

Enhancing Smiles: Aesthetic Rehabilitation of Fluoresced Teeth with Ceramic laminate Veneers

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Abstract

Tooth discoloration is a common problem and affects people of all ages. Apart from the conventional treatment modalities for the same, newer options are available today with better techniques and materials.

This case report describes the successful rehabilitation of dental fluorosis in a 25-year-old girl patient using laminate veneers. The patient presented with stained teeth and enamel irregularities, seeking for an aesthetic rehabilitation. This report discusses the treatment planning, clinical procedures, and outcomes achieved, emphasizing the role of laminate veneers in restoring the patient's smile and self-confidence.

Keywords: Dental fluorosis; Laminate veneers; Esthetic rehabilitation; Minimally invasive dentistry; Case report

Introduction

A radiant smile is often regarded as a hallmark of confidence and beauty. However, certain dental conditions, such as fluorescence in teeth, can sometimes detract from an individual's self-assurance [1].

Fluorescence in teeth occurs due to various factors, including excessive intake of fluoride during tooth development, dental trauma, genetic predisposition, or certain medications.

Fluoresced teeth, characterized by a lack of natural translucency and a chalky appearance under certain lighting, this condition manifests as a milky or opaque appearance in teeth, diminishing their natural vibrancy and translucency [2].

Laminate veneers offer a minimally invasive and esthetically pleasing solution for such cases by covering enamel irregularities and discoloration, providing natural-looking results [3].

A 25-year-old female presented in to the Department of Fixed Prosthodontics at Dental University of Monastir, Tunisia. She complained of an unpleasant smile due to stained teeth.

Case Presentation

Medical history and dental examinations indicated no systemic conditions or dental concerns apart from the esthetic aspect related to dental fluorosis. Intraoral examination revealed generalized discolouration and irregularities affecting the enamel surfaces of teeth. All teeth were affected with pitting and chalky white areas. The pits on the enamel were generalized and yellowish brown in colour. Radiographic evaluation showed no signs of structural abnormalities or caries.

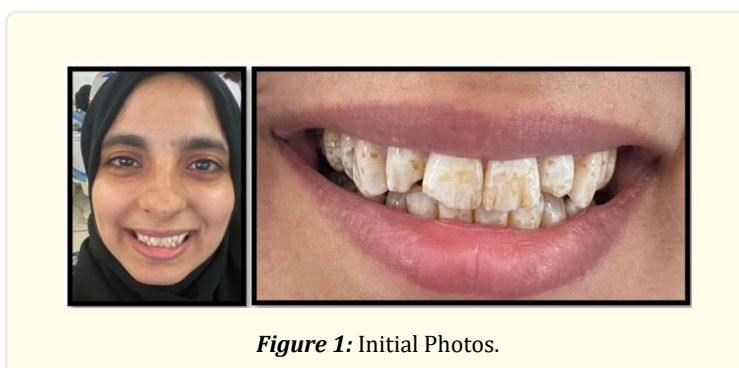


Figure 1: Initial Photos.

After comprehensive evaluation and discussion the treatment options with the patient and the severity of fluorosis, a conservative approach using laminate veneers on the maxillary incisors, canines and the two premolars was proposed to improve the esthetics while preserving maximum tooth structure. The patient expressed financial constraints that made it unfeasible to proceed with veneers for the lower teeth at this time.

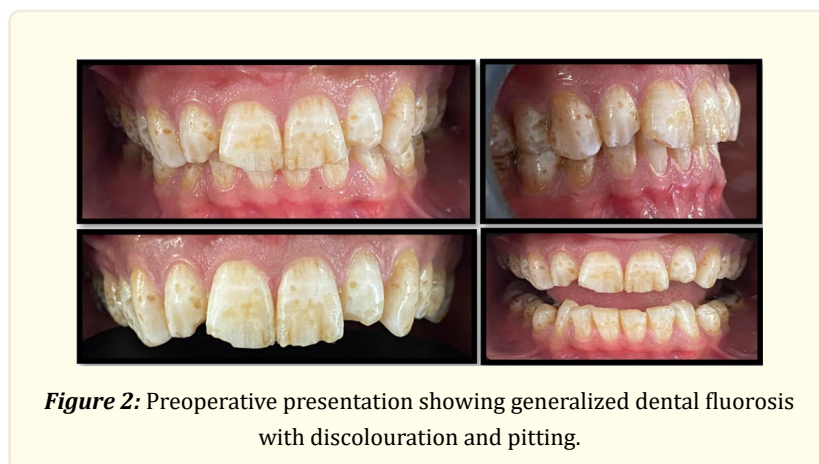


Figure 2: Preoperative presentation showing generalized dental fluorosis with discolouration and pitting.

