The One-Visit Smile Makeover: An Ultraconservative Approach

Oleg Borshch, DDS
Private Practice
Brooklyn, New York
Phone: 718.376.8656
Email: doctoroleg@verizon.net
Web site:
www.omnidentalcare.com

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Abstract

Advances in adhesive dentistry and modern composite resin materials made it possible for the practitioner to achieve beautifully natural, long-lasting smile enhancement in just one office visit. Most importantly, the esthetic makeover involved a very conservative approach with absolutely minimal tooth reduction. The direct resin bonding procedure presented in this article, has unique advantages compared to popular indirect restorative options, and must be part of every esthetic dentist's arsenal when performing smile enhancements. Understanding the indications of direct resin bonding and some artistic skills are essential for achieving the optimal result with this technique. This article demonstrates how an esthetically pleasing smile makeover can be accomplished using a direct resin

Learning Objectives

After reading this article, the reader should be able to:

- explain the difference between cosmetic and esthetic dentistry.
- explain the advantages of direct resin bonding compared to indirect restorative options, such as porcelain laminate veneers.
- learn indications for direct resin bonding.
- describe the sequential technique of direct resin bonding.
- describe the layering technique for achieving optimal esthetics.
- explain the considerations involved with materials selection in this case study.

The demand for esthetic dental services has grown phenomenally in the last decade. An attractive smile is no longer a privilege just for a select few—now every patient can take advantage of the advances in modern esthetic dentistry. Today's dentistry offers numerous treatment options to improve patients' smiles and to fit each practitioner's skill level. Best of all, treatment options are becoming more conservative and at the same time providing long-lasting esthetic improvement.

Ultraconservative Approach

Esthetic dental treatment is a purely elective procedure with the sole purpose of improving the appearance of the patient's smile. Medical or dental indications do not exist for these procedures, just the patient's desire to improve his or her smile.[1,2,3] Esthetic dental treatment, unlike cosmetic treatment, is an indicated dental procedure which is performed to improve the patient's dental health, but at the same time will improve their esthetic appearance. Placing a porcelain crown to restore a broken incisor is an esthetic dental procedure, but a porcelain veneer placed on a healthy tooth to improve its appearance is an example of cosmetic dentistry.[1-3] The practitioner, who is preparing to perform an esthetic dental procedure must carefully consider different treatment options, and should always opt for the most conservative technique that will also satisfy the patient's objectives. The smile make over described in this article will demonstrate how a dramatic improvement using an ultraconservative approach can be achieved in one visit.

Case Presentation

A 23-year-old man presented for consultation with a desire to improve his smile. He expressed that he was extremely unhappy about the appearance of his upper front teeth. A clinical examination revealed a severe misalignment of his maxillary teeth (Figures 1 through 5). Tooth No. 8 was severely protruded buccally, and tooth No. 4 was in crossbite. Tooth No. 5 had a large carious lesion on its mesiofacial surface. Canine No. 11 was positioned higher than the other anterior teeth, creating an uneven appearance of the gum line. Overall, the maxillary anterior teeth exhibited a lack of incisal and facial harmony and a "V" shaped maxillary arch. The patient mentioned that the appearance of his teeth significantly affected his self-esteem and his social life. Also, he expressed a desire to achieve major improvement in the shortest treatment time possible.

Pretreatment Considerations

During the interview, orthodontic treatment, porcelain laminate veneers and direct resin bonding were discussed as possible treatment options.

Orthodontic Treatment

Orthodontic treatment was certainly an ideal treatment option for this patient. The practitioner thoroughly explained the long-term benefits of this option to the patient. Never the less, he immediately rejected orthodontic therapy because of the time required to achieve the desired result and the lengthy retention period.

Porcelain Laminate Veneers

Porcelain laminate veneers would have been an excellent option for this case, and would certainly produce an outstanding esthetic result. Ceramic materials are extremely durable, long-lasting, and capable of beautifully replicating natural teeth.[1-3] However, to provide these outstanding qualities, a ceramic veneer requires some thickness.

Figures 1 through 5—*A clinical examination revealed a severe misalignment of the patient's maxillary teeth.*


Figures 6 and 7*—When the patient was anesthetized, the preparation was completed. Note the extremely conservative preparation, with dentin exposure only on teeth Nos. 8 and 9.*

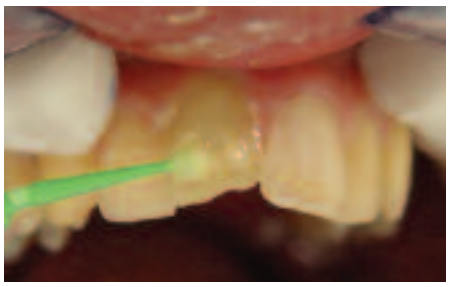

Figure 8—*The fifth-generation bonding agent was liberally applied with a microbrush.*

