Introduction

Post-endodontic treatment, teeth are often structurally weakened due to both the loss of natural tooth structure from caries and the removal of tissue during endodontic access and instrumentation. The structural compromise, combined with the brittleness of the remaining tooth, can make these teeth more **susceptible to fractures under masticatory loads**. For this reason, **effective reinforcement of the tooth is essential** to restore its strength, prevent further fractures, and ensure long-term durability.

Direct composite restorations provide a conservative option to restore endodontically treated teeth. However, traditional composites may not provide adequate fracture resistance, especially in cases with significant tooth structure loss. **GC's everX Flow, a fibre-reinforced flowable composite, offers an advanced solution by incorporating short glass fibres**, which contribute to a stronger, more resilient restoration. When applied in the bulk of the cavity, everX Flow acts as a reinforcement layer that effectively **distributes stress, mimicking the natural toughness of dentin and reducing the risk of fracture**. This fibre-reinforced material serves as an excellent substructure for layered composite restorations, enhancing the structural integrity of the restoration and increasing its longevity.

By utilizing products like everX Flow within the restorative protocol, we can provide both functional and esthetic rehabilitation to endodontically treated teeth while addressing their inherent vulnerabilities.



1 Clinical situation

Clinical situation after removing the old restorations. Tooth 16 has a large defect, missing both approximal walls and the occlusal surface.

2 X-ray

Preoperative periapical x-ray shows inadequate endodontic treatment.

3 Removing root canal filling

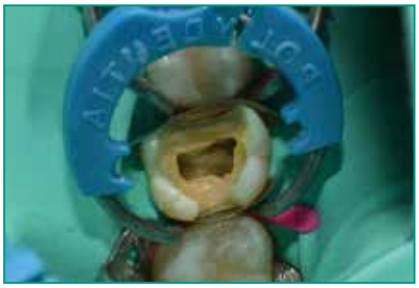
The root canal filling was removed, and the root canals were shaped and cleaned. The working length was confirmed with the help of endodontic files inserted into the canals and x-ray imaging.

4 Post endodontic treatment

Post endodontic treatment x-ray shows excellent obturation of the 4 root canals.

5 Placement of sectional matrices

Sectional matrices are placed to the mesial and distal interproximal areas of the tooth. Wedges are used to ensure the optimal fitting of the matrices to the cervical areas.



6 Securing the matrices

The matrices are secured with a ring.

7 Approximal walls

Approximal walls are rebuilt with Essentia Universal.

8 Tooth strengthening

The tooth is strengthened by everX Flow.

9 Occlusal surface

The occlusal surface is restored with Essentia Universal.

10 Final result

The restoration is finished and polished. The occlusion is verified.

Restorative composite of choice:
Essentia Universal & everX Flow

Crack management in posterior teeth

by Dr Stephane Browet

Dr Browet was born in 1972 in Asse, Belgium. In 1995, he graduated as a dentist from the Free University of Brussels. He pursued a two-year postgraduate program in Aesthetic Dentistry in the same university.

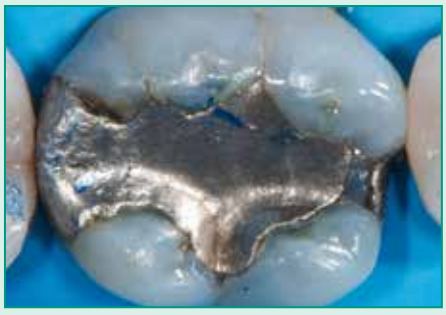
He teaches both nationally and internationally on topics such as rubberdam isolation, microscope enhanced dentistry, cracks, posterior and anterior composites, and indirect ceramic restorations.

He is currently an active member of the Bio-Emulation Group.

Stephane is also a certified Life Coach, Certified High Performance Coach and Certified Management Drives Partner.

