CLOSING DIASTEMA WITH DIRECT COMPOSITE VENEER: A CASE REPORT

DIASTEMA VAKALARININ DIREKT KOMPOZİT VENEERLE KAPATILMASI: OLGU SUNUMU

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Özet

Dişler arasında boşluk olarak tanımlanan diastema, dişlerin boyut ve şekil anomalileri, Bolton uyumsuzluğu gibi genetik nedenler, gömülü dişler veya labial frenulum bağlantıları nedeniyle oluşabilir. Bu vaka sunumunun amacı, maksiller santral dişler arasında oluşan diastemanın direkt kompozit rezin restorasyon ile tedavi edilmesidir. İntraoral ve radyografik incelemeler sonucunda, diastemanın labial frenulum kaynaklı oluştuğu belirlendi. Ilk seansta hastadan ölçü alınıp model üzerinde wax-up hazırlandıktan sonra silikon anahtar hazırlandı. İkinci seansta hastaya rubber-dam takılmadan önce renk seçimi yapıldı. Dişlerin mezial 1/3' lük kısmına %37'lik fosforik asit ile pürüzlendirme yapıldı. Ardından adeziv rezin uygulanıp kompozit rezin restorasyonu yapıldı. Hastanın altı aylık kontrolünde restorasyon başarılı bulundu. Direkt kompozit rezin restorasyon ile diastemanın kapatılması; düşük maliyet, minimal invaziv olması ve kısa sürede hasta memnuniyetinin sağlanması açısından tedavi seçeneği olarak düşünülmüştür.

Anahtar kelimeler: Direkt restorasyon, diastema, bonding

Abstract

Diastema, defined as a space between teeth, may occur due to genetic reasons such as size and shape anomalies of the teeth, Bolton mismatch, impacted teeth or labial frenulum connections. The aim of this case report is to treat the diastema -seen between the maxillary central teeth with direct composite resin restoration. As a result of intraoral and radiographic examinations, it was determined that the diastema resulted from the labial frenulum. In the first session, after measuring the patient and preparing the wax-up on the model, the silicone key was prepared. In the second session, color selection was made before the rubber-dam was attached to the patient. The mesial 1/3 of the teeth was roughened with 37% phosphoric acid. Afterwards, adhesive resin was applied and composite resin restoration was performed. Restoration was successful in the six-month follow-up of the patient. Closure of the diastema with direct composite resin restoration was considered as a treatment option in terms of low cost, minimal invasiveness and providing patient satisfaction in a short time.

Keywords: Direct restoration, diastema, bonding

Introduction

Diastema, defined as the space between teeth, may result from size mismatch between teeth and arch, impacted teeth, tooth loss, congenital tooth deficiency or abnormal frenulum connections. The term polydiastema can also be used to describe a large number of diastemas on the jaw arch.[1,2] Studies have shown that the most common diastema is the one occurring between the maxillary central teeth. If the diastema seen between the maxillary central teeth is more than 2 mm, it is called midline diastema. It has also been reported that the most common cause of midline diastema is labial frenulum. Midline diastema is not a pathological condition. however, patients demand treatment of diastema because it is not aesthetically pleasing.[3] Today, with the prominence of aesthetics, the demand for treatment of patients is increasing, especially because of the interconnectedness of dental and facial aesthetics. Depending on the conditions such as the location and extent of the diastema, the aesthetic expectations and socio-ecenomic level of the patients, the treatment option changes, as well.

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Orthodontic treatment, direct composite resin applications, porcelain lamina restorations and all-ceramic restorations can be counted among the treatment options.[4] Due to the duration of orthodontic treatment and the loss of material caused by traditional porcelain and lamina restorations, it is much more preferred to close diastemas with composite resin restorations made without preparation.

With the discovery of the acidity of the enamel surface, many researchers have worked on bonding systems. Thanks to these studies, very good developments have been experienced in adhesive systems today.[5] Recently emerging adhesive systems contain carboxylate or phosphate monomer that binds to calcium in hydroxyapatite found in enamel tissue. In addition, monomers such as 10-MDP (meta riololoxydecyl dihydrogen phosphate), silane, polyacrylic acid have also been added to many adhesive systems.[6] However, by changing the size of the filler particles and using nanoparticles, highly polishable and aesthetic restorations have begun to be obtained.

There are many application techniques of composite resins. In addition to being applied with the free modeling technique, it can also be applied with the silicone key technique, in which a palatal guide is created on the model with the wax-up or mock-up technique. The free application technique is very suitable for small diastemas. However, palatal guide formation techniques are preferred in large-sized diastemas. Because it is difficult to adjust the size of the teeth in large diastemas. Creating a palatal guide with wax-up and mock-up techniques has advantages such as easier application of the layering technique and adjustment of the mesio-distal dimensions of the teeth. Additionally, better proximal contacts can be adjusted, the length of the incisal edges, lingual contours and anatomical forms can be given by preparing a silicone guide.[7] The aim of this case report was to treat the teeth of patients who come to the clinic with the complaint of midline diastema using the silicone key method and to evaluate the clinical success of the treatment and the clinical follow-up results. Intraoral photographs of the patient for whom the case was presented were taken with a digital compact system camera (Canon EOS 6 D) in our clinic.