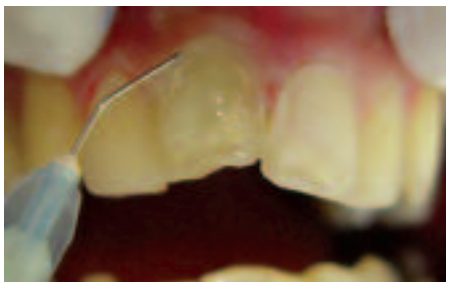

Figure 9—*A small amount of flowable composite resin was applied along the gingival margin.*

Figure 10—*Tooth No. 8 was separated with thin metal matrices.*

Figure 11—*Simile resin shade B1 was applied, sculpted, and light-cured for 20 seconds.*

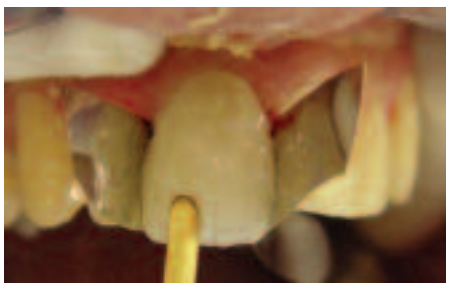

Figure 12—*Simile resin clear incisal shade was used to complete the anatomical shape.*

Figure 13—*The procedure was repeated on tooth No. 9, creating the midline and the symmetry between the two central incisors.*


Figures 14 and 15—*When the harmony between the two central incisors was achieved, the procedure was repeated on the teeth Nos. 5 through 7 on the right side.*


Figures 16 and 17—*The procedure was repeated on teeth Nos. 10 through 12 on the left side.*

Figure 18—*The secondary anatomy and the fine surface characteristics were established, including: vertical and horizontal developmental grooves, surface texture and slight incisal irregularities.*

Even the stacked porcelain must be at least 0.5 mm in thickness to enable the ceramist to produce a vital looking polychromatic restoration.[1-3] Thus, if the masking of some darker tooth structure is desired, even more aggressive preparation is needed. For this patient, preparation for porcelain veneers would present a risk of pulpal exposure for tooth No. 8. Also, considering the young age of the patient, the ultraconservative approach was preferred.

Direct Resin Bonding

Direct resin bonding was the treatment option that was selected for the following reasons: it provided the patient with a beautiful, natural looking result, and without more aggressive preparation required for the porcelain veneers; and modern composite materials allowed the clinician to replicate nature perfectly. Also, improved physical properties, which include wear resistance close to that of natural teeth, and long-term color stability, ensured that the beautiful result would last a reasonably long time.[1-3] Composite resin, unlike ceramic material, can be made paper thin and still exhibit its wonderful qualities. Direct resin bonding helped the clinician have total control of the esthetic outcome, and allowed for easy postoperative adjustments and changes, ensuring the patient's absolute satisfaction. The entire smile makeover was completed in one visit.

As was mentioned earlier, the gum line was uneven because of the malposition of tooth No. 11. However, gingivoplasty was not included in the treatment plan because of the low lip line. The final treatment plan included direct resin bonding of teeth Nos. 5 through 12. The patient also requested that his upper anterior teeth appear lighter in color while maintaining the natural look.

As soon as the treatment plan was established, the patient's esthetic preferences were discussed. In this case, the patient desired perfectly aligned upper front teeth. He emphasized that the teeth must look naturally translucent and significantly higher in value than his existing dentition. As in any esthetic smile makeover, the patient's esthetic preferences must be carefully followed, even if the patient's idea of esthetics is different from the practitioner's.

When the patient was anesthetized, the preparation was completed (Figures 6 and 7). Caries were removed on tooth No. 5, and teeth Nos. 5 through 12 were prepared for the bonding procedure. Tooth No. 8 was prepared more aggressively to correct its buccal version and at the same time taking care not to get too close to the pulp chamber. Remember that the final alignment of the facial surfaces would be achieved not only by facial reduction of buccally displaced teeth, but also by building-out teeth that were positioned lingually, thus allowing for more conservative preparation. Note the extremely conservative preparation, with dentin exposure only on teeth Nos. 8 and 9 (Figures 6 and 7). The enamel surfaces were "freshened" with a coarse diamond bur with an average reduction not exceeding 0.2 mm. During the bonding procedure the practitioner always had the ability to perform additional reduction to achieve an optimal esthetic result if it was necessary.

