Discolored Porcelain Veneer Easily Replaced With Direct Resin Bonding: A Case Report

Robert C. Margeas, DDS
Private Practice
Des Moines, Iowa
Phone: 515.277.6358
Email: rcmarge@aol.com
Adjunct Professor
University of Iowa College of Dentistry
Department of Operative Dentistry
Iowa City, Iowa

Patient demand for esthetic dentistry with minimally invasive procedures has resulted in the extensive use of freehand bonding of composite resin to anterior teeth. It is important for the dentist to have a working knowledge of conservative tooth preparation coupled with an understanding of composite resins and their placement in incremental layers. Incremental buildup of teeth with specific materials will provide the patient with the most natural result. With the numerous composite resin systems available, the dentist must be able to determine when to use a hybrid and/or microfill. In addition, an understanding of tints and opaquers will allow the dentist a virtually unrestricted ability to match adjacent teeth. Today’s composite resins exhibit dramatically improved physical and optical properties, rendering them the ideal materials to facilitate restorations that are indistinguishable from natural dentition.

One of the advantages of a direct resin restoration over a porcelain restoration is that the dentist is able to maintain control and customize the materials throughout the procedure. With porcelain, any modification means a return to the laboratory for correction. When choosing the proper shade of composite for a direct composite veneer restoration, the dentist must first understand the hue, chroma, and value. Hue is commonly understood as the name of the color or the basic shade. Chroma can be defined as the intensity of a color or the degree of hue saturation. The most important of the color dimensions is value, which distinguishes light from dark colors. The value can be defined as the brightness of color. The dentin imparts the color of the tooth and the enamel acts as a fiber optic structure that conducts light through its rods to capture the color. What will assist the dentist in creating the desired esthetic result is the use of an opaque hybrid overlaid with a microfill and customized with opaquers and tints. This combination of materials will mimic natural tooth structure far more effectively than a hybrid composite system will.

Case Presentation

A 35-year-old, out-of-state patient presented to my office with the desire to change the color of what she described as “old bonding.” [QA. Why did she travel out of state to your office to have this done?] Without previous clinical evaluation of her dentition, what presented was slightly different. Her “bonding” was actually porcelain veneer that appeared discolored after the patient had bleached her teeth (Figure 1). After a brief clinical analysis, the treatment plan formulated was to replace the old veneer with a direct composite veneer. Luckily, her dentition was very sound with sufficient enamel and intact interproximal contacts. To properly restore and match her adjacent teeth, a combination of hybrid, opaquer, tint, and microfills were determined to be the best choice of materials. Most hybrid systems consist of dentin and enamel shades with the primary difference being the degree of opacity in each. It is the opinion of the author that the differences in the opacity of most hybrid systems do not match natural tooth structure as well as that of a microfill/hybrid sandwich technique. In addition, from an esthetic longevity standpoint, microfills hold their polish for many years whereas hybrids often lose their polish prematurely.

Clinical Technique

After anesthetic was administered, the porcelain veneer was removed using a course grit chamfer diamond (Brasseler USA®). When the veneer was removed, the preparation was smoothed with a medium grit chamfer diamond to an appropriate depth of 0.9 mm, which exposed some areas of dentin. The incisal was reduced by approximately 1.5 mm because of a previously existing fracture (Figure 2). The lingual margin was prepared with a chamfer approximately 0.5 mm in depth to allow for sufficient thickness of hybrid to ensure long-term strength. The cervical margin was placed equigingivally on the facial to preserve tissue health. If the tooth had been darker, the margin would have been placed 0.5 mm subgingivally to prevent a dark “shine-through.” Care was taken not to break the interproximal contact because the dental team was dealing with a color change and not a tooth shape or size discrepancy. Matrix strips were placed interproximally to isolate the adjacent teeth from the etchant. The total-etch technique was used because of its ability to minimize the potential of microleakage while enhancing

Abstract

Achieving natural esthetics by harmoniously matching the shape, surface texture, and color of a single anterior tooth is one of the greatest challenges in restorative dentistry. Direct composite resin bonding offers a predictable and conservative restorative treatment option. An understanding of the fundamental layering, contouring, and polishing principles is paramount to the success of any direct composite restoration.

Learning Objectives

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

• Explain the layering technique for natural esthetics.
• Explain where and how to use opaquers and tints.
• Create surface texture and anatomy.
• Perform proper finishing and polishing for long-term success.
The patient's "bonding" was actually a porcelain veneer that appeared discolored after the patient had whitened her teeth.

