

A Suggested Technique to Restore a Stable and Tight Contact Point in Diastema Closure

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Clinical Relevance

A clinical challenge in diastema closure with little space for restorative material is avoiding excess material in the cervical regions and restoring a stable and tight contact point between adjacent teeth. Techniques for esthetics reestablishment without impairing periodontal health are required.

SUMMARY

This article presents a case report on diastema closure in anterior teeth with direct resin composite restoration. This suggested approach has been found to be efficient with regards to esthetics, marginal adaptation, and the quality of proximal contacts in diastema closure. These advantages are presented in this report.

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INTRODUCTION

The presence of diastema between anterior teeth is a common condition and causes unsatisfactory esthetics and compromises the harmony of smile. Hence, closure through orthodontic/restorative treatment has gained popularity. For many people, the presence of a diastema in anterior teeth is an important esthetic issue, which can lead to problems such as introversion, bullying, and depression.¹⁻³ The diastema closure is a procedure that presents several difficulties to be performed

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successfully, as it requires a multidisciplinary approach to determine the correct position of the involved teeth and the harmonic composition between them, to measure the horizontal and vertical size of the teeth involved and to choose the best restorative material for each clinical situation.⁴

The occurrence of diastemas in children is quite common, but the prevalence rate falls dramatically between ages 9 and 11 years and continues to decline until the age of 15 years due to adolescent growth and development after eruption of the maxillary lateral incisors and canines.⁵⁻⁷ The presence of diastema is also influenced by race and gender, the condition being more predominant in Blacks, followed by Whites and Asians.⁸ Women show a higher prevalence at 6 years but not at 14 years when compared with men.⁹

Diastema closure can be performed by different methods, such as orthodontic treatment by moving the teeth to close the interdental spaces or to better distribute the available spaces to optimize direct or indirect restorations. When direct resin composite restoration is chosen, many technical difficulties can occur. It can be performed with the aid of a polyvinyl siloxane index made from a wax-up, or it can be performed freehand. However, there are some difficulties inherent to the direct procedure that can compromise the results with respect to esthetics, marginal adaptation, and more importantly, the quality of proximal contacts. Most of the time, the proximal contour is done with the aid of a polyester strip and interproximal wedge, both of which can jeopardize the establishment of a stable and firm contact point and also the marginal adaptation of proximal restoration in the gingival portion. Both problems may, in addition to impairing the result in terms of esthetics, cause periodontal problems such as gingival inflammation resulting from bacterial biofilm accumulation under the excess¹⁰ or food impaction due to absence of an effective contact point.

The purpose of this clinical case report is to describe in detail an innovative technique to minimize these problems by reestablishing an effective and tight contact point between adjacent teeth in diastema closure by a direct resin composite restoration method.

CLINICAL CASE REPORT

A male patient, 20 years old, was presented with a diastema between the upper central incisors (Figure 1A). After clinical and radiographic evaluation, the left central incisor was diagnosed to be slightly narrower than the right one, and for this reason, it was chosen to restore only this element to reestablish harmony and close the diastema (Figures 1B, C). In this pretreatment step, it was possible to notice that the difference between

the widths of both teeth were exactly the width of the diastema.

After prophylaxis and before rubber dam isolation, the resin composite colors were chosen for adequate restoration using increments of different resin shades (Beautifil II A2O, B1 and Incisal, Shofu, Kyoto, Japan). After rubber dam isolation, a polyester strip was positioned between the central incisors to allow acid