The bonding procedure began with tooth No 8. Teeth were isolated with cotton rolls, and the facial surface was etched with 37% phosphoric acid (Etch-Rite, Pulpdent Corporation) for 10 seconds and rinsed with water for 10 seconds. Etching the dentin for more than 10 seconds could have caused postoperative sensitivity and could have actually decreased the bond strength.[1-3] Enamel should be






Figures 19 through 24—*The final result showed that all of the patient's objectives were achieved.*

etched for about 20 seconds. As soon as the acid etch was rinsed away with copious amount of water, the wetting agent, (HurriSeal, Beutlich Pharmaceuticals) was applied and the excess removed with a high volume suction. This step served two purposes: it kept the tooth surface moist, so that the bonding agent effectively penetrated dentinal tubules and interprismatic enamel spaces, and it created a strong, sensitivity-free bond.[1-3] **[QA: edit ok?].** Also, the application of HurriSeal desensitized the dentin and provided the antibacterial effect with fluoride release. During this process, if the wetting agent is not used, the dentist must not over-dry the tooth surface and carefully blot away the excess moisture **[QA: edit ok?]**.

The fifth generation bonding agent (OptiBond Solo Plus, Kerr Corporation) was liberally applied with a microbrush (Figure 8), thinned out with a gentle stream of clean, dry air, and light cured for 10 seconds with a high output halogen light (Optilux 501, Kerr Corporation). A small amount of flowable composite resin (Flow-It ALC, Pentron Clinical Technologies) shade A1 was applied along the gingival margin (Figure 9) and light-cured for 20 seconds. According to the practitioner this simple step created a perfect adaptation of the composite resin to the tooth, and, thereby, prevented future discoloration at the margins. Tooth No. 8 was then separated with thin metal matrices (Figure 10). Simile nanohybrid composite resin (Pentron Clinical Technologies, LLC) shade B1 was applied, sculpted and light-cured for 20 seconds (Figure 11). At this point, mamelons were formed about 2 mm short of the future incisal edge, and the tooth contour was formed incomplete, allowing room for clear enamel shade resin. Simile resin clear incisal shade was used to complete the anatomical shape (Figure 12). Gross shaping and contouring were achieved with fine diamond finishing burs (Brasseler USA) and Fini coarse finishing discs (Pentron Clinical Technologies, LLC). Tooth form, position of incisal edge and the facial surface were only approximated at this time.

> *The teeth were higher in value, as the patient requested, but the shade difference between the maxillary and mandibular teeth were kept within natural limits.*

The procedure was repeated on tooth No. 9, creating the midline and the symmetry between the 2 central incisors (Figure 13). The centrals are the corner stone of a smile design, and creating the harmony between these is of paramount importance. At this point, the esthetic characteristics of the restorations were evaluated, including value, chroma, and the degree of translucency. If any adjustments were needed, these could be easily performed by cutting back some composite material and adding a different shade of the resin. Because the composite surface was not yet polished, it should be evaluated wet, simulating its final appearance after polishing. When the harmony between the 2 central incisors was achieved, the procedure was repeated on the teeth Nos. 5 through 7 on the right side (Figures 14 and15), then teeth Nos. 10 through 12 on the left side (Figures 16 and 17). The build-up of each tooth was completed in the same manner, using the "recipe" that was determined while bonding the two central incisors.

After the preliminary build-up of all teeth was completed, the arch form was evaluated ensuring the teeth size, incisal edges' position, and that the facial contours were satisfactory. The interproximal patency was verified with floss, and any overhangs were removed with the No. 15 surgical blade and fine polishing strips. If any teeth were accidentally bonded together, Ceri-Saw (Den-Mat Corporation) was used to gently separate these without opening the contacts. Then the secondary anatomy and the fine surface characteristics were established, including: vertical and horizontal developmental grooves, surface texture and slight incisal irregularities (Figure 18), using carbide finishing burs and rubber finishing points. This step was critical for achieving a true lifelike appearance—the restorations literally came to life when a slight incisal edge imperfection or developmental grooves were created. The final polishing was achieved using Enhance finishing cups and points (Dentsply Caulk), and progressively finer grit of Fini polishing discs (Pentron Clinical Technologies, LLC). The completed restorations were etched for 20 seconds with 37% phosphoric acid Etch-rite, and the composite surface sealant (Protect-It, Pentron Clinical Technologies, LLC) was applied and light-cured for 20 seconds per surface.

The final result showed that all of the patient's objectives were achieved (Figures 19 through 24). The teeth were perfectly aligned, and the arch form was corrected. These restorations exhibited an extremely lifelike polychromatic appearance with significant incisal translucency present. The surface texture and the manner, in which the light was reflected by the surface, closely resembled the natural enamel luster. The teeth were higher in value, as the patient requested, but the shade difference between the maxillary and mandibular teeth were kept within natural limits. Gingival margins were well finished and were almost undetectable with a sharp explorer. The patient was quite pleased with the esthetics of the final restorations, as well as with the ease, speed, and the conservative nature of his smile makeover.

