Aesthetic Treatment Approach for Enamel Hypoplasia - A Case Report

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Abstract

The nature of tooth enamel is of inherent interest to dental professionals. The current-day clinical practice of paediatric dentistry involves the prevention of enamel demineralization, promotion of enamel remineralization, restoration of cavitated enamel where demineralization has led to cavitation, vital bleaching of dental enamel that has become discolored, and diagnosis and treatment of developmental enamel malformations, which can be caused by environmental or genetic factors. On a daily basis, dental health providers make diagnostic and treatment decisions that are influenced by their understanding of tooth formation. Developmental enamel defects, presenting as enamel hypoplasia or opacities are caused by damage or disruption to the developing enamel organ as a result of inherited and acquired systemic conditions. The high prevalence of these defects in the dentition demonstrates the vulnerability of the teeth to changes in the pre- and postnatal environment. The presence of enamel hypoplasia increases the risk of primary teeth to early childhood caries and tooth wear as the defective enamel is thinner, more plaque retentive and less resistant to dissolution in acid compared to normal enamel. Enamel hypoplasia patients are susceptible to the restorative cycle of replacement restorations like any other patient, but start with a distinct disadvantage. This article"Aesthetic Treatment Approach for Enamel Hypoplasia – A Case Report". demonstrates a minimally invasive, relatively simple and cost-effective option for the aesthetic correction of a case of hypoplastic enamel with layered composite veneers.

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Introduction

In dentistry, the various treatment options, for restoring anterior teeth deformities due to any of the compromising reasons such trauma, developmental defects or caries relate directly or indirectly to the concept of aesthetics. However, the concept of aesthetics is quite subjective and entirely depends on the patient's need of harmony and beauty.

Aesthetically compromising dental deformities have been associated with a large spectrum of aetiologies, including genetic or congenital developmental defects, demineralization and destruction of mineralized structures[(1)], traumatic destruction of the tooth structure etc.

One such developmental defect of the enamel, occurring during its stages of formation which has an impact on the quality and /or quantity of enamel formed depending on the stage of amelogenesis, is enamel hypoplasia. It is an incomplete or defective formation of the organic enamel matrix of the teeth in the embryonic stage of the tooth development.

There are two types of hypoplasia involving enamel[(2).]These are:-

- Environmental enamel hypoplasia
- Hereditary enamel hypoplasia
- Environmental enamel hypoplasia[(3)]is caused by the environmental factors that cause damage to the developing ameloblasts. Deciduous or permanent teeth are involved and sometimes only a single tooth may be affected. Enamel and dentin may beaffected to varying degrees.

The factors which produce enamel hypoplasia are:

Vitamin deficiency (vitamins A, C, and D), Exanthematous diseases such as measles, chickenpox, scarlet fever etc., Hypocalcaemia, Congenital syphilis, Birth injury, premature birth, Rh haemolytic disease, Ingestion of chemicals such as fluoride, antibiotics etc., Local infection or trauma etc.

2. Hereditary enamel hypoplasia is the ectodermal disturbance that occurs during the embryonic development of the enamel. The mesodermal components are normal. Both the deciduous and permanent teeth are involved and only the enamel is affected.

There are 3 types of hereditary enamel hypoplasia:

a) Hypoplastic type, where there is defective formation of organic matrix.
b) Hypocalcification type in which there is defective mineralization of the matrix
c) Hypomaturation type where there is defective maturation of the matrix.

Features of Enamel Hypoplasia

The crowns of the teeth may show discolorations which may present as white spots or cloudy opacities, depending upon the type of disorder from white, to yellowish white, to brown.The enamel appears soft and thin that may chipoff more easily from the underlying dentin[(4).]Enamel does not form to a full thickness. In cases of hypoplasia due to congenital syphilis, the front teeth appear screw driver shaped. These are also known as Hutchinson's teeth and the affected posterior teeth are referred to as Mulberry molars. Ingestion ofdrinking water with excessive fluoride during amelogenesis results in mottled enamel characterized by occasional white opacities or spotting of the enamel. This varies from whitish flecks and/or white opacities to areas showing pitting and brownish staining on the enamel surface[(5).] These teeth have a tendency to wear off prematurely or fracture. The hypoplasia[(6)] caused due to local infection or trauma during the tooth formation may range from mild brownish discoloration of the enamel to severe pitting and irregularity of the structure of the crown, It may involve single tooth only, which is referred to as Turner's Teeth.[(7)]

This article presents a case report of the restorative treatment of a girl child with enamel hypoplasia with indirect composite veneers on maxillary and mandibular anterior teeth (Incisors and canines)

Case Report

A 12 Year old female patient reported to the Department of Pedodontics and Preventive Dentistry, Santosh Dental College& Hospital, Ghaziabad, U.P. with a complaint of discoloured and deformed front teeth. Further history revealed that she had sensitivity to temperature variations in her front teeth. The milk teeth did not have any such abnormality and there was no positive history of trauma during childhood. The child belonged to the lower socio economic strata. The parents accompanying the child were enquired regarding pre-natal and post natal history. Mother's obstetric history was non contributory. General examination of the child revealed slight undernourishment. The dentition corresponded to chronological age.

Clinical findings:- Enamel Hypoplasia with gross structural defects and hypoplastic pitsand grooves on all erupted teeth (Permanent dentition). (Fig,1.)

Differential Diagnosis:- Fluorosis, Amelogenesis imperfecta[(8)]

Final Diagnosis:- Enamel hypoplasia

Treatment Planning:- As per the need of the patient, an interdisciplinary approach was followed. Treatment was planned with the aim of improving the periodontal health, reducing the reported teeth sensitivity, and improving the patient's appearance with indirect composite veneers for anterior teeth.

Method:-Thorough oral prophylaxis was done to improve the gingival status of the child.

A 0.5mm facial reduction was done on the maxillary and mandibular anterior teeth for placement of indirect composite veneers (Fig.2.)The finish line at the proximal and cervical aspects of the tooth preparation was rounded ,and a rounded finish line throughout

was prepared for the veneers . Impression was made in elastomeric compound (double wash technic) and model poured in die stone.

Indirect Composite Veneers were fabricated in the lab. (Fig.3.)

A dual cure adhesive system was used for luting the indirect veneers on the maxillary and mandibular anterior teeth[10] (Fig.4.)

Treatment outcomes:- Outcomes in terms of function and aesthetics satisfied both the patient/parents and the dentist .The indirect composite veneers were both aesthetically and functionally satisfactory at the end of 6 months of review. (Fig.5.)

Fig. 1. Pre Op photograph

Fig. 2. - Labial reduction to receive the indirect composite veneers

Fig. 3.- Composite veneers on models

Fig.4.- Post op picture of veneers after cementation on maxillary and mandibular anterior teeth

Fig. 5. - 6 months follow up

Discussion

There are a number of treatments options for the anterior teeth affected by enamel hypoplasia .The most predictable and durable aesthetic restoration of anterior teeth has been achieved with full coverage crowns. The popularity of indirect composite veneers has increased because the restorations are aesthetic [11]. The result achieved can be satisfactory, both aesthetically and functionally. However the patient and clinician should discuss the advantages and disadvantages of all treatment options while deciding on the best treatment plan. The procedure is composed of a couple of appointments. The treatment is relatively painless. In this case report indirect composite veneers were satisfactory for both patients and clinician on the basis of aesthetics and function after 6 months of recall.

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