ISSN: 0975-833X

Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 11, Issue, 06, pp.4491-4494, June, 2019

DOI: https://doi.org/10.24941/ijcr.35487.06.2019

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

RESEARCH ARTICLE

ESTHETIC MANAGEMENT OF DENTAL FLUOROSIS: A REPORT OF TWO CASES

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ARTICLE INFO

Article History:
Received 25th March, 2019
Received in revised form
20th April, 2019
Accepted 19th May, 2019
Published online 30th June, 2019

Key Words:
Dental fluorosis, Treatment modalities, Whitening, Aesthetics, Vital bleaching, Composite veneers, All ceramic crowns.

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ABSTRACT

Attractive smiles not only influence other people's perceptions but also affect the psychosocial well-being of the individual. Aesthetic dentistry enables the dentist to change the appearance, size, color, shape, spacing and positioning of the teeth. This article comes from Punjab in India where its surrounding towns are fluorosis-prone zones. The treatment options for fluorosis are varied depending upon individual cases. The purpose of this article is to report various treatment modalities available for dental fluorosis.

***Citation: Dr. Navjot Singh Mann, Dr. Ashu Jhamb, Dr. Mohit Sachdeva, Dr. Manu Rana, Dr. Divya Batra and Dr. Garima Goel.*, 2019.** "Esthetic management of dental fluorosis: A report of two cases", *International Journal of Current Research*, 11, (06), 4491-4494.

INTRODUCTION

Esthetic dentistry is the field of dentistry concerned especially with the appearance of dentition as achieved through its arrangement, form and color (Dumfahrt, 1999). Our ultimate goal is to merge function, aesthetic and comfort to meet the individual needs of every patient. There are various common esthetic problems like discoloration, developmental anamolies (Amelogenesis imperfecta, Dentinogenesis imperfecta), fluorosis, malalignment, diastema, fractured teeth etc for which patient seeks esthetic treatment. As the outcome of treatment is highly subjective that requires active participation of co-operation from patient. So, clinician should adopt different protocol to meet challenges regarding color, form and characterization for avoiding disagreements and unsatisfactory outcomes. In today's interdisciplinary dental world treatment planning begins with the well esthetic objectives. The two main objectives are to create teeth with pleasing inherent proportions to one another as well as to create pleasing tooth arrangement in harmony with gingival (Penn). An attractive smile is marred by some discoloration or stain either on individual tooth or all of the teeth. Discoloration can be intrinsic or extrinsic (Goldstein). In Punjab-Haryana region, intrinsic discoloration due to endemic fluorosis is more common because of high fluoride content in drinking water.

Dean's Fluorosis Index:

1. Questionable - occasional white fleckings andspottings of enamel
2. Mild - white opaque areas involving more of the tooth surface
3. Moderate and severe - pitting and brownish staining of tooth surface
4. Corroded appearance of tooth.

Clinical case presentation

A conservative restorative management was proposed to improve smile depending upon the severity of dental fluorosis by bleaching, composite resins, veneers and full coverage crowns. Intrinsic discoloration due to severe fluorosis associated with dental caries needs extensive treatment. This case report shows the various treatment modalities of the patients depending upon the severity of the fluorosis.

Case 1

A female patient 48 yr old reported to the Department of Conservative Dentistry and Endodontics, National Dental College and Hospital, Derabassi with a chief complaint of yellowish-brown discoloration in upper front tooth region of mouth. Patient's background information revealed residence in high fluoride zone. On clinical examination, generalised yellowish-brown discoloration of teeth was found (Fig1). According to Dean's fluorosis index, it was moderate to severe dental fluorosis. Other findings were dental caries wrt 12, 21. No tenderness on vertical percussion was reported. On electric pulp testing, 11, 12, 21 shows negative response. It signifies

non-vitality of teeth. On radiographic examination, periapical radiolucency was present wrt 11, 21.

(a)

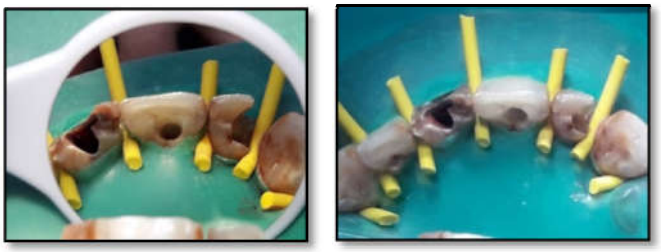
(b)

(c)

Fig. 1. Preoperative view (a) front view (b) Left and (c) Right Side

Fig. 2. Preoperative Radiograph

- First phase of treatment was oral prophylaxis
- Second phase of treatment was
  - root canal therapy wrt 11,12,21 (Fig 3a &3b) followed by post and core (Fibre post) wrt 12, 21 (Fig 4) and restoration with all ceramic full veneer crowns wrt 11,12,21 (Fig 6a).
  - direct composite veneering wrt 13,14, 22,23,24 (Fig6b)



(a) (b)

Fig. 3a &3b. Root Canal Therapy under rubber dam isolation

Fig. 4. Post and Core restoration done w.r.t. 12 and 21

(a) (b)

Fig. 5a,b.: (a)Retraction cord placed (b) Impression made with polyvinylsiloxane elastomeric impression material

