

# Linear enamel hypoplasia – report of a 2 rare cases

## Abstract

Developmental defects can occur during morphogenesis stage of tooth development. Enamel hypoplasia encompasses all deviations from normal enamel in its various degrees of absence. Here we present two cases of linear enamel hypoplasia. In the first case, 14 year old girl reported with a white line present on the both upper and lower arches of front and back teeth. Esthetics is main concern for her hence teeth were restored with composite restoration and she was satisfied with treatment. In the second case, 12 year old girl came for routine dental checkup along with her mother who presented with linear enamel hypoplasia on both maxillary and mandibular anterior teeth including all the first premolars. Parent was not willing for the treatment and preventive measures were done. Also we discussed about the etiological factors, possible complications anticipated and different treatment options were discussed.

**Keywords:** anterior teeth, linear enamel hypoplasia, maxilla, mandible, premolars

Volume 2 Issue 4 - 2015

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**Received:** December 17, 2014 | **Published:** June 11, 2015

## Introduction

Zsigmondy in 1894 coined the term Enamel Hypoplasia. It is defined as an incomplete or defective formation of organic enamel matrix of the teeth,<sup>1</sup> which is associated with hypo calcification and hypo maturation. Basically, ameloblasts produce enamel and these ameloblasts are cells particularly sensitive to changes in their environment. Whenever there is a change in the environment during enamel formation like infection, trauma, nutritional deficiencies, especially, vitamins like A,C and D, exanthema to us diseases, hypocalcaemia, ingestion of chemicals and idiopathic causes,<sup>2</sup> all can lead to the occurrence of enamel hypoplasia.

## Case I

A 12 year old girl presented to a pediatric dentistry department with a chief complaint of white line present in her teeth which was noticed by her mother one month back. Her prenatal, natal and post natal histories were unremarkable and have not visited a dentist before. None of the family members had this problem and she is the only child in the family, parents are daily workers and she hails from a poor socioeconomic background. Past medical history revealed that she had recurrent episodes of fever and hospitalization. No abnormalities were detected upon extra oral and intra oral examination. She was in a permanent dentition period without carious teeth with Angle's class I molar relationship with normal over jet and overbite. One of the interesting finding was that a horizontal line was seen on both maxillary and mandibular anterior teeth as well as premolars in a bilaterally symmetrical pattern. Line started from cervical one third of all the anterior teeth and premolars only on the labial aspect. Based on the natal history and configuration it was diagnosed as enamel hypoplasia (Figure 1). Preventive measures were done and the involved teeth were restored with composite resin restoration to reestablish esthetics (Figure 2).



**Figure 1** Clinical picture showing a ring like line on the maxillary anterior teeth including first premolars.



**Figure 2** Post operative picture of maxilla and mandible teeth restored with composite resin.

## Case 2

A 13 year old girl comes to the department for routine dental checkup. Past medical history revealed that the patient was frequently admitted in hospital in the first 3 years of her life and the patient was subjected to parenteral and systemic antibiotics every time. Neither the patient nor the parents were aware of the particulars of antibiotics administered. She belongs to low socioeconomic status and father is a driver. No abnormality detected on extra oral examination. Upon intraoral examination, horizontal line was present in both maxillary and mandibular anterior teeth and pre molars (Figure 3). Explanation regarding treatment and complications of enamel hypoplasia to the parents was done but mother was not interested regarding treatment and so preventive measures were rendered.



**Figure 3** clinical pictures showing a ring like line on the mandibular anterior including first premolars.

## Discussion

Reports of linear enamel hypoplasia were sparse in the literature. Enamel hypoplasia occurs whenever there is disturbance during enamel formation. The teeth which are most commonly involved are as follows: central incisors, lateral incisors, canines and molars, of these teeth enamel formation takes place within the first year after birth. Premolars and second and third molars are spared, since their mineralization does not begin until about the age of three years or later.<sup>3</sup> In the present cases, these findings are in concurrent where in both the cases all the first premolars are also affected. Miller and Forrester have reported that, enamel hypoplasia is far more common in prematurely born children than in normal term infants. Although teeth differ in their chronology of enamel hypoplasia, the distribution of defects is remarkably similar in regard to the position of the defects on tooth crown. For both the incisor and canine, there is a low frequency of defects in the incisal third and gingival third of the crown and a high frequency in the remaining half of the crown. The peak frequency is near the midpoint of the crown. The enamel prisms at this point on the crown are most nearly perpendicular to the surface. This orientation may render it easier to discern variations in the rod lengths.<sup>4,5</sup> It was noted that there will be an increase in velocity of crown development at this time. The greater rate of development may render the tooth more vulnerable to disruption. Hypoplasia was defined as circumferential lines, bands or low pits of decreased enamel thickness. These crown- surface lesions were easily distinguished from other surface irregularities by visual examination and slightly molding a binocular microscope and dental probe.

In order to determine the age of the individual when these lesions developed, their distance from the cementum-enamel junction was measured. These measurements were converted to a half-year period by reference to the chronology of enamel-crown development,<sup>6</sup> later it was modified by Swardsted.<sup>7</sup> This method involves the division of the incisor crown into 9 (birth to 4.5 years) and the canine crown into 129 (birth to 6.0 years) half-year developmental periods.<sup>7</sup> The uniqueness of our cases is that all the first four premolars were involved with enamel hypoplasia which is not reported in the literature.

## Management

Prevention is always better than cure; linear enamel hypoplasia can be prevented through identification of risk factors, early diagnosis and anticipation of caries. Most of these lesions occur during pre natal and early postnatal periods. This can be minimized by educating the pregnant women through dental home. If the teeth are affected by hypoplasia it can be treated by using re-mineralizing agents like tooth mouse, CPP-ACP, Fluoride application further stop the caries process. Diet counseling followed by establishment of good brushing habits can further prevent caries process. If hypoplasia occurs only in molars there will be attrition of the particular tooth and vertical height will be reduced and this can be prevented by giving acrylic jigs and custom made bite blocks. In the present case molars were not affected, diet counseling was done, oral hygiene instructions were given and the affected teeth were restored with composite resin. Other treatment options include Glass Ionomer cements, stainless steel crowns, full veneer- metal ceramic crowns, fixed, removable partial dentures and implants. If teeth are non restorable, extraction is the only treatment of choice and in such cases, inter disciplinary approach should be more appropriate for young children to restore function.

## Conclusion

It is very essential to diagnose these developmental defects early because it is mainly concerned with esthetics. Pediatric dentist has an opportunity to prevent these defects through anticipatory guidance. If it is already present, proper diagnosis is important to differentiate other conditions and also conservative treatment plan. Recognizing this condition will facilitate the establishment of appropriate treatment plan with multidisciplinary approach in young children to restore esthetics and improve masticatory efficiency.

## Acknowledgments

None

## Conflicts of interest

The author declares that there are no conflicts of interest.

## Funding

None.

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