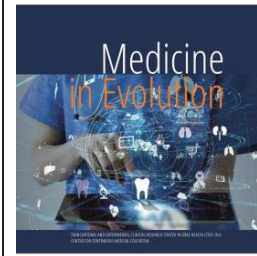


A simplified approach of anterior direct restorations



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Abstract

Direct anterior restorations can be time consuming and challenging in terms of dental aesthetics. The aim of the paper was to approach a simplified technique for the anterior direct restorations, without jeopardizing the aesthetic part. One used a composite resin material, that is based on the technology of color matching with the surrounding dental structures (Smart Chromatic Technology)- Omnicroma (Tokuyama Dental). The results were evaluated immediately after treatment and after one week. The resin material had good aesthetic result in small cavities. In case of deeper cavities, one need to modify the layering protocol, in order to obtain high aesthetic direct restorations.

Keywords: dental aesthetics, single shade direct restoration, simplified approach

INTRODUCTION

Direct aesthetic anterior restorations with composite have become the established standard over the past decades [1,2]. Taking into account a few essential preparation guidelines such as beveling the margins [1,5,8,9] and a proper adhesive technique [1,5,8,9], aesthetic, functional and durable minimally invasive restorations are obtained, that can often withstand comparisons with veneer restorations [2, 8].

There are many composite materials on the market; systems are rapidly replacing each other or simply changing their names. One trend is currently in evidence: the slimming down of the shade range and simplification of techniques [3,4]. Everyday dentistry concept is based on “a single composite for all colours” principle.

Omnichroma (Tokuyama Dental) is a simple and time saving composite material that uses Smart Chromatic Technology along with the spherical fillers. This material can cover all classic VITA shades with only one colour. With this type of composite resin colours were created not by the addition of pigments, but rather by induced structural colours combining with the reflected colour of the surrounding tooth [6,7].

Aim and objectives

The main objective was to simplify the protocol for anterior direct restorations, by eliminating the color selection step and by using a single composite syringe that can fit a large number of dental shades. The purpose was also to evaluate the quality of anterior direct restorations using a single shade material - Omnichroma (Tokuyama Dental) and to test the ability of this composite resin to take over the color of the natural tooth and its chromatic stability over time.

MATERIAL AND METHODS

Two patients with carious and non-carious lesions were selected. The first patient presented secondary carious lesions and old infiltrated restorations that required replacement. The second patient presented a non-carious lesion - fracture type.

For the direct anterior restorations one chose to use a composite material that works according to the chromatic matching criterion (Omnichroma-Tokuyama Dental) and uses a single composite syringe that matches all shades on the Vita Classical shade guide. This composite system includes also a blocker, for the situations that require masking of certain chromatic defects, or in deep cavities and also for the construction of the palatal wall (0.5mm thickness).

CLINICAL CASE NO. 1



Figure 1. Initial situation of the dental composition

The patient (female, 36 year old) came into dental clinic with the complaint of old dischromic restorations (fig.1). After the initial evaluation, the treatment plan assumed removal of old restoration and secondary carious lesions and single visit new direct aesthetic restorations. The patient's teeth matched color A2 on the Vita Classical shade guide.



Figure 2. Dental composition, after removal of old restoration and beveling

The beveling of margins was followed by the adhesive preparation of the tooth, using the selective etching technique. After that, at the level of deeper cavities (1.1 distal and 1.2 mesial) a thin layer of Omnicroma flow blocker was applied (and lightcured for 20 seconds) (fig.3).



Figure 3. Application of Omnicroma Flow Blocker in deep cavities

Next, the Omnicroma composite material of bulky consistency was layered. The cavities were restored one by one. To create the palatal shell of the distal cavity one used Omnicroma Blocker in bulky consistency, applied in a thin layer of 0.5 mm (the producer indication) (fig.4). For the final layer, one used brush and Modeling Resin (Bisco) (fig.5).



Figure 4. Restoration of palatal shell of tooth 1.1



Figure 5. Application of the vestibular layer, with help of brush and Modelling Resin

The same procedure was used for all restorations. The last step was represented by finishing and polishing procedures, after checking the occlusion and the contact area (fig.6).



Figure 6. Aspect from polishing procedure

CLINICAL CASE NO. 2

The patient (male, 18 years old) came into dental office with a tooth fracture on 3.1 (fig.7). The treatment plan assumed direct restoration of the tooth with a single shade resin material - Omnicroma (Tokuyama Dental).



