

Transforming intrinsic discoloration - A conservative approach using porcelain veneers: A case report.

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Abstract

Esthetic rehabilitation of anterior teeth with intrinsic discoloration presents a significant clinical challenge, particularly in young patients with high esthetic demands. Veneers offer a minimally invasive yet highly effective solution to restore both function and esthetics. This case report describes the management of a 24-year-old female patient presenting with generalized yellowish discoloration of anterior teeth since childhood. Clinical examination revealed intrinsic staining suggestive of developmental enamel defects. A conservative treatment plan involving porcelain veneers was executed. The outcome demonstrated excellent esthetic integration, improved patient confidence, and long-term predictability. Veneers remain a cornerstone in modern prosthodontic esthetic rehabilitation.

Keywords: Anterior esthetics, Esthetic dentistry, Enamel defects, Intrinsic discoloration, Porcelain veneers.

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Introduction

Facial esthetics plays a pivotal role in social interaction and psychological well-being. Among dental concerns, discoloration of anterior teeth is one of the most common complaints, particularly in young adults.

Tooth discoloration may be classified as extrinsic or intrinsic, depending on its etiology and depth of involvement.^[1]

Extrinsic discoloration results from the deposition of stains on the tooth surface due to factors such as tobacco use, dietary chromogens (tea, coffee, red wine), poor oral hygiene, and certain mouth rinses, and is often amenable to prophylaxis and bleaching procedures.^[1]

Intrinsic discoloration often arises due to disturbances during tooth development, including fluorosis, tetracycline staining,

enamel hypoplasia, or dentinogenesis-related abnormalities. Such discolorations are usually resistant to conventional bleaching techniques and require restorative intervention.^[1,2]

Porcelain laminate veneers have revolutionized esthetic dentistry by offering a conservative alternative to full-coverage crowns. They provide superior optical properties, color stability, and minimal tooth reduction.^[1,3,4] Their ability to mask underlying discoloration while preserving enamel makes them the treatment of choice in cases of intrinsic staining.^[1,5]

This case report highlights the successful rehabilitation of intrinsic discoloration using porcelain veneers, emphasizing clinical decision-making and procedural protocol.

Case Presentation

A 24-year-old female patient reported to the Department of Prosthodontics at K D Dental College & Hospital, Mathura with the chief complaint of yellowish discoloration of teeth since childhood. The patient expressed significant concern regarding her smile esthetics and desired whiter teeth.

Clinical Examination

Extraoral examination revealed no facial asymmetry or abnormalities. Intraoral examination revealed:

- Generalized yellowish discoloration of maxillary anterior teeth
- Stains predominantly intrinsic in nature
- Enamel surface appeared smooth but discolored
- Mild malalignment with slight rotation of lateral incisors
- No active caries or periodontal pathology
- Healthy gingival architecture with adequate attached gingiva and satisfactory periodontal support.

The discoloration appeared consistent with **intrinsic staining**, likely due to developmental enamel disturbances. The long-standing history since childhood suggests possible causes such as:

- Mild dental fluorosis
- Enamel hypomineralization
- Systemic factors affecting amelogenesis

Such intrinsic discoloration occurs due to incorporation of chromogenic substances within enamel or dentin during tooth formation, making it resistant to surface-level treatments like bleaching.

The patient was informed about various treatment options including bleaching, direct composite veneers, and porcelain laminate veneers. Considering the severity and intrinsic nature of discoloration, porcelain veneers were selected as the definitive treatment.^[2,6]

Clinical Procedure

1. Treatment Planning

- Diagnostic impressions were made
- Study models and smile analysis performed
- Shade selection conducted under natural light following protocol
- Mock-up/wax-up prepared for patient visualization

2. Tooth Preparation

Minimal labial reduction (0.3–0.7 mm) confined to enamel.^[4,7] Chamfer finish line placed supragingivally. Incisal edge reduction performed wherever required. Care taken to preserve maximum enamel for optimal bonding.^[7,8]

3. Impression Procedure

Gingival retraction achieved using retraction cord. Final impression made using addition silicone putty impression material (Express™ XT Putty, 3M ESPE, Seefeld, Germany). Opposing arch and bite registration recorded.

4. Provisionalization

Chairside provisional veneers were fabricated using Protemp™ 4 provisional restorative material (3M ESPE, Seefeld, Germany) to evaluate esthetics and function prior to definitive restoration.

5. Laboratory Fabrication

Veneers fabricated using lithium disilicate ceramic blocks. Characterization performed to match natural translucency.^[9]

6. Try-in and Cementation

Trial placement was done to evaluate fit, shade, and esthetics. The intaglio surface of the ceramic veneers was etched with 9% Hydrofluoric acid etchant (Ultradent Products Inc., South Jordan, UT, USA) for 20 seconds, followed by thorough rinsing and air drying.

The intaglio surface of the veneer was then treated with a Silane coupling agent (Ultradent Products Inc., USA) and allowed to react for 60 seconds to enhance micromechanical and chemical bonding.

Tooth surface was etched with 37% phosphoric acid (Eco-Etch, Ivoclar Vivadent) for 15-20 seconds, followed by thorough rinsing and gentle air drying.

Bonding agent (Ultradent Products Inc., USA) was applied to the prepared tooth surface and gently air-thinned according to manufacturer's instructions.

The veneers were luted using a self-adhesive resin cement (CalibraR Universal, Dentsply Sirona). Each veneer was seated with gentle pressure, and excess cement was removed prior to polymerization.

Final polymerization was carried out using a light-curing unit, followed by removal of residual cement and finishing and polishing of margins.

Results

Significant improvement in tooth colour and overall smile esthetics. Harmonious integration with adjacent dentition. Patient reported high satisfaction and improved self-confidence. Gingival tissues remained healthy post-procedure. No postoperative sensitivity observed.

Discussion

Intrinsic discoloration poses a restorative challenge due to its depth and resistance to conservative treatments like bleaching.^[1,2] In such cases, porcelain veneers provide a predictable and durable solution.^[1,5]

Compared to direct composite veneers, ceramic veneers offer superior:

- a. Colour stability
- b. Wear resistance
- c. Surface smoothness
- d. Optical properties (translucency and fluorescence)^[4,9,10]

Preservation of enamel is critical, as bonding to enamel provides stronger adhesion and longevity.^[7,8] Advances in adhesive dentistry and ceramic materials have significantly improved the success rates of veneers.^[3,11,12]

Proper case selection, meticulous preparation, and adherence to bonding protocols are essential for long-term success.^[5,11-13]

Conclusion

Porcelain veneers offer an excellent conservative solution for managing intrinsic discoloration in young patients.^[1,4,5] This case demonstrates that with appropriate diagnosis, treatment planning, and execution, highly esthetic and durable outcomes can be achieved.^[5,12-15]

Clinical Significance

- a. Provides a minimally invasive solution for intrinsic discoloration
- b. Enhances patient confidence and quality of life
- c. Preserves tooth structure while delivering superior esthetics
- d. Demonstrates predictable long-term outcomes

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FIGURES



Figure 1



Figure 2



Figure 3



Figure 4