

Clinical Experience with a System of Direct Composeer (Coltene/Whaledent, Switzerland) Composite Veneers. Work Difficulties and Ways of Overcoming Them

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Abstract: A system of finished Composeer composite veneers is a unique and having no analogy in the world elaboration of the Swiss company *Coltene/Whaledent*, an outcome of almost half a century experience of the company working in a field of composite materials. It combines the best features of direct and indirect restoration methods. The system is fulfilled of nanocomposite Synergy D6 that has high mechanical strength, convenience for workable consistency, color stability and a system of halftone shades, which facilitates color matching. All this allows achieving excellent aesthetic results in minimal time. Application of an original standard scale gives possibility effectively assess optical properties of dental hard tissues and develop an implementation strategy of restoration before work started. Formation of Composeer form, polymerization and polishing at factory allow a practitioner fully utilize effect of "fluorescence" inherent to the material. All this allows us to position the Composeer system as a serious alternative to non-direct methods of restoration with the possibility of both high aesthetic and cosmetic reconstruction reliability.

Key words: Caries, composite, direct restoration, veneers, Composeer, aesthetic restoration.

1. Introduction

The authors have repeatedly been described in previous articles some clinical capabilities of composite restoration systems manufactured by *Coltene/Whaledent* as the most striking example of a smooth, incremental transition from classical, accessible and understandable to most dentists Vita systems to the $L^*a^*b^*$ color system of evaluation of a tooth and respective restoration construction [1-3].

Currently, the company made another, without exaggeration, a revolutionary step in this direction. Subtotal of the 15-year collaboration with Dr. Mario Besek—the system of finished straight composite veneers Composeer—was presented at the International Dental Show (Köln, Germany) in 2011.

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The system is made of enamel Synergy D6 (white opalescence for young people and universal for adults) masses, which are maximum close to natural enamel anatomical thickness at different places of teeth. In addition, the Composeer laminates are subjected to a technologically complex procedure of multistage prepolymerization under pressure, whereby a polymerization shrinkage and internal stress factor are leveled and absence of "bubbles" and "pores" is provided both on surfaces and in thickness of the laminate. A perfectly smooth, mirror-symmetric for pair of teeth micro texture (e.g., 1.1-2.1, 1.2-2.2, etc.) is applied to the Composeer outer surface, and a special laser engraving (2 micron), which provides secure fixture of laminate to solid tissues of a tooth, is applied to the inner surface during manufacture [4].

Dentin in the Synergy D6 composite is a carrier of color in pure form (intensity), and enamel masses established in accordance with the properties of

characterization depending upon physiological age of an enamel and designed to recreate the effects of transparency, color depth, i. e. characteristics determined by the L*a*b* system [2].

The very creation of *Compeer* was the natural result of solving of a number of problems that arise during conducting direct restorations. First, it is necessary to mention the fact that a practitioner who extensively communicates with colleagues around the world developed the system. If you attempt to systematize the above problems, it turned out that they are very similar to dental practices in different countries [5, 6].

An analysis showed that clinicians note the large number of problems on the final stage of restoration (an enamel layer formation, “microrelief” applying, finishing) due to occurrence of visual aberrations or more simply due to “tricks of the eyes” during extensive restorations including 4-6 teeth.

The problem of “mirroring” is the most severe problem of extensive restorations. First, they are difficulties of recreating an anatomical shape of teeth in the “mirror image” in the left and right quadrants of the restoration, although a variety of surface microstructures can be found even on intact teeth in some cases (Fig. 1). In addition, the necessity to respect the “red aesthetics”, i. e. the same gingival adaptation of restoration should be included here also. The following important problem is the necessity of mirror modeling “incisal angles”. Moreover, as practice shows, the majority of dentists practice complete overlap of a tooth vestibular surface with composite in the presence of lesions on both proximal surfaces [5].

Finally, problems of surface restoration microtexturing (creation of enamel ridges, individual drawing, and applying mamelons) arise before the doctor when problems of overlaying enamel layers of restoration have been overcome. At that, you have to perform these manipulations in a mirror image.

Given the fact that the restoration often takes up to 5-7 h of working time, it is not surprising that doctors

in these conditions or delayed the finishing stages to the next visits, or aesthetics sacrificed for the sake of simplicity of work with the low cost of treatment.

