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Blueprint for SUCCESS

The composite mock-up is an invaluable communication tool to ensure optimal esthetics and function—and patient satisfaction.

By Ara Nazarian DDS

Communication between the ceramist and the cosmetic dentist has always been the key to obtaining a superior result in both esthetic and functional aspects of restorative dentistry. An essential yet overlooked part of this communication is the role of the composite mock-up

The composite mock-up, when used properly, can provide valuable information to the dentist, ceramist, and patient. It may help dentists determine the amount of reduction necessary to achieve the final result, keeping preparation as conservative as possible.

Another important role of the composite mock-up is in the fabrication of provisional restorations. In the mouth, the composite mock-up can be contoured and customized to the patient's facial features. Occlusion and phonetics can be evaluated, and when, along with esthetics, are deemed satisfactory, an impression can be made to communicate the proper size, shape, length, and form to the lab.

Case presentation

A patient in her mid-forties presented dissatisfied with her existing teeth, with edentulous areas in her dentition (**Figure 1**). She desired a more youthful smile and straight, white teeth.

Pre-operative exam

Clinical examination revealed multiple composite restorations with stained margins and overhangs in the anterior maxillary area and teeth Nos. 3 and 5 were missing. Incisal wear on the maxillary anteriors resulted in very flat, square teeth. She had no TMJ symptoms, but the ultimate treatment plan was to include the development of anterior protection of the posterior teeth.

All probing depths were within normal levels and the periodontal health was within acceptable limits. However, the soft tissue symmetry was inadequate on tooth No. 7—there was too much gingiva visible at its cervical margin.

Treatment planning

Given the relationship between the free gingival margin and the height of the crestal bone, the only way to achieve gingival symmetry would be with osseous contouring and gum reshaping. The patient was not interested in undergoing periodontal surgery—her daughter was getting married in two weeks and she wanted her smile enhanced by then. A comprehensive treatment plan was developed and risks, benefits and alternatives were reviewed. She decided to have six veneers from teeth Nos. 6-11, a four-unit bridge from teeth Nos. 2-5 and a crown on tooth No. 12.

Composite mock-up

It was essential to quickly allow the patient to see a preview of the final outcome so that we could immediately initiate treatment to meet the patient's deadline. A composite mock-up was used to complete the smile analysis necessary for pre-designing the case. Her maxillary anteriors were too short, flat, and square. The patient preferred a softer, more feminine look. To achieve this, the shape selected would be rounder, and the embrasures between the teeth would be larger. Lip-line edge versus the incisal edge of the teeth suggested that the patient could tolerate lengthening of the incisal edges. The teeth were prepped for the composite mock-up by adding bonding agent (Optibond Solo Plus, Kerr) *without* etching the teeth. We added composite (Premise, Kerr) and shaped our goal for teeth Nos. 6, 7, and 8 (**Figure 2**). This retracted view allowed the patient to visualize exactly how much we were adding to the length of her teeth to enhance her smile. Once the patient approved the length, shape,

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(1) Retracted pre-operative view (2) Unilateral composite mock-up of No. 6-8 (3) Composite mock-up of teeth No. 6-11

and contour, we applied and shaped the remaining maxillary anteriors (Nos. 9, 10, and 11) (**Figure 3**). Because the patient was not yet anesthetized, she could see the enhancements to her smile without

any interference from drooping lips. Using a PVS material (Take One Super Fast, Kerr) we took an impression of the composite mock-up. This would be poured up as a guide for the laboratory in the fabri-

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(4) Prepared teeth with Expasyl
(5) Final restorations

cation of the final restorations and aid the clinician in fabricating the temporaries.

Preparation

When informed consent was obtained, treatment was initiated. After anesthetic was administered, all teeth requiring buildups were properly cleared of old alloy, and any decay using a Midwest MultiPrep Carbide Bur (Dentsply). A seventh generation bonding agent (All in One, Kerr) was applied following the manufacturer's protocol and cured. Using flowable composite (Premise, Kerr) followed by a packable composite (Premise, Kerr), the build-ups were accomplished on teeth No. 2, 4 and 12.

The teeth were prepared sequentially, starting from the anterior maxillary segments to the posterior right and posterior left segments. Teeth No. 6-11 and No. 12 were prepared for Empress (Ivoclar Vivadent) restorations and No. 2-5 was prepared for a porcelain fused-to-metal bridge (IPS D-Sign, Ivoclar Vivadent). Before taking an impression the tissue was controlled using Expasyl paste (Kerr); we not only controlled hemorrhaging, but also achieved slight gingival retraction (**Fig. 4**). Because the patient had a sensitive gag-reflex, a quick-setting impression material was selected (Take One Super Fast, Kerr) to take the full-arch impressions. Using the polyvinyl siloxane impression of the composite mock-up, the provisional restorations were fabricated, trimmed, and glazed.

Impressions, diagnostic models, a bite registration and photos were forwarded to the lab to aid in the fabrication of the final restorations, which are shown in **Figure 5**.

Upon her return for the delivery, the temporaries were removed and the preparations cleaned. The restorations were tried

in for fit and approved by the patient for esthetics. Initially the porcelain-fused-to-metal bridge from teeth No. 2-5 was seated with Maxcem cement (Kerr) and allowed to set. Clean up was quickly

achieved during the gel stage by peeling away any access cement with a scaler.

Next, the restorations for teeth Nos. 6-11 and tooth No. 12 were cleaned, etched, and treated

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(6) NX3 cement with corresponding try-in gel (7) Retracted post-operative view

with a silanator while their corresponding preparations were treated with Opti-bond All-In-One (Kerr) self-etch adhesive according to the manufacturer's instructions and cured for 15 seconds. The porcelain veneers were loaded with Bleach shade NX3 (Kerr) resin cement (Figure 6) and placed on the prepared teeth starting from the midline going outwards, followed by the crown restoration for tooth No. 12. The restorations were spot cured with an LED curing light (Demi, Kerr) and any excess cement was removed. Once complete clean-up was achieved, the restorations were cured from both facial and lingual surfaces for another 15 seconds each.

As seen in the post-operative photos immediately after seating, the restorations exhibited a nice esthetic look and the patient was extremely happy (Figure 7).

Conclusion

The composite mock-up is an under-utilized protocol that usually guarantees accurate representation of the proposed treatment. For the dentist and the patient, it allows a preview of what the final restorations will look like in the patient's mouth. This is more powerful than any imaging or wax-up since it is created directly in the mouth and the patient has a chance to "try it on for size." Also, it serves as a great model for the dentist and laboratory for proper planning, prepping and provisionalization. **DPR**

Acknowledgment

A special thanks to Burbank Dental Lab for the beautiful lab work on not only the wax-up but also the restorations.