Introduction

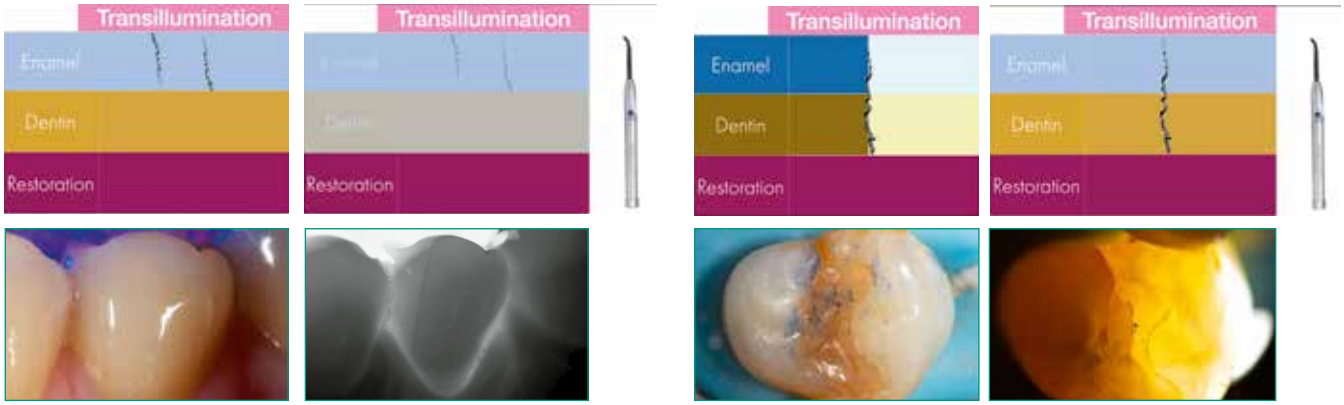
Crack Management in posterior teeth is complex and primarily dependent on thorough diagnosis and the extent of the crack in the given substrate. It is paramount to make the distinction between enamel cracks and structural dentin cracks. This will determine the protocol to follow. As cracks have both bacterial and mechanical implications the protocol will be focused on 2 pillars: the arrest of biological infiltration with Immediate Dentin Sealing and the limitation of crack propagation using fiber reinforced composite and relative cusp coverage.



Diagnostics

Magnification: It makes sense to use magnification as high as x8 to be fully able to see the nuances of crack expression in teeth as well as how colour differences occur around visible cracks.

Transillumination: Remains one of the most simple but underused diagnostic tools to distinguish between enamel only and dentinal implication cracks.

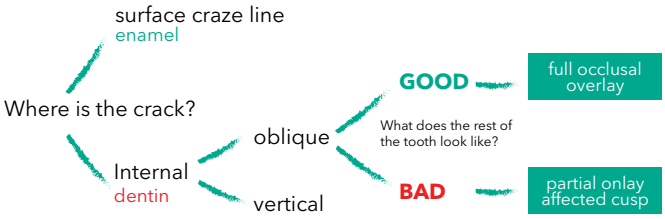


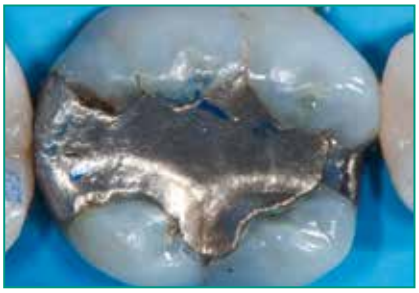
Fluorescence

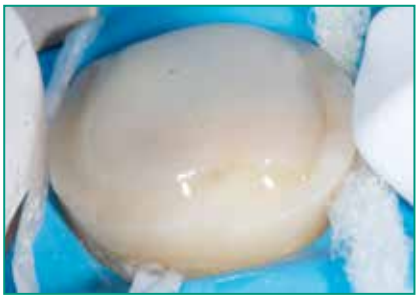
The Detection Mode of the D-Light Pro offers a unique added value in the visual assessment of cracks before and during tooth dissection. It allows to gain a new perspective of bacterial infiltration along those crack lines. The addition of Tri-plaque Gel ads power to the visual acuity.

Frac-Finder

By applying targeted pressure, it allows clinicians to identify crack lines that may otherwise go unnoticed. When the patient experiences pain upon release of pressure, this is a key indicator of a crack.
This tool is especially useful in differentiating between superficial and deeper, more structurally compromising cracks.







1 Treatment Indicator Flowchart

By following the flowchart you can quickly orient your treatment proposal to the patient structurally compromising cracks.

2 Diagnostics

All diagnostic tools were used to conclude multiple dentin core cracks. The above flowchart was followed to decide of a possible design of restoration.

3 Substrate

After preparation and cleaning there was a remaining mixed substrate of enamel and dentin to cover. Main mechanical insult were the oblique cracks leading to complete cusp loss.

4 Immediate Dentin Sealing

This layer, with preferably glass fibre reinforced composite like everX Flow, helps in creating a more fracture resistant bio-base.

5 Final restoration

A lithium-disilicate overlay was bonded with pre-heated restorative composite, GC Essentia Universal Shade.