On assessment of the patient's smile, teeth as far as the second maxillary bicuspids could be seen, which did not necessitate involvement of the first molars.

The preparatory stage of the treatment started with smile analysis, preliminary shade selection, photographs and study models. Preliminary impressions were taken. A diagnostic wax-up aided in visualizing the final esthetic outcome after planning the ideal size, shape, and position of the veneers.

Before starting the tooth preparation, direct composite mockup was done to build up the fractured teeth. The size and shape of the teeth were approved by the patient.



Figure 3: Composite mock-up.

Minimally invasive tooth preparation was performed through mockup with approximately 0.3-0.5 mm depth cutting diamond point and the depth grooves were marked with non-water-soluble ink.



Figure 4: Preparation on the mockup.

The labial and incisal tooth reduction was completed. Proximal preparation was not carried out and the contacts were not involved.

The palatal margins of the veneer preparations on the incisors and canines were planned to be kept as a butt joint; however, on the premolars the palatal margins of the veneers preparation was placed slightly onto the palatal surfaces of the teeth.



Figure 5: Completed tooth preparation of maxillary anterior teeth for ceramic veneers.

After adequate gingival retraction with a retraction cord, a two-step dual impression was made and sent to the laboratory for fabrication of IPS e.max veneers.

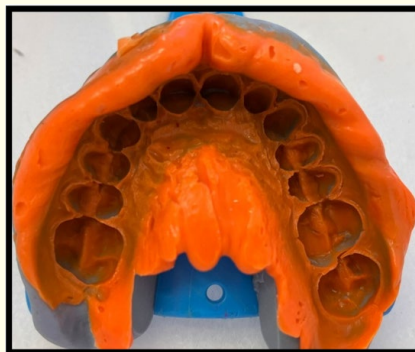


Figure 6: Full impression.

Provisional veneers were fabricated and temporarily cemented to assess their fit, esthetics, and occlusion.

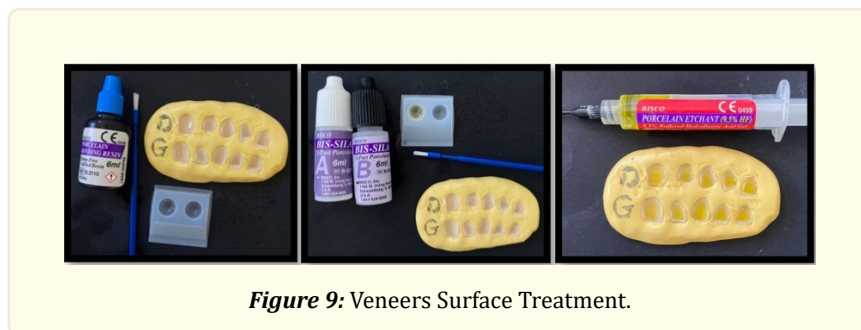


Figure 7: Provisional veneers.

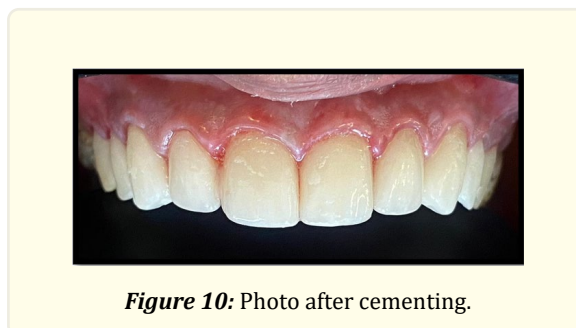
After final veneer fabrication, the fit of the ceramic veneers was verified onto the cast and on the prepared teeth individually. A water-soluble try-in paste was used to determine the shade of the luting cement.



The veneers were rinsed thoroughly, etched with hydrofluoric acid (as per the manufacturer's instructions), rinsed with water and silanized.



The tooth was phosphoric acid-etched and adhesive was applied. Cementation of the veneers was carried out. It was made certain that the veneers were exactly seated. The luting cement was initially light cured for 1-2 seconds and excess was gently removed, followed by thorough curing of the luting agent.



The next appointment, the patient's occlusion was evaluated and adjusted. The patient was instructed about the precautions to be taken after veneer placement.

The final result exhibited a significant improvement in the patient's smile and overall esthetics. The laminate veneers effectively masked the discoloration and irregularities caused by dental fluorosis, providing a natural appearance and harmonious integration with the adjacent dentition. The patient reported increased self-confidence and satisfaction with the outcome.



