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Planning is the main success factor in obtaining a harmonious and minimally invasive result with direct anterior restorations after orthodontic treatment

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Abstract

Orthodontic treatment may lead to the patients dissatisfaction with the anterior teeth microesthetics. This case report demonstrates the reasons of anterior direct restorations choice after digital mock-ups and patient compliance. The clinical procedures improved the patient's oral esthetics of teeth. At one week recall the general outlook of the maxillary anterior teeth was considered natural and esthetical. Clinically, restorations demonstrated no discolorations and dispolishing.

Keywords: *anterior direct restorations, direct mock-up, orthodontic treatment esthetics.*

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INTRODUCTION

Many clinical situations such as tooth discoloration, extensive fractures, orthodontic outcomes or dental caries lesions may cause an important impairment in esthetic appearance and smile harmony [1]. Composite resin has been considered a universal restorative material used in stress-bearing areas in anterior esthetics [2]. Recent esthetic composite resin materials have similar physical and mechanical properties to that of the natural tooth and possess an appearance like natural dentin and enamel [3].

The digital planning allows to evaluate the esthetic relationship among the teeth, gingiva, smile, and face. The use of digital tools offers dentists and technicians a new perspective for diagnosis and treatment plan, facilitating and improving the communication among dentist, technician, and patient [4-7], however not all digital solutions are able to satisfy patients comprehensively.

The aim of this case report is to demonstrate direct anterior restoration to improve esthetics after orthodontic treatment with the direct approach.

CASE REPORT

A 40-year-old female patient, after orthodontic treatment, applied with esthetics impairment. (Figures 1, 2, 3). According to the patient, “the teeth are not white enough and very small compared to my face”. She would like to have veneers in order to have larger, white, natural, even teeth, triangular in shape, with a transparent edge.

Fig. 2. **Clinical view with retractors showing anterior maxillary teeth impairment.**

Fig. 1. **Initial clinical view.**

Fig. 3. **Initial color determination.**

It was decided to start with whitening before placing the veneers to minimize preparation. After determining the initial color of the teeth using the Vita 3D Master and Vita EasyShade V shades as 1M2 (Figure 3), professional oral hygiene was carried out and the next day it was begun to carry out clinical whitening with the Philips ZOOM4 lamp-activated system. Immediately after the procedure, the color 1M1 was obtained. (Figure 4).

After whitening diagnostics and modeling the layout of our future veneers were initiated. A digital impression was obtained using the FonaMyCrown intraoral scanner (Figure 5). Restoration design was provided with ExoCAD program (Figure 6). Modeling the layout using a digital protocol can significantly reduce design time compared to a wax-up technique. We can provide the patient with several options for teeth in the shortest possible time. Also, if necessary, we can easily make adjustments to the shape of the teeth, discussing it with the patient.

After that, the diagnostic options were printed with 3D printer. A silicone impression was taken from the model. Mock-up was made using Acrytemp fast hardening plastic. A photo protocol with the face is required to evaluate