Restorative composite of choice:
everX Flow and Essentia Universal

Creating perfect emergence profile for implant restorations using direct composites

by Prof. Roberto Sorrentino

Prof. Sorrentino is a leading expert in prosthodontics and digital dentistry. He graduated with honours in Dentistry from the University Federico II of Napoli in 2002 and completed a Master of Science and PhD in “Dental Materials and Their Clinical Applications” at the University of Siena.

Currently an Associate Professor at the University Federico II, he became a Full Professor in 2017. Prof. Sorrentino is a sought-after lecturer and consultant for national and international dental companies, and he has authored over 170 publications in peer-reviewed journals, with contributions to several book chapters on prosthodontics.

Prof. Sorrentino has held leadership positions in major dental organizations, including as Past President of the Membership and Recruitment Committee of the International Association for Dental Research (IADR). He is also a member of the Italian Society of Prosthodontics and Oral Rehabilitation (SIPRO) and the Italian Society of Dentistry and Maxillo-Facial Surgery (SIOCMF).

Recognized as a Global Expert in prosthodontics, dental prosthesis design, and dental materials, Prof. Sorrentino has won numerous national and international awards for his research and clinical work. He is the co-founder of Zerodonto, a dental blog and community, and the Napoli Prosthodontic Team.

Introduction

The **emergence profile** is a critical element in implant restorations, influencing both esthetics and function. It refers to the shape and contour of the restoration as it transitions from the implant abutment to the surrounding soft tissue and natural tooth structure. A well-designed emergence profile not only ensures optimal esthetic results but also **contributes to long-term tissue health**, reducing the risk of complications like peri-implantitis.

Direct composite materials offer significant advantages in creating the ideal emergence profile due to their **versatility, sculptability, and ability to be finely adjusted to the surrounding anatomy.** These materials allow for precise customization of the implant crown's contour, promoting a smooth and natural emergence that blends seamlessly with the natural dentition.

1 Pre-operative view

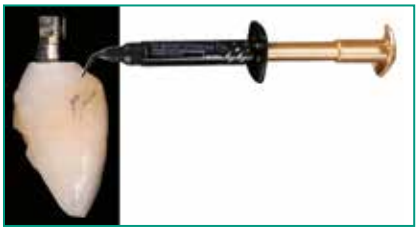
Pre-operative clinical view: Gingival mislevelling of tooth 11.

2 X-ray

Pre-operative x-ray view: Hopeless tooth 11 due to internal root resorption.

3 Prosthetic situation after extrusion

Baseline prosthetic situation after orthodontic slow extrusion of tooth 11, extraction, socket preservation, GBR and implant placement.



4 Placement G-ænial Universal Flo

Placement of G-ænial Universal Flo in the cervical area to shape the peri-implant soft tissues. The material was chosen due to its high polishability.

5 Insertion of temporary crown

Insertion of the screw-retained temporary crown: the bleaching white (BW) colour was used to clearly identify the composite addition to the temporary crown and monitor the progressive shaping of the peri-implant soft tissues.

6 Modification temporary crown

Modifications made to the temporary crown by adding and shaping G-ænial Universal Flo according to the principles of the dynamic compression technique (i.e., apicalization, thickening, creeping).

7 Finishing and polishing

Finishing and polishing steps were used to aid in the maturation of the peri-implant soft tissues, thanks to the high polishability of G-ænial Universal Flo.

8 Shaping of profile

Progressive shaping of the peri-implant emergence profile.

9 Comparison

Comparison between the prosthetic baseline (A) and the final shaping of the peri-implant soft tissues (B).

10 Final result

Post-operative clinical view: screw-retained translucent zirconia layered crown in position 11 (MDT: L. De Stefano).

Post-operative x-ray view.

Restorative composite of choice:
G-ænial Universal Flo

Finishing and polishing protocol of anterior composite restorations

by Dr Javier Tapia Guadix

Dr Tapia Guadix was born in 1978 in Madrid, Spain. He finished dental school at the European University of Madrid in 2003, working then as associate professor in the prosthetics department in 2004.

In 2005, he started his career as professional computer graphics artist, focusing on illustration, animation and application development. He founded the company Juice – Dental Media Design for this purpose. He received the Collegiate Merit Award by the Spanish College of Dentists from the 1st Region in 2005, for his collaboration in the commission of new technologies. In 2011 he founded together with Panaghiotis Bazos and Gianfranco Politano, the Bio-Emulation group. He actively collaborates with several universities across Europe and is member of GC Restorative Advisory Board. He is an international lecturer with participation in numerous congress, hands-on courses and live courses. He published several articles in restorative dentistry, dental photography and computers in dentistry.

