

# Aesthetic Transformation of Fluorosed Teeth Using Minimally Invasive Direct Composite Veneers: A Case Report

## Abstract:

Minimally invasive esthetic dentistry has increased the use of direct composite veneers as a conservative alternative to ceramic restorations for managing anterior discolorations. Dental fluorosis, resulting from excessive fluoride intake during enamel formation, commonly produces frosty white and yellowish-brown stains and surface irregularities that compromise smile esthetics and patient confidence. This case report presents the esthetic management of moderate dental fluorosis using direct composite veneers completed in a single visit. Treatment involved shade selection with the composite button technique, minimal enamel preparation restricted to stained areas, bonding with a self-etch adhesive, and restoration with a nanohybrid composite resin using a polychromatic incremental layering approach to simulate natural dentin–enamel optics. Finishing and polishing with sequential disc systems yielded smooth, glossy surfaces with excellent shade integration and anatomy. The outcome demonstrates that, with appropriate case selection and careful execution, direct composite veneers offer a predictable, conservative, and cost-effective solution for anterior teeth affected by moderate fluorosis.

**Key-words:** Anterior restoration, composite layering, composite resins, dental bonding, dental materials, dental restoration, dental techniques, esthetic dentistry, operative dentistry, and treatment outcome.

## Introduction:

The demand for aesthetic dental treatments has progressively increased over recent years, driving the development of restorative materials that satisfy both functional and aesthetic expectations of patients [1]. Key aesthetic determinants—such as tooth shape and form, symmetry and proportion, alignment, surface texture, colour, and translucency—along with optimal function and phonetics, contribute significantly to achieving an ideal smile (Heymann and Ritter, 2019). However, these parameters may be compromised due to caries, trauma, or congenital and acquired anomalies, negatively influencing facial appearance and self-confidence [2]. Dental crowns are commonly used to restore such defects, but their application often necessitates extensive tooth reduction and may cause damage to adjacent soft tissues, including the gingiva [3].

Advancements in adhesive and restorative dentistry have positioned direct resin veneers as a conservative and effective treatment modality for aesthetic rehabilitation. These restorations are called minimally invasive, functional and

long-lasting 'direct aesthetic restorations' that perfectly emulate natural dental tissues even in anterior area. These restorations involve the direct application of composite resin, with or without tooth preparation, using adhesive systems. When executed properly, direct composite veneers yield excellent aesthetic results, with favorable optical and mechanical properties [4].

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The introduction of microhybrid and nanohybrid composites has further enhanced the surface finish and polishability of these restorations, allowing them to closely replicate porcelain veneers. A 5-year clinical follow-up by Peumans et al. reported an 89% success rate for direct composite veneers. [5] Continuous innovations in resin technology have significantly improved their performance, including reduced shrinkage, enhanced color stability, increased wear resistance, and superior biocompatibility. Compared with indirect restorations, direct composite veneers are minimally invasive and allow maximum preservation of tooth structure. Their ease of repair also makes them a cost-effective alternative to replacement. Consequently, direct composite veneers represent a reliable, conservative, and aesthetically favourable option, particularly for young patients requiring anterior restorations [6]. This case report describes a step-by-step one-day smile makeover of moderate fluorosis with direct composite veneers on maxillary and mandibular anterior teeth.

### Case Report

A 26-year-old male presented with the chief complaint of discoloration of the upper and lower anterior teeth. Clinical examination revealed yellowish-brown stains on teeth 11, 21, and 22 involving the middle and incisal thirds. Teeth 12 and 13 showed a frosty white appearance across the entire surface, along with yellowish-brown stains in the incisal third, while tooth 23 exhibited only a uniform frosty white appearance. The mandibular anterior teeth (31, 41, 32, 42, 33, 43) displayed a generalized frosty white enamel surface with yellowish-brown discoloration noted in the cervical third (FIG NO-1A,1B,1C).

Occlusal evaluation demonstrated a Class I incisor relationship with a favorable overjet and overbite of 2 mm and canine-guided occlusion. Extraoral examination revealed a convex lateral profile and competent lips, with both maxillary and mandibular anterior teeth visible within the patient's smile line. The patient reported long-standing consumption of well water from a high-fluoride region, correlating with the clinical findings. Past dental and medical histories were non-contributory. Based on the clinical presentation and history, a diagnosis of moderate dental fluorosis was established.

Considering the patient's esthetic concerns, along with the desire for a conservative and cost-effective treatment option, direct composite veneers were selected as the treatment modality. The procedure was thoroughly explained to the patient, and informed consent was obtained.