Figure 5—B1 microfill was placed in thicknesses of between 0.3 mm and 0.5 mm and feather blended to the middle one third of the tooth.

bond strength to dentin and enamel. The preparation was etched for 20 seconds with 37% 


glass transition temperature of 150°C (Figures 10 and 11). The finishing and polishing stage of any anterior composite restoration is crucial to achieving the desired result. Often, using a series of discs will result in a flat, nontextured surface that will not appear natural. Sequentially, the use of discs, carbide burs, polishing points, and polishing brushes will create a restoration that is highly polished, contoured, and yet has a natural surface texture to mimic the adjacent tooth. The incisal edge was reduced first using a coarse FlexiDisc (Cosmedent®, Inc) (Figure 9). The interproximal areas were contoured with a medium FlexiDisc to accentuate the line angles (Figure 10). The facial contouring was initiated with an 8-fluted ET® 9 finishing bur (Brasseler USA®). The ET® 9 is easily controlled and allows for the development of primary anatomy that accentuates the previously sculpted mamelons (Figure 11). Secondary anatomy, consistent with the adjacent central, was created using a flame-shaped bur (Figure 12). After the anatomy development is complete, FlexiPoints (Cosmedent®, Inc) are used to polish the secondary anatomy starting with the medium grit and finishing with the fine (Figures 13 and 14). To maintain this anatomy while continuing to polish, a Jiffy® Polisher (Ultra-dent Products, Inc) was used (Figure 15). A football-shaped OS1 (Brasseler USA®) was then used to shape the lingual incisal edge while maintaining a thickness of the hybrid for strength (Figure 16). For the final polish, Enamelize® Composite Polishing Paste (Cosmedent®, Inc) was used in conjunction with Flexi-Buff discs (Cosmedent®, Inc) (Figure 17). Flexi-Buffs are mylar-coated melt discs that, when used with Enamelize®, create an ultrafine and glossy surface, while ensuring the surface texture is maintained (Figure 18).
Completed restoration is shown in Figure 19.

**CONCLUSION**

Truly natural esthetic results are achieved when combining conservative preparations with a choice of materials that provide long-term strength, natural opacity, and color transmission. However, equally important and yet often overlooked is the development of an enduring polish that maintains a natural surface texture. Traditional hybrid composites alone often do not provide all of the elements necessary to match and retain such a naturally looking result. Using a combina-

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_Figures 9 and 10_— The incisal edge was reduced first using a coarse FlexiDisc.

_Figure 10—_ The interproximal areas were contoured with a medium FlexiDisc to accentuate the line angles.

_Figure 11—_ The ET® 9 was easily controlled and allowed for the development of primary anatomy that accentuates the previously sculpted mamelons.

_Figure 12—_ Secondary anatomy, consistent with the adjacent central, was created using a lame-shaped bur.

_Figures 13 and 14—_ FlexiPoints were used to polish the secondary anatomy starting with the medium grit and finishing with the fine.

_Figure 15—_ To maintain this anatomy while continuing to polish, a Jiffy® Polisher was used.
tion of hybrids, opaquers, tints, and microfills, and using a simple, yet multilayered, technique will dramatically improve any dentist's results and provide the patient with his/her desired outcome.

**DISCLOSURE**

This article was originally published in the March 2002 issue of Oral Health magazine.

**REFERENCES**


**Product References**

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<th>Products</th>
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<tr>
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<td>Phone</td>
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<tr>
<td>Address</td>
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<tr>
<td>Phone</td>
<td>800.522.5212</td>
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**Figure 16**—A football-shaped OS1 was then used to shape the lingual incisal edge while maintaining a thickness of the hybrid for strength.

**Figure 17**—For the final polish, Enamelize® Composite Polishing Paste was used in conjunction with FlexiBuff discs.

**Figure 18**—FlexiBuffs used with Enamelize® create an ultrafine and glossy surface while ensuring the surface texture is maintained.

**Figure 19**—Completed restoration.
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1. With porcelain, any modification means:
   a. a change in shade.
   b. a change in texture.
   c. a return to the laboratory for correction.
   d. increased microfracturing of the substructure.

2. What is commonly understood as the name of the color on the basic shade?
   a. Hue
   b. Chroma
   c. Value
   d. Shade

3. What can be defined as the intensity of a color?
   a. Hue
   b. Chroma
   c. Value
   d. Shade

4. What can be defined as the brightness of color?
   a. Hue
   b. Chroma
   c. Value
   d. Shade

5. Most hybrid systems consist of dentin and enamel shades with the primary difference being:
   a. the range of color.
   b. the degree of opacity.
   c. the degree of longevity.
   d. the minimum thickness requirements.

6. The enamel replacement stage begins with the placement of the microfill at the:
   a. cervical third of the tooth.
   b. middle third of the tooth.
   c. incisal third of the tooth.
   d. mesial and distal aspects of the tooth.

7. To recreate the natural translucency of the enamel shades, what was applied in a very thin wash layer and placed vertically in the intrasculpted microfill layer?
   a. Red tint
   b. Gray tint
   c. Yellow tint
   d. Violet tint

8. Sequentially, the use of what will create a restoration that is highly polished, contoured, and yet has a natural surface texture to mimic the adjacent tooth?
   a. Discs
   b. Carbide burs
   c. Polishing points and polishing brushes
   d. All of the above

9. Truly natural esthetic results are achieved when combining conservative preparations with a choice of materials that provide:
   a. long-term strength.
   b. natural opacity.
   c. color transmission.
   d. All of the above

10. Often overlooked is the development of:
    a. faster etching solutions.
    b. an enduring polish.
    c. clear glass ionomer material.
    d. opaque glass ionomer material.

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