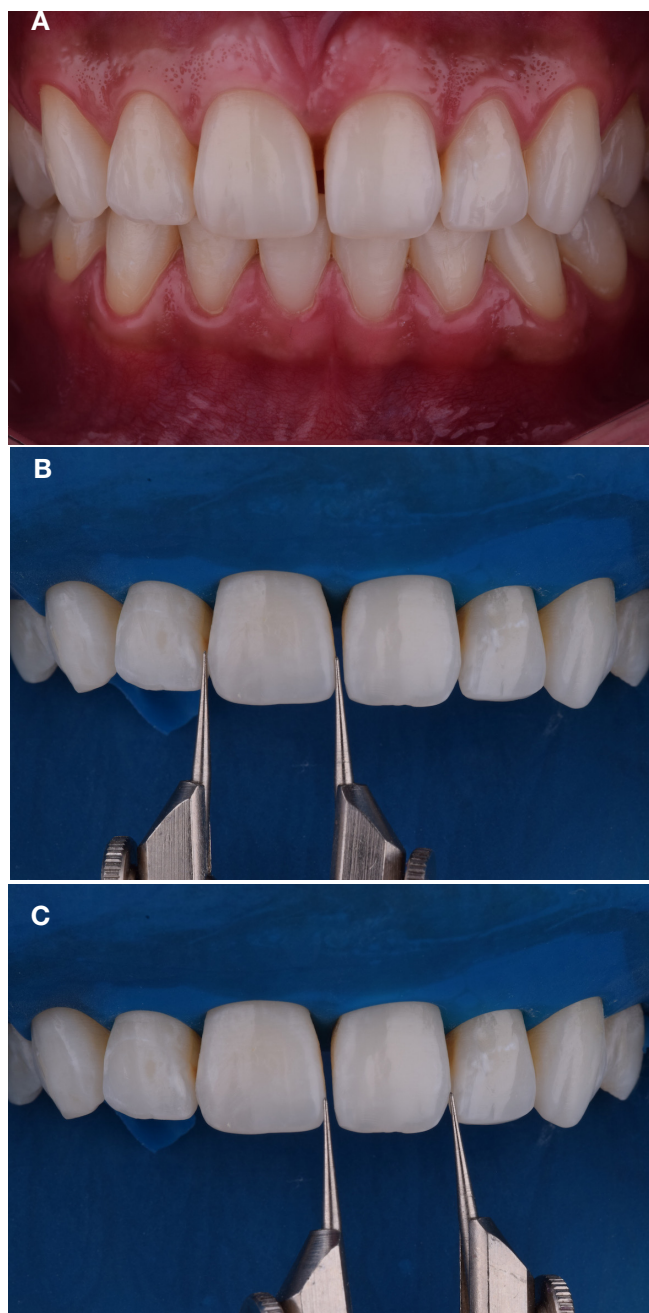


Figure 1. (A): Clinical aspect of a single diastema located between the upper central incisors. (B): Measurement of right central incisor width. (C): Measurement of the left central incisor showing the difference in width.

etching and adhesive procedures (FL Bond II, Shofu) to be performed on only the mesial half of the left incisor, in both buccal and palatal surfaces. The resin composite was applied according to the following techniques.

Step 1

An increment of the opaque resin was applied on the buccal-proximal angle of the tooth. This unique increment serves as a guide/support for proximal restoration and therefore must possess some important characteristics: the right height that extends from the incisal border to the margin of the interproximal papilla; the same contour as that of the proximal face that is to be restored (thicker in the region of the contact point and narrower in the cervical region); and most importantly, a good finish with “zero” profile in the cervical region to avoid an excess of resin composite in the gingival margin (Figure 2A, B).

The above-mentioned characteristics were modeled in this first increment while it was in the buccal surface, with the aid of a dental explorer probe and spatula

for resin manipulation (Figure 3A). To facilitate the procedure, the resin increment was removed from the tube in the shape of a narrow cone (Figure 3B).

Step 2

The guide increment was displaced toward the proximal face until it touched the other tooth in the contact point location (incisal third) (Figure 4A). The contact surface between the guide increment and the neighboring tooth was kept small to facilitate the separation of this joint in step 3. This union ensured the establishment of a real and effective contact point because it was done without the interposition of any polyester matrix/strip. In the buccal-palatal direction, the guide increment was positioned with a small displacement to the buccal surface, where the correct contact point was located. This displacement of the guide increment was gently performed with the aid of a dental explorer probe (Figure 4B). After the correct positioning of the guide increment, it must be light cured in contact with the neighboring tooth before proceeding to the next step.