Shade selection was performed using the composite button technique, resulting in the selection of shade B2. Tooth preparation was completed using a 0.5 mm depth-cutter bur (MANI DIA BUR, Japan) to create a window preparation, followed by tooth reduction with round tapered diamond

bur (MANI DIA BUR, Japan) (FIG NO - 2) with a reduction of approximately 0.5–0.75 mm in the midfacial region and 0.2–0.5 mm near the gingival margin (FIG NO-3A,3B). After preparation, the reduction in the frosty appearance and stains eliminated the need for an opaquer.

Etching was accomplished with total etch technique (Ivoclar-Vivadent Eco) (FIG NO-4). Bonding was accomplished using a tetric-Nbond universal (Ivoclar-Vivadent) which was light-cured for 20 seconds using the Woodpecker i-LED Plus light-curing unit (Guilin Woodpecker Medical Instrument Co. Ltd., China). Composite veneering was performed using a nanohybrid resin (Shofu Beautifil II Basic Kit, dentin shade A2 and enamel shade B2) applied with an incremental layering technique, with each increment light-cured for 10 seconds.

Finishing was achieved using a sequential Super-Snap Mini Kit disc system (black, purple, green, and pink discs), followed by final polishing with 3M ESPE Sof-Lex spiral wheels, resulting in a highly esthetic, glossy surface. (FIG NO-5A,5B,5C).

The patient expressed satisfaction with the final esthetic outcome and was advised to avoid hard or sticky foods to reduce fracture risk, along with maintaining optimal oral hygiene.



Fig No – 1a : Pre Operative Front View



Fig No – 1b : Pre Operative Right Lateral View



Fig No – 1c : Pre Operative Left Lateral View



Fig No – 5a : Post Operative Front View

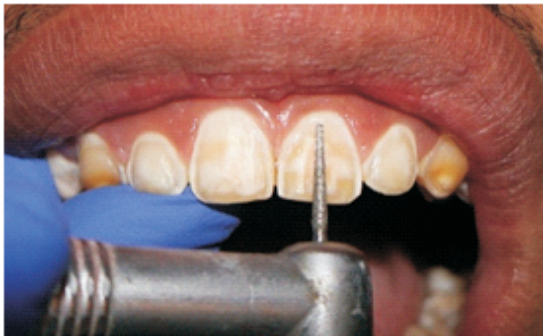


Fig No – 2 :tooth Preparation



Fig No – 5b : Post Operative Right Lateral View



Fig No – 3a :maxillary Anteriors After Tooth Preparation



Fig No – 5c : Post Operative Left Lateral View



Fig No – 4 : Etching



Fig No – 3b : Mandibular Anteriors After Tooth Preparation

**Discussion:**

Surface water generally contains low fluoride levels, typically below the recommended limit of 1.5 mg/L, whereas groundwater may show significantly higher concentrations depending on geological formations, soil porosity, acidity, climate, and other environmental factors[7]. Fluoride plays a major role in caries prevention, with studies showing a 20–40% reduction in dental caries when optimal levels are maintained. It is naturally introduced into the environment through water and air, and additional fluoride compounds may be released through industrial activities involving apatite-based minerals. Owing to its strong affinity for calcium, fluoride predominantly accumulates in calcified tissues such as bones and teeth[8].

For children, the recommended daily fluoride intake ranges from 0.05–0.07 mg/kg/day. While this level helps prevent and remineralize dental caries, excessive consumption increases the risk of developing dental fluorosis[9]. In India, the Bureau of Indian Standards (BIS) establishes a desirable limit of 1.0 mg/L (or 1 ppm) for fluoride in drinking water, which is recognized as the upper safe limit. However, fluorosis has been documented in Indian populations at fluoride concentrations as low as 1.5 mg/L. The critical period for dental fluorosis development spans from birth to approximately 8 years of age, with maximum susceptibility occurring between 15 and 30 months of age for early-erupting permanent teeth such as maxillary central incisors, while late-erupting permanent teeth remain vulnerable from age 2 to 8 years[10,11].

In patients with fluorosis-induced esthetic concerns, laminate veneers—both direct and indirect—have emerged as reliable treatment options for anterior teeth rehabilitation[3]. In addition bleaching and micro-abrasion represent viable treatment alternatives, both techniques have notable limitations when applied to hypo-mineralized fluorotic teeth. Bleaching is particularly problematic in these cases because hydrogen peroxide rapidly penetrates the compromised enamel structure, leading to excessive demineralization, diminished enamel microhardness, and increased susceptibility to dental caries. Conversely, while micro-abrasion effectively removes surface stains, it irreversibly removes valuable enamel tissue and frequently results in post-treatment complications including darkening or yellowish discoloration of the tooth surface along with heightened tooth sensitivity. These inherent disadvantages underscore why conservative restorative approaches, such as direct composite veneers, are often preferred for managing hypo-mineralized fluorotic teeth, as they preserve remaining tooth structure while delivering superior esthetic outcomes without compromising the tooth's structural integrity or increasing sensitivity[12,13].

