# ESTHETIC DENTISTRY



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# Tooth movement with elastic separators before ceramic veneer treatment: Rearranging asymmetric diastemas by managing the horizontal distance

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The treatment of diastemas should be conservative to preserve tooth structure, and porcelain veneers provide an esthetic solution with minimal tooth preparation. However, asymmetric diastemas can be difficult to treat and may require redistribution of spaces. Additionally, extensive proximal restorations may negatively impact periodontal health. Minor tooth movement with elastic separators can be used to redistribute the interdental spaces and provide space for the interdental papilla. The aim of this paper was to present a clinical treatment involving the movement of peg-shaped maxillary lateral incisors with elastic separators to rearrange the spaces of asymmetric diastemas, thereby managing the horizontal distance during rehabilitation of the smile with minimally invasive ceramic veneers. (Quintessence Int 2018;49:133–137; doi: 10.3290/j.qi.a39511)

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The vertical and horizontal interproximal distances between anterior teeth have a substantial effect on the interproximal papilla and, consequently, on smile esthetics.<sup>1</sup> If the vertical distance between the proximal contact and the alveolar crest is small, or adjacent roots are in close proximity, periodontal health and esthetics may be affected. If a restoration is necessary, it may not be in harmony with adjacent structures. In such situations, different approaches may be appropriate, including orthodontic or periodontal treatment.<sup>2</sup>

However, in some situations, orthodontic elastic separators used to create interproximal space before the placement of orthodontic bands may also create interproximal space between the teeth. Appropriately used, they can improve tooth angulation and the horizontal distance between teeth, enhancing contours if a restoration is indicated.<sup>3</sup> This is a straightforward, rapid, low-cost method, since it does not require special orthodontic treatment or periodontal surgery.

Orthodontic elastic separators can also be used for minor redistribution of the spaces between teeth designated for restorations,<sup>4</sup> as in patients with asymmetric diastemas. Redistribution will lead to veneers with improved anterior tooth proportion. Therefore, under-

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**Figs 1a and 1b** Facial (*a*) and lateral (*b*) views of maxillary anterior teeth showing esthetic problems related to presence of diastemas and peg-shaped lateral incisors.



Fig 2a Diagnostic wax-up.



**Fig 2b** Trial restorations with excessively large maxillary central incisors.



**Fig 3** Minor tooth movement with orthodontic elastic separators, to provide interdental space required for ceramic restoration. Note localized gingival inflammation, induced by the elastic.

standing the use of elastic separators and consequent planning can help reconcile their periodontal and restorative advantages.

Ceramic veneers with minimal tooth preparation have shown good outcomes for the closure of diastemas from both the restorative and periodontal points of view.<sup>5</sup> The lithium disilicate ceramic IRS e.max Impulse (Ivoclar Vivadent) is suitable for nondiscolored teeth, can match bleached teeth, and can be characterized with subsequent veneering with feldspathic ceramics or extrinsic staining. Careful communication between the dentist and the laboratory technician is essential for appropriate material selection and for the treatment outcome.<sup>2</sup>

This paper describes a clinical treatment in which peg-shaped lateral incisors were separated with orthodontic elastic spacers to increase the proximal space and redistribute the diastemas before closing with minimally invasive ceramic veneers.

### **CASE PRESENTATION**

An 18-year-old woman attended a specialist dental clinic, reporting dissatisfaction with the size and shape of her maxillary anterior teeth. The clinical examination revealed multiple diastemas between anterior teeth of different widths and locations and the presence of peg-shaped lateral incisors. The left maxillary central and lateral incisors were in contact, but not the right maxillary central and lateral incisors (Fig 1).

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Fig 4a Definitive cast.

Options were discussed, and the patient consented to receive minimally invasive ceramic veneers. After tooth prophylaxis, impressions were made and poured for diagnostic waxing (Fig 2a). Treatment started with in-office whitening (Whiteness HP Blue 35%, FGM) in two 40-minute applications, followed by home whitening for 2 weeks (Whiteness Perfect 10%, FGM).

In a subsequent clinical appointment, trial restorations based on the diagnostic wax-up were made with Structur 3 bisacrylic resin (Voco) (Fig 2b). The trial restorations served to evaluate the incisor length and its relationship with the lower lip and the shape and size of the spaces between the teeth. Additionally, anterior guidance was evaluated, as was the cervical emergence profile of the teeth. The papilla between the maxillary left central and lateral incisors was excessively compressed, and therefore increasing the space with an orthodontic elastic separator for 24 hours was recommended.

