

Clinical Showcase

Clinical Showcase is a series of pictorial essays that focus on the technical art of clinical dentistry. This section features step-by-step case demonstrations of clinical problems encountered in dental practice. This month's article is by Dr. John Kanca, one of the featured speakers at the Ontario Dental Association Annual Spring Meeting, which will take place in Toronto, Ontario, from May 6 to 8. For more information on the meeting, visit www.oda.on.ca. If you would like to propose a case or recommend a clinician who could contribute to Clinical Showcase, contact editor-in-chief Dr. John O'Keefe at jokeefe@cda-adc.ca.



Posterior Composites: Beauty, Efficiency and No Sensitivity

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Tooth-coloured restorations are a highly desirable health service, especially when they can be delivered in a predictable and sensitivity-free manner. As is typical of restorative dental procedures, there is more than one way to place a posterior resin composite. This article describes a method used by the author to routinely place resin composite restorations in posterior teeth.

Posterior resin composite restorations are becoming increasingly popular. The key to success is the proper technique and selection of materials. A common error in the placement of these restorations is lack of familiarity with a new material, be it an adhesive or a resin composite. Before a new material is used or a new technique implemented, the instructions should be thoroughly reviewed and all parts of the system laid out, such that there will be no need to search for anything, once the technique has begun.

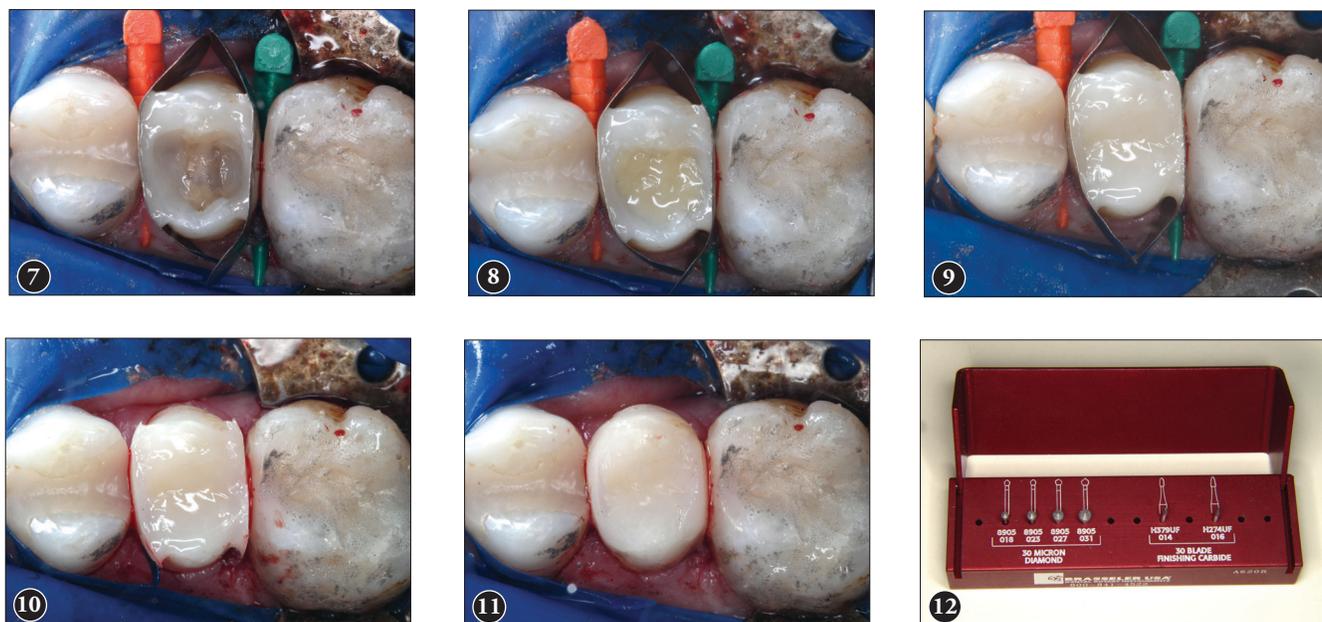
The teeth being restored are the maxillary second bicuspid and the maxillary first molar (Fig. 1). The resin adhesive

used is Simplicity (Apex Dental Products, Sandwich, Ill.; Fig. 2), the flowable composite Permaflo (Ultradent Products, South Jordan, Utah) and the resin composite Vit-I-escence (Ultradent). The first step is to isolate with a rubber dam. The first molar was restored separately from the second bicuspid. It is this author's experience that doing back-to-back resin composite restorations is very difficult and makes problematic a predictable placement of the contact area. Removing the amalgam and beveling all margins completes the preparation (Fig. 3).

