

Safe Midline Diastema Closure in the Presence of Porcelain Veneered Central Incisors

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Abstract

Midline maxillary diastemas have been known to have a detrimental effect on facial aesthetics. Orthodontics can successfully close a diastema using fixed appliances. Porcelain restorations bonded with fixed appliances may suffer damage. A case is presented where a fixed appliance was used to close a midline maxillary diastema bypassing porcelain veneered central incisors. Palatal attachments were used to optimise tooth movements and the porcelain veneers were left intact.

Keywords: diastemas, central incisors, maxillary midline

Introduction

A maxillary midline diastema has been described as a space between the proximal surfaces of the central incisors that is greater than 0.5 mm [1]. Diastemas have been known to have a detrimental effect on facial appearance and can negatively affect an individual's self-esteem [2]. A range of therapies have been used to treat the midline diastema ranging from orthodontic and restorative approaches to surgical procedures such as frenectomies [3, 4].

Porcelain is an important aesthetic material commonly used in dentistry and can frequently be found in patients seeking orthodontic treatment. Bonding to porcelain can be highly unpredictable and a range of protocols have been advocated to obtain an adequate shear bond strength between orthodontic bracket and porcelain [5]. However, orthodontic bonding is known to alter the porcelain surface and cause irreversible damage to the

surface texture and glaze [6, 7]. Furthermore, porcelain fracture can also occur at debonding necessitating replacement of porcelain restorations [8, 9].

Case Presentation

A healthy 29-year-old female presented with the chief complaint of a maxillary midline diastema (Figure 1. a-e). The patient reported a history of having a diastema previously, but this had been filled using porcelain veneers on both maxillary central incisors some years ago. Recently, a diastema had reappeared, and the patient was now seeking an orthodontic resolution along with a commitment to indefinite retention. The periodontal condition was assessed and found to be satisfactory. The patient was happy with the colour, shape and size of the veneers and preferred for them not to be disturbed. The patient reported that the restorative treatment had cost her a considerable sum of money and therefore neither wanted the porcelain veneers replaced, nor damaged





Figure 1. (a-e) A 29-year-old female with a maxillary midline diastema and porcelain veneers on the maxillary central incisors. The arches were well aligned, and the buccal segments had an acceptable occlusion.

Orthodontic treatment that did not bond the labial aspects of the maxillary central incisors would limit options to removable appliances such as those with an activated labial bow or a series of aligners, or a lingual fixed appliance.

A sectional labial fixed appliance was placed from the maxillary first

premolars using MBT pre-adjusted Edgewise brackets. The central incisors were bypassed to avoid bonding the porcelain veneers (Figure 2. a-c). After initial alignment with 0.014" and 0.018" nickel titanium wires, a 0.018" stainless steel working arch wire was placed. Elastomeric chain was used to close the diastema.





Figure 2. (a-d) Sectional labial fixed appliance bypassing the porcelain veneers on the maxillary central incisors. Palatal buttons were placed, close to the gingival margin, to minimise any rotation and tipping of the central incisors.

To reduce the introduction of mesiopalatal rotations of the maxillary central incisors, palatal buttons were placed on both the central incisors (Figure 2. d). Since the porcelain did not extend to the palatal surfaces of the incisors, bonding to enamel was possible. Elastomeric chain was placed across the buttons to counteract any rotation effect from the labial force. The buttons were placed close to the gingival margin so that when the elastomeric chain was placed, it would direct a force closer to the centre of resistance of these teeth. This would minimise mesial crown tipping of the maxillary central incisors and the amplification of any dark triangle.

Treatment was completed in just over four months and was concluded with the placement of a fixed retainer bonded to the maxillary six anterior teeth (Figure 3. a-d). This was supplemented with a vacuum formed retainer for nocturnal wear. The patient was very pleased with the outcome obtained and was grateful that the maxillary central incisor veneers were left intact.





Figure 3. (a-d) The maxillary midline diastema has been closed in four months and a palatal fixed retainer on the anterior six teeth was placed. The buccal occlusion had remained stable.

Compliance with Ethical Standards

Conflict of Interest:

The authors declare that they have no conflict of interest.

Informed Consent:

Consent was obtained from the patient included in the article.

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