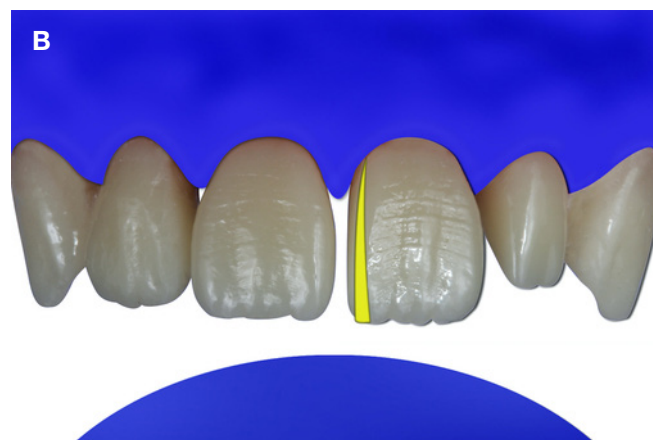


Figure 2. (A): Clinical aspect of the guide increment in the buccal-proximal angle. (B): Schematic drawing of the guide increment with the mentioned characteristics.



Figure 3. (A): Modeling the guide increment with aid of a spatula for resin mainly in the gingival region to create an adequate emergency profile (finish at “zero”) without excess. (B): Removing the resin increment from the tube in the shape of a narrow cone.

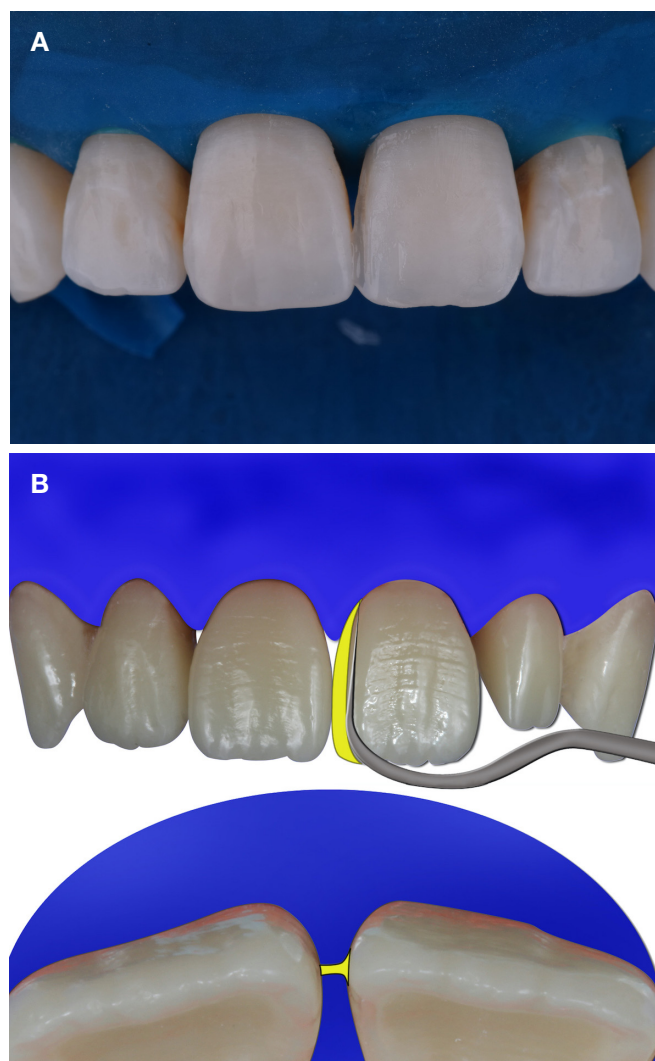


Figure 4. (A): Clinical aspect of the guide increment displaced to proximal surface touching the adjacent tooth in the incisal third. (B): Schematic drawing of the displacement of the guide increment with aid of a dental explorer probe. The contact point is slightly displaced to the buccal surface.

Step 3

The guide increment was separated from the adjacent tooth with the aid of a thicker spatula for resin. This rupturing was achieved by placing the spatula in the cervical region and performing a slight torsional movement (Figures 5A, B). As the contact of the guide increment with the neighboring tooth was smaller than the tooth to be restored, the rupture occurred at the contact point.