Choosing between these approaches requires consideration of cost, time, and social factors. Ceramic veneers offer advantages such as high colour stability and excellent abrasion resistance; however, they present several drawbacks, including higher costs, multiple visits, and the need for adhesive cementation. Other limitations include the challenge of achieving shade harmony, masking underlying discoloration when minimal preparation is performed—particularly in the cervical region—and complications arising from technical inaccuracies or cementation errors. Composite resins have evolved significantly, enhancing their physical and esthetic properties and making them strong alternatives to traditional veneers.

Modern dentistry also emphasizes conservative treatment, making composite veneers—requiring minimal tooth reduction—a highly suitable choice for many patients. Their advantages include single-visit completion, reduced cost compared with ceramic veneers, and elimination of laboratory procedures, contributing to their growing popularity[3].

Despite these benefits, direct composite veneers still demonstrate lower resistance to abrasion and fractures compared with indirect composite or ceramic veneers. The learning curve for direct composite veneers is considerably steep, requiring mastery of multiple competencies simultaneously, key requirements are like

- Precise shade matching and color replication
- Proper moisture control and isolation techniques
- Mastery of layering and incremental placement
- Advanced finishing and polishing skills
- Management of polymerization shrinkage stress
- Anatomical contour and morphology understanding
- Using best quality material-nano hybrid composite

Despite significant technological advancements in contemporary composite systems, most clinicians continue to rely on monochromatic materials when restoring anterior teeth [13].

The Polychromatic Layering Technique for composite restorations is a multi-layer approach that mimics natural tooth structure by using different shades and opacities of composite resin to replicate enamel, dentin, and internal characteristics, creating highly aesthetic, lifelike results with superior depth and translucency[14]. However, inappropriate layering techniques often lead to restorations that appear either excessively translucent or overly opaque. Achieving esthetic success depends largely on maintaining the correct thickness relationship between opaque dentin composites and translucent enamel layers[13].

In natural teeth, dentin forms the opaque core while enamel provides translucency; therefore, composite restorations must replicate this optical layering to achieve lifelike esthetics[12]. During dentin layer build-up, the composite should terminate short of the incisal edge and be sculpted into dentinal lobes, leaving adequate space for materials specifically designed to reproduce the optical characteristics of the incisal third. The final increment generally consists of an enamel or incisal composite with a smaller average filler particle size, exhibiting high translucency and, in many cases, opalescent properties [13].

When aesthetic demands are particularly high, the Vaninipolychromatic stratification technique proposed is widely recommended. This approach is based on the fundamental principle of using multiple composite shades to reproduce the layered structure observed in natural teeth, recognizing that each clinical situation presents unique aesthetic challenges. To enhance surface polymerization, a layer of translucent material such as glycerine may be applied over the final increment to prevent oxygen inhibition during curing [13].

From a material standpoint, the dentin or opaque layer is characterized by low translucency, enabling effective masking of background discoloration. A medium-opacity dentin shade is selected to match the underlying tooth value and is typically applied in the deepest cervical region with a thickness of approximately 0.5–1.0 mm. In contrast, the enamel layer exhibits high translucency, allowing light transmission and replicating natural enamel. Enamel shades are selected to match adjacent teeth and are generally applied at a thickness of 0.3–0.5 mm [15].

In cases involving discoloured teeth, masking efficiency becomes the primary concern rather than final colour selection. An opaque dentin shade with higher value is chosen and applied in sufficient thickness (minimum 0.5–1.0 mm) to block underlying discoloration before placement of the enamel layer. The choice of layering technique significantly influences the final aesthetic outcome, mechanical strength, and overall success of the restoration [15].

Despite its esthetic advantages, polychromatic layering presents certain drawbacks, including increased chairside time, higher material costs, the need to maintain a wider inventory, and greater technical skill, training, and clinical experience [16].

The stratification silicone guide technique, as demonstrated in the research by Romero et al., exemplifies a structured approach to composite layering [17]. In this technique, enamel composite is first applied to the palatal aspect of a sectioned silicone guide, followed by the formation of proximal walls to create a composite frame. Dentin stratification is then performed within this framework, which is subsequently covered with a vestibular enamel layer to complete the restoration. Successful direct veneering also requires comprehensive documentation of the dental arches, including detailed evaluation of occlusion and identification of any parafunctional or detrimental habits that may compromise restoration longevity [18]. In the management of diastemas, careful assessment of available space and the use of diagnostic mock-ups are essential to visualize the integration of the proposed restorations within the existing dental arch and achieve harmonious aesthetic outcomes [19].

