

Achieving Tight Contact in Large Posterior Composite Restorations Using a Sectional Matrix System with Pre-contoured Matrix Bands: Composi-Tight®

by Dory Stutman, DDS



Learning Objectives

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

- Explain the challenges involved with placing direct posterior composite restorations.
- Describe the material and equipment advancements that have enhanced the predictability of placing direct posterior composite restorations.
- Discuss the capabilities and limitations of different matrix systems for direct posterior composite restorations.

Amalgam's foothold as the material traditionally used for creating predictable posterior restorations is giving way to patient demands for more natural-looking esthetics and their health concerns regarding mercury toxicity.¹ As a result, amalgam restorations are no longer considered a satisfactory treatment for most patients or clinicians. Yet, as the numbers of patients requesting composite restorations for their posterior fillings has increased, so too have dentists' demands for materials, instruments, and protocols that simplify the inherently challenging posterior direct composite procedure. Simultaneously, dentists also seek armamentarium that contributes to less technique-sensitive composite placement and the long-term predictability of posterior composite restorations.

To help prevent postoperative sensitivity, ensure marginal integrity, and prevent gap formation and microleakage, posterior direct composite restorations have been placed using incremental layering and curing techniques. In attempts to make the placement process easier, more predictable, and less time consuming, dental product manufacturers have introduced direct composite materials that demonstrate enhanced material and physical properties, some of which can be placed in bulk. However, despite these advancements, challenges continue when placing these

restorations due to the difficulties associated with achieving tight proximal contacts, creating proper mesial/distal contours, and eliminating flash or overhangs.^{2,3}

Matrices have, therefore, provided a solution to the problems associated with achieving tight proximal contacts and appropriate anatomical contours. Additionally, they have proven significant to the quality and longevity of direct posterior composite restorations,⁴ helping to reduce overhang and increase contact. However, varying techniques for placement have shown to significantly affect the success of posterior restorations and the amount of marginal overhang.^{5,6}

Contributing to difficulties are limited access to and visibility in the posterior area of the mouth, which can restrict a clinician's ability to maximize the use of matrices to reconstruct the proximal contact characteristics of an intact tooth.⁷ For example, although circumferential matrices can be beneficial in establishing tight contacts in small to moderate sized preparations, different

matrix systems are required when preparations are wide buccolingually.⁸

This observation is supported by a study published in 2011 which concluded that sectional matrix systems resulted in statistically significantly tighter proximal contacts than the use of circumferential matrix systems in Class II restorations.⁹ This difference is most likely attributed to the wider gap between teeth that circumferential systems can create, thereby making it harder to burnish and typically the cause of increased formation of marginal lines.

Although sectional matrix systems help to produce tighter proximal contacts, additional studies have demonstrated enhanced results when a combination of sectional matrices and separation rings is used.¹⁰⁻¹² The additional band decreases the amount of space required to achieve good contact, and the combination also results in the least amount of marginal overhang.¹³ Sectional matrix systems help to produce enhanced contact tightness by contributing to contact concavity.¹⁴

Another type of matrix system—contoured sectional matrix bands—also contribute to decreased space between adjacent teeth in order to achieve good contact. Research has demonstrated that the use of a contoured sectional matrix with ring provides a predictable way to achieve highly predictable results.¹⁵ Further, in mesio-occlusal-distal restorations (MOD), research suggests that when sectional matrices and separation rings are applied to both proximal surfaces, tighter contacts can be achieved.¹⁵

Just as clinicians have multiple options for direct posterior composites, so too do they have myriad choices of sectional matrices, circumferential bands, and ring systems. Not all are suitable for use when placing all direct posterior composite restorations, but rather work best depending on the clinical situation (e.g., width and depth of cavity and preparation, number of surfaces affected, etc.). However, for conservative Class II restorations, restorations distal of canines and/or short or malpositioned teeth, and slightly wide and/or deep restorations, the use of a flexible sectional

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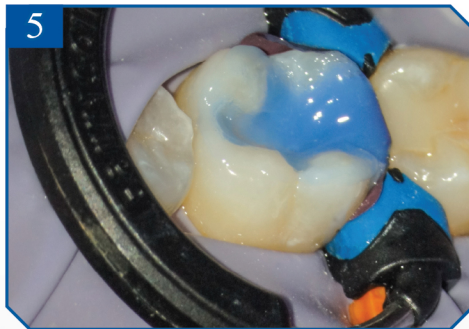
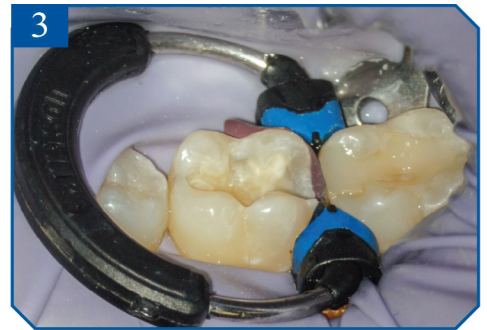


Figure 1. Patient presented with damage on tooth #15 which required a root canal.

