

# Different Treatment Modalities For Fluorosis: A Case Series

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## Abstract

Fluorosis has been reported way back in 1901.(1) Dental fluorosis is a developmental disturbance of dental enamel, caused by successive exposures to high concentrations of fluoride during tooth development, leading to enamel with lower mineral content and increased porosity. The affected teeth show varying range of discoloration from opacity to dark brown colour with either smooth surface or pitting.(2)Three patients with complaint of discoloured upper front teeth reported from a 'fluorosis prone zone' with mild to moderate grade of fluorosis.Treatment modalities followed for these cases were -

- 1) In office vital tooth bleaching
- 2) Composite restoration
- 3) Combination of both

## Introduction

Fluorosis was first described by GV Black and Frederick S McKay in 1916. Dental fluorosis is a developmental disturbance of dental enamel, caused by successive exposures to high concentrations of fluoride during tooth development, leading to enamel with lower mineral content and increased porosity.The severity of dental fluorosis depends on:

1. Duration of exposure
2. The individual response;
3. Weight;
4. Degree of physical activity.
5. Nutritional factors and bone growth, suggesting that similar doses of fluoride may lead to different levels of dental fluorosis.(1)

## Clinical Appearance

**MILD DENTAL FLUOROSIS** Bilateral, diffuse (not sharply demarcated),opaque, and white striations that run horizontally across the enamel. (1)

**SEVERE FORM** Enamel may become discoloured and/or pitted. The safe level for daily fluoride intake is 0.05 to 0.07 mg F/Kg/day. Above this level, the risk of developing fluorosis due to chronic fluoride consumption will be evident.(1)

### Dean's fluorosis index:(1)

Questionable - Occasional white flecking and spotting of enamel;



Very mild -Less than 25% of the tooth surfaces displays irregular white areas.



Very mild -Less than 25% of the tooth surfaces displays irregular white areas.



Mild- More than 25% of the tooth surface but less than 50% is affected.



Moderate- Generalized areas of hypocalcification on all surfaces of the tooth, brown spots may be present.



Severe - Generalized pitting and brown discolorations of the enamel on all surfaces, tooth shape may be affected as well.(2)

- Very severely hypo mineralized enamel will be very fragile and hence as soon as they erupt into oral cavity they undergo surface damage as a result of mastication, attrition and abrasion. The definite evidence that fluoride can induce dental fluorosis by affecting the enamel maturation.(1)

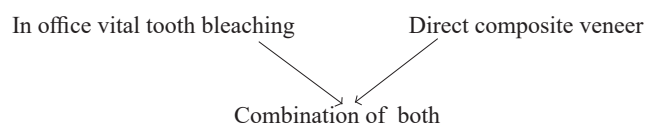
Depending upon the severity, treatment options include: (2)

- Micro/Macro abrasion
- Bleaching
- Composite restorations
- Veneers
- Full crowns(2)

Aesthetics changes in permanent dentition are the greatest concern in dental fluorosis.

- The purpose of this paper is to report various treatment options available for dental fluorosis.

Treatment modalities followed for different cases were -



## Case Series

### CASE 1

• A 19 years old male patient, reported with a chief complaint of white spots in upper front teeth. Clinical examination revealed white chalky spots localised to incisal third of upper front teeth. These white chalky spots were diagnosed to be due to Fluorosis, as patient was resident of place where fluoride levels of water are high. He had mild grade of fluorosis according to Dean's Fluorosis index. His oral hygiene was good.

#### Treatment procedure

In this patient, an direct composite partial veneer was advocated because of mild grade of fluorosis.

#### First Phase

oral prophylaxis

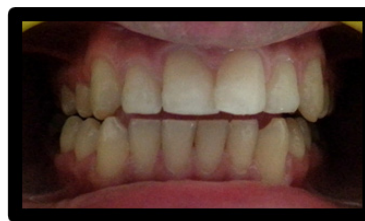
### SECOND PHASE

direct composite partial veneer.

