






CASE REPORT

Diastema closure with direct composite veneers: A case report

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Abstract

Diastema closure is a frequently requested, technique-sensitive cosmetic procedure. Because of their predictable results and conservation of tooth structure, direct veneers are indicated for the esthetic treatment of anterior teeth with anomalous positions or appearance. This case report aims to highlight the steps in dental rehabilitation using direct veneers. In this case, the patient had diastemas in her maxillary centrals. After preliminary procedures, diagnostic models, waxing, and mock-ups were completed. Impression was made with additional silicone and the veneers were fabricated and cemented with light-cure cement. As a result, the esthetics and function expected by the patient were achieved. The use of direct veneers enabled a conservative and esthetically successful rehabilitation treatment. Traditional porcelain veneer placement may offer an excellent esthetic result, but typically requires the removal of tooth structure as such, this is an irreversible procedure. The present article reports the case of a maxillary midline diastema closure in a healthy dentition by means of sectional porcelain veneers cemented onto the natural teeth and without tooth preparation. A step-by-step procedure is proposed to illustrate the proper implementation of an additive-only and noninvasive indirect technique that yields satisfactory clinical and esthetic outcomes for clinicians and patients.

Keywords diastema, addition silicone, direct composite veneers, light cure cement, porcelain veneer, veneers

1 | Introduction

A common aesthetic concern among patients is maxillary anterior space or

diastema. Midline diastema, according to Keene, is defined as an anterior midline separation of more than 0.5 mm between the proximal surfaces of

neighboring teeth. In comparison to the mandible, the maxilla was shown to have a higher prevalence of midline diastema. The etiology of midline diastema is complex. In addition to the labial frenulum, other conditions that can result in diastema include microdontia, mesiodens, peg-shaped lateral incisors, lateral incisor agenesis, cysts in the midline region, habits like finger, tongue, and/or lip sucking, dental malformations, genetics, maxillary incisor proclination, dental-skeletal discrepancies, and imperfect coalescence of the interdental septum as one of the potential causes of diastema. The treatment strategy for difficult midline diastema closure instances depends on the breadth to length ratio of the central incisors for aesthetic rehabilitation. According to that ratio, decisions are made on things like the degree of distal proximal reduction, the number of teeth to be treated, the placement and location of prominences and concavities to create the illusion, and whether to use full-veneers or just increase the interproximal. Time, financial, physical, and psychological constraints all play a role in choosing the right method and material for a patient. Direct composite resins give the dentist and the patient entire control over the creation of a natural smile in diastema closure cases. Patient's aesthetic needs are met while professionals continue to advance thanks to often

offered improved materials and processes. Recent cosmetic composite resin materials resemble real dentin and enamel in appearance and have physical and mechanical characteristics that are similar to those of natural teeth. The aim of this case report is to review the methods and materials used on the closure of the patient's diastema.¹

2 | Case presentation section

2.1. Chief complaint



Figure 1. Pre-treatment photograph

A 27--year-old female patient presented to the dental clinic with the chief complaint of prominent space in between her central incisors. Confidence was also a problem whenever she talks or smiles because of the gap (Figure 1).

2.2. Medical & dental history

Medical history was non-contributory. Dental history indicated that the last

appointment the patient had was for oral prophylaxis, last Oct 2021.



Figure 2. Post-treatment photograph

2.3. Diagnosis & etiology

Upon clinical examination, maxillary diastema of 3 mm was observed between the maxillary central incisors #11 and #21. Also, a 1mm spacing between her central incisor #11 and lateral incisor #12. Patient presents healthy gingiva and no abnormalities in adjacent structures. With her radiographic and clinical examinations there were no dental caries observed. She presents a symmetrical face and a normal smile line. Maxillary diastema was her final diagnosis which was an inherited condition from both of her parents.

2.4. Prognosis

A direct composite veneer was used. Closure of maxillary diastema was accomplished in one visit. The chosen treatment was successful since the patient's chief complaint was addressed directly. The chosen materials, color shade and composite were a good choice since it would appear natural. The patient gained her confidence again. Thus, this is a good prognosis.

2.5. Treatment

For the aesthetic correction of midline diastema of 3mm between tooth #11 and #21 and spacing of 1 mm between tooth #11 and #12, tooth preparation was done for both teeth. Mesial and distal wall of #11, and distal wall of #21 was built using direct composite with a shade of A2. Patient was then advised for a maintenance visit for every 6 months (Figure 2).

