Adhesion of Restorative Materials

By Gregg A. Helvey, DDS

A 46-year-old patient presented with fractured incisal edges on her maxillary central incisors (Figure 1). She wanted her teeth restored and the spaces between the other maxillary anterior teeth closed. After discussing the risks and benefits of several treatment options, the decision was made for placement of six anterior ceramic laminate veneers. Duplicate study models were poured and a mock-up was created in the laboratory. On the next appointment, using a vacuum-form stent filled with shade B-1 Prodigy (Sybron/Kerr), the mock-up was transferred onto the patient's maxillary anterior teeth. After finishing and polishing the additive mock-up, the patient was dismissed (Figure 2). One week later, she reported that she was happy with the esthetics and phonetics and had no problems with speech or chewing (function). At the preparation appointment the teeth were prepared using the "round-bur preparation technique," and after completing impressions, face-bow transfer, and bite registration, the provisional restorations were placed using the same mock-up material and stent.

The restorations were fabricated using the wax-injection method that duplicates the provisional restorations in shape and contour. IPS e.Max® (Ivoclar Vivadent) pressable ingots were used in the in-office laboratory. After verifying the fit, the restorations were cutback in the incisal regions and then layered with incisal porcelains using the lateral segmental technique.

GREGG A. HELVEY, DDS
Adjunct Associate Professor
Virginia Commonwealth University
School of Dentistry
Richmond, Virginia

Private Practice
Middleburg, Virginia

At the insertion appointment, the provisionals were removed and the prepared tooth surfaces were air-abraded. The restorations were tried in to verify fit, and the intaglio surfaces were then treated for adhesive bonding.

The teeth were isolated. One drop of OptiBond XTR primer was dispensed into a disposable mixing well, and a microbrush was used to apply the primer in a scrubbing motion for 20 seconds (Figure 3). A fresh drop was dispensed and the next tooth was then primed. Once the OptiBond XTR primer had been applied to all the teeth, the surfaces were air-thinned for 5 seconds (Figure 4). Next, the OptiBond XTR adhesive was shaken briefly and several drops were dispensed in the disposable mixing well. The adhesive was applied to each tooth using a microbrush with a light brushing motion for 15 seconds (Figure 5). Afterwards, the adhesive was air-thinned for 5 seconds (Figure 6), and all the treated teeth were then light-cured for 10 seconds (Figure 7).

All of the restorations would be placed simultaneously to ensure correct placement. Light polymerization would only begin after placement verification. Each restoration was filled with Nexus® 3 (Sybron/Kerr) resin adhesive cement (clear) and then placed on its respective


FIG. 1


FIG. 2


FIG. 3


FIG. 4


FIG. 5


FIG. 6


FIG. 7

(1.) Frontal view of the fractured central incisors and diastemas present in the remaining anterior teeth. **(2.)** After placement of the B-1 Prodigy composite mock-up, the patient was able to evaluate the proposed treatment for esthetics, phonetics, and function. **(3.)** OptiBond XTR primer was applied using a scrubbing motion for 20 seconds for each tooth. It is important to use a new drop of primer for each tooth. **(4.)** OptiBond XTR primer was air-thinned for 5 seconds. **(5.)** Using a brushing motion, OptiBond XTR adhesive was applied to each tooth for 15 seconds. **(6.)** Optibond XTR adhesive was air-thinned for 5 seconds. **(7.)** The treated teeth were each light-cured for 10 seconds.

tooth (Figure 8). After all the restorations were in place, a cotton roll was used to remove the gross excess cement (Figure 9). Taking hold of the two central incisor restorations with the index finger and thumb, the clinician held them firmly into place and then exposed them to the curing light for 5 seconds (Figure 10). The positioning of the hands blocked the adjacent restoration from any light exposure. Next, the two lateral incisors were held in a similar fashion and light-polyermized for 5 seconds. The procedure was repeated for the two canine restorations. Using two curing lights placed on the facial surface and incisal edge of the teeth, the restorations were fully light-polymerized.

The excess cement was removed. A composite saw and ultra-fine diamond finishing strips were used interproximally, and dental floss was then used to fine any remaining excess cement. After checking the occlusion, photographs were taken and the patient was dismissed (Figure 11 and Figure 12).


FIG. 8


FIG. 9


FIG. 10


FIG. 11


FIG. 12

(8.) The restorations were filled with Nexus 3 light-cure and placed all at once. **(9.)** A cotton roll was used to remove the gross excess cement. **(10.)** The two central incisor restorations were firmly held in place then exposed to the curing light for 5 seconds. The same procedure was repeated for the lateral and canine restorations. **(11.)** Retracted view of the final restorations in place. **(12.)** Facial view of the finished restorations.