

DIRECT ADHESIVE REHABILITATION WITH DOUBLE INDEX TECHNIQUE: A CASE REPORT

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SUMMARY

Nowadays patients desire not only to restore function and phonation, but above all to restore or gain good aesthetics in the anterior upper and lower jaws. "Minimally invasive" preparation techniques have been introduced, which have become today the state-of-the-art in daily clinical practice for the aesthetic rehabilitation of the anterior teeth.

The most convenient clinical situation that meets these concepts is the correction of the aesthetics of a smile with only additive restorations.

In this paper we present the use of a double index technique, palatal and vestibular, intended for multiple, up to 6 teeth per arch, direct aesthetic composite veneers of the anterior teeth.

Key words: aesthetic, direct composite veneers, restorations, tooth adhesion, sound enamel.

Introduction

Nowadays aesthetic demands are always higher. Patients desire not only to restore function and phonation, but above all to restore or gain good aesthetics in the anterior upper and lower jaws (1). Mainly the requests are to restore color, shape, proportions and position of teeth, without sacrificing healthy tissue. Therefore, "minimally invasive" preparation techniques have been introduced, which have become today the state of the art in daily clinical practice for the aesthetic rehabilitation of the anterior teeth (2-4).

What in the past was done only with full ceramic crowns is now achievable with adhesive materials, partial restorations (direct or indirect), and with very little teeth preparation or even with no preparation (5-8).

Regardless the direct or indirect restorative technique, modern enamel-dentine adhesion and

restorative materials changed completely the rules for preparations (9). Aesthetic materials rely their properties on a solid and durable bonding to teeth structures. Even with all the changes we had in bonding chemistry what is still true is that bonding to enamel is always more predictable and advisable (10, 11). This means that for maximum bonding performances it is preferable to have no preparation (preserving all sound enamel) or minimal preparations preserving available sound enamel and periodontal tissues (47-74, 79-82). The most convenient clinical situation that meets these concepts is the correction of the aesthetics of a smile with only additive restorations (12-15, 86). Every time we have to deal with multiple adhesive interfaces, enamel-dentine-composite, we must consider that we will end with lower adhesion forces and take that into count for the complete treatment plan.

Indirect veneers, indicated for multiple teeth treatment, usually need a preparation of the vestibular and often incisal portions of the teeth giving the

technician no more than 1 mm of thickness for the composite resin or ceramic restoration (16).

Composite direct veneers, usually intended for 2-3 teeth, are instead directly shaped on the patient and are best realized with the aid of a palatal silicon index and if possible, with no preparation (1, 17).

In both cases, direct or indirect techniques, the preliminary phase to an aesthetic reshaping of anterior teeth is a careful waxup and a direct intraoral mockup with an appropriate resin. The mockup allows the patient to preview the final result in terms of shape and more important allows the clinician to check phonetics and function of the restorations (1).

In this paper we present the use of a double index technique, palatal and vestibular, intended for multiple, up to 6 teeth per arch, direct aesthetic composite veneers of the anterior teeth. There is no doubt that indirect veneers do have many advantages to direct veneers such as a higher fracture resistance (18), but, at the same time, costs, the need for specific cementing compounds, multiple materials at the adhesive interface and longer working time can be considered disadvantages (19). The improved characteris-

tics of modern composite materials, and a single and strong adhesive interface, are the key features that make the direct remodeling of anterior teeth a predictable, affordable and wide spreading technique (20).

The complexities of the direct technique are in the ability of the clinician to reproduce natural and harmonious teeth shapes, managing teeth shade, recreate correctly surface finishing and duration of procedures at the chair. All of these parameters are greatly eased by the use of palatal and vestibular silicon indexes.

In this case report we present a six upper teeth direct composite veneers, complete anterior sector from canine to canine, performed to close diastemas, cover a discolored endodontically treated tooth (21-28) and improve teeth shape and color with a double silicon index technique.

Case report

A 25-year-old smoker female came to our attention asking for the rehabilitation of the upper front teeth (Figure 1).



Figure 1
Preoperative intraoral photo, front view.

Her major complaints were the presence of large diastemas and poor aesthetics. The patient did not accept an orthodontic treatment (29, 30, 84, 85, 88-90) and asked for a quicker solution. Also due to costs the treatment plan was direct composite veneers of all six upper front teeth, from upper right canine to upper left canine. Firstly, a waxup was made on precision casts of the upper and lower arches of the patient (Figure 2). The planned restorations were able to close all diastemas with only additional restorations and no preparation. A silicon mold of the waxup was then used to stamp a mockup directly over the patient teeth using a self curing resin (Jetkit) allowing for acceptance from the patient of the new aesthetics and checking of all functional parameters. Once the mockup was successfully accepted by the patient two more silicon index were produced on the waxup. These silicon indexes were made out of a transparent rigid silicone (Elite Transparent Zermack), one to reshape palatal additional walls and one, the vestibular, to reproduce the planned waxup with the composite resin using the index as a press mold.

