Research Paper Dental Science

Anterior Aesthetic Build-Up and Diastema Closure Procedures Supporting Orthodontic Treatment: 2 - Case Reports

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ABSTRACT

One of the challenges in clinical dentistry is closing anterior diastemas without creating black triangles. From orthodontic standpoint, etiology of diastemas is divided into two: those present before beginning of orthodontic treatment and those present either before removal of bands but after teeth are moved to desired relations. Even after orthodontic treatment diastemas can remain causing unwilling aesthetic outcome so restorative approach should be considered. This report describes two cases of build-up and diastema closure procedures in anterior teeth during orthodontic treatment by using direct composite restorations. As conclusion, considering that having such advantages such as simulating natural dental tissues, being functional, economical and repaired easily and saving chairtime; direct composite resins are one of the best options in need of supporting orthodontic treatment. Using appropriate technique and modern materials, they can yield highly aesthetic results that can satisfy patients as under conditions of cases presented.

KEYWORDS | Diastema, build-up, direct composite restoration, aesthetic dentistry

INTRODUCTION

One of the challenges in clinical esthetic dentistry is closing anterior diastemas without creating "black triangles" between the teeth.[1] Keene described midline diastema as anterior midline spacing greater than 0.5 mm between the proximal surfaces of adjacent teeth.[2] These spaces can occur anywhere in the upper or lower dental arches, and they have various etiologic factors.[3, 4] From an orthodontic standpoint, the etiology of diastemas can be divided into two categories: those present before the beginning of orthodontic treatment, and those present either before the removal of the bands but after the teeth are moved to their desired anteroposterior and vertical relations. Even after orthodontic treatment diastemas between incisors can remain causing an unwilling aesthetic outcome.[5] If these spaces can not be closed with orhodontic treatment, then restorative approach should be considered. The width to length ratio of the incisors for aesthetic rehabilitation in complex midline diastema closure cases determines the treatment plan. Decisions such as the amount of distal proximal reduction, the number of teeth to be treated, the placement and location of prominences and concavities to create the illusion and the decision for full-veneers or just adding to the interproximal are decided according to that ratio.[6] Improved materials and techniques are often introduced leading professionals to endless improvement while fulfilling their patients' aesthetic demands.[7] Recent aesthetic composite resin materials have similar physical and mechanical properties to that of the natural tooth and possess an appearance like natural dentin and enamel.[8] They offer an expanded range of shades and varying opacities designed specifically for layering technique whereas early brands of composite resins offered only "body" shades besides appeared dull and dense.[9] The appropriate technique and material for a patient is also based on time, physical, psychological, and economic limitations.[10] Direct composite resin restorations in diastema closure cases allow dentist and patient complete control of formation of a natural smile.[11]

This case report describes two cases of build-up and diastema closure procedures in anterior teeth during orthodontic treatment by using direct composite resin restorations.

CASE REPORTS

An 15 years old female and a 17 years old male patient reported with the demand of diastema closure in mandibular right central incisor distal region (Figure 1).

Figure 1: Diastema in mandibular right central incisor distal region.

Another male patient at the age of 17 reported with the same demand in maxillary right lateral incisor distal region (Figure 2).

Figure 2: Diastema in maxillary lateral incisor distal region.

Both patient's medical history did not reveal any systemic diseases and no dental caries were observed in both clinical and radiographical examinations. As a more conservative, economical and aesthetic option, direct aesthetic partial composite laminate veneers as build-ups for the teeth were considered.

Shade selections were considered as A1 shade of Vita guide for both patients to be treated. In order to simulate natural looks shades AO2, A1 and JE (Gaenial, GC, Japan) were de-

cided to be used as layering. The teetth were retracted with retraction cords and the adjacent teeth were covered with teflon bands (Figure 3, 4).

Figure 3, 4: Retraction of the teeth and isolation with teflon bands.

37% phosphoric acid (Etching Gel, Kerr, USA) was applied on the mesial and labial surfaces, rinsed for 20 seconds and dried slightly. Then a single bottle bonding agent (Adper Single Bond, 3M ESPE, USA) was applied and polymerized for 20 seconds with a led light generator (Demi Led Light Curing System, Kerr, USA). In both cases thin layer of JE shade transparent composite resin was used palatinally as enamel and polimerized. Thin layer of AO2 shade opaque composite resin was placed roughly as the second layers and polimerized (Figure 5, 6).

Figure 5, 6: Placement of AO2 shade opaque composite resin as the second layer.

A1 shade composite resin was used as dentin layer and a thin layer of JE shade was used as the top enamel layer in both cases. Labial surfaces of the restorations were flattened by using a red banded knife-edge tip diamond bur (Acurata, GERMANY). Polishing discs (Ultra Gloss Composite Polishing System, Axis, USA) were used for detailed polishing from rough to fine grains (Figure 7, 8). Both patients were motivated for oral hygiene and returned to their orthodontists for the finalization of their treatments.

Figure 7, 8: The teeth after detailed polishing.

DISCUSSION

The direct composite resin restorations can be placed in a single visit, often do not require preliminary models or wax-ups and do not involve laboratory fees that escalate costs.[12] In terms of aesthetic dentistry these restorations offer various advantages that other possible treatment options like ceramic veneers and orthodontic treatment do not. They are kinder to the opposing dentition compared to ceramic materials and able to be repaired easily compared to costly and time-consuming repairs or remakes for porcelain alternatives.[13] Diastemas that can not be closed due to the orthodontic limitations can be treated with direct aesthetic restorations in one appointment during the orthodontic treatment. However there are also some disadvantages of direct composite restorations compared to some indirect porcelain alternatives. Most composite materials possess less fractural toughness, shear and compressive strength, and are not ideally suited for ultra high-stress areas.[14] Presence of unmanaged parafunctional forces such as bruxism, Class III malocclusion or noxious oral habits such as nail biting can jeopardize the longevity of direct composite restorations.[15] Moreover the color stability of direct composite resin restorations are not as inert as ceramics however this depends on the quality of finishing and polishing procedures and can be prevented with recalls.[8] Regardless of the fact that direct composite resin restorations have these disadvantages, the developing adhesive techniques and better quality resin materials gives dentists the chance to create more conservative, functional, aesthetic, economic and long lasting restorations.[5, 16] These case reports demonstrated aesthetic anterior restorations without any preparations. Considering that having such advantages as simulating natural dental tissues, being functional, economical and repaired easily and saving chairtime; direct composite resin restorations are one of the best options in need of supporting orthodontic treatment. Using an appropriate technique and modern materials, the direct composite resin restorations can yield highly aesthetic and durable results that can satisfy the patients as under the conditions of the cases presented.[17]

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