

# Prophylaxis-based dental treatment: cavity prophylaxis using enamel-protective bracket attachment

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Orthopaedic jaw treatment that uses brackets and bands puts teeth at a higher risk of cavities as it is difficult for the patient to maintain good oral hygiene during the course of treatment. Another issue is the physical strain exerted on the teeth during treatments using fixed apparatus. Simply fixing the attachment in place can harm the tooth enamel and potentially cause long-term damage. However it is not just the process of bonding brackets that poses a risk; removing them can also cause (sometimes irreparable) damage. That is why, roughly one year ago, we decided to start using GC Fuji Ortho LC Paste Pak Automix (GC Germany), a light-cured glass ionomer cement (GIC), as a bonding agent for our fixed apparatus. The advantages of this fluoride-releasing material include its simple application during the bonding process, and also its quick and clean removal upon completion of the treatment. In the following article I will illustrate just how easy this product is to apply using a patient case study.

## Introduction

At our general dental practice, located directly on Lake Steinhuder, we offer a wide range of dental treatments. Alongside fillings and dental implants, one of our practice's main specialist fields is orthopaedic jaw treatment.

Our general practice in Petershagen was opened in 1994 and since then we have established ourselves as prophylaxis-based dental practitioners. We therefore employ both a dental prophylaxis assistant and a dental hygienist. We consider it of great importance that all treatments at our practice are provided within the scope of individual prophylaxis (IP), especially for patients who have been referred to us by their general dentist for orthopaedic jaw treatment.

Literature on the subject has long indicated that a considerable amount of tooth enamel can be lost during the course of orthopaedic jaw treatment. [1] It is for this reason that we take great care in choosing bonding materials that cause a minimal amount of damage to the enamel and ensure that brackets and cement residue can be removed upon completion of the treatment without leaving any marks on the tooth and, most importantly, without causing any lasting damage.

Standard adhesives usually require acid etching (e.g. with phosphoric acids), which inevitably subjects the enamel to a substantial amount of stress. As perfect occlusion and articulation, and also long-term maintenance of healthy tooth enamel, are essential to the success of our treatment, we began looking for alternatives which offered a sufficient level of adhesion without causing excessive damage to teeth. The treatment process (and the insertion of foreign elements inside the mouth) already means that our patients have difficulty with their dental hygiene. Under certain circumstances this can contribute to the acceleration or exacerbation of the demineralisation process. [2]

Normal composite cements generally fix the brackets to the teeth very well and provide excellent adhesion. However, I personally find them more time-consuming to apply. [3] In addition to this, using these cements means keeping the application area as dry as possible during the entire bonding procedure.

Approximately one year ago we began using a light-cured glass ionomer cement (GIC) to attach brackets. Fuji ORTHO LC Paste Pak Automix is based around a modified synthetic-resin glass ionomer cement which has been specially developed to meet the demands of orthopaedic jaw treatments. The material has been shown to be effective in numerous studies. [4.5] It delivers sufficient adhesion and helps keep the tooth flawless, both in terms of aesthetics and function.

The adhesive material is quick and easy to use as it requires neither acid etching with phosphoric acid nor the use of a conditioner. Nonetheless I still use the GC Fuji Ortho Conditioner fairly often because I believe it ensures even better adhesion. Compared to composite cements, the amount of effort required to keep the application area dry is significantly reduced, as this adhesive does not require the complete removal of moisture. Furthermore, this material allows all traces to be removed upon completion of treatment. Various studies have also shown that glass ionomer cement can have a prophylactic effect in terms of cavities. [6.7] Fuji ORTHO prevents demineralisation from taking place and has been proven to release fluoride over a limited period of time.

### **Background information**

The patient (born in 1999) came to our practice at the beginning of 2011. In accordance with the German classification table for orthopaedic jaw treatment requirements, based on orthopaedic jaw indication groups (KIG), she was classified as T3: misalignment of the vertical grade of more than three millimetres, requiring treatment, and traumatic contact of the gingiva. Before treatment was initiated, a grade II dysgnathia was noted with a half premolar width (PB) on both sides.

A prerequisite for successful treatment is patient compliance and very good dental hygiene. We generally ascertain the level of oral hygiene before fixing brackets. If required, IP care is provided before commencing treatment or applying brackets. Once the brackets are in place, we give the patient detailed and comprehensive advice on good oral hygiene.



Image 1: Before treatment

### **Practical use**

In order to correct the misalignment, we initially decided to apply a removable apparatus to be used for half a year and to then insert fixed brackets to achieve the final desired position. Once the patient had almost completed the first six-month

period with a splint activator and had returned to the practice for a two week recall, we bonded the brackets (image 1-6) on the 15 August of this year (2011).

The patient's teeth were then extensively and thoroughly cleaned using a polishing paste and a polishing cup, and the bands were subsequently selected, adjusted and cemented. The Optra Gate (extrasoft-small, Ivoclar Vivadent) was inserted before any cementing or further steps were undertaken.

We used a saliva extractor (buccal) and dental rolls (lingual) to dry out the teeth. Before treating the surface of the teeth with a conditioner (GC Fuji Ortho Gel Conditioner), the tooth enamel was dried using compressed air. The conditioner was then left on the tooth for 10 seconds before being washed off and the tooth surface cleaned. The surface was dried again but this time some moisture was allowed to remain on the tooth (slightly sparkling enamel).

The brackets could then be positioned and bonded. Finally, the material was hardened using a G-Light (10 second exposure for both mesial and distal).



Image 2: Attaching bands and preparation for the brackets.



Image 3: Brackets are attached after tooth surface is pre-treated with the GC Ortho Gel Conditioner



Image 4: Light curing of the GC Fuji Ortho LC PP Automix glass ionomer cement



Image 5: Fixed brackets after curing



Image 6: Fixed and activated brackets

The added advantages of using glass ionomers become apparent during the treatment process. The GC Fuji Ortho produces a limited amount of fluoride over the course of the treatment and this prevents teeth from becoming demineralised. [8] Once the treatment is finished, the brackets can be removed with much less physical effort than with composite adhesive systems. The outcome: successful orthopaedic jaw treatment with a flawless result, i.e. straight and healthy teeth.

**Summary: simple application, good adhesion and easy to remove**

Based on our previous experience with GC Fuji Ortho LC PP Automix, I can say with some certainty that this material has shown its worth, even in comparison to other adhesives and composite elements. During application it gave me enough time to place the brackets correctly. The entire preparation procedure is made faster thanks to the material's easy application, and we noticed it resulted in a fewer brackets being lost. Another advantage of glass ionomer cement, besides the release of fluoride during treatment, is the fact that it can be removed quickly and cleanly.



Thomas Vidahl began working in jaw orthopaedics in 1994 and runs the "Am alten Lahder Forsthaus" general dental practice with Dr Dirk Rahlfs in Petershagen.

### **Thomas Vidahl: short C.V**

1986-1994: Studied dentistry in Heidelberg and Marburg

1994-1996: Assistant at the dental practice of Dr Dirk Rahlfs

1996 – present: Runs a general practice with Dr Dirk Rahlfs

- Completed several training courses in jaw orthopaedics and implantology
- Recognised by the Westphalia-Lippe Chamber of Dentistry as a specialist in "jaw orthopaedics"
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