



ESTHETIC ENHANCEMENT - DIASTEMA CLOSURE WITH COMPOSITE LAYERING TECHNIQUE: A CASE REPORT

Endodontic

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ABSTRACT

The two primary objectives of modern dentistry are appearance and functionality. One typical aesthetic issue that patients have is maxillary anterior spacing. The causes of midline diastema are complex and include labial frenulum, microdontia, mesiodens, peg-shaped lateral incisors, agenesis, cysts, habits like lip or tongue thrusting or finger sucking, dental malformations, genetics, proclinations, dental-skeletal discrepancies, and imperfect coalescence of the interdental septum. Direct composite resins in diastema situations give the dentist and patient full control over these restrictions, enabling the creation of natural smiles. In this case report, a maxillary midline diastema was filled directly with composite resin in a single appointment with no preparatory work. The surfaces of the teeth that were segregated with a rubber dam and teflon bands were coated with translucent/opaque composite resin shades using one bottle of total-etch adhesive. Polishing discs were employed to complete the finishing and polishing processes.

KEYWORDS

Aesthetic, Midline diastema, Composite resin

INTRODUCTION

Patients frequently complain about their maxillary anterior gap, also known as a diastema. Midline diastema was defined by Keene as an anterior midline gap of more than 0.5 mm between the proximal surfaces of neighboring teeth. The maxilla was shown to have a higher prevalence of midline diastema than the mandible. The causes of midline diastema are complex. In addition to the labial frenulum, other conditions such as microdontia, mesiodens, peg-shaped lateral incisors, lateral incisor agenesis, cysts in the midline, habits like lip or finger sucking, tongue thrusting, or finger sucking, dental malformations, genetics, maxillary incisor proclination, dental-skeletal discrepancies, and imperfect coalescence of the interdental septum.¹

One of the most common malocclusions is a maxillary midline diastema, which has an incidence that varies from 1.6% to 25.4% and is inversely correlated with age. Midline diastema, a prevalent kind of inadequate occlusion marked by a space between the maxillary and, less frequently, mandibular central incisors, was described by Angle. To ensure that the patient has "straight and beautiful teeth as well as perfect overall dental occlusion," Andrews wrote in his famous paper that there shouldn't be any interdental diastemas and that all contacts should be tight.²

Utilizing composite resin to bind Diastema is a conservative and reasonably priced way to improve each person's smile, and it is frequently completed in only one appointment. Many patients are motivated to improve their appearance either restoratively with composite resin bonding, veneers, crowns, or orthodontic therapy since the presence of diastema in the anterior aesthetic zone can be unpleasant to a person's smile.³

CASE REPORT

A 32-year-old female patient reported to the department of Conservative Dentistry and Endodontics, Narsinhbhai Patel dental College and Hospital, Visnagar with a chief complaint of spacing in her upper front teeth region. A complete clinical examination was performed. This included radiographs, photographs, and a review of the periodontal condition. No pathologies were found which would impede esthetic enhancement. No contributory occlusal factors were noted that would require functional rehabilitation. There was a spacing between the central and lateral incisors. After explaining all treatment modalities, the patient decided to restore the teeth with direct composite restorations.

In the first appointment, a Preoperative photograph (Figure 1) was taken after that tray selection was done and then c-silicone putty material was used to make a preliminary impression and a then

diagnostic cast was obtained. A dental mock-up wax was used and diagnostic wax-up was done on the cast and a putty index was created to obtain palatal and labial halves respectively index (Figure 2) was then split into two halves in the mesiodistal direction. The palatal half was then examined intraorally in the second appointment for the correct fit, which will provide the reference guide and act as a firm template to rebuild the palatal surface of the tooth. Then shade selection was done. (Beautiful II, Shofu). After the placement of the rubber dam, bevels are given to the upper central and lateral incisors on the labial surface of the tooth. Proper isolation was done and 37% phosphoric acid was used for etching on exposed facial and palatal surfaces of the tooth for 15 seconds, and the application of bonding agent was done. The palatal silicon index was resealed, and incremental layering of direct composite resin restorative material was done on all maxillary anterior teeth. The index was used throughout the composite build-up procedure. The mesial and distal aspects are shaped using a sectional matrix. Finishing and polishing were done using the composite polishing kit (Shofu Inc, Kyoto Japan) to achieve aesthetically pleasing diastema closure. Oral hygiene instructions were given to the patient. The final outcome of the restorative procedure can be seen. (Figure 3)



Figure 1: Preoperative photograph



Figure 2: Diagnostic wax-up, Labial, and Palatal halves



Figure 3: Postoperative photograph

DISCUSSION

Hands-on training and regular practice will enable the physician to impact a high level of competency in direct composite resins, which requires experience. Following orthodontic treatment, restorative operations could be needed to improve the appearance.

Multidisciplinary techniques usually employ this course of action. One such instance where both orthodontic and restorative operations are required is anterior teeth spacing, including midline diastema. Porcelain veneers and crowns are additional treatment choices for diastema closure, but in the era of minimally invasive dentistry, the conservative method is the most popular. Particularly in younger individuals, this procedure is minimally invasive and produces good cosmetic outcomes. These materials also offer the added benefits of being easier to repair in the event of fracture and being less abrasive to the opposing dentition than other treatment choices.⁵

Diastema closures have recently been performed using different methods that have been described. In order to make the proximal anatomy more easily constructed, the use of a posterior stainless-steel matrix has been documented. However, while it aids in creating the incisor proximal angles, it again does not ensure a sufficient width for the incisors themselves. Another method that has been discussed in the literature involves employing a Teflon band to isolate the neighboring tooth. This method only has the advantage of preventing the adherence of the proximal walls of the neighboring teeth. Despite this benefit, it has a drawback in that it obscures the tooth next to the working region and occasionally may not be necessary. A mylar strip and a flowable composite have also been employed to create an emergence profile. These methods have the advantages of avoiding black triangles and producing anatomically accurate interproximal emergence profiles, but they do not guarantee width central proportion.⁴

Among the several diastema closure methods, the most common one involves simulating the diastema closure by constructing a wax-up repair. This method is quite helpful because it makes it simple to replicate the anatomy of the teeth that were previously established by the wax-up, following tooth separation and shade choosing. On the afflicted tooth, a thin coating of opaque white composite resin was applied after the lingual layer and labial layer were finished. The advantage of creating the lingual layer with putty is that the mesial and distal line angles can be restored without the use of wedges. Additionally, the bevel creates bulk across the cavosurface angle and permits a gentle transition from resin to teeth.

The attainment of an unnoticeable restoration is made possible by a better understanding of the behaviour of dental tissues under light frequency and the aesthetically pleasing looks of modern composite resins. A powerful and secure alternative for oral rehabilitation was suggested in the form of direct restorative treatment. The planning stage, technical skill and knowledge, finishing and polishing materials, and other elements all play a role in how well restorations turn out. Monitoring and maintenance also extend the life of the treatment.

CONCLUSION

Direct composite resin restorations have been proposed for the closure of diastemas in the anterior zone to enhance the patient's smile. With the use of direct resin, form, function, and aesthetics can all be developed while maintaining a natural-looking smile for the patient.

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