(a) (b)

Fig. 6a,b. (a) All ceramic crowns luted w.r.t. 12,11,21 (b) Tooth Preparation for Direct composite veneering done

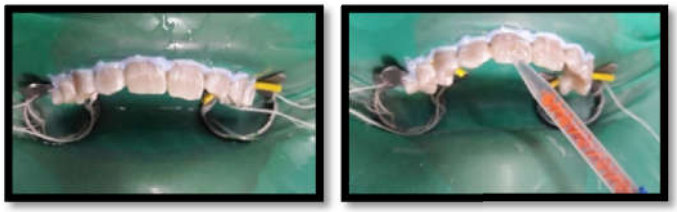
(a) (b)

Fig. 7a,b.(a)Postoperativeview(b) Postoperative smile

Case 2

Conservative Dentistry and Endodontics, National Dental College and Hospital, Derabassi with a chief complaint of generalised yellowish discoloration in upper and lower front tooth region of mouth. She gave a history of discoloration since her childhood (Fig 8). No contributory medical history was reported. On clinical examination, she had mild dental fluorosis according to Dean's fluorosis index. No other relevant findings reported. Firstly, oral prophylaxis was done followed by In-office vital bleaching using Pola-office plus (SDI) was done in both the arches. Bleaching procedure was done in two sittings (3 applications per sitting).

Fig 8. Preoperative view



(a) (b)

Fig. 9(a,b). (a) Gingival protection with Liquid Gingidam (b)Application of bleaching gel

Application details: Each bleaching sitting consists application of bleaching agent for 8 minutes with an interval of 1 minute under dam isolation followed by polishing of teeth with prophylactic paste after 3 such applications. The patient was satisfied with the outcome of two sittings.

(a) (b)

Fig. 10(a,b). Improvement of shade in upper arch wrt lower arch

(a) (b)

Fig. 11(a,b). Application of Bleaching gel in lower arch under rubber dam isolation and gingidam protection

Fig. 12. Postoperative view

DISCUSSION

In Case 1, the patient had moderate to severe type of fluorosis which necessitated that the patient was treated by veneer procedure or crowns. Since root canal therapy procedure was done w.r.t. 11, 12 and 21 followed by fibre post and composite core wrt 12 and 21, the all ceramic crowns were preferred for providing strength as well as improvement of aesthetics. Veneers have been successfully employed for management of moderate grade fluorosis (Akapata, 2001). In view of the patient's economic conditions and the time constraint, direct composite veneer treatment option in rest of the teeth was selected. Advantage of direct composite veneer is that it is done with minimal chair time when compared to indirect ceramic veneers, disadvantage being its long-term wear resistance and color stability (Roberson *et al.,* 2002). The patient was satisfied with her improved aesthetics and was advised for further estehtic treatment w.r.t. lower anterior teeth also. The clinical management of tooth discolouration aims to produce an acceptable cosmetic result as conservatively as possible (Rodd and Davidson, 1997). Conservative treatment options such as tooth whitening can produce dramatic improvements in brown and yellow discolouration, providing a satisfactory interim result before more invasive procedures are considered, if necessary (Rodd and Davidson, 1997). Thus, in Case 2 as patient had mild grade of fluorosis, in-office vital bleaching procedure was advocated. Advantage of this procedure is that it is relatively noninvasive compared to other restorative procedures and also it could be done with minimum chair side time. The main disadvantage of this procedure is the postoperative sensitivity (though reversible) it produces and that it cannot be employed in patients with more severe grade of fluorosis (Sherwood, 2010). Vital bleaching is more successful for fluorosis in younger patients presenting with opaque to orange colour stain rather than older patients with darker type of brown stains (Seale, and Thrash, 1985). No doubt the safety concerns like localized adverse effects and potential for toxicity and sensitivity are associated with the use of peroxide-based whitening products, (Lee *et al.,* 2005) in current case it was taken care of that the benefits of improved aesthetics outweighed the risks.

Conclusion

Fluorosis is a major health problem in India with over 65 million people at risk and 6 million children seriously affected. The prevalence of fluorosis is as an endemic problem for Punjab. This report illustrates two clinical cases in which in-office tooth whitening technique and combination of all ceramic crowns with direct composite veneers improved the appearance of patient's discoloured anterior teeth. The purpose of this article was to report various treatment options available for dental fluorosis from a conservative bleaching management

to extensive full crown restorations. So, it is in the interest of both patient and dentist that the dentist be aware of all the treatment modalities available to us. Newer treatment options which combine these various treatment modalities are emerging (Ardu *et al.,* 2007; Ng and Manton, 2007). Other treatment options available are laser assisted bleaching, abrasion employing abrasive pastes (Ardu *et al.,* 2007; Ng and Manton, 2007). This article does not conclude about superiority of any treatment option over another rather severity of lesion and patient's expectations determine the treatment option.

Dr. Charles Pincus is rightly recognized as the Father of esthetic dentistry made a prophetic statement in the year 1937 which is quoted as "A captivating smile showing an even row of gleaming white natural teeth is a major factor in achieving the dominant characteristic known as personality."The above statement was true in the year 1937, is a reality today and will be so in the years to come.

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