Use of Bulkfill Composite in pediatric dentistry

By: Dr. Marta Giménez, Barcelona, Spain
DMD. Oral surgery, prosthetics & dental aesthetics
Lecturer: Hyaluronic acid techniques in dentistry.

Clinical Case Presentation:

An 8-year-old patient came to the clinic for consultation. This patient had previously been in the clinic and this was a repeat visit. Following examination, we identified mesial caries and distal caries in the temporary tooth (63 and 64).

This clinical case presented a challenge in treatment method (sitting time) since the patient, due to her age, could not stay still for long in the dental chair. It was unlikely that the patient could tolerate a lengthy treatment.

In general, the signs and symptoms of the caries disease range from the smallest subsurface loss of minerals to severe destruction of the tooth.
Prior to selecting a treatment plan and clinical techniques, a comprehensive assessment of the patient history including clinical findings was carried out. The treatment plan took into account the child's age, maturity, and ability to cope.

Products used in clinical case

ProFil Bulk™ - suitable for bulk fill technique in the posterior region and can be applied in an unlimited layer thickness.

ProLink SE™ - light cured self etching one component dentin/enamel bonding agent.

ProEtch™ - 37% phosphoric acid, high quality, non drying, medium viscosity gel

ProFil Finishing Kit™ - Autoclavable Finishing Burs. Esthetic restoration finishing method featuring morphological quality & fast restoration ability.

Treatment procedure

The treatment method selected was sealing with bulk composite.

Since sitting time was a crucial factor, the products selected for treatment were **ProEtch™**: 37% phosphoric acid, **ProLink SE™:** One component self etch adhesive and **ProFil Bulk™** : Dual Cure bulk fill composite (*Silmet Ltd*) .

The following clinical case illustrations present the step-by-step treatment performed during the dental sitting.

The patient experienced discolored enamel, cavities, and pain usually typical with dental caries
Also in this case, the caries were detected clinically by visual inspection and probing (tactile).

Radiographs taken showed mesial and distal caries in 64 and distal in 63.
Codes and criteria used to assess and grade the severity of a caries lesion according to International Caries Detection and Assessment System (ICDAS) were 4 in 63 and 5 in 64

Fig.1 : Products were selected for quality and efficiency during each step of the treatment.

Procedure:
The restorative material chosen for this patient was composite. This tooth-colored material provides improved restorative care in primary teeth due to their ability to adhere to the tooth tissues. In accordance with the principles of minimal invasive dentistry, these materials are appropriate for small cavities with restricted loss of tooth substance.

ProLink SE™, a self etch adhesive system , in combination with **ProFil Bulk™** a bulk fill composite was used.

Material Characteristics:
High fracture strength & wear resistance. Strong adhesion to enamel (acid etch), & dentin
Handling: High early strength & moisture sensitive

Caries treatment: Operative treatment which involved removal and preparation of the cavity and filling with a restorative material

Step 1: Tooth preparation

First a local anesthesia was given to numb the tooth and surrounding tissue. This was followed by isolation with a rubber dam and correct removal of caries.
This established an appropriate outline, resistance, retention, and convenience form compatible with the restorative material to be used.

Step 2. Isolation with rubber dam

Acid etching of the enamel and the use of a dentin adhesive are procedures that are extremely sensitive to moisture contamination. Isolation with a rubber dam is therefore preferable. The rubber dam is used to isolate working area from the rest of oral cavity and for moisture control.
We placed some bands to form the dental pieces and avoid adhesion with the neighboring pieces.
The entire cavity was then filled with **ProFil Bulk™**

