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Case Report

Direct Composite Resin Veneers Rehabilitation of Moderate Dental Fluorosis

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Abstract

Dental fluorosis is a condition of enamel hypo mineralization caused by the effects of excessive fluoride on ameloblasts during enamel development. The unaesthetic appearance of the anterior teeth affected by dental fluorosis represents the chief complaint of patients and request for aesthetic treatment. The treatment options of dental fluorosis are varied depending upon individual cases. This article described a minimally invasive technique to treat a moderate case of enamel fluorosis and to makeover the patient smile using direct composite resin laminate veneers. This technique was fast and easy to perform, improving the unaesthetic discolorations of the anterior teeth and correcting the existing abnormalities.

Introduction

Dental fluorosis (DF) is a developmental disturbance of enamel caused by excessive exposure to high concentrations of fluoride during tooth development, leading to enamel with lower mineral content and increased porosity [1-3]. Clinically, the clinical aspects of fluorosed teeth depends upon the severity, which ranges from narrow white lines following the parenchyma to discrete white opaque areas or to an entirely chalky white tooth surface and even brown discolorations in severe cases. In some patients, the enamel may become so porous that the outer layers break down (pitting) and the exposed porous subsurface becomes discolored [4]. Fluorosis staining is commonly considered as a serious esthetic problem because of the psychological impact of unaesthetic maxillary and/or mandibular anterior teeth. A number of conservative or restorative techniques have been proposed for the aesthetic management of fluorosed teeth [5]. The selection of an appropriate treatment plan depends on the severity of fluorosis, the color, darkness, location and extent of the staining, as well as the number of teeth affected, the age, cooperation level and expectations of the patient and the treatment trends of the period [3,6,7,8]. Bleaching and microabrasion have been recommended for treating mild cases of fluorosis; however, in moderate to severe cases, this combined technique is either ineffective or may lead to only transient improvement. For that, invasive approaches, such as resin composite restorations, ceramic veneers, or even crowns, are recommended [9]. The aim of this paper was to describe the management of dental moderate fluorosis defects and anterior diastema by direct composite laminate veneer technique.

Case Presentation

A 24-year-old female was referred to the Department of Dental Medicine of Charles Nicolle Hospital of Tunis complaining the appearance of her smile. Patient medical history did not reveal any systemic diseases. Patient's origin was Siliana, which is a city in Tunisia with highly fluoridated drinking water (up to 6 ppm). Clinical examination revealed dental fluorosis, pit on the frontal side of teeth and diastema. The patient has been embarrassed with her smile for years. Satisfactory oral hygiene and healthy periodontal conditions were noticed. No dental caries or other associated dental anomalies were observed in both clinical and radiological examinations (Figure 1a). The diagnosis of moderate fluorosis was retained based on the Dean's dental fluorosis index. Orthodontic treatment and ceramic laminate veneers were proposed to the patient. However, because of prolonged treatment and her financial constraints, the patient did not give her agreement to these treatment options. So, the consent was the restoration of her smile by direct composite resin laminate veneers. First of all, teeth were cleaned with a silk brush and a prophylactic paste. Then, shade selection was performed using a VITA shade guide. Dentin DA1 and enamel (E-Bleach) shades were selected. The restoration was performed using a nano-spheroidal charge of zirconium silicate light cured composite resin (Vittra APS, FGM[®]) which was placed using a layering technique. Local anesthesia was performed and for better isolation, rubber dam was placed keeping the operating field dry and free of contaminants. Floss ligatures were placed to help invert the rubber dam into the gingival sulcus (Figure 1b).

Minimally invasive preparations were performed on maxillary central and lateral incisors. A lite chamfer finish gingival marginal line was given. The depth of preparation was limited to enamel tissue and preparation was cleaned with silicone points, water washed and dried (Figure 1c). After protecting adjacent teeth with Teflon, enamel was etched with phosphoric acid (Meta Etchant 37% Phosphoric Acid Meta Biomed[®]) for 30 s (Figure 1d). Care was taken to completely rinse the etchant gel for 30 seconds and then the tooth was air dried. Enamel margins were then coated with a bonding agent (Ambar universal bonding FGM[®]) and light cured for 20 seconds with an LED source. A very thin layer of composite resin dentin DA1 (Vittra APS, FGM[®]) was incrementally applied to the enamel surface and light cured for 20 s followed by a fine layer of composite resin enamel E-Bleach (Vittra APS, FGM[®]) and 40 s light curing. The layering of the restorations was carried out one by one for each tooth. The midline diastema was closed by building up the mesial surfaces of central incisors one by one. It is recommended to

