CLINICAL MANAGEMENT OF HYPOPLASTIC DEFECTS OF ENAMEL- A REPORT OF FIVE CASES

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Hypoplastic defects of enamel are a frequent finding in the primary as well as permanent teeth. There are many factors responsible for hypoplasia of enamel. Excess fluoride in drinking water can also cause hypoplasia called dental fluorosis, leading to enamel with lower mineral content and increased porosity. The importance of restoring esthetics as well as function in the growing years cannot be over emphasized. The treatment planning may be different for each child and is influenced by such factors as severity of the defect, age, sex, mental sensitivity of the child and interest of the parents. Various treatment options to treat fluorosed enamel defects like bleaching with enamel microabrasion , composite veneering, crowning with acrylic jacket crowns have been considered here in five clinical cases, depending on the severity of the defects and the demands of the patient.

Key words: Hypoplastic defects, Dental fluorosis, Bleaching, Enamel microabrasion, Composite veneering, Acrylic jacket crowns.

Introduction

Hypoplastic defects of enamel are a frequent finding in the primary as well as permanent teeth. Defective enamel formation may result either from factors of environmental origin or from genetic abnormality. Hypoplasia may also be produced by excessive fluoride in drinking water[1].

Dental fluorosis, a specific disturbance in tooth formation, is defined as a chronic, fluoride induced condition, in which enamel development is disrupted and enamel is hypomineralized[2]. The severity of dental fluorosis depends on when and for how long the overexposure to fluoride occurs. The risk period for esthetic changes is between 20 and 30 months of age. The recommended level for daily fluoride intake is 0.005- 0.007mg/kg, which is considered of help in preventing dental caries, helping in remineralization. A daily intake above this level leads to an increased risk of fluorosis[3].The fluoride content of fluorosed enamel is increased during tooth formation[4]. Microscopically, fluoride affects the forming enamel by making it more porous. The structural arrangement of the crystals appear normal, but the width of the intercrystalline spaces is increased, causing pores[5].

Clinically, enamel fluorosis may present as occasional white flecking or spotting of the enamel to white opaque areas in mild fluorosis. Moderate and severe changes show pitting and brownish staining of the surface. Those teeth which are moderately or severely affected may show a tendency to wear and even fracture of the enamel[1].

Limited reports exist in the dental literature that address patients in late childhood with the need for transitional care prior to complete eruption of the permanent dentition[6-9]. It is during this preadolescent period that patients with developmental defects can present with an array of problems including rapid dental deterioration, severe esthetic concerns, hypersensitivity to thermal, chemical and mechanical stimuli, alteration in vertical dimension of occlusion[10].

This report describes the clinical management of five cases of fluorosis of enamel. The cases were done in the Department Of Pedodontics, S.G.T. Dental College, Gurgaon, Haryana, India.

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Case presentations

Case 1

A 13 years old female presented with a chief complaint of stained upper front teeth. Intra oral examination showed generalized fluorosis of teeth (Dean's Grade 3). Oral hygiene was fair. No pitting or cavitation was seen. After a thorough prophylaxis , bleaching of teeth was done with Hydrogen peroxide after enamel microabrasion.

The patient went very satisfied and did not turn up for subsequent sittings.

Case 2

A 12 years old male presented with a chief complaint of discolored and disfigured teeth. Intra oral examination showed generalized Dean's Grade 3 fluorosis with pitting in incisal one -third of anterior teeth . Oral hygiene was good and no cavities were present After prophylaxis, upper and lower anterior teeth were etched with 30% phosphoric acid and restored with direct composite veneers.

Case 3

A 13 years old female presented with a chief complaint of disfigured teeth. Intra oral examination showed generalized Dean's Grade 4 fluorosis with generalized mottling of teeth . Oral hygiene was fair . Her lower lateral incisors were missing. After prophylaxis, upper and lower anterior teeth were etched with 30% phosphoric acid and restored with direct Composite veneers.

Case 4

A 16 years old female presented with a chief complaint of poor esthetics due to stained and disfigured upper front teeth. Intra oral examination showed generalized.

Dean's Grade 3 fluorosis with generalized mottling of teeth . Oral hygiene was fair. The patient had a wedding in the family and she wanted immediate improvement in her appearance. She insisted that only her upper teeth should be suitably altered. After prophylaxis, upper anterior teeth were etched with 30% phosphoric acid and restored with direct Composite veneers.