Step 4

Once the teeth were separated, a polyester strip was inserted between them. At this stage, the proximal region was basically divided into two portions: buccal

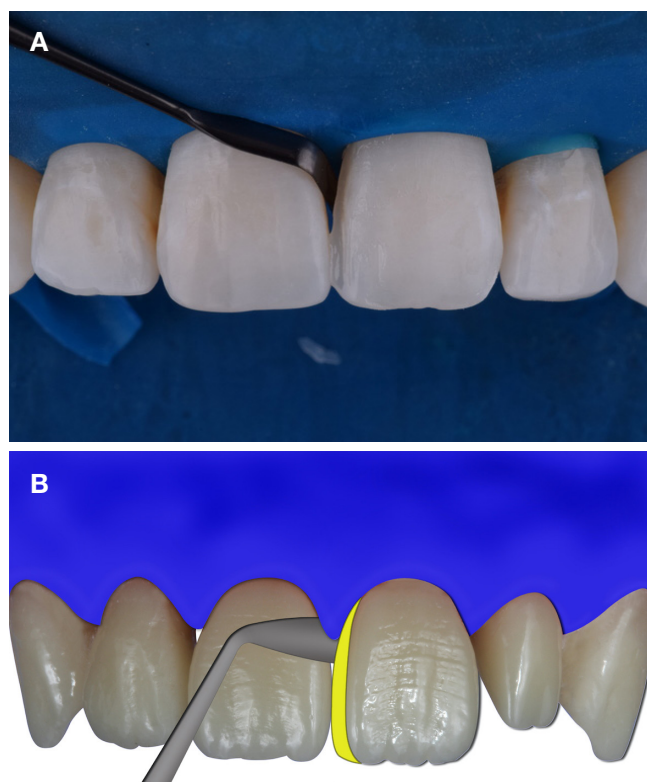


Figure 5. (A): Clinical aspect of the contact point rupture with aid of a thicker spatula. (B): Schematic drawing of this procedure.

and palatal (Figure 6). The integrity of the contact point was apparent as it remained firm throughout the difficult passage of the strip. With the strip in position, restoration of the palatal portion began. Proximal and cervical contour was established by placing resin in the palatal embrasure inside the matrix strip. The strip was adapted to the tooth on the palatal and at the cervical and drawn to the facial pulling the resin proximally against the guide increment. The resulting palatal restoration will have the same emergence profile and contour as the guide increment with zero cervical excess (Figures 7A, B). In this palatal restoration, both opaque and enamel resin were used.

Step 5

After the palatal portion was restored, the restoration of the buccal portion progressed the same way. However, the polyester strip was pulled in a buccal to palatal direction (Figure 8A). In this step, concerns about esthetic parameters were addressed. Over the guide increment, an opaque dentin resin was applied to fill the entire missing volume except for a very thin space, which was filled with an enamel shade resin composite to complete the buccal contour. Any other particular detail of the patient's teeth, especially at the incisal

