AN AESTHETIC AND BIOMIMETIC APPROACH WITH A GLASS HYBRID FOR DIRECT RESTORATIONS

The overall goal of this article is to provide the clinician with an overview of the information on a newly developed glass hybrid system (EQUIA Forte® HT) and as well as to give useful application tips based on results from clinical cases.

What differentiates glass hybrid from other conventional GI restoratives is its chemistry. The highly reactive fluoro-alumino-silicate (FAS) micron-sized fillers (<4 µm) were added to the standard FAS glass filler particles of EQUIA Fil. The micron-sized filler particles release more metal ions, which improve the cross-linking of the polyacrylic acid matrix and the overall physical properties.

Additionally, EQUIA Forte HT Fil liquid comprises a high-molecular-weight polyacrylic acid, which helps to improve the chemical stability, acid resistance, and physical properties of the set cement.

The light-cured, nano- filled resin coating (EQUIA Forte Coat) was improved by incorporating a reactive multifunctional monomer that increases resistance to wear, has a higher polymerisation conversion and thinner film layer, and also provides a smoother surface to the final restoration.

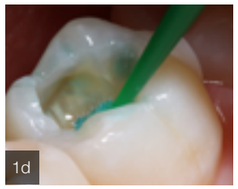
EQUIA Forte® HT was used in a 34-year-old female patient for the emergency treatment of a vital lower first molar (tooth 36) with a deep, large carious lesion (Fig 1a). The vitality of the tooth was first determined by pulp testing and a radiograph was taken to check the depth of the lesion (Fig 1b).


1a

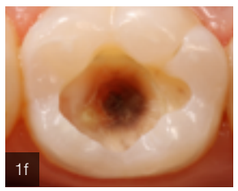

1b

Local anaesthesia was applied and caries was removed using tungsten carbide burs (Busch "AU" Carbide Burr - TF1AU). Infected dentine was removed with an excavator (Fig 1c). The cavity walls were cleaned with 20% polyacrylic acid (Cavity conditioner, GC) during to for for 10s (Fig 1d), rinsed thoroughly with water (Fig 1e) and dried gently (Fig 1f).


1c

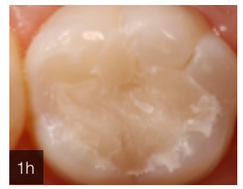

1d


1e


1f

EQUIA Forte® HT capsules were prepared and mixed for 10 s, then restorative was directly applied into the cavity in a sufficient quantity using a bulk-fill technique with a special applicator (Fig 1g). EQUIA Forte® HT was condensed against the cavity with a plastic hand instrument and was allowed to set undisturbed for approx. 2.5 min (Fig 1h). This restorative does not require a special surface coating during the setting reaction.


1g


1h

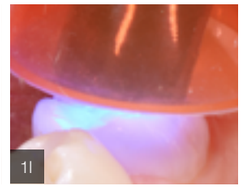
The finishing process was performed with the use of rotary instruments in 2 steps: a) tapered trimming & finishing tungsten carbide burs were used for forming the fissures and occlusal anatomy of the restoration; b) flame-shaped rubber points (blue and gray) were used for polishing (Fig 1i). All burs and polishers were used under water irrigation to avoid over-drying the restorative. The occlusal contact points were checked (Fig 1j).


1i


1j

A final layer of the coating agent (EQUIA Forte® HT Coat) was applied on the surface of the restoration without air- blowing (Fig 1k), then it was light-cured for 20 s with a D-Light DUO LED curing device at 1400 mW/cm2 (Fig 1l).


1k


1l

The final clinical and radiographic views of the restoration are shown in Figures 1m-o, demonstrating excellent contour and aesthetics.


1m


1n


1o

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Turkey

G-CEM ONE™

SELF-ADHESIVE UNIVERSAL RESIN CEMENT

The patient presented with defective restorations. After a comprehensive evaluation, recurrent decay was identified in the existing resin restorations on teeth 14 and 15. The patient also reported discomfort due to an open contact, leading to food trapping.

Tooth 14: It was decided to restore tooth 14 with a direct composite. GC Essentia Universal was used.
Tooth 15: An indirect restoration was fabricated for tooth 15. The tooth was prepared and scanned. GC Initial LiSi Block was selected to mill the inlay.

The inlay was bonded using G-CEM ONE™ self-adhesive universal resin cement, chosen for its excellent bond strength, easy handling, and reliable long-term outcomes. After seating the restoration, excess cement was carefully removed, and the restoration was light- cured.

G-CEM ONE™ is a truly universal, non-technique sensitive, versatile and reliable product that gives the flexibility of being effective in all cementation procedures for any type of restorations; from metal- based to resin and all-ceramic inlays, onlays, crowns, bridges, and posts. It demonstrates excellent bond strength to enamel, dentin and all indirect restorations.