#### DIRECT COMPOSITE PARTIAL VENEER



PREOPERATIVE



POSTOPERATIVE

### CASE 2

- A 23 years old male patient, reported with a chief complaint of discoloured upper front teeth.
- He gave a history of discoloration since his childhood. No other relevant medical history was elicited from him.
- He gave history of similar discolouration in siblings and neighbours.
- Clinical examination revealed generalized yellowish brown discolorations and white chalky spots.
- The patient was a resident of fluorosis prone area. He had moderate grade of fluorosis according to Dean's Fluorosis index. His oral hygiene was good.

#### Treatment procedure

- In office bleaching kit (Pola office) containing 35% of hydrogen peroxide is used. The patient was satisfied with the outcome after two sittings, which were done 2 weeks apart from each session.
- **FIRST PHASE** oral prophylaxis
- **SECOND PHASE** in- office vital bleaching



PREOPERATIVE



POSTOPERATIVE



**CASE 3**

- A 15 years old male patient, reported with a chief complaint of yellowish white spots on the teeth. He gave a history of discoloration since his childhood. No other relevant medical history was elicited from him. Clinical examination revealed brown bands on maxillary central incisors and yellowish white chalky areas on all the surfaces of teeth. The patient was a resident of fluorosis prone area. He had severe grade of fluorosis according to Dean's Fluorosis index. His oral hygiene was good.

**Treatment procedure summary**

- In office bleaching kit (Pola office) containing 35% of hydrogen peroxide is used followed by direct composite veneer as the patient has severe grade of fluorosis.
- **FIRST PHASE** oral prophylaxis
- **SECOND PHASE** in-office vital tooth bleaching

**After 2 weeks**

- Composite direct veneer.

**IN OFFICE BLEACHING****PREOPERATIVE****COMPOSITE DIRECT VEENER****POSTOPERATIVE****Discussion**

- It is well documented that fluoride can have both beneficial and detrimental effects on the dentition. The beneficial effects of fluoride on dental caries are primarily due to the topical effect of fluoride after the teeth have erupted in the oral cavity. In contrast, detrimental effects are due to systemic absorption during tooth development resulting in dental fluorosis.<sup>(3)</sup> Dean and McKay suggested that optimum level of water fluoride should be below 0.9 - 1.0 PPM<sup>(4)</sup>
- In all the cases described here, diagnosis of dental fluorosis was made from clinical examination, family history and place of residence. All the patients were from fluorosis prone zone. No other contributory findings were elicited for discoloration of tooth.
- In first patient, direct composite partial veneer was advocated because of mild grade of fluorosis affecting mainly incisal third of central and lateral incisor. In the second patient, an in-office bleaching approach was advocated because of moderate grade of fluorosis. In the third patient, an in-office bleaching approach was

advocated followed by direct composite veneer because of severe grade of fluorosis. The treatment for all three patients was decided as per patients grading of fluorosis and as per their economic status and individual needs.

**Advantage and disadvantage of in office bleaching****ADVANTAGE**

- Relatively non-invasive compared to other restorative procedures.
- Patient compliance
- Immediate results
- Less overall time (5)

**DISADVANTAGE**

- postoperative sensitivity<sup>(5)</sup>

**Advantage and disadvantage of direct veneer**

**Advantage** - minimal chair time when compared to indirect ceramic veneers

**Disadvantage** - Long term wear resistance colour stability<sup>(6)</sup>

- Composite direct veneer is done in 2 weeks interval after in office bleaching as immediate bonding of resin after bleaching will alter and compromise bond strength of composite to tooth structure. The oxygen released by bleaching processes inhibits polymerization of the adhesive system and is responsible for compromising the bond strength between restorative material and dental substrate.<sup>(8)</sup>

**Conclusion**

In each of the treatment options described above, each one has its own advantages and disadvantages; a good clinician should be aware of all the treatment options available, its merits and demerits and select the best treatment option according to individual patient needs.<sup>(1)</sup>

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