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From Space to Smile: Closure of Maxillary Midline Diastema With E-Max Veneers - A Case Report

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Abstract

Midline diastema and peg-shaped lateral incisors are common esthetic concerns that can adversely affect smile harmony and patient confidence. Contemporary esthetic dentistry emphasizes minimally invasive treatment modalities that preserve natural tooth structure while achieving optimal esthetic outcomes. This case report describes the rehabilitation of a female patient presenting with a maxillary midline diastema using lithium disilicate (E-max) laminate veneers. Following clinical evaluation, smile analysis, and conservative tooth preparation, E-max veneers were fabricated and adhesively bonded to the maxillary central and lateral incisors. The treatment successfully closed the diastema, corrected tooth morphology, and improved the overall esthetic appearance of the smile while maintaining maximum enamel preservation. The patient expressed high satisfaction with the functional and esthetic outcome. This case highlights the predictability, durability, and esthetic excellence of lithium disilicate laminate veneers as a conservative treatment option for the management of anterior spacing and tooth form discrepancies.

Keywords: Midline Diastema, E-Max Veneers, Lithium Disilicate, Esthetic Rehabilitation.

Introduction

In contemporary esthetic dentistry, the demand for minimally invasive restorations that concurrently satisfy biological, mechanical, and optical criteria has led to the widespread adoption of porcelain laminate veneers (PLVs) over full-coverage crowns .[1] A major milestone in this paradigm shift was the development of IPS Emax, a lithium disilicate glass-ceramic featuring an interlocking crystalline microstructure that provides a high flexural strength of exceptional fracture toughness.[3] This elevated structural capacity allows for ultra-thin tooth preparations ranging from 0.3 mm to 0.5 mm, maximizing enamel preservation which is pivotal for predictable, long-term adhesive bond strength.[1] Beyond its mechanical superiority, the low refractive index, native fluorescence, and variable translucency options of lithium disilicate seamlessly replicate the light transmission and optical characteristics of natural tooth enamel. Consequently, Emax veneers have emerged as a highly reliable and biologically compatible solution for managing anterior microdontia, severe intrinsic tooth discoloration, localized spacing, and minor malalignments.[2] This case report describes the clinical sequence and step-by-step rehabilitation of a patient presenting with a midline diastema using digital guided Emax laminate veneers.

Case Report

A 35 year old female patient presented to the department of prosthodontics at St. Gregorios Dental College in Kothamangalam, Kerala, complaining of gap in the upper front tooth region since 6 years. Extraoral examination revealed Symmetrical facial profile., Competent lips at rest, Visible maxillary midline diastema during smiling.

Intraoral examination revealed: Midline diastema between maxillary central incisors, Mild spacing in the maxillary anterior segment, Healthy periodontal tissues, Stable posterior occlusion, No evidence of active caries or periapical pathology, Mild proclination in the anterior segment.

Treatment Objectives

1. Close the maxillary midline diastema.
2. Correct the generalised anterior spacing
3. Improve smile esthetics.
4. Preserve maximum natural tooth structure.
5. Achieve harmonious tooth proportions.

Treatment Plan

After discussing available treatment options, including orthodontic treatment, using direct composite veneers, root canal treatment followed by crowns to correct proclination along with diastema, the patient opted for Emax Veneers since patient didn't want to do root canal treatment.

Figure 1:

Figure 2:

Procedure

At the first appointment, diagnostic impressions were obtained and study casts were fabricated. Based on the diagnostic casts, a diagnostic wax-up was performed to visualize the proposed treatment outcome and establish the desired esthetic contours.

During the second appointment, the diagnostic mock-up was evaluated intraorally and presented to the patient. Following assessment of the proposed esthetic outcome, informed consent was obtained as the patient expressed satisfaction with the planned treatment. A silicone putty index was fabricated from the diagnostic wax-up to serve as a guide for provisionalization and evaluation of the final restoration.

The first step was to select the appropriate shade. Cervical shade was selected to be 2M3 and the middle and incisal shade was 2M2. Subsequently, tooth preparation was carried out for the maxillary central and lateral incisors. A conservative Class V veneer preparation design was employed with a butt-joint incisal finish line. Incisal reduction was performed to provide adequate restorative material thickness and optimal esthetics. The preparation was extended palatally, terminating in a 90-degree palatal finish line to enhance restoration support and marginal integrity. Interproximal preparation was extended through the contact areas to facilitate complete closure of the diastema, improve emergence profile, and achieve seamless integration of the restorations within the dental arch.

Figure 3:

Figure 4:

Following tooth preparation, the stump shade was selected as 2M2 and gingival retraction cords were carefully placed to achieve adequate soft tissue displacement and facilitate accurate recording of the preparation margins. A definitive digital impression was then obtained using the Shining 3D intraoral scanner, ensuring precise capture of the prepared teeth and surrounding structures for fabrication of the definitive restorations.

After completion of the digital scan, provisional restorations were fabricated using a silicone putty index derived from the diagnostic wax-up and a bis-acryl composite resin material. The provisional veneers were adjusted to ensure proper contour, aesthetics, and patient comfort. The patient was highly satisfied with the provisional restorations, which provided a preview of the anticipated final outcome while maintaining function and aesthetics during the interim period.