Figure 7. Initial aspect of dento-gingival composition

After beveling, the tooth was prepared for adhesion (total etch technique). The layering steps were: 0.5mm Omnicroma composite for palatal shell (fig.8), followed by 2 layers of Omnicroma Blocker in bulky consistency (fig.9) and, in the end the last buccal layer of Omnicroma, which was modelled with brush and Modeling Resin (Bisco).

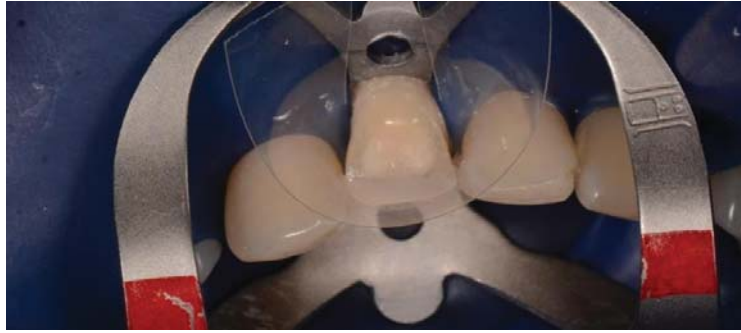


Figure 8. Aspect of palatal shell after lightcuring



Figure 9. Layering of Omnichroma Blocker

In the end, the finishing and polishing procedures were done - using finishing and polishing SofLex System (3M ESPE), and polishing paste.

RESULTS

Direct composite restorations were made using the layering technique proposed by manufacturer (Tokuyama Dental) for the Omnichroma composite. The chromatic matching of the restorations was evaluate immediately postoperatively and approximately after one week. We analyzed the ability of the Omnichroma composite to adapt to the surrounding dental tissues, from a chromatic point of view.

As we can see (fig.10), the results obtained in the first session do not meet all the aesthetic criteria. In the first meeting, this case was restored following the general recipe for layering the Omnichroma composite. It can be observed that tooth 1.1 did not present enough opacity (in the distal area, where the cavity was the deepest).



Figure 10. Aspect of the restorations at one week recall

During the second visit (after one week), when the chromatic adaptation of the composite was checked, the distal direct restoration was redone, by adding a thicker layer of Blocker to achieve a higher degree of opacity.

After the second visit the results are much better, as one can see in fig.11. The chromatic integration of the restoration was obtained also due to a layering technique similar to that of the Style Italiano technique.



Figure 11. Aspect of the restorations after the corrections made during the second visit

In case of the second patient, the results were good (fig.12); there was no need for second intervention, because we modified the layering procedure (similar to Style Italiano).



Figure 12. Final aspect of the direct restoration on tooth 3.1

DISCUSSIONS AND CONCLUSIONS

Choosing the right shade for the restoration can be challenging, the surrounding light and time of the day having great influence on this choice. The simplicity of the Omnichroma composite material is impressive – one needs to purchase only two syringes (filling material and blocker) for a new composite system. It is certainly still a little too far-reaching to claim that all direct anterior indications can be covered with this one shade; for this, considerably more cases need to be evaluated.

The purpose of this study was to simplify the approach of direct anterior aesthetic restorations without jeopardizing their aesthetics.

One used a nano-hybrid material that is based on the technology of color matching with the surrounding dental structures (Smart Chromatic Technology). This material (Omnichroma-Tokuyama Dental) has the property of color matching with a wide range of dental colors and shades, especially those on the Vita Classical scale but not only; in other

words, using a single syringe of composite resin one aim to obtain aesthetic restorations in frontal area of the oral cavity.

In our study, the results were good only in the case of smaller cavities. The composite has adapted chromatically to the remaining dental tissues. In the case of larger cavities, the 0.5 mm layer of Blocker was not enough, the restoration having a translucent appearance. In a second session, one had to remove the vestibular layers and add a thicker layer of Blocker, followed by a thin buccal layer of Omnicroma composite. After that, the aesthetics improved.

From an aesthetic point of view, this composite adapted chromatically, but the general recipe offered by the Tokuyama manufacturer cannot be generally used; it did not work in every case, failing to meet the requirements in terms of opacity and translucency. A better aesthetic was obtained using this composite after the layering sequence of the Style Italiano technique

Within the limitation of this study, one can conclude that this type of materials will revolutionize the approach of direct restoration in the anterior area of oral cavity, in the same time simplifying the dentist's working protocol (no need for multiple shades and opacities of the composite resin). Sometimes, one need to modify the layering protocol, especially in deep cavities, in order to obtain high aesthetic restorations.

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