# External staining procedure in posterior direct restorations


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## Abstract

The main purpose of direct restoration procedures is to obtain a natural aspect of the restored tooth. The modern restoration materials (direct composite resins) offer this possibility, through their large amount of shades and opacities. More than ever, nowadays the use of pigments in dental medicine has become very usual, due to the increasing demand of the patients for aesthetic restorations. The external staining procedure consists in placing of the pigment on the tooth surface, after the tooth morphology is finished. This paper shows the aesthetic potential of dental pigments to restore the natural appearance of the posterior teeth, using the external staining procedure. Although the staining procedure is time consuming, it offers much satisfaction not only to the patient, but especially to the dentist. Good knowledge of direct composite layering techniques and dental morphology is necessary, in order to obtain a good result.

**Keywords:** external staining procedure, posterior direct restorations, dental aesthetics

## INTRODUCTION

The patient of the 21th century, well informed, wants dental restorations that are both functional and aesthetic.

Modern direct restoration techniques have as main objective to obtain a more natural appearance of the tooth, a possibility offered by current restoration materials (composite resins). These materials come in a wide range of shades and opacities, which gives them the advantage of imperceptible restorations.

Dental pigments are increasingly used at the moment in the dental office and are aesthetic, light-curable materials that help to imitate the natural teeth. Pigments are important elements in direct dental restorations of composite resins. The most frequent used dental pigments are white, dark brown, ochre, blue. The need to use pigments is determined by the possibility of obtaining imperceptible restorations, which should be confused with the natural tooth. They can be applied over the composite resin or mixed with it, to produce certain effects on the restorative material. They can be applied in ditches, pits, dimples and even at the cusp slopes of the posterior teeth or the vestibular or oral surfaces of the anterior teeth. [1,2]

There are many staining procedures [1]:

External staining. This technique is performed after applying the last layer of composite, after performing the occlusal morphology.

The internal pigmentation technique consists in the use of pigments when performing the occlusal morphology, after the application of the last dentin layer of composite.

The technique of material shade changing. This technique involves the mixing of dental pigment with the composite resin material, to change its shade, followed by the application of the final material on the tooth, its modelling, then lightcuring, finishing and polishing.

### *Aim and objectives*

The purpose of this paper was to highlight the importance of using pigments to restore the natural appearance of teeth in the lateral area, in direct restorations, using the external staining procedure.

## MATERIALS AND METHODS

This paper presents a case report that underlines the aesthetic potential of the dental pigments used in direct restorations.

The patient (female, 24y) came into dental office, accusing sensitivity at tooth 1.5 (which had a direct occlusal-distal restoration with overflowing edges and a carious lesion) (Fig.1)

The therapeutic decision consisted in the direct restoration of the tooth 1.5, using external staining procedure.

Both carious lesion and direct occlusal-distal restoration were removed; then followed the finishing of the walls of the resulting cavity (Fig.2) and making of adhesive substrate of the restoration. A piece of Teflon tape was applied on tooth 1.6, to protect it. Orthophosphoric acid 37% was applied on the tooth 1.5 for 30 seconds (Fig. 3), after which it was removed with a jet of water and the tooth was dried. The dental surface was conditioned with adhesive (Single Bond Universal, 3M ESPE), followed by lightcuring for 20 seconds (Fig.4).

Figure 1. Initial situation of tooth 1.5

Figure 2. Finishing of cavity wall

Figure 3. Acid etching with orthophosphoric acid 37%

Figure 4. Applying of Single Bond Universal (3M ESPE)

The desire was to transform the second class cavity into a first class cavity and to create a contact surface. In this sense, a preformed matrix was used, interdentaly immobilized with a wooden wedge and flow (Estelite Asteria,Tokuyama Dental) (Fig.5).

Figure 5. Restoration of the tooth 1.5 distal wall

Figure 6. Aspect of the restoration- oblique layering technique

The direct restoration of the tooth was performed with direct composite resin (Estelite Asteria, Tokuyama Dental). One applied the oblique layering technique, with layers of maximum 2 mm thickness (Fig. 6). In order for the restoration to imitate a natural tooth, a drop of dark brown dental pigment was used in the central groove, meant to give a natural appearance of tooth (Fig.7).

After application of the pigment, the excess was removed with an applicator and lightcured for 30 seconds. The final appearance is that of a tooth with a small staining on the occlusal surface (Fig. 8).

Figure 7. Application of dark brown dental pigment in the central groove of tooth 1.5 with a k-file needle # 06

Figure 8. The final appearance of the tooth, after the application of the dental pigment

After removing the rubber dam foil, the dental contacts were checked, using 40 microns paper. Then followed the surface polishing of the tooth 1.5.

The restoration of the tooth 1.6 will be performed in another appointment.

## RESULTS

The final appearance of the tooth 1.5 (Fig.11) is highlighting the aesthetic potential of dental pigments.

Figure 10. The initial aspect of tooth 1.5

Figure 11. The final appearance of tooth 1.5

## DISCUSSIONS

Aesthetic dentistry represents the perfection of restorative dentistry. Attempts to achieve this goal are often frustrating and color mismatch or improper matching is a factor responsible for many failures. Color matching is a very important criterion for achieving an aesthetic restoration, and improving its knowledge is possible with the study of tooth anatomy and surface morphology. [3,4]

From the point of view of the medical act itself, the pigments are not necessary in the restoration of the posterior teeth, but they improve the aesthetic aspect. Staining procedure define better the 3D perception of dental morphology. The intensity of the dark brown pigment should be carefully chosen. [5]

## CONCLUSIONS

The use of dental pigments has gained importance in recent years, managing to meet the high aesthetic demands of patients.

Some doctors might consider this procedure a waste of time and useless; others opine that beauty lies in the details, that the use of pigments in dental aesthetics gives direct restorations that natural, imperceptible look that any restoration should have.

Nevertheless, these pigmentation techniques develop the artistic part of dental profession, the accuracy of workmanship and train the sense of observation of details and last, but not least, the aesthetic sense.

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