To choose the correct shade for the finished veneers, little quantities of composite resin was di-

rectly applied to the teeth and completely cured (with no adhesive). This is the best way to control the desired color change as a result of the chosen composite and its thickness. After having set shape and color of the veneers it is now time for the completion of the treatments. The previous week the patient performed an accurate professional oral hygiene (31-40, 83, 87) the upper arch was insulated with rubber dam from right upper second premolar to left upper second premolar to ensure a vast and stable working area. The six teeth to be treated received also floss ligatures in order to push even apically the marginal gum. Adjacent teeth were protected using Teflon strips. After a local anesthesia on teeth where the rubber dam has been installed (41-46, 75, 76) and after a thorough cleaning of all teeth surfaces with mounted brushes and no other tooth preparation, all teeth surfaces to be bonded were etched for 30" with 37% phosphoric acid. After a prolonged rinsing time all enamel surfaces were completely dried by air spray. A two steps E&R adhesive (Optibond FL, Kerr) was applied with a microbrush and then gently thinned and dried with air spray for 10" before a 30" light curing time.



Figure 2
Waxup, made on precision
cast of the upper arch of the
patient.

According to the palatal to vestibular layering technique (77, 78) the restorative procedures started using the palatal index (Figure 3) to produce a layer of enamel composite (Adonis, Sweden & Martina) with 0.5 mm thickness. Composite resin was cured through the transparent index tooth by tooth for 20" each time. After removal of the palatal index we started the layering of dentine masses decreasing saturation of the chosen shade from cervical to incisal and from palatal to vestibular. In this phase, to recreate the tridimensional structure, it is important to recreate all internal structures such as mamelons that will be covered by a final layer of translucent enamel composite. These details, like internal dentin volumes and incisal transparencies, are very important to obtain a final result that mimics nature and gives high aesthetics. Each single added mass of composite is shaped with tiny spatulas and then adapted with a clean brush and light cured for 20". To enhance incisal transparency and opalescence light cured liquid tints were painted on the dentine mass prior to enamel application. After completion of dentinal shaping and internal characterization, it is time to finalize the restorations with the last enamel layer. Enamel composite was

placed both on teeth surface and inside the vestibular transparent index (Figure 4), then the index was positioned over the teeth and pressed into place removing every excess material being pushed out of the pressed mold. It is crucial to have excesses of composite material as this will ensure proper adaptation and absence of voids or air bubbles. As previously, the composite is cured through the transparent index tooth by tooth for 20" each. After removing the index, additional 40" curing time for each tooth is necessary and finally we have the six restorations completely cured but still united all together.

In the finishing process gross amounts of excess composite are removed manually with a n.11 scalpel; then, to separate the teeth, a thin pointed sharp steel bur was used to open carefully interdental spaces and then a controlled pressure was applied to crack the residual composite between teeth. Finishing of the interdental walls was completed with fine grit metal diamond strips (Komet). To obtain the final shine of the restored teeth, polishing of all surfaces was performed with three steps silicon rubber burs (Komet) and a final buffing with aluminum oxide paste (Figure 5).



Figure 3
Palatal index in position.

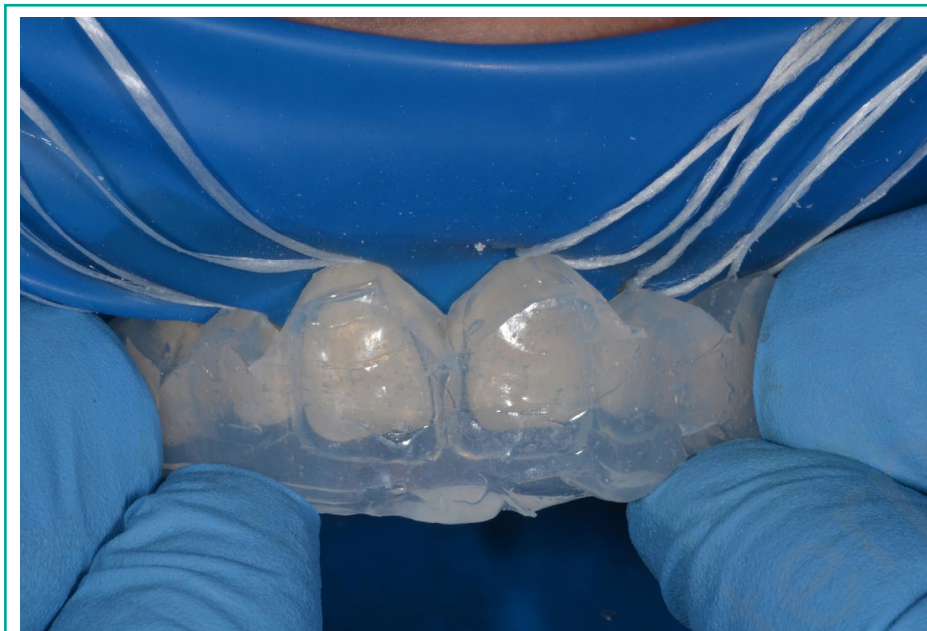


Figure 4
Vestibular index in position.



Figure 5
Postoperative intraoral photo, front view.

Discussion

This case report presents the planning and realization of six direct no-prep composite veneers with double index technique. In just one appointment, it is possible to perform six direct

restorations with highly aesthetic and long lasting results. The waxup can be made directly by the clinician or demanded to a lab (in this case more appointments will be needed). The double index technique confirmed its validity as it speeds up operations and guides effectively in reproducing teeth shapes both palatally and



Figure 6
4 years follow-up, front view.

vestibularly. The possibility of press molding the final enamel layer is a great simplification to manual layering and allows for multiple restorations in a reasonable operation time. Time and materials make this approach cost effective. Finished restorations are very well integrated with other teeth and give the patient the desired aesthetic result. Control at 4 years (Figure 6) showed that modern composite resins, if well used and polished, can keep their optimal aesthetic appearance with no evidence of wear or staining even if the patient is a smoker.

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