Case 5

A 17 years old male presented with a chief complaint of discolored, sensitive and disfigured anterior teeth. Intra oral examination showed generalized Dean's Grade 4 fluorosis with pitting in cervical third of front teeth. Oral hygiene was poor. A treatment plan was established. Complete oral prophylaxis was done. RCT was done in cariously broken upper left lateral incisor.composite restorations were given in other three incisors. An interim treatment for this case was acrylic jacket crowns for the upper front incisors.

DISCUSSION

Aesthetic problems in childhood and adolescence can have a significant effect on psychosocial development and interaction with peers.[11] The importance of restoring esthetics as well as function in the period of development cannot be over emphasized.[12] The treatment planning may be different for each child and is influenced by such factors as severity of the defect, age, sex, mental sensitivity of the child and interest of the parents.[13]

The treatment objectives were to improve the esthetics, eliminate the tooth sensitivity, prevent further loss of tooth structure, provide an efficient masticatory apparatus, modify the child's attitude and behavior towards dental treatment and improve periodontal health.

A preventive regime is also an important part in the management of the patient.[13] Plaque retention and calculus formation resulting from the rough enamel surfaces necessitate high level of oral health care.[14] Frequent topical fluoride application and dietary control are strongly recommended to prevent caries. Topical fluoride can also be used to control dentinal sensitivity to sweet, hot and cold till definitive restorations can be placed.



Fig. 1. Preoperative



Fig. 2. Postoperative



Fig. 3. Preoperative



Fig. 4. Postoperative



Fig. 5. Preoperative



Fig. 6. Postoperative



Fig. 7. Preoperative



Fig. 8. Postoperative

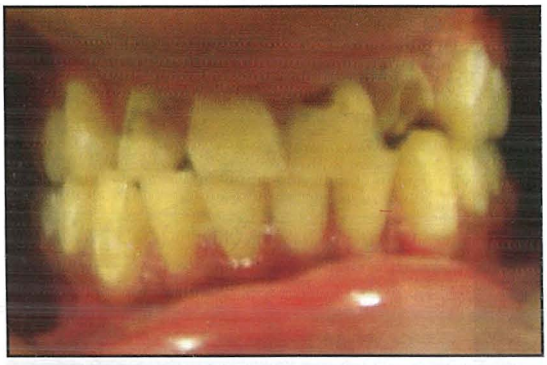


Fig. 9. Preoperative



Fig. 10. Postoperative

For mild fluorosis, enamel micro abrasion may be considered but it may cause aggressive reduction of enamel as a function of duration, number and intensity of application.[14] Combining with external bleaching may improve the esthetic result and conserve tooth substance.[15] Hydrogen peroxide has a long history of use and would appear to be safe to use to change the appearance of discoloured teeth. It is conservative of tooth tissue and may delay the need for more invasive veneers and crowns.[16]

In pitting hypoplasia, the use of acid etch and composite restorations as an intermediate treatment is currently being employed when only an improvement in aesthetics is required.[17] As the thickness of enamel is reduced, conservative tooth preparation or even no preparation for direct composite veneer is recommended.[17] Mild to moderate fluorosis does not adversely affect the adhesion of resin composite to fluorosed enamel. Doubling the time for etching may improve esthetics.[18] For mildly hypoplastic molars, pit and fissure sealants may be applied, followed by preventive resin restoration if needed.

Teeth with severely hypomineralized enamel are typically treated with stainless steel or indirect resin crowns to protect the developmentally defective teeth and to improve esthetics.[19] For anterior teeth polycarbonate crowns may be more durable. Alternatively acrylic jacket crowns can be made with direct or indirect technique with minimum preparation.[18] Stainless steel crowns are used for posterior teeth as they are not as technique sensitive or costly as cast restorations, require little time to insert and

need minimal reduction of tooth structure. Porcelain jacket crowns though provide esthetic permanent restorations but their use in young patients is contraindicated because of presence of large pulp chambers and the likely need for frequent replacement due to passive eruption.[20] Glass ionomer cements are used for cementation for its fluoride releasing and improved adhesion characteristics. These properties may be an asset in case of severe hypomineralization, enhancing the resistance to secondary caries and decreasing thermal sensitivity.[18]

The benefits of obtaining satisfactory esthetics and function in the mixed dentition outweigh the technical difficulties. A conservative approach is desirable.

Conclusion

Dental fluorosis is a common cause of hypoplastic defects in enamel. It is important to restore esthetics and function of the dentition in children. A conservative approach to maintain the vitality of teeth and still attain satisfactory esthetics and function is always the desirable approach.

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