## Conclusion:

For the treatment of moderate dental fluorosis, direct composite veneers provide a conservative and aesthetically beautiful option. Clinicians may now precisely mimic natural tooth structure using polychromatic layering technique, thanks to the advancements in adhesive systems and nanohybrid composite resins, which have greatly enhanced their optical and mechanical performance. This instance shows that obtaining good results requires cautious diagnosis, careful shade selection, controlled dental preparation, and exact incremental placement. Direct composite veneers, when performed with the right clinical expertise, offer a single-visit, affordable substitute for ceramic restorations while maintaining the most tooth structure and improving patient satisfaction.

## References:

1. Martini EC, SibelliOlivieriParreiras S, Sezs AL, Mendes Pupo Y, Gomes G, Mongruel M, et al. Aesthetic treatment with prefabricated composite veneers: a case report. *Dent Oral Craniofac Res.* 2016;2(3):282–6.
2. Rathee M, Divakar S, Jain P, Chahal S, Singh S. Anterior esthetic rehabilitation with full and partial veneers using conventional and digital techniques: A case series. *J Conserv Dent Endod*2023;26:601-7.
3. Yanıkoğlu F, Günday M. Direct composite laminate veneers: three case reports. *J Dent Res Dent Clin Dent Prospects.* 2013;7(2):105–11.
4. Korkut B. Smile makeover with direct composite veneers: a two-year follow-up report. *J Dent Res Dent Clin Dent Prospects.* 2018;12(2):146–51.
5. Sowmya K, Dwijendra KS, Pranitha V, Roy KK. Esthetic Rehabilitation with Direct Composite Veneering: A Report of 2 Cases. *Case Reports in Dentistry.* 2017;1–3.
6. Harshita, V Asit, S Neha, KV Vijay, B Nikhil. Esthetic rehabilitation with direct composite veneering-two case reports. *International Journal of Applied Dental Sciences.* 2022;8(4):178-80.
7. Değirmenci A, Balousha JK, Pehlivan İE. Aesthetic rehabilitation for anterior teeth of dental fluorosis with direct composite veneers. *Niger J Clin Pract*2023;26:1211-4.
8. Kohn WG, Maas WR, Malvitz DM, Presson SM, Shaddix KK. Recommendations for using fluoride to prevent and control dental caries in the United States. *MMWR Recomm Rep.* 2001;50(RR-14):1–42.
9. Abanto Alvarez J, Rezende KM, Marocho SM, Alves FB, Celiberti P, Ciamponi AL. Dental fluorosis: exposure, prevention and management. *Med Oral Patol Oral Cir Bucal.* 2009 1;14(2):E103-7.
10. Bhagavatula P, Levy SM, Broffitt B, Weber-Gasparoni K, Warren JJ. Timing of fluoride intake and dental fluorosis on late-erupting permanent teeth. *Community Dent Oral Epidemiol.* 2016;44(1):32–45.

11. Den Besten PK. Mechanism and timing of fluoride effects on developing enamel. *J Public Health Dent.* 1999;59(4):247–51.
12. Sundfeld RH, Sundfeld-Neto D, Machado LS, Franco LM, Fagundes TC, Briso ALF. Microabrasion in tooth enamel discoloration defects: three cases with long-term follow-ups. *J Appl Oral Sci.* 2014;22(4):347–54.
13. Cavalli V, Rosa DAD, Silva DPD, Kury M, Liporoni PCS, Soares LES, Martins AA. Effects of experimental bleaching agents on the mineral content of sound and demineralized enamels. *J Appl Oral Sci.* 2018:26.
14. Ricci WA, Fahl N Jr. Nature-mimicking layering with composite resins through a bio-inspired analysis: 25 years of the polychromatic technique. *J EsthetRestor Dent.* 2023;35(1):7–18.
15. Soares PM, Chiapinotto GF, Abreu DDS, Pereira GKR. Masking discolored substrates with resin composites: effect of layering strategies. *Braz Dent J.* 2024;35:e245910.
16. Mackenzie L, Parmar D, Shortall A, Burke FJT. Direct anterior composites: a practical guide. *Dent Update.* 2013;40(4):297–317.
17. Negucioiu M, Rusnac ME, Dosa R, Kui A, Flueraşu M, Buduru S. Composite layering techniques in direct anterior restorations: a scoping review on longevity and clinical outcomes. *Rom J Oral Rehabil.* 2025;17(2):52–64.
18. Saisho H, Pontons-Melo JC, Vargas M. Direct anterior resin composite restorations: an update on esthetic techniques. *Int Dent Afr Ed.* 2024;14(2):12–18
19. Villarroel M, Fahl N, De Sousa AM, De Oliveira OB Jr. Direct esthetic restorations based on translucency and opacity of composite resins. *J EsthetRestor Dent.* 2011;23(2):73–87.