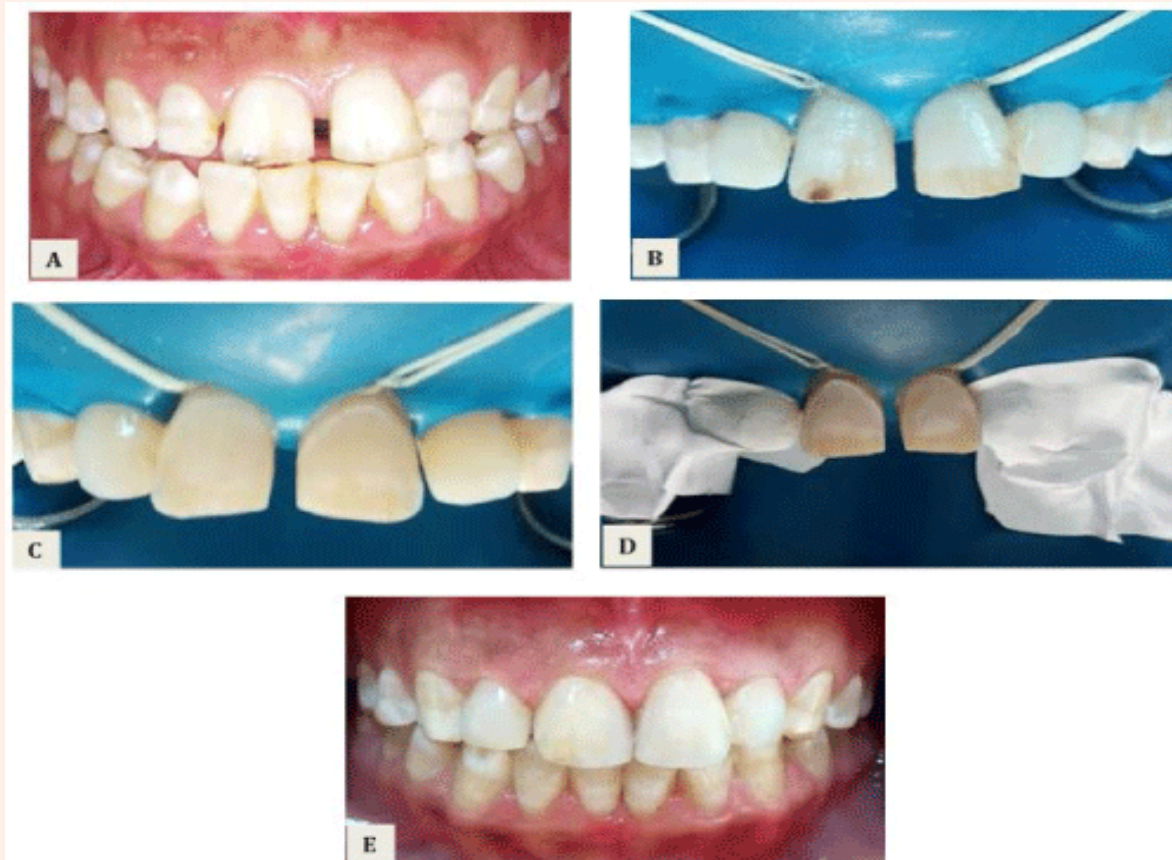


Figure 1: A: Initial View, B: Rubber dam isolation and floss ligatures, C: Teeth chamfer like line preparation, D: Aspect of teeth after etching, E: Final result.

slightly overbuild the first tooth, so that, after finishing and polishing, the tooth achieves the correct mesio-distal dimension. Care was taken to apply an anatomically correct interproximal emergence profile, and avoiding black triangles. Particular attention was given to the contouring of the apical finish line of the restorations and especially in the gingival embrasure area. Assuming the central incisors, the lateral incisors were launched. The diastema between central and lateral incisors was closed in the same manner. The incisal embrasures were kept small and general anatomic forms of teeth were kept flat which best suited his face and body type (see flat canines of the patient). Finally, the rubber dam was removed and occlusion relations were controlled. The surfaces were polished using fine-grained abrasive flexible discs (SofLex Discs, 3M ESPE) and silicone polishing points. Interdental polishing was carried out with interdental strips in different grains (SofLex Inteproximal Polishing Strips, 3M ESPE). The patient was very satisfied with her new smile (Figure 1e). Rigorous and effective oral hygiene was recommended for the patient.

Discussion

Dental fluorosis is a tooth malformation caused by the chronic ingestion of fluoride during tooth development, characterized by outer hypermineralization and subsurface hypomineralization of enamel tissue and even dentin. Dental fluorosis affects the color and/or the structure of enamel, which leads to an unpleasant esthetic appearance [2]. Treatment options for teeth discolored by dental fluorosis vary depending on the thickness of the layer of enamel involved and include microabrasion, macroabrasion, bleaching, composite resin restorations, veneers, or crowns. However, most patients seeking treatment for dental fluorosis are young, and prosthetic treatment options result in excessive removal of tooth structure that weakens its mechanical properties at an early age. Moreover, these treatments are more time-consuming and expensive [2,3,4,10].

The laminated veneers aim to correct abnormalities, aesthetic deficiencies and discolorations. These restorations can be made in two different techniques, either directly or indirectly. Indirect laminates have the excellent prognosis with veneers ceramics which

makes them an option of treatment for anterior teeth, as well as excellent properties, such as biocompatibility, aesthetics and wear resistance. Nevertheless, ceramic laminates require dental wear which can cause injury to the pulp and periodontal tissues. Therefore, some advantages of direct laminates, as low cost, no necessity for dental wear, ease of polishing and intraoral repair makes this technique an alternative for aesthetic minimally invasive restorative treatment [10]. Resin-based composite restorations are single-visit procedures and bypass laboratory work which reduces the cost of the treatment. In addition to this, they are gentle towards the opposing dentition and easy to repair in case of fracture [11]. For this young patient who sought a conservative treatment plan with rapid result and inexpensive technique, composite resin laminate veneer was an appropriate option for the esthetic improvement of her smile by removing enamel brown stains and pits of fluorosed teeth and closing the diastema.

Conclusion

The unaesthetic appearance of teeth affected by dental fluorosis is a common patient problem. Although different materials and techniques are available to achieve esthetically satisfactory results in clinical practice, dilemmas arise in the challenging situation of anterior reconstruction, with composite resin being commonly used in a minimally invasive approach. Preserving tooth sound tissue and responding to the patient wishes should be the highest priority for clinicians when formulating a dental treatment plan.

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