Case Report

The patient, who applied to our clinic with the complaint of aesthetic diastema between the maxillary anterior teeth, did not have any anomaly or impacted teeth in the radiographic examination. In addition, it was observed that the patient's 21st tooth was slightly rotated and palatal. It was observed that the general oral hygiene of the patient was good and there was no caries or old restoration in the mouth. (Picture 2).

Picture 1. Labial frenulum

Picture 2. Initial intraoral photograph

After the patient was informed about the treatment, aconsent form was obtained regarding the treatment to be performed. Before restorative treatment, the patient's labial frenulum was removed by frenectomy in the periodontology clinic (Picture 3). After 4 weeks, the patient was called for control and wound healing was checked. It was decided that the desired level of improvement was achieved and restorative treatment could be performed (Picture 4).

Picture 3. Frenectomy surger

Picture 4. Healing after frenectomy

Since the size of the diastema was more than 2 mm, it was decided that the desired result would not be obtained with direct composite restoration. Then, wax-up was prepared on the plaster model by measuring the patient with alginate (Zhermack SpA, Italy) impression material. After the patient accepted the wax-up model, a key was prepared on the model with silicone.

At the beginning of the treatment, color selection was made in daylight as the first step. For better isolation and gingival retraction, a rubber dam was inserted, including teeth 14-24 (Picture 5). The surface of the teeth was roughened with 37% phosphoric acid for 30 seconds without any preparation (Picture 6). After pickling, the tooth surface was acid washed with water running from the tap. Then the tooth surface was completely dried with strong air. Then tooth number 22 was isolated with Teflon tape and bond was applied to tooth number 11 (Clearfil SE Bond Kuraray). The bond film layer was thinned by squeezing strong air on the tooth surface for 5 seconds. Then, polymerization was achieved for 20 seconds with an LED (3M ESPE Elipar S10, Netherlands) light device.

Picture 5. Rubber-dam application

Picture 6. Etching of the surface

GC JE (G-aenial A'CHORD, GC Europe) composite was used to form the palatal surface of the teeth under the guidance of a silicone key. Subsequently, dentin form was obtained by using GC A1D composite. Finally, the restoration of tooth number 11 was completed by making a final

restoration with GC A1 composite. Polishing processes were first performed using discs (Soflex, 3M ESPE, The Netherlands), and surface treatments (Clearfil Twist Dia, Kuraray) were completed using polishing rubbers. The same procedures were applied to teeth number 21 and diastema closure restoration was completed.

Oral hygiene training was given to the patient and a follow-up appointment was given six months later. In the control session, the patient expressed his satisfaction and stated that he had no complaints. In the intraoral examination, it was observed that there was no staining at the restoration margins, but the papilla did not close the dark triangle at the desired level (Picture 7). However, no procedure was performed because the patient did not have any aesthetic complaints. An appointment was made for 6 months later.

Picture 7. 6-month follow-up

Picture 8. Initial and final photo

Discussion

Closure of diastemas, which have many treatment options, with direct composite resin restorations is the most common treatment option today. Restoration with direct composite has important advantages such as less cost and completion of the treatment in a single session.[1] Additionally as stated in this treatment option, since no preparation is made on the tooth surface, the restoration can be removed and the teeth can be restored (if necessary). In the treatment we performed, there was no need for disassembly or additional operation since the patient was satisfied and there was no problem in the restoration in the 6-month control session. Also, in case of a problem in composite restorations, easy restoration with adhesive systems provides superiority to porcelain laminated and all-ceramic restorations.

Evaluation of the midline of the face is accepted as the starting criterion in an aesthetic restoration. The line drawn between the nasion point and the base of the philtrum determines both the direction of the facial line and the direction of the midline.[8] The dental midline should overlap with the midline of the face or be parallel to the midline of the face. Studies have shown that the maxillary midline coincides with the facial midline only by 70%; however, it has been stated that a 2-mm-midline discrepancy is usually not noticed, and a 2-mm-discrepancy is not noticed when the dental midline is perpendicular to the incisal plane.[9]

In diastema treatments, composite resin restorations can be applied with direct modeling or silicon key technique. It is very difficult to fully provide the anatomical contours of the teeth or to provide symmetry in the teeth with the direct technique. Wax-up made for this purpose both gives an idea to the patient and provides the creation of natura contours.[7]

Composite resin applications require a lot of technical precision and the process steps are very important in terms of the continuity of the restoration. With the acidification of the enamel surface, many microscopically rough areas occur on the surface, the bond surface area expands, and the surface energy and wettability of the surface

increase.[10] As a result of developments in adhesive systems, adhesives that can be bonded both chemically and mechanically have been developed. Thus, the connection properties are improved and microleakage is reduced. Longer lasting restorations are achieved due to increased retention and less edge discoloration.[11]

In our case, maximum attention was paid to the application steps of the composite resin, and in the control session, it was observed that the edge adaptation of the restoration was very good and there were no problems such as roughness and coloration in the surface properties.

Conclusion

As a result, direct composite resin applications can be applied quickly and easily with low costs without preparation on the tooth surface. In addition, they were found to be quite successful in meeting aesthetic expectations of the patient and physician. With the silicone key technique, it provides easier application of both palatal anatomical contours and layering technique. However, more clinical observations are needed to talk about the long-term success of direct composite restorations.

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