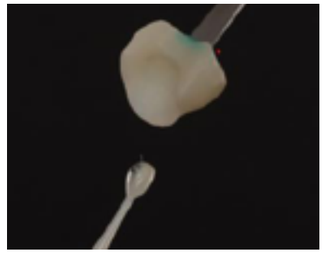
The final restoration demonstrated excellent aesthetics and functional integrity. The patient reported satisfaction with both the comfort and appearance of the restorations.

1. Pre-operative Image - Recurrent decay in existing resin restorations 14,15. Open contact with food trapping.

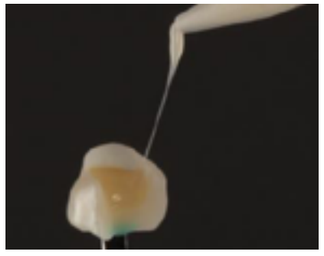
2. Immediate Dentin Seal and Resin Coat for tooth 15 following caries removal G-Premio BOND™ + everX Flow + G-aenial Injectable A2.

3. Preparations air-abraded and ready for bonding protocol with G-Premio BOND™

4. 15 LISI Restoration + 14 Resin Restoration Polished restoration with EVE Diapol Twist Polishers + GC Diapolisher Paste.



5. Application of G-Multi PRIMER™ on LISI restoration.



6. Application of G-CEM ONE ready for cementation.

7. 15 - G-Premio BOND™ for tooth structure. G-Multi PRIMER™ & G-CEM ONE for restoration.

14 - G-Premio Bond for tooth structure. G-aenial Injectable A2 for proximal box/ marginal ridge. GC Essentia Universal for occlusal form.

8. Finished restorations.

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MOLAR HYPOMINERALISATION

CHALKY TEETH - A SILENT EPIDEMIC DAMAGING 1 IN 5 CHILDREN'S TEETH*

What is Molar Hypomineralisation?

Molar Hypomin is a common developmental condition affecting primarily one or more first permanent molars.[1-3] Central incisors may be affected as well, but this usually occurs to a lesser extent.[1-3] Hypomineralisation of the second deciduous molars (HSPM) or canines may also occur.[1-3] Molar Hypomin enamel presents low levels of calcium and phosphate. Molar Hypomin is characterized by white-yellow enamel patches and dentine hypersensitivity. Variations in severity exist, ranging from mild opacities to post eruptive enamel breakdown. While Molar Hypomin affects patients' quality of life, it also creates treatment challenges, which can lead to ongoing restorations and more complex care.[1-4]

What causes Molar Hypomin?

Recently published new research findings showed that serum albumin plays a direct role in the pathogenesis of molar hypomin.[4] For more info visit: www.ncbi.nlm.nih.gov/pmc/articles/PMC7303361/

What are the Molar Hypomin clinical challenges?

- Molar Hypomin teeth are formed with less mineral, which makes them more prone to break down during chewing and tooth brushing.
- Once erupted, Molar Hypomin teeth may start to break down, even without excess sugars or acids in the diet.
- Tooth sensitivity and pain are common, which might lead to poor oral hygiene and therefore, increased caries risk.
- Difficulty in achieving anaesthesia, which are possibly related to chronic pulp inflammation
- Limited cooperation of young patients, due to dental fear and anxiety.
- Repeated marginal breakdown of restorations, leading to dentine exposure and risk of pulp involvement.

Tooth Surface Protection

It is particularly important that Molar Hypomin teeth are looked after carefully to limit problems. Management of Molar Hypomin teeth should include long-term prognosis, as well as management of the presenting concerns, such as pain.

1. Tooth Surface Protection at the practice

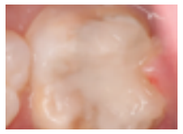
a) Reduce hypersensitivity: MI Varnish™ a 5% NAF varnish containing 2% RECALDENT® (CPP-ACP). When MI Varnish™ is applied, it adheres to the tooth and seals exposed dentine tubules.

b) Shield Molar Hypomin enamel surface: Surface protection with GC Fuji® VII or GC Fuji® VII EP creates a hardened outer layer which prevents plaque accumulation and facilitates tooth brushing.

2. Tooth Surface Protection at home:

Daily extra protection - Promote the importance of oral hygiene with a fluoride containing toothpaste and application of GC Tooth Mousse™ or GC Tooth Mousse™ Plus for daily extra protection.

An erupting Hypomin first permanent molar showing occlusal breakdown.



Completed surface protection using GC Fuji® VII. Images courtesy of Dr Jamie Lucas.

View the Molar Hypomin Brochure

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* For 2-year and 6-year molars: https://www.thed3group.org/prevalence.html

*Arrow P. Prevalence of developmental enamel defects of the first permanent molars among school children in Western Australia. Aust Dent J. 2008; 53(3):250-9.