

Nonorthodontic Realignment Using a Noninvasive Direct Resin Technique



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In recent years, significant improvements in composite resin technology have occurred. The development of these composite materials has provided dentists with the ability to directly restore fractured, misshapen, malaligned teeth and to repair enamel defects easily.

The availability of composite materials with improved physical and optical characteristics facilitates the development of enhanced esthetics while these materials maintain their vital function.

The direct application of composite resin has grown in importance to contemporary dentistry, and its use will continue to expand as material composition is improved by future research.^{1,2}

The introduction and further development of hydrophilic dentin bonding agents have added a new horizon to restorative possibilities. Since then, more conservative approaches to restorative solutions based on adhesive technology are taking place, causing dentists everywhere to choose “augmentation” over “amputation” of the remaining sound tooth structure when indicated.³

Direct application of composite

Abstract

[QA: Author to send]

Learning Objectives

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

- explain the role of composite resin in developing predictable restorations.
- explain when to use tints and opaquers.
- explain the conservation of tooth structure to achieve long-term results.

resins satisfies considerations for the patient and dentist, including: a single appointment, direct dentist control, and reduced expense. The major drawback why most dentists do not do more direct bonding is that they are not receiving a fair fee for the time involved to achieve a natural result. The proficiency of dentists using direct procedures must be improved. Significant improvements in the stratification of composites permit natural depth and visual effects similar to those of

porcelain build-up techniques.⁴

The clinical example in this article presents a simplified technique that combines function with esthetics in a very conservative approach that is 100% reversible.

Case Presentation

A 34-year-old woman presented for a consultation concerning anterior esthetics that she was not pleased with. The patient stated she did not like the way her teeth showed dark spaces against the

lower arch when smiling. Another area of concern was the position of her left lateral incisor. It was in lingual version and locked behind the left central incisor. The midline embrasure was also slanted to the patient’s left side. Bilateral negative space was presented distal to the cuspids. The anterior open bite bilaterally of the laterals and cuspids was caused by a tongue thrust habit. A preoperative smile is shown in Figures 1 and 2. When the patient was in centric occlusion, she did not contact the lateral incisors and cuspid (Figure 3). In addition, the upper arch was slightly narrow in the anterior region with moderate crowding (Figure 4).

Orthodontic treatment was the ideal choice for restoring this case. The patient felt she did not want to go with that treatment option at this time. Direct free hand bonding was explained to the patient as the most conservative, reversible treatment available. This case was done without any preparation of tooth structure. This allowed the patient to have the bonding removed in the future if she did not like it, without placing a bur on the teeth.

There was a small esthetic compromise in the final outcome of the



Figures 1 and 2—Preoperative smile.

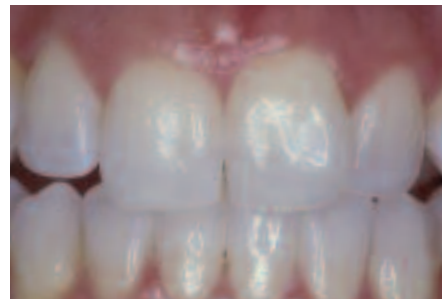


Figure 3—When the patient was in centric occlusion, she did not have contact with the lateral incisors and cuspid.



Figure 5—The left lateral incisor in lingual version was the first tooth worked on.



Figure 6—When the tooth was etched, a bonding agent was applied and light-cured for 20 seconds



Figure 7—Renamel microfill was placed in 2-mm increments to establish dentinal lobes and was subsequently light-cured.



Figure 8—Violet tint was added to the lobe concavities and interproximal region to provide a more translucent effect.



Figure 9—When the microfill was sculpted into the desired shape and position, it was light-cured for 40 seconds.



Figure 10—A hybrid was placed first and undercontoured on the facial.



Figure 11—Microfill composite was placed, sculpted, and contoured. The composite was light-cured for 40 seconds.