Figure 2. View of the preoperative radiograph.

Figure 3. A pulpotomy was completed and the Composi-Tight™ matrix (Garrison Dental Solutions, Spring Lake, MI) placed.

Figure 4. The contoured sectional matrix band was secured.

Figure 5. A flowable composite (Venus Flow, Heraeus Kulzer) was placed on the preparation floor.

Figure 6. Continued layering and light-curing was completed.

Figure 7. Additional composite (Venus) was placed in the preparation to form a wall against the matrix.

Figure 8. A composite instrument and microbrush were used to form the wall against the matrix.

Figure 9. The matrix was removed, leaving a perfect contact against the proximal tooth.

Figure 10. The composite was filled in by layers, similar to a Class I restoration.

Figure 11. The restoration was contoured.

Figure 12. Lastly, the restoration was polished and the surface was glazed.

Figure 13. A postoperative radiograph was taken showing the pulpotomy and excellent contour of the restoration.

Figure 14. The occlusion was checked immediately post-placement.

matrix combined with a separation ring (e.g., Composi-Tight®, Garrison Dental) makes the direct posterior composite placement technique efficient and predictable.¹³

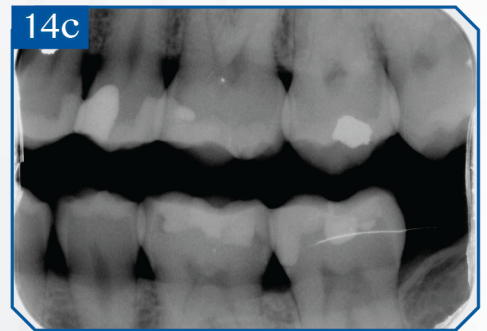
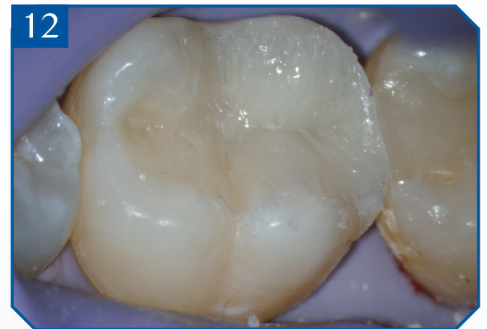
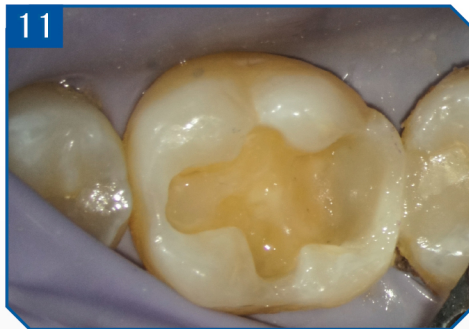
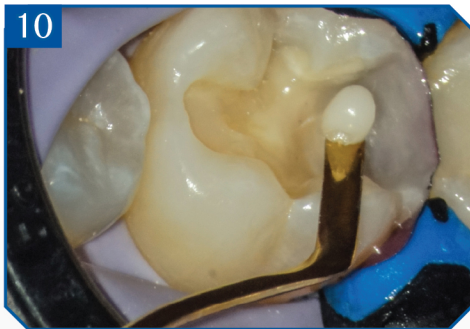
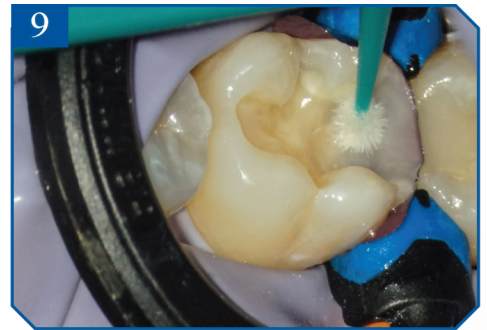
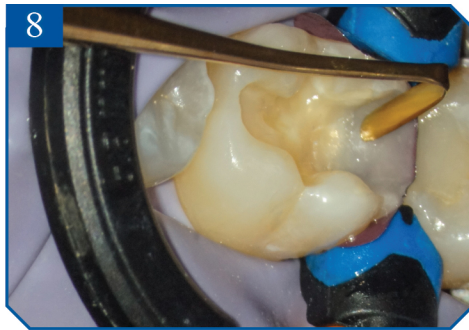
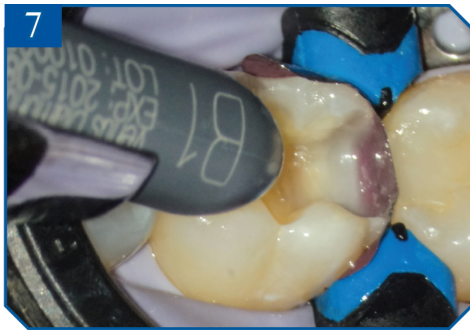
Composi-Tight®

