

A step-by-step approach to a diastema closure - a dual-purpose technique that manages black triangles

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Introduction

Freehand direct resin composites provide an esthetic and conservative approach for closing diastemas and should be part of the armamentarium of every cosmetic dentist. By applying a step-by-step approach to diastema closure when using direct resin composites, the practitioner has the opportunity to creatively incorporate shade selection, tooth preparation, material selection, composite layering, material blending, proper gingival contouring, and polishing to close diastemas in a predictable and efficient manner in daily practice.

This article summarizes the technique demonstrated by the author at the 2010 AACD Annual Scientific Session for artistically using direct composite resins to close diastemas. Consideration is given to creating an ideal emergence profile for gingival health, as well as to managing “black triangles.” Few techniques are available to close diastemas. This technique is well suited for non-slumping and non-sticking materials. This technique is well suited for non-slumping and non-sticking materials.

Case Presentation

A 27-year-old female concerned with the space between her front teeth presented to our practice (Fig 1). The patient also stated that a friend had their diastema closed, but that a black space was left between the buildups and the gingiva (i.e., black triangles). It was explained that a black triangle results from the architecture of the bone and the distance between the contact points and the crest of



Figure 1: Preoperative view of a patient who presented with a diastema between teeth #8 and #9.



Figure 2: The appropriate shade of direct composite is selected.

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the bone.¹ The option of closing the diastema with resin composites was presented to the patient, who agreed to the proposed treatment plan.

Shade and Opacity Selection

Tooth shade should be obtained by comparing the center middle-third of the tooth against the middle of the shade tab (Fig 2). An enamel-like opacity material is usually selected when closing diastemas up to 2 mm. Larger diastemas may require layering of a dentin-like opacity material to prevent show-through, followed by an enamel-like opacity material.

Isolation

Rubber dam isolation with ligatures is recommended. The rubber dam keeps the operatory field dry and free of contaminants. The ligatures help the rubber dam push the gingiva apically, to allow access to the proximal gingival areas for ideal contouring and polishing of the restorations.

Tooth Preparation

Usually, tooth preparation is not required when closing a diastema. In situations where the teeth are slightly misaligned (Fig 3), a slight recontouring may be necessary when the teeth are positioned facially. On the other hand, no preparation is necessary when the teeth are lingually positioned. Roughening of the enamel is recommended only when self-etch adhesives are to be used. Following tooth preparation, the enamel surface of both teeth is etched for at least 30 seconds (Fig 4), after which the adhesive bonding agent is placed and cured (Fig 5).

Material Selection

Composite resin materials for this technique must demonstrate handling characteristics that enable placement without slumping or sticking to placement instruments. Few commercially available resin composites (e.g., Estelite Sigma, Tokuyama [Tokyo, Japan]; Filtek Supreme Ultra, 3M ESPE [St. Paul, MN]; Premise, Kerr [Orange, CA]; Renamel Microfill, Cosmedent [Chicago, IL]) demonstrate the handling characteristics for this particular diastema closure technique.

Material Placement

Step 1. A small increment of the appropriately shaded composite resin that corresponds to the facial half of each diastema is placed over the mesiofacial aspect of each tooth. These increments are placed simultaneously and contoured to ensure optimal contour and identical width



Figure 3: The enamel surface of the teeth is minimally prepared for composite placement.

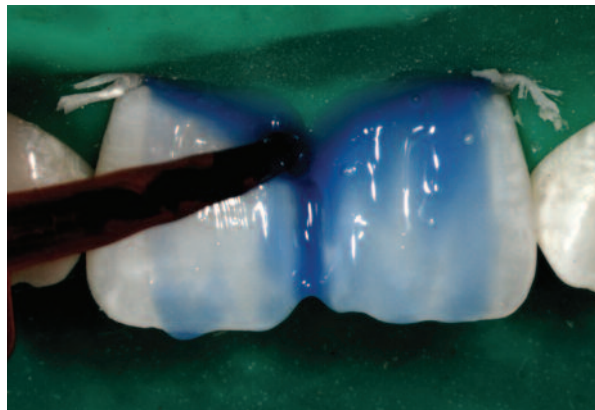


Figure 4: The enamel surface of teeth #8 and #9 is etched.



Figure 5: An adhesive bonding agent is applied to the preparations and light-cured.

for both central incisors (Fig 6). Attention should be given to blending the increments over the facial surface.

Step 2. Using a thin-bladed interproximal carver (IPC) instrument, contour the increments to match each other's profile and ensure adequate gingival embrasure and emergence profile (Fig 7).



Figure 6: Two increments of nano-composite resin are applied to the diastema simultaneously and contoured to optimal proportion on the mesial aspect.

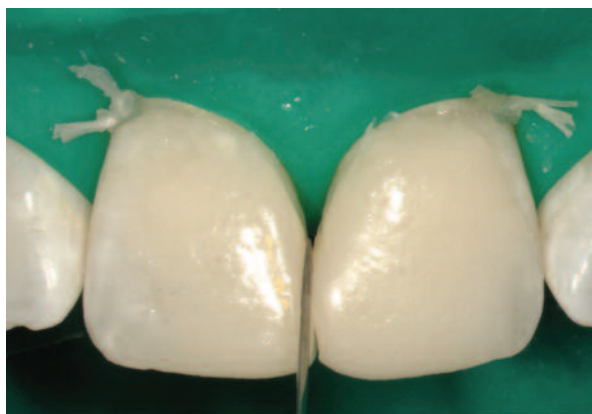


Figure 7: An IPC instrument is used to adapt the resin to the proper contour.



Figure 8: A small brush is used to smooth the composite.