Figure 12—The final contour and polish of the right lateral incisor was completed.

case without the preparation, but the conservative nature of doing this case was more important than removing healthy tooth structure.

The treatment involved direct composite veneers on the right first bicuspid, cuspid, and lateral incisor. The mesial incisal embrasure of the left central incisor received a small amount of composite. Direct composite veneers on the left lateral incisor, cuspid, and first bicuspid were also employed. The composite was blended into the cervical of the cuspids and right lateral incisor without covering the whole tooth surface. This allowed more chroma at the cervical area of these teeth.

Restoring one tooth at a time allows the dentist to develop ideal interproximal contact areas and overall shape and contour. Each tooth was isolated with a matrix band or plastic strip and then acid etched. A bonding agent was applied and light-cured to accomplish incremental buildup. Each tooth was finished and polished before starting the next tooth.

Clinical Technique

Before starting the case, the first step was to determine the shade of the teeth. A color map may be needed if there is a significant shade difference between the cervical, middle, and incisal thirds. The left lateral incisor in lingual version was the first tooth worked on. This helped set up the case (Figure 5). When the tooth was etched, a bonding agent was applied and light-cured for 20 seconds (Figure 6). The teeth have moderate translucency, and only enamel was being replaced. Therefore, a microfill was chosen to build out the facial contour. A hybrid was not needed for opacity or strength in this area.

Renamel microfill (Cosmedent, Inc) **[QA: Because of our fair play policy, please list what other com-**



Figures 13 through 16—The final postoperative images.

posites could have been used?]

was placed in 2-mm increments, to establish dentinal lobes and was subsequently light-cured (Figure 7). The mamelon anatomy can be enhanced through the placement of tints. Violet tint was added to the lobe concavities and interproximal region to provide a more translucent effect (Figure 8). The tints were light-cured for 20 seconds.

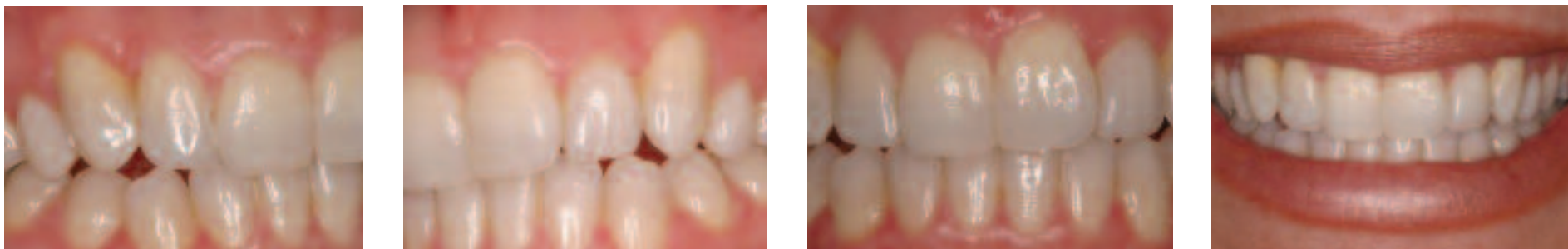
Sufficient space must be left on the facial aspect for subsequent placement of the incisal light microfill. When the microfill was sculpted into the desired shape and position, it was light-cured for 40 seconds (Figure 9).

Before starting on the next tooth, this tooth was contoured, finished, and polished. This step was accomplished with discs and finishing carbide burs such as ET burs (Brasseler USA) and Flexi-Discs (Cosmedent, Inc).

The tooth should be viewed incisally to verify the accuracy of the 3 planes of facial contour.⁵ The subtle surface characterizations must be evaluated, and a high polish should be established on the final surface layer. This was easily accomplished using enamelize polishing paste with FlexiBuffs (Cosmedent, Inc).