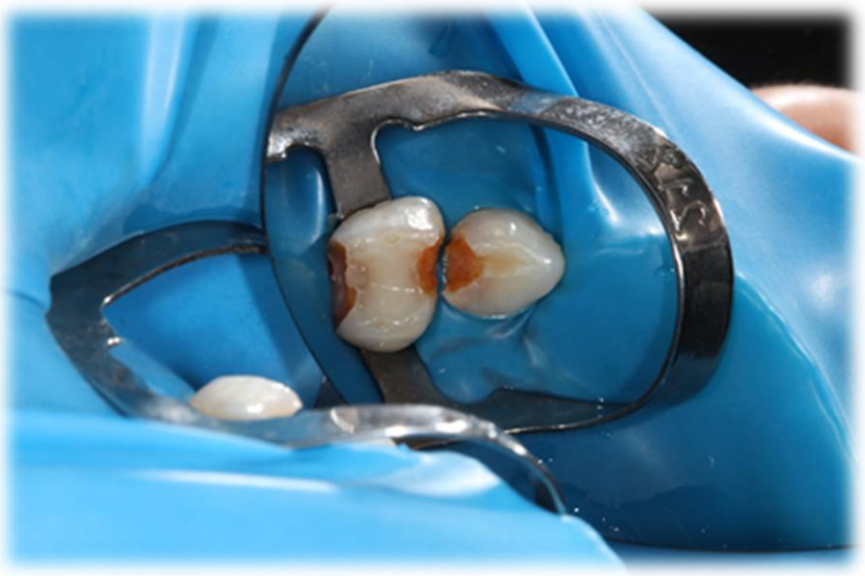

Fig. 2: Isolation of the working area with rubber dam
(caries on the back 'interproximal' & on the front of 'interproximal' surface of tooth)

Step 3: Self etch adhesive system

We chose to use the self etch system since it is ideal for pediatric patients - fast, simple, and reliable. There is no "wash/dry" step. The treatment process is shorter and working time is decreased.

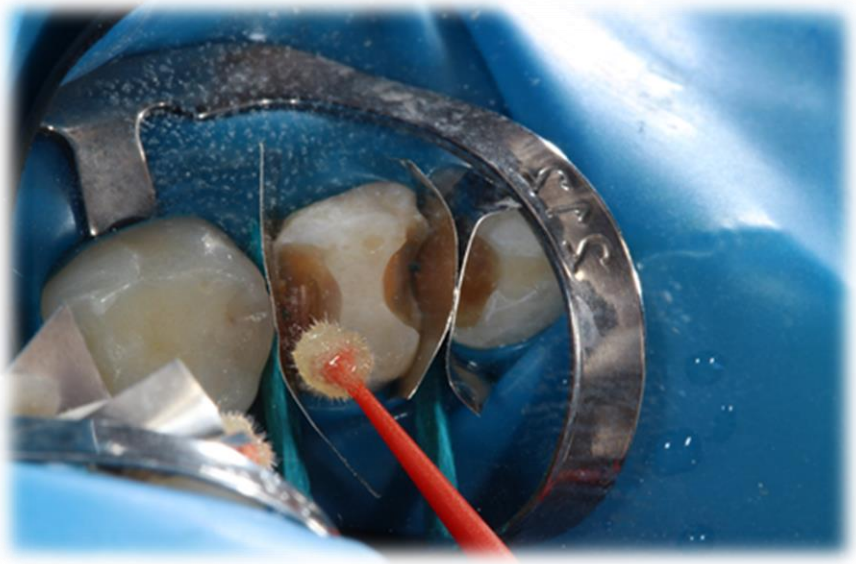

Fig. 3: Application or ProEtch (37% phosphoric acid) & ProLink SE (one component dentin/enamel bonding agent)

The pre etching of the primary enamel tends to improve the clinical performance of the self-etch adhesive systems in primary teeth. After isolation, we etched using **ProEtch™** for 15 seconds and **ProLink SE™** adhesive, according to manufacturers instructions, to allow bonding of the resin-based composites to the tooth.
The dentin/enamel adhesive in primary teeth enhances retention of restorations, minimizes microleakage and reduces sensitivity.

Step 3: Composite placement

We directly applied **ProFil Bulk™**to fill the cavity in a single step. Bulk-fill composites possess increased depths of cure allowing placement and photopolymerization of thicker composite layers.

The bulk layer of composite was placed, packed, shaped then light cured according to manufacturers recommendations. With bulk application, we overcame challenges such as void formation and contamination risk between the layers, as well as difficulty in the placement of layers in the small cavities.

Fig. 4: Image of the tooth after restoration buildup with single layer of **ProFil Bulk™**

The bulkfill composite is ideal for pediatric dentistry since in just 1 application we can fill the entire cavity and polymerize 100% like any other composite

Step 4: Finish & polish

To finalize the restoration, we first checked occlusion.
Finishing and polishing procedures were performed using **ProFil Finishing Kit**™ high-speed fine diamond burs. This kit provided good polishing results without the use of disposable polishing disks.

Fig. 4: Restoration completed

Advice on a good tooth brushing routine, oral health and dietary recommendations was provided to the patient and parents.
A follow up appointment was scheduled.

Discussion

Materials ideal for this type of treatment in a pediatric patient require quality, esthetics and predictability. The ideal treatment proceeds as quickly as possible while providing results that will last as long as necessary to prevent retreatment.