



Minimally Invasive Esthetic Rehabilitation of Fluorosis Affected Anterior Teeth with Diastema Using Direct Composite Veneers and Esthetic Procedures

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Abstract

Background:

Dental fluorosis is a developmental enamel defect caused by excessive fluoride intake, resulting in intrinsic discoloration and increased porosity. These changes often impair esthetics and may be associated with anterior spacing, creating both functional and psychological concerns. Direct composite veneers provide a conservative and economical approach for managing such cases, allowing simultaneous correction of color, contour, and diastema.

Case Presentation:

A 21-year-old female presented with discolored maxillary anterior teeth exhibiting features of fluorosis along with spacing in the anterior region. A multidisciplinary treatment plan was implemented, including gingivoplasty and gingival depigmentation, followed by direct composite veneering. A stratified layering technique using a giomer-based composite was employed to restore esthetics and close the diastema.

Results:

Post-treatment evaluation revealed significant enhancement in smile esthetics, with improved gingival architecture, closure of interdental spaces, and satisfactory shade integration. The procedure was completed with minimal tooth reduction and provided immediate results.

Conclusion:

The combination of periodontal esthetic procedures and direct composite veneers offers an effective and minimally invasive solution for fluorosis cases with diastema. This approach preserves tooth structure and provides predictable esthetic outcomes, although long-term follow-up is necessary to assess durability.

Keywords: Composite veneers; Dental fluorosis; Diastema closure; Esthetic dentistry; Giomer; Gingivoplasty

Introduction

Dental fluorosis is a hypomineralization defect of enamel caused by excessive fluoride exposure during tooth development, resulting in subsurface porosity and intrinsic discoloration [1]. Clinically, it may range from mild white opacities to severe brown staining and enamel irregularities [1,2]. These changes are

particularly significant when anterior teeth are involved, as they adversely affect facial esthetics and self-esteem.

Management strategies vary depending on severity and include microabrasion, bleaching, resin

infiltration, and restorative approaches [2,3]. While ceramic veneers provide excellent esthetic outcomes, they require greater tooth reduction as compared to direct composite veneers and are relatively expensive [5]. In contrast, direct composite veneers offer a conservative, cost-effective, and reversible alternative with immediate results [4].

Advances in adhesive dentistry have improved bonding to fluorosed enamel despite its altered structure [3,4]. Stratified layering techniques further enhance esthetic outcomes by mimicking natural tooth structure and effectively masking discoloration [13,14].

When fluorosis is associated with anterior diastema, treatment becomes more complex, requiring simultaneous correction of spacing and discoloration. Direct composite veneering allows both objectives to be achieved in a single procedure [4,5]. Additionally, periodontal esthetic procedures such as gingivoplasty and depigmentation play a vital role in improving gingival symmetry and overall smile harmony [8].

Case Report:

A 21-year-old female patient reported to Department of Conservative Dentistry and Endodontics at Goenka Research Institute of Dental Sciences, Gandhinagar with the chief complain of discoloration and spacing in the maxillary anterior region. Clinical examination revealed diffuse white opacities and brownish discoloration consistent with moderate dental fluorosis. Mild surface irregularities and anterior diastema were noted. Gingival examination showed hyperpigmentation and slight asymmetry. All teeth were vital, and oral hygiene was satisfactory. [Figure 1]

A minimally invasive treatment plan was developed. Periodontal procedures, including gingivoplasty and gingival depigmentation, were performed to improve soft tissue esthetics. [Figure 2] After healing, Shade selection was performed prior to isolation [Figure 3]. Minimal enamel preparation was carried out using a fine-grit diamond bur to enhance bonding while preserving tooth structure [4,7].

Restoration using direct composite veneers using a giomer-based nanohybrid composite resin (Beautiful II, Shofu Inc.) was done, which was selected for its

esthetic properties and fluoride release [15]. A stratified layering technique was used, beginning with an opaque/dentin layer to mask discoloration, followed by enamel layers to achieve natural translucency [13,14]. Diastema closure was achieved by careful proximal contouring.

Finishing and polishing were completed using Super-Snap Mini polishing discs (Shofu Inc.) to achieve a smooth and glossy surface. The final restorations demonstrated improved esthetics, proper contour, and closure of spacing. [Figure 4]

Discussion:

Fluorosed enamel presents both structural and optical challenges due to hypomineralization, leading to altered light reflection and compromised esthetics [1,4]. It may also affect bonding due to changes in enamel composition. Treatment selection should therefore be based on severity, with restorative approaches indicated in moderate cases [2].

Direct composite veneers represent a conservative and effective solution for esthetic rehabilitation. They preserve enamel, allowing optimal bonding, and enable simultaneous correction of discoloration and spacing [5,6]. The use of stratified layering techniques is particularly advantageous, as it allows clinicians to replicate natural tooth structure while effectively masking intrinsic stains [13,14].

Clinical studies have demonstrated favorable outcomes with composite veneers, including satisfactory esthetics and acceptable longevity [6,9]. Demarco et al. reported good survival rates of anterior composite restorations, although maintenance may be required over time [10]. A recent randomized clinical trial also showed comparable short-term performance between composite and ceramic veneers, with composites requiring more frequent upkeep [12].

Bonding to fluorosed enamel can be challenging due to its altered structure. However, studies have shown that surface preparation, including enamel roughening and acid etching, improves micromechanical retention and bond strength [4,7]. In the present case, minimal preparation contributed to successful adhesion.

Periodontal esthetic procedures significantly enhanced the final outcome. Gingivoplasty and depigmentation improved gingival contour and color, which are

essential for achieving an esthetically pleasing smile [8].

The use of giomer-based composite resin provided additional benefits such as fluoride release and good polishability, contributing to improved clinical performance [15]. Proper finishing and polishing are essential to reduce surface roughness and enhance longevity.

Despite these advantages, composite veneers are prone to discoloration and wear over time [11]. Therefore, regular follow-up and maintenance are necessary to ensure long-term success.

Conclusion:

A multidisciplinary approach combining periodontal esthetic procedures with direct composite veneers provides an effective and conservative treatment for fluorosis-affected anterior teeth with diastema. This technique preserves tooth structure, delivers immediate esthetic improvement, and ensures high patient satisfaction. Stratified layering further enhances the natural appearance of restorations. Long-term clinical evaluation is required to confirm durability

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Figure 1: Pre-operative clinical image



Figure 2: Periodontal esthetic procedures



Figure 3: Shade selection for Stratified Layering Technique

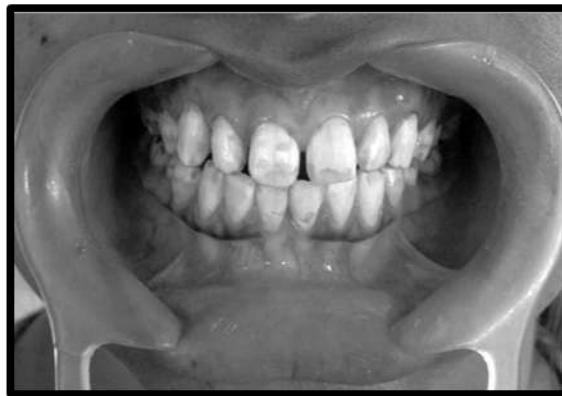


Figure 4: Comparison of Pre-operative and Post-operative clinical image