Material Considerations

Simile nanohybrid composite resin was chosen for this case because of the following reasons: Simile nanohybrid composite regular shades are quite opaque, so this material can effectively mask a discolored tooth surface. At the same time, it appears extremely lifelike, especially when different shades are blended. The clear incisal shade has just the right amount of translucency and is high in value, which is very helpful when creating a polychromatic appearance of the restorations. The material has excellent polishability and is quite durable at the same time.[1-3] When different shades and opacities are layered and polished to a high luster; Simile

The handling properties of the material are quite good, which makes it a pleasure to sculpt.

exhibits optical properties remarkably similar to the natural enamel. The handling properties of the material are quite good, which makes it a pleasure to sculpt.

Conclusion

Direct composite resin bonding is an esthetic treatment option that allows a skilled practitioner to achieve a dramatic smile improvement for patients, and it preserves healthy tooth structure. Direct resin bonding, a true form of art, provides dentists with enormous satisfaction and gives them the ability to have total control of the outcome. Direct resin bonding gives patients instant results, thus satisfying the demand for immediate gratification. Ultimately, direct resin bonding makes practicing in the beloved dental profession even more enjoyable. ■

Acknowledgement

My greatest continuing education experience was Esthetic Epitome with Dr. Ross Nash and Dr. Robert Lowe. This continuum provided me with knowledge and expertise of esthetic dentistry, and it definitely helped bring my practice to the next level. Many of the techniques described in this article I learned from Drs. Nash and Lowe.

References

1. Nash RW, Lowe RA: Recreating nature using today's composite materials. *Restorative Quaterly*. 2000. **[QA: is this a journal? Please provide page numbers].**
2. Nash RW, Lowe RA: Recreating nature using today's composite materials—part 2: anterior direct veneers. *Restorative Quarterly*. 2001 **.[QA: is this a journal? Please provide page numbers]**
3. Borshch O. One-visit smile transformation—new paradigm of esthetic dentistry. *Contemporary Esthetics and Restorative Practice*. 2005;38-44.

Product References

Product: Etch-Rite
Manufacturer: Pulpdent Corporation
Location: Watertown, Massachusetts
Phone: 800.343.4342
Web site: www.pulpdent.com

Product: HurriSeal
Manufacturer: Beutlich Pharmaceuticals
Location: McDonough, Georgia
Phone: 800.238.8542
Web site: www.beutlich.com

Products: OptiBond Solo Plus, Optilux 501
Manufacturer: Kerr Corporation
Location: Orange, California
Phone: 800.KERR.123
Web site: www.kerrdental.com

Products: Flow-It ALC, Simile nanohybrid composite, Fini coarse finishing discs, Fini Polishing System, Protect-It
Manufacturer: Pentron Clinical Technologies, LLC
Location: Wallingford, Connecticut
Phone: 800.551.0283
Web site: www.pentron.com

Product: Diamond Finishing Bur
Manufacturer: Brasseler USA
Location: Savannah, Georgia
Phone: 800.841.4522
Web site: www.brasselerusa.com

Product: CeriSaw
Manufacturer: Den-Mat Corporation
Location: Santa Maria, California
Phone: 800.433.6628
Web site: www.denmat.com

Product: Enhance
Manufacturer: Dentsply Caulk
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1. What is the indicated dental procedure which is performed to improve the patient's dental health?
a. Esthetic dental treatment
b. Routine operative dentistry
c. Cosmetic dentistry
d. Holistic dentistry

2. Which is an example of cosmetic dentistry?
a. Crown lengthening
b. Orthodontic extrusion
c. Porcelain veneer placed on a health tooth
d. Porcelain veneer placed over a Class 2 incisal fracture

3. Which were discussed as possible treatment options?
a. Orthodontic treatment
b. Porcelain laminate veneers
c. Direct resin bonding
d. All of the above

4. Stacked porcelain must be at least how thick to enable the ceramist to produce a vital looking polychromatic restoration?
a. Paper thin
b. 0.2 mm
c. 0.5 mm
d. 0.8 mm

5. Gingivoplasty was not included in the treatment plan because of:
a. an anesthetic allergy.
b. a bleeding history.
c. a preexisting periodontal pocket.
d. a low lip line.

6. What are the corner stones of a smile design?
a. Centrals
b. Laterals
c. Canines
d. Lip height

7. Should any adjustments be needed, they can be easily performed by:
a. adding translucent material.
b. cutting back some composite material.
c. porcelain etching.
d. debonding and reglazing.

8. Interproximal patency was verified with:
a. Radiographs
b. Perioprobe
c. Floss
d. Articulating paper

9. The restorations literally come to life when:
a. developmental grooves are reduced.
b. slight incisal edge imperfections are created.
c. the tooth is masked with opaque shade.
d. the incisal is tinted yellow-blue.

10. As the patient requested, the teeth were:
a. higher in hue.
b. lower in chroma.
c. higher in value.
d. lower in value.

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