Fig. 4. **Color determination after tooth whitening.**

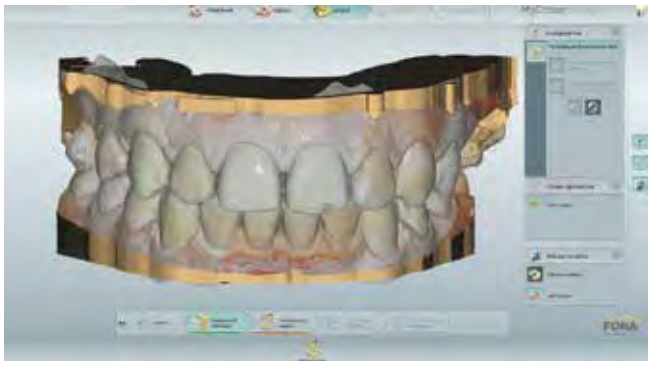

Fig. 5. **Digital impression.**

Fig. 6. **Digital wax-up of the future restorations.**

Fig. 7. **First mock-up based on the patient wishes.**

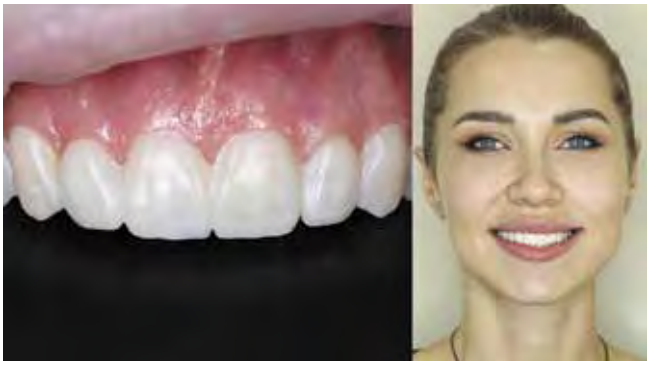

Fig. 8. **Second mock-up based on the esthetic rules.**

Fig. 9. **New first mock-up tried in the next appointment.**

Fig. 10. **New second mock-up tried in the next appointment.**

Fig. 11. **Direct mock-up technique.**

the shape of the teeth from the face. The first mock-up (Figure 7) was made based on the patient's wishes – large triangular teeth. The second (Figure 8) was made focusing on the aesthetic beliefs, since the triangular shape did not fit into the patient's appearance. After trying it on, it turned out that none of these designs met her expectations. The patient is scheduled for the next visit. Two new diagnostic kits were produced. We try it on in the mouth (Figures 9, 10).

But the patient again is not satisfied with offered options. According to the patient: “Better, but maybe triangular doesn't suit me? But I don't like people like these either." At this point, I understand that, despite the digital protocol and its speed, we can experiment with temporary layouts for an infinitely long time, but we will never reach an agreement. And even more so, there can be no question of any veneers, since by intervening invasively, we will no longer be able to easily correct the situation if necessary, and this will only entail a huge amount of wasted time and money for rework in an attempt to please the patient. Or we get a patient with a negative attitude towards us. In such a situation, we need a minimally invasive method in which it will be possible to return everything to its original state without loss. Direct restorations were offered. After all, firstly, we can easily remove it, if suddenly the patient does not like something. Secondly, if additional adjustments are suddenly needed, they will be easy to make and changes can be made in one visit.

For quick interaction with the patient and visualization of our future restoration, the direct mock -up technique, performed directly in the patient's oral cavity with a composite, is suitable (Figure 11). Any composite is taken to provide this technique, any of its shades, and without any isolation and adhesive preparation, we apply it to the tooth, modeling the required shape. I prefer to use the composite and its shade, which I then plan to use for the bulk of the restoration, in order to assess its harmony with the tooth color. In this situation, it was a composite of Micerium "Enamel plus HRI" shade UD 2. In this way, we restored only the incisal edge of the central incisors and changed the rounded shape of the lateral incisors. Having brought the patient to the mirror, we heard the phrase: “WOW! And what, so it was possible? Is it possible not to do veneers? ". As a result, the patient and I settled on a direct restoration option.

The restoration was carried out on the same visit removed the silicone index from the direct mock-up. Since the patient had the palatal retainer glued, the isolation was performed with a split technique using Optradam (Ivoclar Vivadent). Direct restoration was carried out in the L. Vanini stratification technique using the composite restorative material "Enamel Plus HRI" (Micerium) with shades UD 2, UE3, OBN. Grinding was performed with the red burs. and polishing with VITA Enamic polishing set (pink and gray rubber bands), goat bristle brush with Shiny A, B pastes and cotton disc (Micerium). (Figures 12-14). Patient was recalled in a week (Figures 15, 16).

Fig. 12. **Silicone index made from direct mock-up.**

Fig. 13. **Mamelons restoring.**

Fig. 14. **Final restoration.**

DISCUSSION

A happy and grateful smile of a patient is the main thing in a dentist's work. But in order to achieve harmony at times

Fig. 15. **Intraoral photo of final restoration in a week.**

Fig. 16. **Patient smile in a week.**

it takes a lot of emotional and energy costs for a doctor. And this does not always end with the satisfaction of our needs and the needs of the patient. Planning. It is planning that makes it possible to achieve mutual understanding between the doctor and the patient. Beauty is a subjective concept. And what is beautiful to us, as a doctor, does not always turn out to be beautiful for the patient, and not always our delightful, in our opinion, work justifies the patient's expectations. Therefore, before starting any invasive manipulations, I attach great importance to planning and diagnosis. Indeed, often the time spent on diagnostics allows you to reduce the time for alterations, get a predictable result and avoid errors in work and conflict situations with the patient.

Anterior composite restorations presented satisfying performance, with no significant differences in relation to the survival rates. They showed statistically better surface luster, lower marginal and surface staining, better color match, anatomic form, better marginal adaptation and scored better on the patients' view criterion [8].

CONCLUSION

Thus, preliminary diagnostics allowed us to achieve a predictable and harmonious result in minimal invasion, and most importantly, to get a happy and contented smile of the patients, which they had dreamed about for many years.

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