

The importance of diagnostic wax-up to make predictable composite resin aesthetic restorations in anterior dentition

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Abstract: *Composite resin restorations are still important for dentistry due to a number of factors. In order to obtain better results, the clinician should always evaluate its correct indication, treatment planning and execution. All of these steps must be strictly followed and enforced with the minimum details to obtain not only aesthetic results, but also long term stability. The present article shows an important stage of planning to get a more predictable and natural result. Diagnostic wax-up when performed by the dentist in the case of composite resin, make the final result more detailed because the same professional who perform the planning in the casts will execute it in the mouth. In this manner, improving predictability in search of natural aesthetics and long-term stability. **Keywords:** Diagnostic wax-up. Composite resins. Predictability.*

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» Patients displayed in this article previously approved the use of their facial and intraoral photographs.

Introduction

Direct composite resin restorative procedures are a reality of daily practice, either in “simpler” restorations or in large rehabilitative cases where it is necessary to modify function and aesthetics, both in the anterior and posterior areas.

The scientific literature has shown that restorative biomaterials (e.g. composite resin) had a large evolution from the optical and biomechanical points of view. With the correct indication, elaborate planning and refined execution techniques, it is possible to carry out cases of high aesthetic complexity. Factors such as color selection, layering quality, finishing and polishing are critical for beautiful, natural results. However, it is important to note that the clinical follow-up, with the repolishing of those works, is also of paramount importance for achieving longevity in this type of treatment.

Composite resins evolved in several aspects of their composition and a major change occurred in the size and shape of charge particles. Some brands of resin have spherical particles and consequently achieve a high standard polish and thus its stability.

Bearing in mind obtaining results that are increasingly predictable for the dentist and patient, this article presents a technique in which the dentist her or himself performs the diagnostic wax-up for the execution of works in composite resin.

With patients' high aesthetic requirement, one aims at works with function, longevity,

but also highly aesthetic. It is noticed that by personalizing the smile design of each patient, a better and more natural result is achieved. Restorative Dentistry is going through a phase where many professionals are indicating or overindicating treatments and materials incorrectly. In many articles, and even in social media, there is often the sense that there is only one restorative material - called ceramics - and one forgets that composite resins have space and indication for aesthetic restorative treatments.

With the correct indication of the treatments, we noticed that composite resins can positively surprise both the patient and the dental surgeon with the results obtained. This article shows the importance of diagnosis, indication and how to achieve a more predictable, qualified and personalized result when the dentist himself executes the diagnostic wrap-up and then performs composite resin restorations. Therefore, when the indicated treatment is for ceramic restorations, it is extremely important that the dental technician or the laboratory perform the diagnostic wax-up of that case. However, when the indicated treatment is with composite resin - where the clinician himself will restore the tooth -, it is very important that he himself perform this planning and diagnostic wax-up. Thus, a number of benefits will be achieved, such as: predictability in being able to make the mock-up, allowing the necessary adjustments in mouth. In this way, the result can be approved and customized for the patient, with a more detailed planning of the case, training of the contour of the restorations, volume and dental anatomy, texture and microtexture. By performing the waxing with all these details and information, a mastery of the anatomy is achieved before performing the procedure. When the time to perform the direct mouth restorations comes, the work has already been planned, trained, and performed previously. Everything ends up being done with more tranquility, security and with sharper details. In this way, the dental surgeon will only worry about color stratification at that moment. In addition, the predictability of arriving at the expected result is greater as to achieve the anatomy of the diagnostic wax-up.

Clinical case

Female patient, suitable for reanatomization for orthodontic finishing (Fig 1 and 2). The planning was done together with the patient, and it was decided to perform six veneers in composed resin from # 13 to # 23, by the direct technique. A previous bleaching was done, in order to leave the substrates lighter and to allow the accomplishment of a veneer with smaller thickness; during the whitening phase, addition diagnostic wax-up was performed, repairing all the details of anatomy, contour, macro and microtexture (Fig 3 and 4).

After the waiting time (7-14 days) for the release of oxygen free radicals and color stability, and after mock-up completion and approval by the patient, the restorative phase was scheduled. After color selection, rubber dam isolation was performed (Fig 5) with floss ligatures and clamps, stabilizing it in the premolar region to a perfect moisture control. Then, there was the proving of the palatal wall obtained by the wax-up, to evaluate the adaptation and to observe the presence of any area of interference (Fig 6). Then, etching was performed with phosphoric acid 35% (Potenza Attaco PHS) for 30 seconds, since the substrate



Figure 1: Initial smile photography.



Figure 2: Initial intraoral photography.

