

# Esthetic solution for Worn Dentition with Minimal Approach — Case Report

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## Initial Diagnostic Phase and Orthodontic Treatment

A 45-year-old woman visited the COEI clinic in Valencia-Venezuela, complaining about the wear on the incisal edge of her maxillary anterior teeth. A comprehensive examination of the relationship between the patient's teeth, smile, and face was performed (Fig 1).

Study casts were obtained and articulated on a semi-

adjustable articulator in maximum intercuspitation position.

Special attention was paid to the position and aspect of the incisal edges. There was supraeruption of the incisors to compensate for the wear caused by the edge to edge maxillary relationship.

To reduce the amount of tooth preparation, orthodontic treatment was planned and carried out. The objective of this first phase was to improve the overjet and overbite and to



Fig 1



Fig 2



Fig 3



Fig 4

provide a sufficient space for the final restorative material.

In order to achieve this goal, orthodontic movement of the upper incisors was planned (intrusion and buccal movement) and lower incisors as well (intrusion and lingual movement). The strategy behind this choice was trying to provide longer final facial veneers and minimized tooth preparation.

As interincisal space was gained with the orthodontic treatment, and provisional composite restorations were fabricated to lengthen the upper anterior teeth and reach the esthetic result. (Fig 2).

New study models were taken and a diagnostic additive wax up including teeth #6, 7, 8, 9, 10 and 11 was made. The wax up was transferred to the mouth as a mock-up for clinical evaluation of shape, size and length of the teeth. A totally additive procedure was used to fabricate the corresponding mock-up, which was made using a Bis-acrylic temporary

material (Luxatemp, DMG, Hamburg, Germany). No modification was required, and the patient accepted the treatment plan.

The treatment plan consisted of fabricating four lithium disilicate laminate veneers for teeth #7, 8, 9 and 10, and two composite resin addition restorations on the canine tips.

To facilitate tooth preparation, three silicone indexes were fabricated from the wax up: facial, lingual- incisal, and the one used to perform a mock-up. All silicone indexes were evaluated for fit before positioning in the patient's mouth.

Mock-up driven preparations were performed using the appropriate burs to achieve overall reductions. (Galip) (Fig 3).

Calibration marks were done with round burs. The rest of the tooth surface was made uniform using regular chamfer burs. Incisal and buccal silicone matrices were used to check the correct tooth preparation (medidas) (Fig 4). For optimal integration of the smile and to improve canine guidance,

composite restorations were added to the cusps of the canines. The prepared teeth (number 7,8,9,10) were cleaned up and polished. A one-step technique final impression was used to provide appropriate reproduction of the preparation and surrounding tissues.

Double gingival cord was placed in the sulcus (Ultrapack, Ultradent, Utah, USA) from tooth #7 to 10, using a polyvinyl siloxane material (Aquasil).

Following the final impression, provisional restorations were fabricated using the same silicone index used for the mock-up. Provisionals were made including teeth #7, 8, 9, and 10 using a Bis-acrylic temporary material (Luxatemp, DMG, Hamburg, Germany). Since the mechanical retention of the preparation was absent, retention relied on the interproximal contact and spot etching (using Acido Usado) for 30 seconds. Once the tooth was etched, primer (Marca) was brushed to the etched surface, air dried and cured (Tiempo).

Bis-acrylic resin was injected into the silicone matrix and placed on the prepared teeth. Overhangs were removed, using a no. 12 blade to avoid damage to the soft tissues. The provisional restorations were highly polished (Fresas de pulido) and glazed to minimize plaque accumulation.

A study model of the provisionals restorations and antagonist was done with irreversible hydrocolloid impression material to be sent to the laboratory. A new set of pictures was also taken during a following appointment.

Casts of the provisionals and antagonist arch, final impression, bite registration, shade information, and a set of pictures were sent to the lab.

Four lithium disilicate ceramic laminate veneers were fabricated (e.max Press LY, Ivoclar Vivadent) for the maxillary central and lateral incisors. (estar seguros de la técnica y tipo de cerámica)

## Cementation procedure

Definitive insertion of the ceramic restorations was preceded by a try-in procedure.

After removal of the provisionals, it is important to remove the adhesive layer created from the spot- etched area using a no. 12 scalpel.

For the cementation procedure, retraction cords (#000 ultradent) were placed in the sulcus of every prepared tooth to minimize the humidity from the crevicular fluid and to act as a barrier for the penetration of the resin cement to the base of the sulcus.

## Surface preparation of the e-max veneers

The inner surfaces of the restorations were etched with hydrofluoric acid 4.5% (Ivoclar Vivadent, Schaan, Liechtenstein) for 20 seconds, thoroughly rinsed with water and cleaned, using an ultrasonic bath with alcohol, for 5 minutes.

After thorough air drying, the etched surface was silanized (Monobond- S, Ivoclar Vivadent, Schaan, Liechtenstein) and dried for 60 seconds (Fig 5).

Tooth conditioning before cementation

Tooth preparations were cleaned with pumice and



Fig 5

rubber burs, etched for 30 seconds on enamel with 37.5% phosphoric acid (Ultra-Etch, Ultradent Products), then rinsed and dried. Both fitting surfaces, restorations and teeth were coated with the adhesive system (Syntac, Ivoclar Vivadent) and, because of the reduced thickness of the laminate veneers, a light-polymerized composite resin cement (Variolink II, Ivoclar Vivadent, Schaan, Liechtenstein) was selected to lute the restorations (Fig 6). After careful removal of the resin cement, the restoration was light polymerized with a light curing unit for 40 seconds on each surface. A water soluble glycerin gel was used to air block, and restorations were light polymerized again for 40 more seconds. The excess resin

was removed with a no. 12 scalpel to avoid scratches on the ceramic surface. In this case, the clinician started placing both centrals at the same time, and laterals were placed one by one (Fig 7). After the cementation process was completed, meticulous finishing procedure was done. Interproximal finishing strips, dental floss and Super floss (Oral-B) were used to polish and remove adhesive and resin cement overhangs. Finally, occlusal adjustments were made with diamond and polishing system for emax ceramic system.



Fig 6



Fig 7



Fig 8