Discussion

Dental fluorosis, a condition affecting individuals residing in areas with high fluoride content in drinking water, this disorder arises due to excessive fluoride exposure during tooth enamel formation, commonly observed in pediatric patients. The heightened fluoride concentration notably impacts ameloblast cells responsible for enamel creation during tooth development [4]. The interaction between these cells and the enamel's mineral matrix leads to observable changes. Elevated fluoride intake during enamel formation diminishes the free calcium ion concentration in the mineralizing matrix, hindering enzyme proteases from promptly breaking down matrix proteins in the maturation phase. Consequently, the degradation of matrix proteins is delayed. Moreover, the presence of fluoride-induced retention of enamel matrix proteins, including amelogenins, ameloblastins, tuftelins, enamelin, and high molecular weight sulfated proteins, contributes to impaired crystal growth [5].

Treatment options for dental fluorosis include micro/ macro etching, bleaching, composite restorations, veneers, and full crowns [6]. Other conservative techniques for treating dental fluorosis include composite veneers and resin infiltration. Given that dental fluorosis stands as a prevalent public health concern, the accessibility of these treatment alternatives holds promise for improved outcomes among patients [7].

Dental fluorosis can significantly impact a patient's quality of life due to esthetic concerns. In this case, the use of laminate veneers offered an effective and minimally invasive solution, addressing both the esthetic and psychological aspects associated with dental flu-

orosis. The conservative nature of veneer placement preserved tooth structure while achieving desirable esthetic results. Long-term follow-up is essential to monitor the stability and longevity of the veneers [1, 6].

Ceramic laminate veneers stand as a remarkable solution for the aesthetic restoration of fluoresced teeth. These ultra-thin porcelain shells are custom-designed to fit over the front surface of teeth, meticulously crafted to match the natural appearance of surrounding teeth in color, shape, and translucency. The veneers are bonded to the teeth using advanced adhesive techniques, providing a durable and natural-looking result [8].

The process of aesthetic rehabilitation with ceramic laminate veneers typically begins with a comprehensive assessment by a qualified cosmetic dentist [9]. This evaluation involves examining the patient's dental condition, discussing their goals and expectations, and creating a personalized treatment plan. Advanced digital imaging technologies, such as 3D scans and smile design software, allow for precise planning and visualization of the final outcome [10].

The final phase involves the bonding of the ceramic laminate veneers to the teeth. The dentist ensures meticulous placement, making necessary adjustments to achieve optimal fit, function, and aesthetics. With expert craftsmanship and attention to detail, the veneers seamlessly blend with the natural dentition, restoring the patient's smile to its former brilliance [11].

The benefits of ceramic laminate veneers extend beyond aesthetic enhancement. Not only do they conceal fluorescence and imperfections in teeth, but they also provide strength and durability comparable to natural tooth enamel. Moreover, these veneers are highly resistant to stains, offering long-term aesthetic benefits with proper care and maintenance. [12].

Ceramic veneers can completely mask the discolored tooth with minimal reduction of sound tooth substance because they require a minimally invasive design preparation. In addition, advances in ceramic materials have facilitated this process. Ceramic veneers provide both pre-dictable and long-lasting aesthetic rehabilitation [10, 11].

The durability and clinical success of porcelain veneers have been widely investigated in the literature. It has been reported that ceramic veneers provide durable and successful restoration with an estimated survival probability of 93.5% over 10 years [12]. Satisfactory results were obtained in a case of fluorosed teeth restored with porcelain laminate veneers over a 6-year follow-up [13]. Furthermore, numerous studies have demonstrated acceptable aesthetic outcomes in cases of moderate to severe fluorosis where restoration with porcelain veneers was performed.

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However, it is essential to note that while ceramic laminate veneers offer a transformative solution for fluoresced teeth, this procedure requires a skilled cosmetic dentist and diligent oral hygiene practices from the patient. Routine dental check-ups and proper oral care habits are essential to ensure the longevity and beauty of the veneers [16].

Conclusion

The aesthetic rehabilitation of fluoresced teeth with ceramic laminate veneers represents a remarkable advancement in cosmetic dentistry. Beyond simply addressing the aesthetic concerns, this procedure restores confidence and enhances the overall quality of life for individuals seeking a radiant and natural-looking smile. Through meticulous craftsmanship and modern dental techniques, ceramic laminate veneers stand as a beacon of hope, offering a path to a brighter, more confident smile for those affected by fluorescence in their teeth.

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