Today, a combination matrix and ring system is available to enhance the longevity, predictability, and ease of placement of direct posterior composite restorations. Composi-Tight® from Garrison Dental Solutions

(Spring Lake, MI) enables clinicians to maintain tight contacts in hard-to-reach posterior areas, as well as reduce the finishing time required for most posterior direct composite restorations. Ideal for conservative Class II composite restorations, restorations distal of canines and/or short or malpositioned teeth, and slightly wide and/or deep restorations, the Composi-Tight® ultra-retentive ring design aids in producing ideal proximal contacts and contours by ensuring matrix band adaptation.¹⁶

The advanced and operator-friendly design of Composi-Tight® improves retention between the canine and first bicuspid. The ring handles provide increased stability, allowing for easier placement of the wedges. Additionally, the contoured band easily conforms to the interproximal areas, creating more predictable proximal contacts.¹⁶

In particular, Composi-Tight® helps to eliminate buccal and lingual flash by incorporating a soft silicone material that molds to the shape of the tooth and provides a steady, sturdy,



and tight fit. Increased ring retention through burnished flanges at the end of each tine help grip the teeth securely, eliminating slipping.

Two ring sizes with differing tine heights (e.g., standard and long) provide a simple solution when treating patients with large or longer teeth. The larger ring diameter also prevents the ring from taking a set too easily and increases its longevity compared to smaller diameter rings.¹⁶

Five matrix band sizes allow for greater selection and enhanced

fit depending on the individual clinical situation. The three-dimensional band contour provides a broader contact area, reduced space below the contact area, and no loss of contact during occlusal adjustment. The 30 µm matrix band thickness allows it to easily slide into place and makes it easier to burnish and broaden the contact area.¹⁶ Additionally, with almost half the thickness of some other sectional matrix bands, Compo-Tight® requires less separation of the teeth to achieve excellent contact.

The following case demonstrates a technique for utilizing the Compo-Tight® system to facilitate placement of an anatomically correct, conservative Class II posterior composite restoration. Had the patient presented with a larger

Class II lesion, or required a crown build-up—for which a cure-through matrix would be necessary—an alternative matrix system (e.g., Reel Matrix™, Garrison Dental) would have been used.

Case Presentation

A patient presented with damage on tooth #15 (**Figure 1**). The preoperative radiograph showed the need for emergency endodontic treatment (**Figure 2**). A rubber dam was placed, and the tooth was prepared with a conservative Class II preparation. The pulpotomy was completed, and the preparation cleaned and rinsed.

To ensure proper marginal and proximal adaptation, a contoured sectional matrix band (Composi-Tight®) was placed by rolling the contoured band with a finger over the approximate tooth curvature (**Figure 3**). The G-Ring retainers (Garrison Dental Solutions) were spread with the clamp forceps and placed over the band. The band was then burnished against the adjacent tooth using a ball burnisher to ensure no spring-back of the band, as well as to confirm excellent contacts (**Figure 4**).

The dentine and enamel were etched with a total-etch technique for 15 seconds using 35% phosphoric acid and then rinsed. Then, a flowable composite (Venus Flow, Heraeus Kulzer) was placed into the cavity in thin layers (**Figure**

5). Each layer was light cured for 20 to 40 seconds to ensure complete polymerization and help to reduce postoperative sensitivity and gap formation. After the floor of the preparation was coated (**Figure 6**), the flowable composite was also placed into the preparation to form a wall against the matrix (**Figure 7**). The wall was formed using a composite instrument and microbrush (**Figure 8**), then light-cured.

The G-ring and matrix were removed, leaving perfect contact against the proximal tooth (**Figure 9**). After the matrix was removed, an additional composite layer—similar to the manner in which a Class I restoration is created—was placed and cured (**Figure 10**). Research has shown that in order to achieve better marginal adaptation in direct posterior composite restorations, bulk techniques should be avoided in order to prevent large contraction gaps.¹⁷

The restoration was contoured and polished (**Figures 11 and 12**). A postoperative radiograph was taken to verify the pulpotomy and contour of the restoration (**Figure 13**). Once the restoration was complete, the occlusion was checked (**Figure 14**).

Conclusion

For conservative Class II restorations, restorations distal of canines and/or short or malpositioned teeth, and slightly

wide and/or deep restorations, the use of a flexible sectional matrix combined with a separation ring (e.g., Composi-Tight®, Garrison Dental) makes the direct posterior composite placement technique efficient and predictable. The separate contoured ring and matrix bands create an ideal environment in which to place an anatomically correct and properly contoured restoration, while the size options provide enough customization for a correct fit for every unique clinical situation. As the demand for amalgam restorations decreases and clinicians are faced with demands for functional, long-lasting, and esthetic posterior restorations, the efficiency, simplicity, and predictability of the Composi-Tight® system make it an ideal addition to the direct posterior composite armamentarium.

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