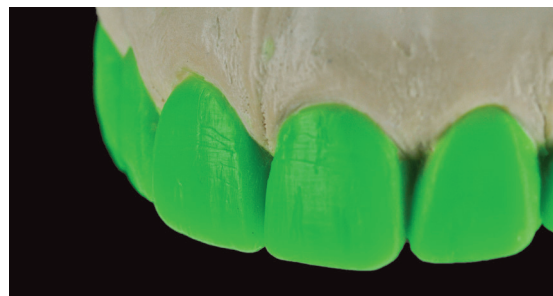


Figure 3 e 4: Diagnostic wax-up made by the dental surgeon.

had only enamel (Fig 7), followed by thorough washing and drying, leaving the enamel completely dried and dehydrated (Fig 8) ready to receive the adhesive system. After application of the adhesive system, an increment composite was placed WE (White Enamel) (Palfique LX5, Tokuyama Dental) to make the enamel layer and it was positioned in the mouth, to return the correct contour obtained by the diagnostic wax-up (Fig 9). Then, the same coating was applied to the adjacent teeth one by

one, reestablishing the anatomy and incisal contour with all anatomical details developed by the wax-up (Fig 10).

Then, to reduce the appearance of the connecting line between tooth and resin, an OA1 color dentin resin (Palfique LX5, Tokuyama Dental) was applied by drawing the mamelons and rising slightly at the edge of incisal edge continuing to the buccal side. A little white dye (Empress Direct Color, Ivoclar Vivadent) was applied on the incisal edges, simulating an opaque halo, and also a little of ocher in the central region of the mamelons (Fig 11).



Figure 5: Isolation carried out with rubber dam, dental floss ligatures and clamps for stabilization.



Figure 6: Photograph showing the silicon wall obtained by the diagnostic wax-up to verify that was stable and well adapted.

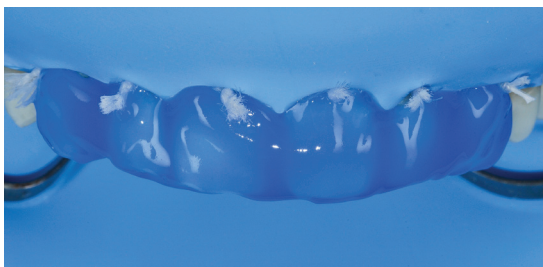


Figure 7: Etching with 37% phosphoric acid.



Figure 8: After washing and drying of the enamel surface.



Figure 9: After application of the adhesive system, followed by curing, a thin WE resin layer (Palfique LX5, Tokuyama Dental) was applied on the wall of tooth 11, taken to position to make the palatal contour layer, followed by curing.

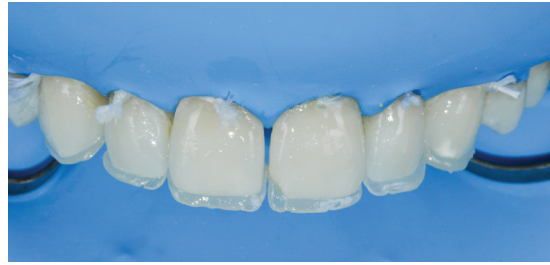


Figure 10: After all palatine layers were done one by one, following the technique described above, the WE resin is applied to the wall and light-cured.



Figure 11: Application of the dentin layer with the OA1 resin (Palfique LX5, Tokuyama Dental), gently rising in the tooth in the vestibular region, roughly 0.5 to 1.0mm (in height, not thickness), to reduce the bonding line; followed by curing and white dye application, simulating an opaque halo, and other color, highlighting the central mamelon.



Figure 12: Application final enamel resin of the same color as the color palate layer WE (Palfique LX5, Tokuyama Dental), following the final drawn and Anatomy developed in diagnostic waxing. As this anatomy was trained during wax-up, the result is easier and more predictable to obtain.

In the final buccal layer, a thin resin layer was applied WE (Palfique LX5, Tokuyama Dental), returning the same final anatomy developed in the diagnostic wax-up, tooth by tooth, until the end of the six teeth (Fig 12). Finishing was performed, texture and microtexture, followed by a final polishing with rubber and felt to obtain the final brightness and a more natural look (Fig 13, 14). In Figure 15, one can see the final smile, with the direct veneers in composite resin.



Figure 13: Intraoral Photography after final polishing with finishing discs, finishing rubbers, polishing rubbers and felts.

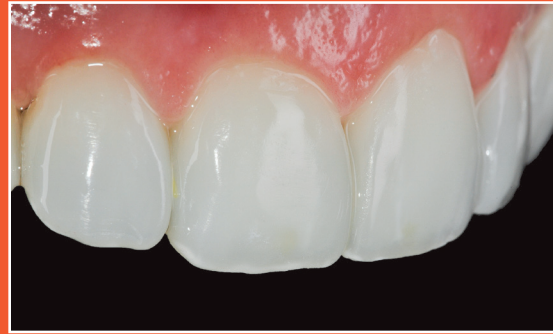


Figure 14: Final photograph showing a natural resin veneer, even by using simple stratification with two colors and three layers.



Figure 15: Final smile, with smooth and natural appearance.

Final considerations

When the dentist himself performs the diagnostic wax-up, we have full predictability of the restorative outcome, even if in composite resin, because we can do a mock-up for approval of the patient and thus end the case with the same result approved during rehearsal, also achieving predictability, a more personalized and natural restorative result. However, the technique, indication and the follow-up are of paramount importance, since we know of the behavior of composite resins in the mouth. Thus, following up and repolishing the resins become essential for a successful outcome in the short, medium and long term.

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