3 | Discussion

Diastema closure is often a difficult restorative procedure. A vision of the intended goal and good treatment planning are essential to success.¹ This "outcome-based" design offers the direction required to build aesthetically pleasing, easily cleanable, and durable restorations. It is significant to first apply the treatment planning concepts of Facially Generated Treatment Planning (FGTP) as the patient wishes to close a

diastema to conduct the proposed restorative procedure. Utilizing FGTP templates, the tooth contours perhaps evaluated to regulate the correct tooth proportion along with closure of the interproximal space.² The above-mentioned templates, a diagnostic wax-up may be produced to supply guidance for tooth preparation finish lines and margins. The locating of these lines is critical to longevity and maintainability of the restorations. There is an overall rule for finishing positions upon closing open contact situations. Ordinarily, for teeth ideally positioned within the dental arches, the contact point between the anterior teeth is located directly beneath the peak of the gingival papilla.³ This arrangement allows for adequate facial, incisal, and gingival embrasure form of the teeth. It is significant for the restorative dentist to justly position the finishing lines of the restoration to close open contact conditions

The lingual finish line of the veneer should be one-millimeter palatal to the papilla as the rule suggests presuming that there is one millimeter between the roots of the teeth. If two millimeters subsist between the roots, then the finish line should be two millimeters palatal to the contact. If there is three millimeters between the roots, then the new contact ought to be placed three millimeters to the lingual. Beyond that orthodontics or tooth

movement should be advised as a tool for closing contacts.⁴ The patient wanted to have her maxillary anterior diastema closed when she visited the clinic. There were no medical issues that would have restricted her care. She had no desire to pursue orthodontics. The patient interaction and treatment planning were facilitated using facially generated treatment planning sheets. To get the desired outcome, it was decided to use two anterior direct veneers and a lateral direct veneer. A line is drawn from the distal portion of each central incisor to the incisal margins of the suggested veneers. This line makes it easier to see where the tooth surfaces come into touch. The dimension of the midline diastema is approximately 3mm. This infers that the midline root proximity is 3mm. Also, a 1mm spacing between tooth 11 and 12. The rule guideline requires that the veneer margin be placed 3mm palatal to the midline papilla. The distal contacts of the proposed veneers will remain in their existing positions. Therefore, the distal margins will be placed 3mm palatal to the contact point.

Right central incisor surfaces were prepared by being etched with phosphoric acid-etching gel for 30 seconds, followed by a thorough rinsing and light drying. On the etched surfaces, a universal dentin and enamel adhesives were generously applied. To eliminate the solvent

carrier and any remaining water, the adhesive was gently air-thinned. A LED curing light was then used to cure the adhesion for 30 seconds.

The direct veneer's facial surface was then given its final outlines using a long, tapered finishing diamond bur. The lingual region was formed with a diamond finishing bur. An interproximal overhang that was very small was trimmed using a surgical blade. The contoured surfaces were then polished and the final surface shine was created using diamond impregnated polishers.

The second central incisor was treated in a similar way and ran parallel on the first veneer's mesial polished surface. A hard-composite spatula was used to gently rotate the two teeth apart because the polished tooth had no binding to the finished central incisor, resulting in an excellent proximal contact. The second repair has a similar appearance.

An image of the final veneer preparations shows the actual placement of the interproximal finishing lines. The midline finish lines are 3mm lingual to the contact point. The distal margins were placed one-millimeter palatal to the contact. These margin placements allow for them to be cleansed and to allow for adequate thickness. After preparing the veneers, both teeth were etched for 30 seconds, then placed in adhesive bonding. Mesial and distal wall of tooth 11,

distal wall of tooth 21 was built using direct composite with a shade of A2. Patient was advised to visit every 6 months for maintenance.⁷

The placement difference between the mesial and distal completed edges are easily seen because of the direct veneers. A smooth transition from the natural tooth structure to the direct veneer is made possible by positioning the margins with the appropriate palatal extension. This shape enables effective and adequate home care.⁸

These finished restorations have properly closed the patient's midline diastema. Patient is very pleased with the results. The margin placement has allowed for healthy tissue and ideal papilla form. Applying the rule concepts to margin placement helps to create restorative results that are predictable and long lasting. The process begins with "outcome-based" design and planning. By knowing where we want to go from the beginning, it is possible to execute the process with precision and predictability.⁹

4 | Conclusions

The simplest method for closing a diastema is direct composite repair, which can be done in just a single appointment at a lower cost. In this case, we were able to produce the desired aesthetic outcome; to create a natural smile that can boost the self-

confidence of the patient. The symmetrical and aesthetic alignment of the teeth, in this case, was made possible by the conservative direct resin bonding technique.

Institutional Review Board Statement

The study was conducted in accordance with the Declaration of Helsinki, and approved by the Ethics Committee of Southwestern University PHINMA School of dentistry.

Informed Consent Statement

Informed consent was obtained from the patient and the attending dentist.

All methods have been exhausted to maintain the anonymity of the patient.

Acknowledgments

The authors wish to thank the faculty members of the Southwestern University PHINMA School of Dentistry for their support in this study. Special thanks to Dr. Kimberly D. Lequin for providing the case.

Conflicts of Interest

The authors declare no conflict of interest.

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