Step 3. A metal matrix is sometimes utilized to produce a small separation between the two increments. A small brush is used to smooth the composite resin surface and approximate the increments (Fig 8). Light-cure the increments (Fig 9).

Step 4. Place a matrix against one of the central incisors and layer the lingual half of the diastema between the tooth and the matrix. Push this increment facially, close the matrix against the tooth, and pull it through toward the facial to ensure proper lingual contour (Fig 10). If excess composite remains in the gingival embrasure, remove it prior to light-curing.

Step 5. Light-cure the direct resin buildup and repeat Step 4 for the other central incisor.

Finishing and Polishing

Using a #12 blade, remove any excess material gingivally to the contact point. Sof-Lex disks (3M ESPE) and a coarse polishing cup were used to contour the facial surface of the restorations (Fig 11). Create surface characteristics with a diamond bur, without water irrigation (Fig 12).

Proximal polishing was achieved by sequentially using polishing strips (Epitex strips, GC America; Alsip, IL). Polishing cups (HiLuster, Kerr) were used to create the restoration's final luster and surface anatomy (Fig 13).

In this case, the patient was scheduled a week later to evaluate her satisfaction, gingival healing, and marginal adaptation.

Conclusion

In esthetic dentistry, one of the biggest challenges practitioners face is closing anterior diastemas without the presence of "black triangles" around the teeth.² Although the success of a restorative treatment in anterior teeth depends on the esthetic integration between soft and hard tissues, direct restorative techniques can be applied to treat this condition (Fig 14).³ Following the step-by-step protocol described here will enable the dentist to successfully close the diastema, while taking into consideration those criteria necessary to create an ideal emergence profile for gingival health and properly managing "black triangles."

References

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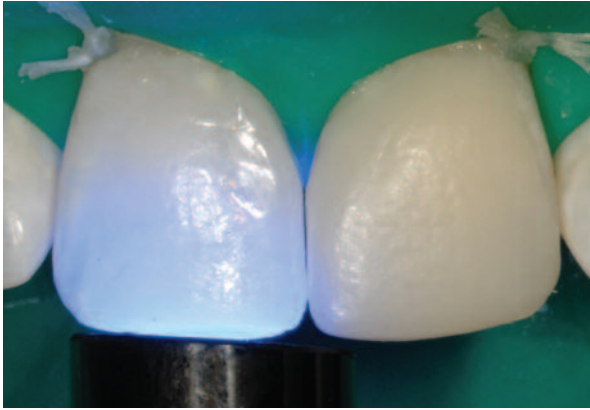


Figure 9: These increments of composite are light-cured.

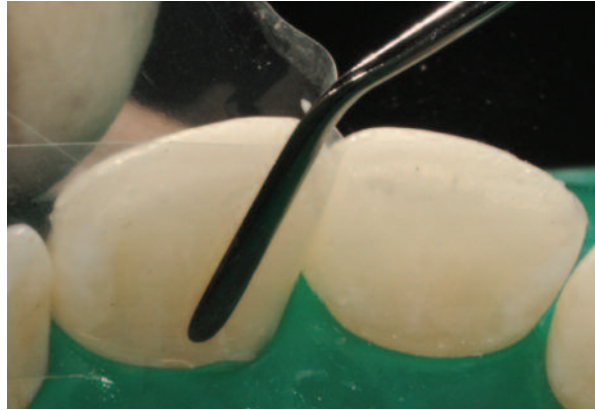


Figure 10: After the matrix is placed, the composite is layered against the matrix lingually and pulled through toward the facial.

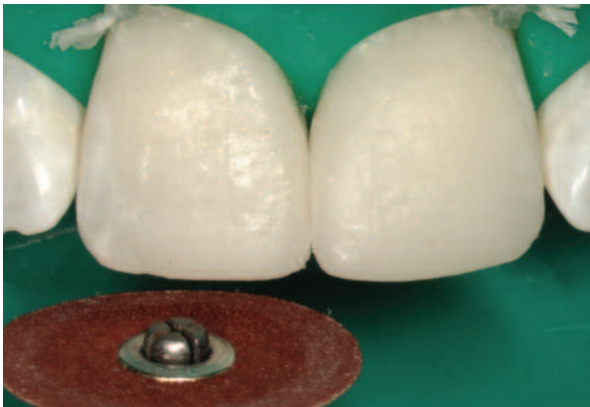


Figure 11: The facial surface is finished using a finishing disk.

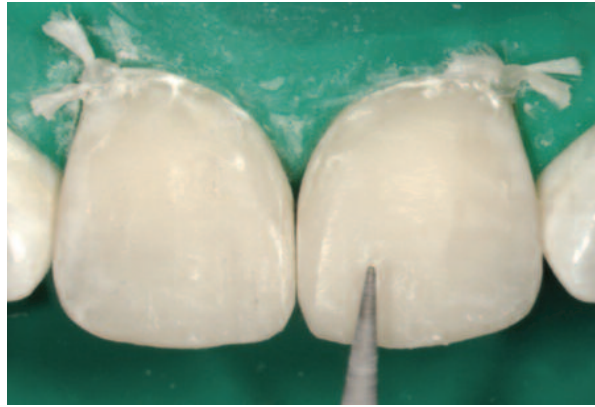


Figure 12: Surface characteristics are created with a diamond bur, without water irrigation.



Figure 13: The use of polishing cups contributes to the creation of the restoration's final luster and surface anatomy.



Figure 14: Postoperative view after the diastema between teeth #8 and #9 was closed with direct composite resin.

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Dr Marcos Vargas will be a keynote speaker at Nomads, incorporating SAAAD, on 10-12 November 2011 – Gauteng and Cape Town.