

Comprehensive Bimaxillary Esthetic Rehabilitation of Dental Fluorosis Using Lithium Disilicate Laminate Veneers: A Case Report

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Abstract

Dental fluorosis may produce persistent enamel discoloration and can significantly affect smile esthetics. Ceramic laminate veneers provide a restorative option when correction of both tooth color and morphology is required. This case report describes the comprehensive esthetic rehabilitation of a 28-year-old healthy female patient with dental fluorosis and a history of discoloration since childhood. Twenty lithium disilicate laminate veneers were planned from 15–25 and 35–45. Conventional tooth preparation with chamfer finish lines and incisal overlap was performed, followed by digital intraoral scanning. Definitive veneers were fabricated using lithium disilicate ceramic in shade A2 and adhesively cemented using light-cured resin cement under isolation. The patient was evaluated after one and three months. The treatment resulted in satisfactory improvement in tooth color, morphology, symmetry and overall smile harmony at the documented follow-up.

Keywords: Adhesive cementation, Dental fluorosis, Ceramic veneers, Esthetic rehabilitation, Laminate veneers, Lithium disilicate.

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Introduction

Dental fluorosis is a developmental alteration of enamel associated with excessive fluoride exposure during tooth formation. Its clinical appearance ranges from mild white opacities to more extensive discoloration and structural changes.^[1] Management depends on the severity and depth of the lesions and may include bleaching, microabrasion, resin infiltration, direct restorations or indirect ceramic restorations.^[1,2]

Minimally invasive approaches such as bleaching and resin infiltration can improve the appearance of selected fluorotic lesions.^[2,3] However, when discoloration is extensive and the patient also requires modification of tooth morphology and

proportions, ceramic laminate veneers may provide a more comprehensive restorative solution.

Ceramic veneers have demonstrated favorable clinical longevity, with systematic reviews reporting high medium- and long-term survival.^[4] Lithium disilicate is particularly suitable for adhesive esthetic restorations because of its optical properties, mechanical performance and ability to be conditioned for resin bonding.^[5,6] A 10-year clinical evaluation of 364 lithium disilicate laminate veneers reported a survival rate of 97.4%.^[6]

The present case describes comprehensive bimaxillary rehabilitation using 20 lithium disilicate laminate veneers in a patient with generalized dental fluorosis.

Case Report

A 28-year-old female patient reported to the Department of Prosthodontics with a chief complaint of discolored teeth and dissatisfaction with her smile. The patient was systemically healthy and reported that discoloration.

Clinical examination revealed generalized enamel discoloration consistent with dental fluorosis (Fig. 1). The esthetic concern was particularly evident in the visible dentition. Variations in tooth morphology and alignment contributed to an overall lack of smile harmony.

After clinical and esthetic evaluation (Fig. 2), treatment alternatives were discussed. Conservative options such as bleaching and microabrasion were considered; however, comprehensive ceramic rehabilitation was selected because the patient desired simultaneous improvement in tooth color and overall tooth form.

A total of 20 veneers were planned, extending from 15–25 in the maxillary arch and 35–45 in the mandibular arch. A diagnostic wax-up was used for evaluation of the proposed tooth morphology and restorative contours. An intraoral scan was subsequently obtained for digital fabrication of the definitive restorations.

Conventional veneer preparations were performed. A chamfer finish line was established and the preparations incorporated incisal overlap (Fig 3). The exact numerical amount of tooth reduction was not recorded and therefore is not reported. Care was taken to provide adequate restorative space while preserving sound tooth structure.

Definitive restorations were fabricated using lithium disilicate ceramic (IPS e.max) in shade A2. The veneers were evaluated intraorally for marginal adaptation, proximal contacts, morphology, shade, symmetry and occlusal relationships before cementation.

The internal ceramic surfaces were conditioned according to the recommended protocol for lithium disilicate. Hydrofluoric acid etching followed by silanization is an established method for improving resin bonding to lithium disilicate (Fig.4).^[7,8] The prepared teeth were isolated using cotton rolls and conditioned according to the adhesive system protocol.

The veneers were adhesively cemented using resin cement (Calibra Veneer Esthetic Light shade). The restorations were individually seated, excess cement was removed, and the veneers were light cured. The margins were finished and polished, followed by evaluation and adjustment of the occlusion (Fig 5).

The patient was recalled at 1 month and 3 months. At the documented 3-month follow-up, the restorations demonstrated satisfactory esthetic integration, marginal integrity and function, with no major clinical complication reported (Fig 6).

Discussion

Dental fluorosis presents a challenging esthetic problem because the discoloration originates from developmental changes within enamel. Treatment should therefore be individualized according to the extent of discoloration, structural involvement and patient expectations.^[1,2]

Although minimally invasive procedures may provide satisfactory results in mild-to-moderate fluorosis, their ability to completely modify tooth morphology is limited.^[2,3] In the present case, the patient's concern involved generalized discoloration together with the overall appearance of the dentition. Comprehensive veneer rehabilitation was therefore selected to address both color and morphology.

