

Replacement of Missing Teeth with **Sinfony™** Light Curing Composite and Glass Fibres

## From Prep to Crown – Dental Materials in Daily Practice

Luca Ortensi; Bologna, Italy

Contemporary composite resin materials have evolved significantly, facilitating the delivery of aesthetic and functional restorations. The stiffness, strength and toughness of composite resin can be increased when applied to the glass fibres. The objective of this article is to describe the construction and the cementation of a fibre-reinforced composite bridge and an indirect composite restoration.

### Case presentation

A 25-year old male manifested pain to the second left bicuspid. The clinical and radiographic examination revealed a metal-resin crown on the second bicuspid with an extension which replaced the first bicuspid. An amalgam restoration was present on the first molar (Fig. 1, Fig. 2). The second bicuspid presented a carious lesion. A fibre reinforced bridge between the second premolar and the palatal surface of the canine was suggested to the patient as an option of treatment as replacement of the metal-resin bridge after curing of the carious lesion. An indirect composite restoration was proposed to replace the old amalgam filling on the molar. The patient accepted the treatment plan.

During the following appointment, the teeth were isolated with a rubber dam, and the preexisting amalgam restoration and the metal-resin bridge were removed with high-speed tungsten carbide burs (Fig. 3). The carious lesion, present on the second bicuspid, was eliminated and a build-up was carried out with a flowable composite (Filtek™ Flow, the flowable composite from 3M ESPE) (Fig. 4).



Fig. 1: Preoperative view shows metal-resin bridge and amalgam restoration to be removed.



Fig. 2: X-ray shows infiltration of the carious lesion at the margin of the crown (distal zone).



Fig. 3: The operative area was isolated with rubber dam. It is possible to see the carious lesion in the distal zone of premolar.



Fig. 4: Build-up of the first molar with flowable composite.



Fig. 5: Preparation of the premolar. An adhesive preparation was made with butt margin and rounded surfaces.



Fig. 6: Tooth preparation was performed for proper fibre-reinforced composite bridge and overlay.

The first molar was prepared with a diamond bur to obtain butt joint margins and rounded internal line angles. The premolar was prepared with butt margin and rounded surfaces (Fig. 5, Fig. 6). Approximately 0,7 mm of palatal enamel was removed from the canine. An impression of the prepared teeth was taken using the polyether impression material Impregum™ Penta™ H/L DuoSoft from 3M ESPE (Fig. 7). The provisional restorations were fabricated with

Protemp™ 3 Garant (3M ESPE) and were cemented with a eugenol-free cement. The impression was poured with high-strength dental stone for master model fabrication (Fig. 8).

The fibre-reinforced composite bridge and the indirect composite restoration were constructed on the master model using a layering technique (Sinfony, 3M ESPE; Vectris, Ivoclar-Vivadent) (Fig. 9).



*Fig. 7: A polyether impression of the preparation was obtained.*



*Fig. 8: Master model. It is possible to see the preparation of the distal surface of the canine.*



*Fig. 9: The external aspect of the fibre-reinforced composite bridge was completed and returned to the clinician for try-in.*



*Fig. 10: Cementation of the overlay with RelyX<sup>™</sup> Unicem Self Adhesive Universal Resin Cement.*

At the cementation appointment the restorations were tried-in and checked for the color match prior to placing the rubber dam. The abutments were sandblasted with 50 microns aluminium oxide to obtain a cleaned surface. The overlay was cemented with RelyX Unicem (Fig. 10). The fibre-reinforced composite bridge was cemented with two different systems at the same time. We used RelyX Unicem for the premolar and the RelyX<sup>™</sup> ARC Adhesive Resin Cement for the canine, due to the large amount of enamel present on the canine preparation. Before the cementation the palatal surface of the canine was acid-etched for 30 seconds and treated with an adhesive system (Scotchbond<sup>™</sup> 1, 3M ESPE). Excess



*Fig. 11: Postoperative occlusal view of the fibre-reinforced composite fixed partial denture. Note the good integration and the natural effect obtained by the restoration.*

luting material was removed with a small brush and floss. The luting composite was light-cured for 120 seconds. Following the removal of the rubber dam, the occlusion was adjusted with diamond finishing burs (Fig. 11).

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