2. Materials and Methods

In the opinion, the above problems are fully solved by application of the system of straight *Compeer* composite veneers. Like any new system, it requires the acquisition of certain skills, and the so-called “local adaptation”. The authors were trained to operate the system in the Training Center of Coltene/Whaledent Company and Clinic of Dr. Mario Besek (Zurich) and had the opportunity to ask all questions directly to its creators. Below, we would like to share experience of working with *Compeer*, describe the difficulties encountered and ways of their overcoming using examples of several clinical cases from our own practice.

First, in the authors’ opinion, as with any method of treatment, these challenges should be divided into two main groups: complexities involved during the treatment-planning phase, and the complexities involved directly during the restoration process.

The main difficulties in the planning stage are choice of *Compeer* size and color. The authors have already pointed out that the set of templates which size and anatomical shape closely matches laminates and thicknesses on different parts maximally repeats thickness of the corresponding tooth natural enamel is included in the starter kit to facilitate sizing *Compeer*. By getting experience in this matter, the authors can state that the conformity of the laminate length with the proposed tooth clinical length is a prerequisite for future aesthetic restoration. Given the fact that a crown of anterior teeth has enough individual geometric shape (square, tapered, etc.) the necessary form for the laminate can be given with a grinding disc (Fig. 2).

Regarding the choice of colors used in laminates, this question depends on the purposes pursued. If the main purpose is cosmetic, the color selection should be carried out in conjunction with the patient and



Fig. 1 Variety of surface relief on intact teeth in some patient.

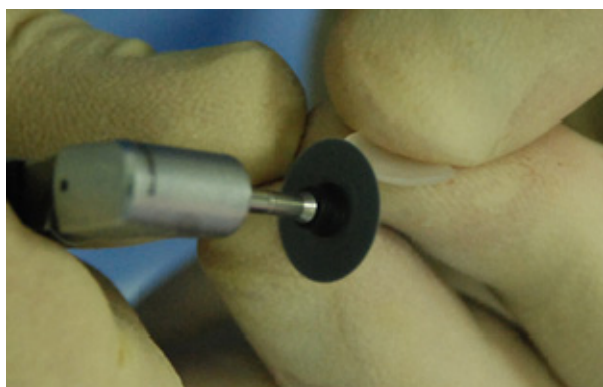


Fig. 2 Manual correcting COMPONEER's form and size.

according to his wishes. If aesthetic purposes are prosecuted, the color of the future restoration must comply with the surrounding teeth, and your choice depends on this. You also need to take into account “vitality” of the restored teeth and the presence of discolorations of other etiologies. Being available in the set, the color template that give possibility to match shades of enamel and dentin has many help here. However, the practice has shown that fixation of a laminate of selected shade to an enamel mass of the same color is more reasonable.

Using a kofferdam is completely dependent on the preferences of a doctor; it does not perform here its primary function—isolation of dentogingival sulcus. The authors have an equivalent experience of performing restorations using *Componeer*, both with it and without it. If you are planning to use the kofferdam for the handkerchief incision according to the Mario Besek technique, then it is expedient to tuck the

vestibular part of the handkerchief under a ready roll (better at full-size Parostrol) and attach to the mucosa using a medical adhesive “Histoakryl”. The handkerchief palatal portion is glued as well, but without any roll. The area of gluing should be treated with ethanol after finishing the treatment before removing the kofferdam to avoid the oral mucosa traumatizing.

3. Results

3.1 Clinical Case 1. Patient S., Age 31

The initial clinical situation is shown in Fig. 3. The 1.2-2.2 teeth were previously treated by over caries. Patient complaints were primarily on aesthetic character. The front surface of the teeth was overlapped with composite. Recurrent caries were not found after visual and instrumental examinations. It was decided to restore the vestibular surface of these teeth using *Componeer* laminates. Medium size, universal color was selected. Enamel universal (Synergy D6) was selected as a fixing composite mass. Dissection of the 1.2-2.2 teeth and subsequent application of the Ultrapak 000 gingival retraction cord (Fig. 5) was performed by the method described above (Fig. 4) after the kofferdam application and fixation). The necessity of using filament and time to add it is determined by the attending physician based on each clinical situation. The authors use retraction cord only in cases where the marginal gingiva has signs of inflammation (small!) and/or if it was injured during machining of the teeth. Moreover, we do the cord imposition perform just before the final fitting and fixation of the laminate and not before dissection, because we believe that the preliminary retraction of gingival changes its anatomical shape and real location.