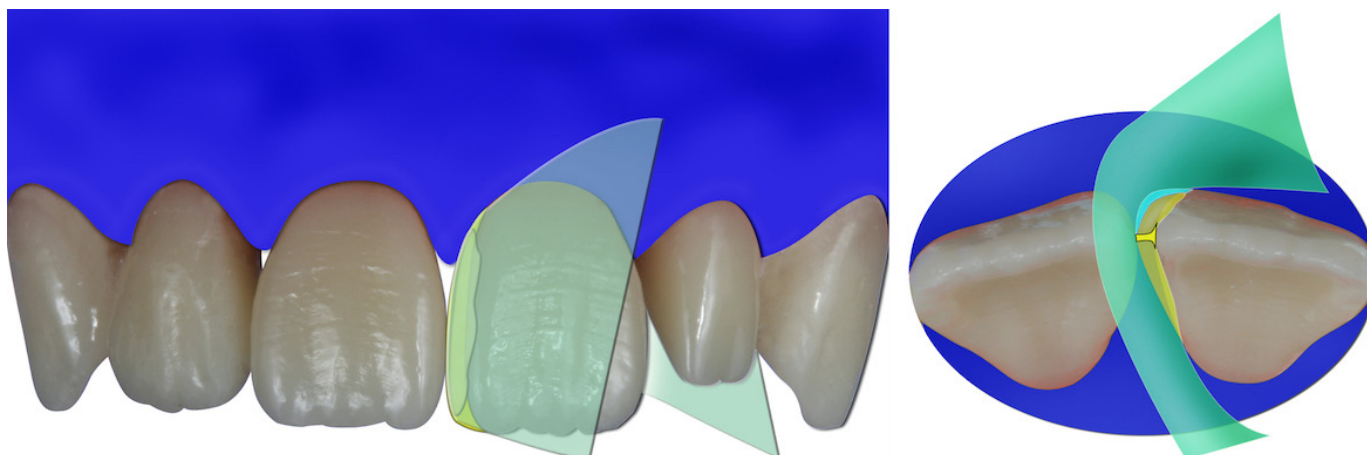


Figure 6. Schematic drawing of the polyester strip passage through the contact point. The pulling of the strip against the guide increment helps the restoration of the palatal and buccal surfaces with the same profile as that of the guide.

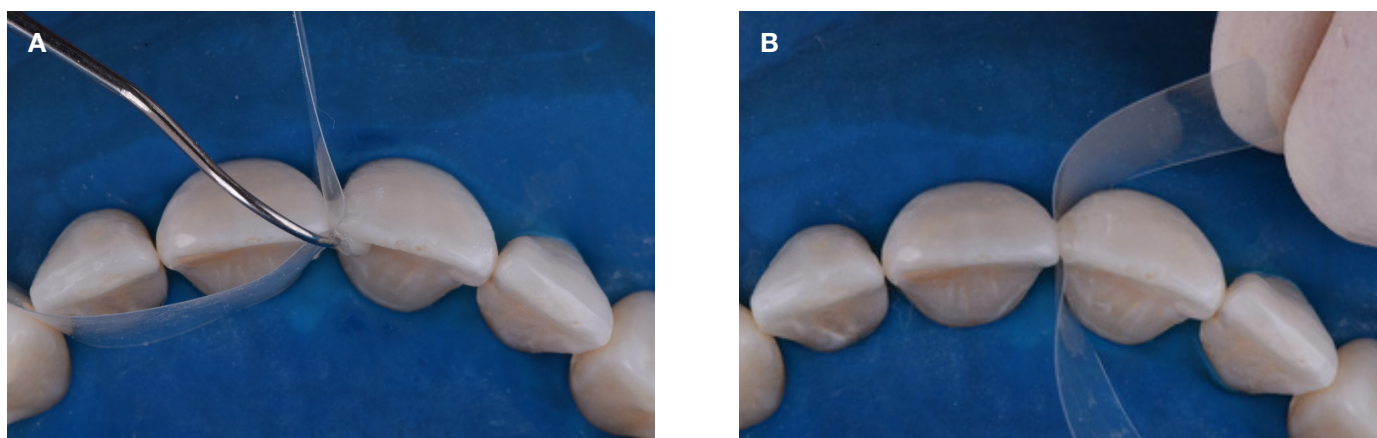


Figure 7. Restoration of the palatal region. (A): The resin increment is positioned in the palatal region. (B): The pulling of the polyester strip against the guide increment to establish the restoration contour and emergence profile.

edge, was replicated at this stage with specific resin composite. Texture of the last buccal resin increment was also reproduced with the aid of a small flat brush (Figures 8B and 9).

DISCUSSION

Although the technique described demonstrates the closure of diastema with restoration of one tooth, it can also be used when the diastema is closed through restorations involving both teeth. In such cases, the first tooth is restored by freehand on the proximal face, and the second uses the above described technique for establishing the contact point between them.