Two sectional matrices (Garrison Dental, Spring Lake, Mich.) are placed, along with 2 wedges (Flexiwedge, Common Sense Dental, Nunica, Mich.) (Fig. 4). Sectional matrices are highly recommended, as they encourage the proper placement of the contact area and permit a desirable contour interproximally. The use of Toffelmire-type retainers tends to result in flat interproximals with contacts at the marginal ridge areas. The next step is to apply the self-etching



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adhesive Simplicity and the flowable composite Permaflo. Simplicity is reported to have good bond strengths to enamel and dentin, and to be stable in storage.¹⁻³ A thin layer (approximately 0.5 mm) of Permaflo is applied to the bottom of the cavity, up to and including the cavosurface interface where the matrix meets the floor of the cavity preparation (Fig. 5). This is one of the most important places to apply the flowable composite. Flowable resin composites improve adaptation of the composite to the preparation and, in some cases, improve resistance to dye penetration.⁴⁻⁸ The flowable composite and the adhesive are light-activated for 10 seconds, using an Ultralume 5 LED light (Ultradent) (Fig. 6). If the light output is unknown, then a 20-second exposure is recommended.

If establishment of the contact is going to be obviously difficult, then a slightly modified technique is recommended. To assist in establishing a contact, apply the flowable composite only to one of the proximal boxes and insert a ball burnisher into the cavity. Press the ball burnisher into the desired contact area and hold with a small amount of pressure for 5 seconds. Then, while maintaining that pressure, turn on the activation light for 10 seconds. The flowable resin composite will then hold the newly created contact. This can be repeated for the second contact, if there is one.

Vit-l-escence resin composite shade Pearl Neutral is placed in the proximal boxes to create the interproximal contours (Fig. 7). The increments are light-activated for 10 seconds. Placing the resin composite in increments helps create the multichromatic effects seen in natural teeth. The internal aspect is then filled to within 1 mm of the occlusal surface with Vit-l-escence dentin shade A4 and light-activated for 10 seconds (Fig. 8). Finally, the missing

occlusal portion is added in a manner that minimizes excess (Fig. 9). Since enamel is a highly brittle substrate, this layer will be hardened with pulse activation, which is effective in reducing stress along the enamel cavosurface margins.⁹⁻¹² It is intended for use on the enamel replacement layer only, as enamel has a much higher modulus of elasticity than dentin and is far more brittle. It is not necessary for the deeper layers of posterior resin composite restorations, where the predominant substrate is dentin. The Ultralume 5 has settings that allow for the control of time of exposure, making it particularly useful for pulse activation and for tacking veneers into place. The Ultralume 5 is set to turn on for 3 seconds, held over the enamel layer of composite and turned on.

The resin composite is allowed to set undisturbed for 10 seconds, at which time the wedges and matrices are removed (Fig. 10). Any excess flash at the embrasure areas is removed with a disc and slow-speed handpiece (Fig. 11). About 3 minutes into the finishing procedure, the restoration is pulse-activated again for 3 seconds. Preliminary anatomy may be carved into the restoration at this time. Of significant usefulness are the 8905 series of Brasseler multifluted carbide-shaped burs (Brasseler USA, Savannah, Ga.) (Fig. 12). The 019 and the 023 sizes are designed for bicuspids; the larger 027 and 031 sizes are designed for molars. The 8905-023 bur was used to carve preliminary anatomy into the restoration (Figs. 13 and 14). The rubber dam is then removed and the occlusion further developed (Fig. 15).

The restoration is then smoothed with the 379 and 274 burs (Fig. 16). A brilliant luster may be created on the surface of the restoration with Jiffy brushes (Ultradent)



(Fig. 17). Jiffy brushes are used in the slow-speed handpiece at high rpm on a dry tooth surface, beginning with a gentle application and gradually increasing pressure. The restoration is then sealed to ensure tiny marginal defects are occluded. The Simplicity adhesive is reapplied, followed by a layer of the surface sealer Permaseal (Ultradent), a very thin resin sealer. Permaseal is thinned with air, so no additional occlusal adjustment is necessary. The restoration is then light-activated for 10 seconds per surface, both to activate the sealer and to provide additional energies to the resin composite within the restoration. Because of the use of more than one shade of resin composite, the completed restoration (Fig. 18) has taken on a very natural multichromatic effect. The ability to provide natural-appearing, durable and sensitivity-free restorations in a predictable and efficient manner is a great benefit to both patient and practitioner. ♦



Dr. Kanca is the creator of the Simplicity adhesive bonding system and has a financial interest in the product. Dr. Kanca maintains a private practice in Middlebury, Conn., with an emphasis on cosmetic dentistry.

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Dr. Kanca's session "Adhesive Dentistry for the New Millennium" will be presented on Saturday, May 8.

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