Figure 5:

Figure 6:

Figure 7:

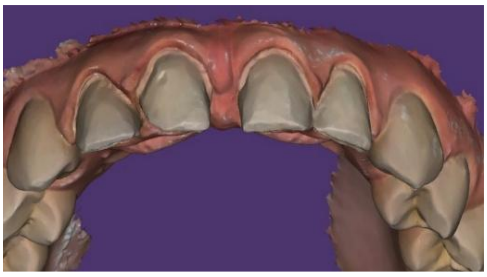

Figure 8:

Figure 9:

Figure 10:

At the final appointment, the definitive lithium disilicate (E-max) veneers were evaluated intraorally prior to cementation. The intimate adaptation of each veneer to the prepared tooth surface was carefully assessed, and the marginal fit was verified individually. A small amount of glycerin was applied to facilitate temporary positioning of the veneers during the try-in procedure. Following confirmation of the fit of each restoration, all veneers were placed sequentially to evaluate their collective adaptation, esthetics, proximal contacts, and overall harmony within the anterior dentition.

The intaglio surfaces of the veneers were etched with hydrofluoric acid for 90 seconds, thoroughly rinsed with water, and air-dried. A silane coupling agent was then applied to the etched ceramic surfaces and allowed to react for 60 seconds before gentle air drying. This surface treatment enhanced the chemical bond between the ceramic restoration and the resin cement, thereby improving bond strength and long-term clinical performance.

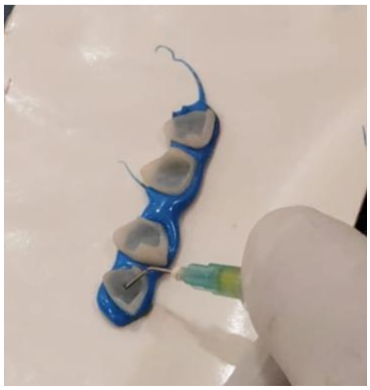

Figure 11:

Figure 12:

Figure 13:

The prepared teeth were isolated and cleaned before adhesive procedures were initiated. Enamel surfaces were etched with 37% phosphoric acid for 40 seconds, rinsed thoroughly with water for 15 seconds, and gently air-dried. Following the manufacturer's adhesive protocol, a translucent light-cure veneer resin cement was applied to the restorations. The maxillary central incisor veneers were seated simultaneously to ensure proper midline alignment, followed by placement of the lateral incisor veneers.

Figure 14:

Each veneer was initially light-cured for approximately 5 seconds to stabilize its position and facilitate removal of excess marginal cement. Residual interproximal cement was carefully removed using dental floss and dental explorers without disturbing the position of the restorations. Final polymerization was then completed by light-curing all surfaces of each veneer for a minimum of 60 seconds, ensuring complete resin polymerization and optimal bonding.

Figure 15:

Figure 16:

The restorations exhibited excellent marginal adaptation, esthetics, and functional integration, resulting in a highly satisfactory clinical outcome.

Figure 17:

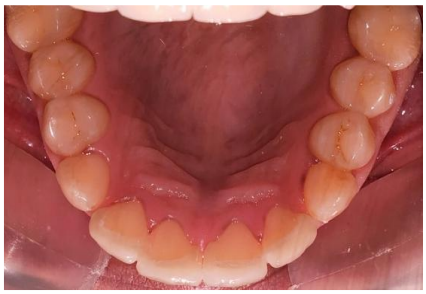

Figure 18:

Figure 19:

Discussion

Midline diastema and peg-shaped lateral incisors are common esthetic concerns that can adversely affect smile harmony and patient self-confidence. The treatment approach for such cases depends on the etiology of the spacing, the amount of enamel available, occlusal considerations, and the patient's esthetic expectations. Although orthodontic treatment remains a viable option for diastema closure, restorative approaches are often preferred when tooth size discrepancies or morphological anomalies such as peg lateral incisors are present.

Lithium disilicate (E-max) laminate veneers have gained widespread acceptance in esthetic dentistry because of their excellent optical properties, high flexural strength, biocompatibility, and ability to be bonded conservatively to enamel. The adhesive bonding protocol allows for minimal tooth preparation while achieving durable and highly esthetic restorations. In the present case, the combination of a maxillary midline diastema and peg-shaped lateral incisors made E-max veneers an ideal treatment choice, as both spacing and tooth morphology could be corrected simultaneously without extensive removal of tooth structure.

The diagnostic wax-up and mock-up phase played a crucial role in treatment planning by allowing visualization of the final outcome and ensuring patient acceptance before irreversible procedures were initiated. The use of digital impression techniques further enhanced the accuracy of the definitive restorations and improved clinical workflow. Careful adhesive cementation protocols, including hydrofluoric acid etching, silanization of the ceramic surface, and enamel bonding, contributed to optimal retention and marginal adaptation of the veneers. The final restorations successfully restored esthetic proportions, closed the diastema, and created a harmonious smile with high patient satisfaction.

Conclusion

Lithium disilicate (E-max) laminate veneers provide a predictable, conservative, and highly esthetic treatment option for the management of midline diastema. Through meticulous treatment planning, conservative tooth preparation, and adherence to established adhesive protocols, excellent functional and esthetic outcomes can be achieved while preserving maximum enamel. This case demonstrates that E-max veneers are an effective solution for smile enhancement, offering superior esthetics, long-term durability, and high patient satisfaction in the rehabilitation of anterior dental discrepancies.

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