The use of 20 veneers from first premolar to first premolar in both arches allowed the visible dentition to be treated as a continuous esthetic unit. This approach also avoided a

marked transition between treated anterior teeth and untreated premolars during smiling. Lithium disilicate was selected because it provides favorable optical characteristics and adequate strength for adhesive esthetic restorations.^[5] Long-term clinical evidence has demonstrated favorable performance, with Aslan et al. reporting 97.4% survival after 10 years for lithium disilicate laminate veneers.^[6] A recent systematic review and meta-analysis reported a pooled 10-year survival rate of 96.81% for lithium disilicate veneers.^[9]

Preparation design is another important consideration. The present case used conventional preparation with a chamfer finish line and incisal overlap. Evidence regarding incisal coverage is not completely uniform, and preparation design should be selected according to tooth morphology, occlusion, available restorative space and functional requirements.^[10] Preservation of enamel is desirable because enamel provides a more predictable substrate for adhesive bonding than extensively exposed dentin.^[4] For lithium disilicate, hydrofluoric acid conditioning followed by silanization provides micromechanical and chemical mechanisms for resin-ceramic adhesion.^[7,8] The definitive restorations were cemented with a light-cured veneer resin cement, providing an adhesive interface appropriate for thin esthetic ceramic restorations.

The main limitation of this report is the short follow-up period of 3 months. Therefore, the present case demonstrates a satisfactory short-term clinical outcome rather than long-term survival.

Conclusion

Comprehensive bimaxillary rehabilitation with lithium disilicate laminate veneers provided a satisfactory esthetic solution for a young patient with generalized dental fluorosis. Treatment planning, conservative preparation, appropriate ceramic selection, digital impression, controlled adhesive

procedures and careful occlusal evaluation contributed to the favorable short-term outcome. Continued follow-up is necessary to assess the long-term clinical performance of the restorations.

Patient Consent

Written informed consent should be obtained from the patient for treatment and publication of anonymized clinical photographs.

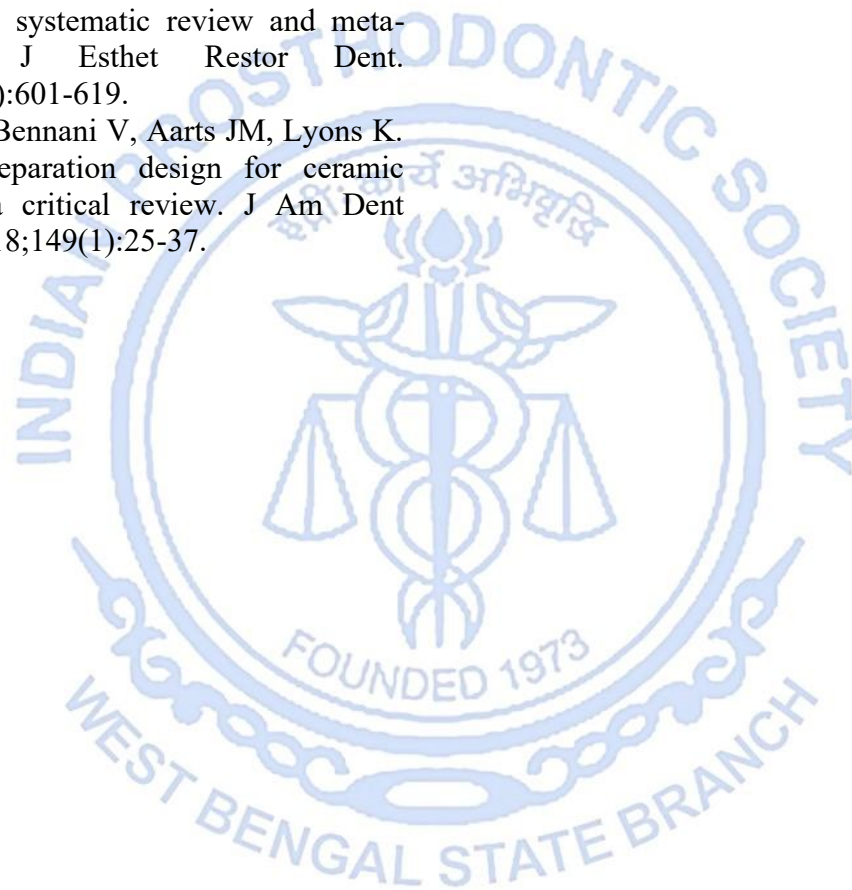
Conflict of Interest

The authors declare no conflict of interest.

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FIGURES



Figure 1



Figure 2



Figure 3

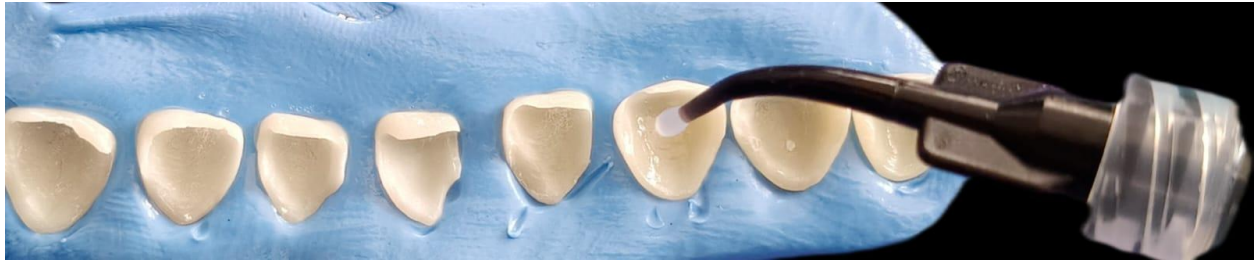


Figure 4



Figure 5



Figure 6