

3MSM Health Care Academy

Esthetic Restoration of Maxillary Central Incisors.

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Anterior composite restorations present many esthetic challenges to the clinician, and the difficulties increase with the size of the restoration. However, the quality of composite materials has advanced steadily in recent years, to the point that it is now more possible than ever to achieve excellent esthetics, high strength and longevity with a composite resin restoration. A careful and precise technique is of course vital to the success of any clinical case, but the results that can be achieved with composite continue to grow more impressive.

Case Report

The patient, a 22-year-old male, visited the clinic after having broken teeth Nos. 1.1 and 2.1 in a fall the previous night (Fig. 1). The patient's college graduation was in 3 days, and he was seeking a way to repair the teeth quickly and esthetically. Radiographs were taken, and because of the severity of the break on tooth No. 2.1, it was also tested for vitality with an electric pulp test, a cold test, and a percussion test prior to determination of treatment. All test results showed the tooth to be vital, and the patient agreed to proceed with a resin buildup. The patient was informed at this time that tooth No. 2.1 would have to be monitored closely with regular 6-month checkups to ensure its ongoing vitality, and he understood that a root canal might eventually become necessary.



Figure 1: The patient had broken both teeth Nos. 1.1 and 2.1 from a fall.

An alginate impression was taken for the creation of diagnostic wax-up, and the patient was sent home with glass ionomer temporaries. The wax-up was used to fabricate a lingual index with a vinyl polysiloxane (VPS) putty material. The patient returned to the office the following day for the final restorations. Local anesthesia was administered and shade selection was performed. A significant amount of white stain was noted on the patient's teeth during this step.

Next, a rubber dam was placed and ligated with floss. Then, the preparations were done using a flame diamond (8862-014 [Brasseler USA]) to create a bevel around the teeth. A flexible disc (3M Sof-Lex™ Extra-Thin Contouring & Polishing Disc) was then used to blend the bevel on the tooth surface and to round the sharp angles interproximally (Fig. 2).

The smaller break on tooth No. 1.1 was repaired first. Enamel was etched with phosphoric acid etching gel and Single Bond Universal Adhesive (3M) was applied. The adhesive was cured, and the lingual matrix was tried in place to ensure its fit.

A small amount of Filtek™ Z350 XT Universal Restorative (3M) in shade A1E was placed in the lingual matrix (Fig. 3), and the matrix was then held to the lingual of the teeth. The resin was attached to tooth No. 1.1 with a football burnisher and cured in place (Fig. 4). This process created a lingual shell upon which to build the remainder of the restoration, with the proper width and height pre-determined by the diagnostic wax-up (Fig. 5).

A fine line of white tint was then applied at the incisal edge to create a "halo" on the tooth (Fig. 6), and the dentine buildup was then performed with the more opaque and darker shade of Filtek™ Z350 XT A2B shade (Fig. 7). The dentine component was cured, and incisal translucent material was placed in the incisal third. These layers were followed with additional white tint to recreate the white spot effect on the patient's other teeth. The final enamel layer was placed with A1E material, and was then shaped with an interproximal carver, a gold Almore instrument, and brushes to make the surface smooth and to bring the restoration to the proper contour (Fig. 8).



Figure 2: The teeth were prepared with infinite bevels.



Figure 3: A small amount of composite in shade A1E was placed in the lingual matrix.



Figure 4: A football burnisher was used to attach the resin.



Figure 5: The index was removed, leaving a lingual shell on which the remainder of the restoration was built.

Following completion of tooth No. 1.1, tooth No. 2.1 was treated similarly. Celluloid strips were placed to protect the adjacent teeth during etching and bonding, then removed following curing of the bonding agent. Composite resin was again placed first in the lingual matrix (Fig. 9), then brought to the teeth and attached with a football burnisher and a brush to create the lingual shelf. A metal matrix (Original Tofflemire® matrix band #1, .0015in. [Waterpik]) was placed and the distal contact and surface were built with A1E material (Fig. 10). The same process was then used to create the mesial contact, surface and embrasure (Fig. 11). With the lingual, mesial and distal components in place (Fig. 12), the dentine buildup was performed with Filtek™ Z350 XT A2B material. The dentinal lobes were shaped and cured, and an incisal halo was again created using white tint. Clear translucent material was used in the incisal third between the dentinal lobes, and white tint was then applied and cured. The final layer of A1E was placed and shaped as described for No. 8 (Fig. 13).

Finishing was performed with Sof-Lex™ Contouring and Polishing Discs, which were used to open up the incisal embrasures and refine the incisal contour and length. Surface anatomy was refined with a fine diamond (8862-014 [Brasseler USA]), and a No. 12 scalpel blade was used to remove excess material at the gingival as well as to refine the embrasures. A series of coarse, medium and fine polishers was then used, and an aluminium oxide polishing paste completed the finishing procedures.

The completed restorations showed a very natural emergence profile and the overall match to the patient's teeth was excellent (Figs 14 and 15). The patient was very pleased with the final result and felt confident heading in to his graduation. Despite the success of this treatment, the patient understands that the area must be monitored carefully in the future due to the trauma the teeth suffered. However, if tooth No. 2.1 remains vital, it is hoped that these restorations will serve for a number of years.



Figure 6: A halo was created with white tint at the incisal edge.



Figure 7: Shade A2B was utilised for the dentine buildup.



Figure 8: The final enamel layer was shaped with an IPC, gold Almore instrument, and brushes.



Figure 9: Composite was placed first in the lingual matrix, then brought to the teeth and attached with a football burnisher and a brush to create the lingual shelf.

Discussion

Composite resin is an appealing restorative option, especially for young patients. Composite resin offers a conservative approach, while providing a highly acceptable esthetic outcome. The additional time demand demonstrated in this case also illustrates an important benefit of composite – it can be used to quickly create large restorations that help patients feel confident in their appearance. Rather than being fitted with a temporary crown for his graduation, this patient was able to attend his event with a lifelike final restoration in place.

As seen here, careful shade selection and technique throughout the restorative process can help assure a natural-looking result. The effort is well worth it, and the wear properties and strength of this nanocomposite material will serve the patient nicely over the coming years.



Figure 10: The distal contact and surface were formed.



Figure 11: The mesial contact, surface and embrasure were created.



Figure 12: The final proximal surfaces.



Figure 13: Final contour of the restorations before finishing.



Figure 14: The completed restorations.





Figure 15: A very natural emergence profile was achieved.



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Dr Cathia Bergeron received her DMD degree from Laval University in Québec, Canada, in 1993. The following year, she completed a General Practice Residency (GPR) in the same institution. In 1999, she received a Certificate in Operative Dentistry and a Master of Science degree from the University of Iowa, USA. Dr Bergeron is currently Professor of Operative Dentistry at Laval University where she also serves as Dean. She maintains a university practice limited to Operative Dentistry with a strong emphasis on esthetic dentistry. Her primary interests are in the areas of esthetics, composite resins, dental adhesion and minimally invasive dentistry. Dr Bergeron shares her expertise in direct restorative procedures through numerous lecture and hands-on courses in Canada and abroad.

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