Final fitting of laminates, preparation of the adhesive surfaces of the teeth to be restored (Fig. 6) were performed in the next stage, after which the *Componeer* laminates were inserted and fixed. The result of restoration after removal of the gingival retraction cord and finishing the laminates is shown in Fig. 7.



Fig. 3 Clinical case 1. Teeth 1.2-2.1. The initial clinical situation.



Fig. 6 Clinical case 1. Teeth 1.2-2.1. The etching of adhesion surfaces.



Fig. 4 Clinical case 1. Teeth 1.2-2.1. The isolation of restoration area.



Fig. 7 Clinical case 1. Teeth 1.2-2.1. The result of restoration.



Fig. 5 Clinical case 1. Teeth 1.2-2.1. Preparation of hard teeth tissues.

The authors would like to immediately warn colleagues who are just beginning to work with *Componeer* system. Quality final assessment of the performed work should be expediently carried out after a while. In this case—after 2 weeks (Fig. 8). The authors would also like to add that the presented case is the authors' first clinical experience with the system.

3.2 Clinical Case 2. Patient B., Age 30

The initial clinical situation is shown in Figs. 9, 10. The 1.2-2.2 teeth were previously treated by over caries. All teeth are vital, there were complaints concerning aesthetic defect of anterior maxillary teeth. The decision to perform a combined restoration—caries treatment of the 1.2-2.2 teeth by the direct method, followed by reduction of the *Componeer* vestibular surface was made. A medium size of the laminate, universal color and an enamel of the same color (Synergy D6) as the fixation composite mass were selected. Dentins A2\B2, A3\D3 and A3,5\B3 (Synergy D6) were selected for the direct restoration. Direct part of the restoration (Fig. 11) was performed after dissection and following gingival retraction cord overlay, and then laminates on the 1.1 and 2.1 teeth (Fig. 12) were inserted and fixed. Further treatment had to be postponed for 1 day due to excessive time spent during the preceding part of the direct restoration.

Applying of Compoener on the 1.2 and 2.2 teeth and finishing restorations were carried out on the next visit (Fig. 13). The result of the restoration after 2 weeks is shown in Fig. 14.

3.3 Clinical Case 3. Patient F, Age 29

The initial clinical situation is shown in Fig. 15. The 1.2-2.2 teeth were previously endodontically treated by over a complicated caries. The patient's complaints were of aesthetic character. The decision to restore the vestibular surface of these teeth using Compoener laminates with a preliminary restoration of the teeth "dentine body" was made. Dentins C2\C3, A3\D3 and



Fig. 8 Clinical case 1. Teeth 1.2-2.1. The view of teeth after 2 weeks.



Fig. 9 Clinical case 2. Teeth 1.2-2.1. The initial clinical situation (the frontal view).



Fig. 10 Clinical case 2. Teeth 1.2-2.1. The initial clinical situation (the distal view).



Fig. 11 Clinical case 2. Teeth 1.2-2.1. The result of the first part of the restoration—direct manual composite restoration.



Fig. 12 Clinical case 2. Teeth 1.2-2.1. The laminats were applying on the 1.2 and 1.1 teeth.



Fig. 13 Clinical case 2. Teeth 1.2-2.1. The result of restoration.



Fig. 14 Clinical case 2. Teeth 1.2-2.1. The view of teeth after 2 weeks.

A3,5\B3 (Synergy D6) were selected for the direct restoration. Selection of the size (medium), color (universal) and individual fitting of the laminates (Fig. 17) were performed after the "dentine body" recovery



Fig. 15 Clinical case 3. Teeth 1.2-2.1. The initial clinical situation.

(Fig. 16). Dissection of the 1.2-2.2 teeth and the subsequent imposition of the gingival retraction cord Ultrapak 000 (Fig. 18) was fulfilled after applying and fixing the kofferdam. The tint of the fixing composite mass was chosen empirically (Fig. 19) and universal (Synergy D6) enamel was selected.