After 24 hours, the interproximal space had increased (Fig 3). The shade was selected before dehydration of the teeth, and the teeth were minimally prepared for veneers. After bleaching, the teeth were much lighter than the Vita Classic B1 shade tab. No preparation with diamond rotary instruments was conducted. However, the teeth were rounded with Sof-Lex disks (3M Espe). Displacement cord (Pro Retract 0000, FGM) was inserted into the gingival sulcus, and the impression was made with polyvinyl siloxane material (Express XT, 3M Espe). Because the preparation was minimal, interim restorations were not placed.

The space obtained by using the elastic separators could be seen on the definitive cast (Fig 4a). IPS e.max



**Fig 4b** Ceramic veneers made with the IPS e.max Impulse system.



**Fig 4c** Restorations positioned on cast. The ceramic veneer is of minimal thickness.

Impulse ceramic (Ivoclar Vivadent) was used to make the veneers (Fig 4b). The cervical and proximal margins of the veneers were thinned with stones and ZZag ceramic polishers, making the ceramic as thin as possible. The proximal and incisal areas were characterized with stains to reduce translucency and prevent the dark background spoiling the esthetics. On the labial surface, the color of the bleached tooth structure shone through the translucent veneers (Fig 4c).

After the ceramic veneers had been finished, the patient was recalled, and the space was regained with an elastic of the same size as in the previous session. Twenty-four hours later, the ceramic veneers were evaluated with clear try-in paste (Nexus 3, Kerr). At this stage, gingival inflammation was observed (Fig 5).

With the patient's approval, the restorations were etched with hydrofluoric acid for 20 seconds (Condac Porcelana 5%, FGM), washed for 20 seconds and air dried, and a silane bonding agent (Kerr) was applied and left in place for 60 seconds.

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**Fig 5** Clinical evaluation of ceramic veneers. The interdental spacing provided by the elastic separators was sufficient to fabricate veneers of improved shape and proportion.



**Fig 6** Gingival appearance 2 days after adhesive cementation, with reduced inflammation of the interdental papilla and filling of the cervical space.



Fig 7a Facial and lateral view.



**Fig 7b** Two months after placement. The periodontium is healthy.



**Fig 8** Appearance of patient's smile 10 months after cementation. Anterior tooth proportion, periodontal health, and smile arc are all optimal.

The teeth were etched with phosphoric acid for 30 seconds and then rinsed and air dried. Optibond S (Kerr) adhesive was applied to the ceramic surface and teeth with no polymerization. Clear cement paste (Nexus 3, Kerr) was applied to the intaglio of the restorations. Any excess was removed with a microbrush and

dental tape. Each restoration was polymerized for 120 seconds by Radii-cal (SDI). The occlusion was adjusted with ceramic silicone polishers (ZZag), and the anterior and lateral occlusal guidance were evaluated.

Two days after cementation, the inflammation between the maxillary left central and lateral incisors had resolved (Fig 6). The esthetic results of the restorations and the appropriate emergent profile 3 months after cementation can be observed in Figure 7. The patient's new smile at a 10-month clinical follow-up is seen in Figure 8.

## DISCUSSION

The use of elastic separators, as in this patient's treatment, is a straightforward, inexpensive option, with no need for orthodontic appliances.<sup>6</sup> However, this technique can cause minor discomfort for the patient. In



some situations, the elastic may break or move gingivally during treatment, in which case it must be replaced and allowed to stabilize for an additional 24 hours.

After the minor tooth movement, the interproximal relationship improved, enhancing the final result as presented. In addition, the patient's periodontal maintenance and dental hygiene were facilitated. However, the separators should not be left for extended periods, such as weeks, since that may irreversibly damage the periodontal ligament.<sup>7</sup> The restorative procedures were also facilitated. Preparation is easier and often less invasive, and the possibility of damage to the adjacent tooth is reduced.<sup>6</sup> The evaluation, fit, and cementation of the veneers are facilitated as proximal interference is reduced.

Lithium disilicate can be used for anterior or posterior, complete, or partial restorations.<sup>8</sup> The ceramic is available in different shades and opalescence, and can accurately mimic the natural dental substrate to provide the high brightness shade requested by many patients. In the treatment presented, because of the very thin minimally invasive restorations in the labial regions, the color of the whitened tooth substrate prevailed. In the proximal region, stains were used to avoid the appearance of the dark background at the diastemas. This same characterization was made at the incisal edges. Thus, the technique allowed for the reproduction of labial and proximal esthetics in a satisfactory and predictable way with minimally invasive restorations.

#### CONCLUSION

A technique to redistribute spaces for the fabrication of minimally invasive lithium disilicate ceramic veneers for patients with asymmetric diastemas is described. With this technique, tooth spacing can be corrected in some patients with a quick, efficient, and low-cost alternative to the redistribution of interdental spaces. It can also help maintain periodontal health during indirect restorative treatments with minimally invasive ceramic veneers.

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