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Smile rejuvenation: Layering to perfection

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Abstract

Dental fluorosis is a major dental concern caused by excessive intake of fluoride during enamel formation, which can lead to abnormalities or defects on the tooth surfaces ranging from white opaque areas to severe pitting with brownish or blackish discoloration of the teeth. And this discoloration of teeth has to be treated with aesthetic rehabilitation using Ceramic Veneers. Present case report describes the case of fluorosis causing brown discoloration with enamel pitting on teeth surface and was treated with ceramic laminates to provide the desired aesthetics.

Keywords: Dental fluorosis, ceramic laminates, E-max veneers

1. Introduction

When oral cavity get exposed to high amount of fluoride during the age of 1-8 years leads to Dental fluorosis. This exposure can occur during other circumstances like use of fluoridated toothpastes, fluoride supplements mouthwashes, when the growing child unknowingly ingests some of these substances and through the consumption of highly fluoridated drinking water.

11.5 million population of India are at high risk of fluorosis due to lack of clean drinking water. The earliest clinical manifestation of Dental fluorosis can be seen in the form of increase enamel porosity on the tooth surface^[1].

There are various treatment options for fluorosis depending upon the fluorosis index firstly described by Dean *et al* in 1941^[2].

Different treatment protocol includes Bleaching, Micro abrasion, Composite restorations which are prone to discoloration, Ceramic Veneers and Conventional Prosthetic Procedures are other treatment modalities depending upon the severity of fluorosis^[3].

Therefore, the aim of the treatment is to manage dental fluorosis with minimally invasive procedure with conservative approach using E-MAX Veneers.

2. Case Report

A 28-year-old male patient came to the clinic, with the chief complaint of severe discoloration of teeth and desires to have natural looking teeth.

Complete case history of the patient was taken. It revealed that he was a native of Hyderabad district, Telangana and he used to drink tap water without purifying. This in addition led to the diagnosis of the dental fluorosis. The initial phase requires bleaching, an initial shade was taken for future reference and two sessions of bleaching were performed using Mc Innes solution to get a lighter shade of veneers. (Fig. 1 and Fig. 2)

Diagnostic mock wax up was made (Fig. 3) to establish the correct symmetry of tooth.



Fig. 1: Pre-operative view



Fig 2: Result of teeth bleaching



Fig 3: Wax mock up cast

Left Lateral incisor was mesially tilted and might have gone for intentional RCT because of higher level of pulp horn. But in the process of preparation, pulp remained unexposed. Hence, chose for veneer directly.

Shade selection was done before tooth preparation in order to prevent dehydration of tooth using vita shade guide and window preparation with incisor overlapping was planned. Putty index recorded prior to the preparation.

Facial reduction: Dept cutting bur of 0.5mm used [13]. The preparation depth should be in order of 0.3mm in cervical third, 0.5mm in middle third and 0.7mm in incisal third and incisal 1-1.5mm reduction if necessary.

Two planes facial reduction should be done [4] that is cervically bur tip should be placed toward the tooth and in incisal third bur tip should be away from tooth surface. Diamond chamfer bur was used for preparation of tooth. Equigingival shoulder finish line was made. Proximal reduction was just short of breaking the contact with all the internal line angles rounded [6, 14]. (Fig. 4)



Fig 4: Veneer preparation

Retraction cord (No.000) was placed using cord packer for 5 min (Fig. 5) and full arch impression was taken using putty impression material (EliteHD+ Zhermack) (Fig. 6) and were send to lab along with the instructions regarding shape, size and shade of individual tooth.



Fig 5: Prepared teeth with Retraction cord placed



Fig 6: Impression with polyvinyl siloxane material

After receiving fabricated Veneer restorations, they were placed first on model and then individually fitted on the prepared tooth and checked for marginal accuracy, shade, fit appearance and translucency. (Fig 7)



Fig 7: Veneers placed on model

Proper isolation using rubber dam, cotton rolls and high vaccueme evacuator were used to maintain a fluid free environment before final placement of Veneers.

The prepared teeth surfaces were treated with pumice and rinsed to remove surface contaminants and etched with 37% phosphoric acid (Meta etchant) for 15 sec followed by rinsing with spray and gentle drying. Bonding agent (3M ESPE single bond 2) was applied on the etched teeth surface using applicator tip and light cured for 20 sec.

The intaglio surface of Veneers was acid etched with 9% hydrofluoric acid (Ultradent porcelain etch) rinse thoroughly with water and air dried. A silane coupling agent was applied to etched surface of veneers (Monobond N- Ivoclar Vivadent) according to manufacturer's instructions. (Fig 8)



Fig 8: Finished and polished veneers

After drying a self-adhesive resin cement (3M ESPE Relyx Ultimate) is applied to the intaglio surface of laminates and gently pressed on the teeth and excess cement is removed and resin cement is tack cured on each surface for 1 sec and final finishing was done.

Patient was satisfied with desired aesthetic outcome of the treatment (Fig 9) and post treatment instruction was given and maintenance protocols were explained to patient.



Fig. 9: Pre- and post-operative view

3. Discussion

Dental fluorosis is caused by over consumption of fluoride results in development disturbance of enamel. Mild form of fluorosis results in white lines or diffuse opacities, while in the more severe forms generalized opaque and chalky appearance with pitting and staining of tissue can be seen.⁷

Recent studies have shown over exposure of fluoride in some regions of the world, such as India, Africa and China where ongoing endemics of systemic fluorosis result from over exposure to naturally occurring fluoride ingested through drinking water^[8].

The successful outcome of Veneers is greatly determined by the durability and strength of bond formed between three different components i.e bonded veneer complex, the luting material, tooth surface^[9].

The main principle of tooth preparation is to maintain the maximum amount of enamel whenever possible because the bond strength of ceramic bonded to enamel is higher when compared with the bond strength of Ceramic bonded to dentin^[10, 11].

However, Veneers are not appropriate treatment protocol in all circumstances of dental fluorosis. Minor fluorosis may not require the invasive removal of tooth structure^[12]. In the

present case, veneers were opted as a treatment option, as the patient was diagnosed as moderate fluorosis.

Pleasing results were achieved through laminates the patient was satisfied with the final outcome of treatment. Patient follow-up after two months revealed that all restorations were fixed in place, esthetics was excellent with sound margins and with no discoloration of tooth or staining. (Fig 10).



Fig 10: Two months follow-up

4. Conclusion

This case report shows how to employ a multiple step process to conservatively treat fluorosis to achieve successful aesthetic outcome. A combination of Bleaching and Ceramic laminates can provide the patient maximum function and aesthetics. With the wide range of treatment modalities that are available in modern era, each case should be chosen with caution and most appropriate treatment option should be selected depending upon severity of each case.

5. Conflict of Interest

Not available

6. Financial Support

Not available

7. References

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