Preparation of the adhesive surfaces of the restored teeth was performed on the next stage, after which the *Componeer* laminates were inserted and fixed. Exterior restoration after removal of the gingival retraction cord is shown in Figure 20. Insufficient depth of overlap of approximate areas in the cervical area is clearly seen in Fig. 20. This defect was corrected by the direct method of restoration after re-conditioning adhesive enamel surfaces with universal (Synergy D6, Fig. 21). Exterior restoration after 1 month is shown in Fig. 22.

In addition, we have a clinical experience of successful application of the *Componeer* system for direct occlusion correction (Fig. 23—the initial situation, Fig. 24—the result of treatment). Dissection in this case was not carried out.

4. Discussion

Unfortunately, the print job is always limited in volume and has one-way directivity because of a dialogue absence. However, we anticipate some possible objections from our colleagues, particularly from dentists and orthopedists.



Fig. 16 Clinical case 3. Teeth 1.2-2.1. The view of the adhesion surfaces after the bleaching.



Fig. 17 Clinical case 3. Teeth 1.2-2.1. The individual fitting of laminat's for every tooth.



Fig. 18 Clinical case 3. Teeth 1.2-2.1. The isolation of restoration area.



Fig. 19 Clinical case 3. Teeth 1.2-2.1. The checking of optical properties of composite.



Fig. 20 Clinical case 3. Teeth 1.2-2.1. The view of the restoration after removal of the gingival retraction cord.



Fig. 21 Clinical case 3. Teeth 1.2-2.1. The view of the restoration after direct composite correcting.



Fig. 22 Clinical case 3. Teeth 1.2-2.1. The view of the restoration after 1 month after treatment.

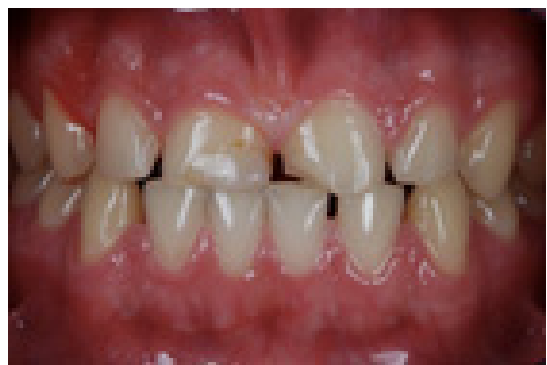


Fig. 23 Direct occlusion correction (the initial situation).

The authors would like to draw readers' attention to the fact that the *Componeer* system according to both the developer and the manufacturer is considered as part of a direct restoration created to solve the above



Fig. 24 Direct occlusion correction (the result of treatment).

problems of direct restorations. Accordingly, this system, which is made of a composite material, designed primarily for restorations of “vital” teeth, although we have successfully used it for clinical situations that were more complex. Yet we believe aesthetics and/or cosmetics of dentition frontal sites, while maintaining “the vitality of teeth”, are the main aims of its use.

The authors have analyzed ergonomic and financial components of the system in the previous work. The following four main factors have particular importance for patients and doctors:

- cost of treatment (for a patient) and cost of consumables (for a doctor);
- duration of treatment (number of visits);
- compliance with the expected results obtained;
- durability of outcomes.

Componeer laminates have clear and distinct advantages over indirect techniques of restoration for at least half of the positions. However, by no means we do not claim that the system is designed to replace *Componeer* indirect methods of restoration completely, in particular all-ceramic. Just in some cases, the system is able to make a very worthy competition to ceramic veneers on all items subject to indications, and especially considering ergonomic and economic benefits for both the patient and the doctor. Hand on heart, the majority of dentists and especially dental therapists agree that such system has been long expected by not only clinical necessity, but due purely

mercenary motives also:

- Firstly, the system enables physician-therapists working in different conditions (mixed reception, self-employment and some more) to perform highly aesthetic restorations and do not turn to related professionals;

- Secondly, absence of necessity to have a dental laboratory is also an important factor.

Finally, in conclusion of the work, the authors hope that clinical examples from his own practice the authors have described will help the colleagues to acquire the necessary skills and experience to work with the system and to avoid some of the difficulties and problems that are inevitable during mastering any new treatment technique.

The authors are trying to avoid laudatory words, although we believe they would be quite appropriate here, and everyone, who has ever used the given laminates in a clinic, can easily be agreed on this. Moreover, the authors believe that the *Componeer* system will undoubtedly be evaluated appropriately and take its rightful place in an arsenal of every

medical practitioner specializing in direct restorations of dental hard tissues.

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