The technique described seeks to solve two major problems related to the closure of diastema located between anterior teeth: 1) absence of a firm and stable contact point and 2) cervical termination with an excess of resin composite. These problems can be minimized by making the guide increment as

described. If it is not possible to acquire the desired characteristics of the guide in a single increment, additional small increments must be added until it has the appropriate contour and cervical profile. Scalpel blades can be used to model the profile of the guide increment especially in the cervical region that should finish with a zero profile. Presence of excess resin composite in the cervical region of the guide increment can lead to more resin composite excess during final restoration.

Establishment of a proximal contact point between the guide increment and the adjacent tooth without using a polyester strip helps the formation of a stable and tight contact point. Although the use of sectioned matrices and wedges is an effective technique to obtain a tight contact point between posterior teeth,¹¹ the use of a wedge in anterior teeth makes it difficult to obtain the correct emergence profile and may jeopardize the tightness of the contact point also because of the

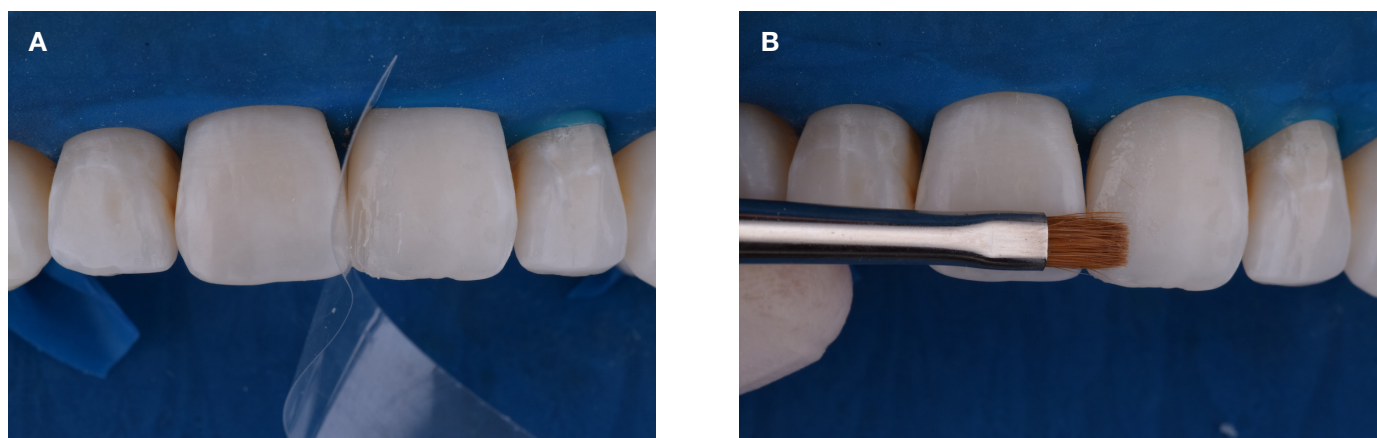


Figure 8. Buccal portion restoration. (A): Pulling of the polyester strip from buccal to palatal position, modeling the restoration contour according to the guide increment. (B): Texturing the last resin composite increment with the aid of small flat brush.

polymerization contraction inherent to the resin composite material.¹²

It is worth emphasizing the importance of establishing only a small contact area between the guide increment and the adjacent tooth because, if an extensive surface is established, the separation can be difficult and may lead to the release of the guide increment from the tooth that is being restored. During the restoration of the buccal and palatal portions, pulling of the strip to adapt the resin composite to the guide increment allows the proximal contact to become increasingly tight. To allow pulling of the strip without too much resin adherence therein, the resin increments must be first well accommodated on the enamel and guide increment through short vibratory movements of the spatula.

CONCLUSION

This restorative technique is efficient in closing single or multiple diastema with the establishment of a stable and firm contact point and a satisfactory proximal contour and emergency profile.



Figure 9. Final aspect of restoration with an establishment of a firm and stable contact point and adequate emergency profile without excess in cervical portion.

Conflict of Interest

The authors of this article certify that they have no proprietary, financial, or other personal interest of any nature or kind in any product, service, and/or company that is presented in this article.

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