Horizontal perikymata can be placed using a diamond with a light touch from mesial to distal surface. When the restoration was completed, the same process in sequential fashion would be followed for the adjacent teeth.

It is important to note that when increasing the incisal length, a hybrid composite is needed for strength and opacity. The right lateral incisor requires incisal lengthening. A hybrid was placed first and undercontoured on the facial (Figure 10). Microfill composite was placed, sculpted, and contoured. This was light-cured for 40



Figures 17 through 20—Postoperative images (3 years later).

seconds (Figure 11). The final contour and polish of the right lateral incisor was finished (Figure 12). The exact same steps were followed for the remaining teeth to be restored. The final result is shown in Figures 13 through 16. Figure 17 through 20 shows how well the composites held up 3 years later.

Conclusion

Addressing your patients' concerns and needs and providing a predictable outcome is paramount to achieving clinical satisfaction. Simply providing a pleasing natural result will fall short in your patient's eyes if their preferences are not addressed. Optimal clinical success can be accomplished when the dentist has an adequate understanding of composite layering techniques, the use of tints, opaquers, and contouring, finishing, and polishing protocols. ■

Disclosure

This article first appeared in the April 2003 issue of *Oral Health* magazine.

References

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2. Feigenbaum NL. A renaissance of freehand bonding. *Curr Opin Cosmet Dent.* 1994;4:47-51.
3. Fahl N. A new direct composite system with optimize particle size for universal applications. *Compend Contin Educ Dent.* 2000, Supplement No. 26
4. Magne P, Holz J. Stratification of composite restorations: systematic and durable replication of natural aesthetics. *Pract Periodont Aesthet Dent.* 1996;8(1):61-68.
5. Mopper KW. Renamel restorative system clinical brochure from Cosmedent, Inc. 1994.

Product References

Products: Renamel microfill, FlexiDiscs, FlexiBuffs
Manufacturer: Cosmedent, Inc
Location: Chicago, Illinois
Phone: 800.621.6726
Web site: www.cosmedent.com

Product: ET Burs
Manufacturer: Brasseler USA
Location: Savannah, Georgia
Phone: 800.841.4522
Web site: www.brasselerusa.com

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1. The clinical example in this article presents a simplified technique that (is):
 - a. combines function with esthetics.
 - b. a very conservative approach.
 - c. 100% reversible.
 - d. All of the above.
2. What was the ideal choice for restoring this case?
 - a. Orthognathic surgery
 - b. Orthodontic treatment
 - c. Selective occlusal adjustment
 - d. Elective endodontic therapy
3. What was more important than removing healthy tooth structure?
 - a. The conservative nature of doing this case
 - b. Periodontal pocket reduction
 - c. Periodontal pocket elimination
 - d. Long central occlusal stops
4. What may be needed if there is a significant shade difference between cervical, middle, and incisal thirds?
 - a. The use of 3 different evaluators
 - b. The use of 3 different shade guides
 - c. A color map
 - d. Digital image analysis
5. The mamelon anatomy can be enhanced through:
 - a. placement of tints.
 - b. external shading.
 - c. mesial placement.
 - d. anterior placement.
6. What was added to lobe concavities and interproximal region to provide a more translucent effect?
 - a. Yellow tint
 - b. Brown tint
 - c. Violet tint
 - d. Green tint
7. Before starting on the next tooth, this (each) tooth was:
 - a. contoured.
 - b. finished.
 - c. polished.
 - d. All of the above
8. The tooth should be viewed in what direction to verify the accuracy of the 3 planes of facial contour?
 - a. Mesially
 - b. Facially
 - c. Incisally
 - d. Lingually
9. Horizontal perikymata can be placed using a:
 - a. diamond.
 - b. inverted cone.
 - c. round bur.
 - d. slow-speed polishing points.
10. When increasing the incisal length, what composite is needed for strength and opacity?
 - a. Hybrid
 - b. Microfill
 - c. Nanofill
 - d. Dual-cure

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