Introduction

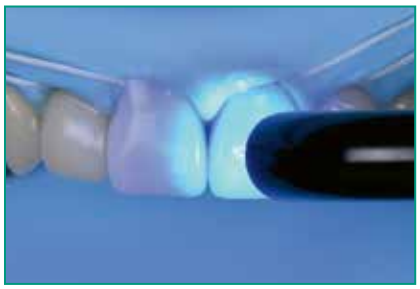
Polishing is an important step in the workflow of anterior direct restorations. Although it is a seemingly easy and straightforward procedure, it can be detrimental to the final aesthetics of an otherwise nicely sculpted restoration if wrong techniques and tools are used.

Surface roughness due to improper finishing and polishing can result in **excessive plaque accumulation, gingival irritation**, increased surface staining and **poor aesthetics** of restored teeth. Furthermore, the rough surfaces of the restorations present a very irritating factor to the oral soft tissues.

Implementing the correct sequence of the steps and using the optimal tools during the polishing protocol will **ensure the longevity** and aesthetics of the restorations and **high satisfaction** of the patients and dentists.

1 After composite application

After applying the last layer of composite material, apply glycerin gel to the restorations.



2 Light-cure

Light-cure over a layer of glycerin gel to remove the oxygen inhibition layer.

3 Polish sharp edges

Use a medium polishing disk to remove any sharp edges and to additionally shape the anatomy of the teeth.

TIP! Apply some water to the rubber dam to prevent accidental tearing.

4 Medium polisher

Polish with a medium composite polisher.

5 Fine polisher

Polish with a fine composite polisher.

6 Secondary anatomy

Create secondary anatomy with a diamond bur.
Create developmental grooves, vertical lines and small indentations and lastly the horizontal lines.

7 Re-polish

Re-polish with a fine composite polisher.

8 Polish

Polish with goat hair
wheel and DIAPOLISHER PASTE.

9 Fine polishing

Use EPITEX polishing strips for the fine polishing of the approximal surfaces.

10 Final result

High gloss of the restorations is achieved. This will prevent discolourations, plaque accumulation, and maximize the life of the restorations.

GC materials of choice:
EPITEX

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A blooming journey

A blooming journey

This brochure has taken you on a journey through the art and science of direct composite restorations, a discipline that, while routine in its frequency, holds extraordinary potential for clinical excellence and personal mastery. From foundational workflows to advanced shade-matching techniques, each section is designed to inspire confidence, precision, and creativity in your daily practice.

Through the insights of the GC Restorative Advisory Board, we've shared not only protocols and product innovation, but the spirit behind them: the drive to make restorative dentistry simpler, smarter, and more beautiful. From the fundamentals of composite work to detailed workflows of anterior and posterior restorations, this guide reflects decades of experience, continuous learning, and an unwavering commitment to quality.

By integrating thoughtful strategies, with simplification in mind, you're not just restoring a tooth; you're restoring function, confidence, and natural beauty. This brochure empowers you to view each case as an opportunity to express clinical excellence through a personalized, patient-centred approach.

Dentistry is no longer just about fixing what is broken. It is about preserving what is natural, enhancing what is possible, and elevating the patient experience at every step. As materials continue to evolve and new techniques emerge, the principles of attention, intention, and simplicity remain your most powerful tools.

We hope this guide has equipped you with not only practical tools but also a renewed sense of purpose. Let it be a reminder that the seemingly ordinary tasks you perform every day are, in fact, extraordinary acts of care, craftsmanship, and connection.

Prof. Marleen Peumans: "Being part of the Restorative Advisory Board means joining a thoughtful and inspiring group – one that brings fresh energy, innovative ideas, and deep care to the world of restorative dentistry."

Dr Georg Benjamin: "In collaboration with the leading minds in dentistry, we are not just developing products – we're shaping the future of restorative care with innovation, clinical relevance, and real impact."

Prof. Joseph Sabbagh: "Being a member of the restorative advisory board of GC since 15 years is an amazing experience mixing science and social."

Dr Mindaugas Kudelis: "RAB is just a wonderful group of people. Every meeting is super inspirational and I am always amazed how much insight and discussion group can generate while discussing new materials or treatment modalities."

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