ABSTRACT

Hypoplasia is a quantitative or qualitative defect in enamel synthesis. Hypoplasia of enamel is seen as a break in the continuity of the enamel with a reduction in its layers; thus creating grooves or depressions. Several environmental factors act at different periods of time and for variable amount of time thus producing a range of hypoplasia. Linear enamel hypoplasia is a specific type of environmental hypoplasia characterized by symmetrical and ring-like defects involving many teeth. Multiplicity and severity of these lesions make treatment complex, hence requiring early detection to prevent further enamel breakdown and prompt treatment to prevent severe morbidity associated with this disease.

Keywords: Linear enamel hypoplasia, Enamel hypoplasia, Environmental hypoplasia, Diagnosis, Prevention.


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INTRODUCTION

Enamel is highly mineralized tissue. Mineralization process is a highly coordinated mechanism that involves interplay of genetic and environmental factors. Hypoplasia is a quantitative or qualitative defect in enamel synthesis which results due to absence of factors required for enamel formation or presence of factors that prevent this synchronized pattern. Enamel formation of each tooth occurs at different intervals of time and at different rates. Several environmental factors act at different periods of time and for variable amount of time thus producing a range of hypoplasia. Commonly implicated factors for enamel hypoplasia are—deficiency of minerals like calcium, deficiency of vitamins, malnutrition; systemic illnesses like hypothyroidism, hypoparathyroidism and renal disease; drugs like tetracycline, environmental pollutants like fluoride, heavy metals; and several others.

Linear enamel hypoplasia is a specific type of environmental hypoplasia characterized by symmetrical and ring-like defects involving many teeth. Since, amelogenesis is one time process, any malformation can lead to permanent defects in enamel. Enamel defects have strong impact on health and quality of life of an individual. Repercussions of hypoplasia depend on the severity of disease, interaction of etiological agent and age of presentation of patient to dental clinic. A wide variety of complaints are associated with linear enamel hypoplasia which include sensitivity to air, cold, warm and mechanical stimuli, inability to chew food, carious teeth and its sequel. Patients may even complaint of repeated or failing restorations. Hence, an early diagnosis and treatment planning as well as prognostication of linear enamel hypoplasia are required.

CASE REPORT

Child aged 14 years, male had come with a complaint of ugly looking front teeth. Further history revealed that the patient noticed scratches on surface of many of his front teeth ever since the successor tooth erupted into the oral cavity. Primary teeth did not have one such abnormality. No positive history of trauma was present. Child belonged to lower socioeconomic strata. The parents accompanying the child were enquired regarding prenatal and postnatal history. Mother’s obstetric history was noncontributory. Child’s natal history revealed that the child was hospitalized in 1st year of life for approximately 5 months. Parents revealed malnutrition to be the cause for hospitalization. General examination revealed a slightly malnourished child. Intraoral examination revealed dentition corresponding to chronological age. Hypoplasia (quantitative deficiency) was seen in several teeth. The distribution of hypoplasia showed a characteristic presentation which was symmetrical, chronological, and presented as a ring like defect around the tooth (buccal, lingual, mesial and distal). The ring like deformity was seen in the incisal 1/3rd of 11, 21, 31, 41, 32 and 42; cusp tips of 13, 23, 33 and 43; (Figs 1 to 3) and gross loss of tooth structure (occlusal and middle 1/3rd) with accompanying caries in 16 (Fig. 4), 26 (Fig. 5), 36 (Fig. 6) and 46 (Fig. 7).

Fig. 1: Labial aspect
Diagnosis of linear enamel hypoplasia was deduced based on following:

1. Characteristic presentation-hypoplasia that produced:
   a. Multiple and symmetrical lesions.
   b. Ring like defect involving all surfaces of tooth (buccal, lingual, mesial and distal).
   c. Chronological pattern of hypoplasia in all teeth (age of hypoplasia corresponding to defect in enamel synthesis from 0 to 9 months of birth) which corresponded with child’s hospitalization history.

2. Usually caries involves pits and fissure of molars, cusps are usually not involved in molars. In the present case, there was gross loss of incisal and middle 1/3rd of all permanent molars which could have occurred due to caries and attrition acting on hypoplastic molars.

The guardians were not keen on treatment. Parents were motivated for treatment and initial fluoride regimen was initiated. The patient was advised for follow-up for restoration of esthetics and function.

**DISCUSSION**

Clinical significance of linear enamel hypoplasia includes poor esthetics, tooth sensitivity, malocclusion and predisposition to dental caries.\textsuperscript{6,7}
not valid. It proposed a new classification of caries associated with hypoplasia; this form of caries affects mostly young children living at or below poverty, characterized by structurally damaged primary teeth that are particularly vulnerable to dental caries.8

An early diagnosis and treatment planning as well as prognostication of linear enamel hypoplasia is required. Following approach can be useful:
1. Risk recognition
2. Early diagnosis
3. Anticipation of caries and post-eruption breakdown
4. Remineralization and desensitization
5. Restorations and extractions and

Prevention of linear enamel hypoplasia is easier said than done; because most of the lesions happen during prenatal and early postnatal periods.9 Only means of preventing is by decreasing the number of risk factors. In such cases establishment of dental home as early as pregnancy can be of little hope. So, interception of the deleterious effects of hypoplasia is the only course. Tooth regenerative agents like fluoride, calcium phosphate agents can prevent further breakdown and halt the carious process. Diet counseling and establishment of good oral hygiene procedure is done to caries activity. Pit and fissure sealants and preventive resin restorations for teeth can arrest caries. Acrylic jigs or custom-made bite blocks can be given to prevent effects of attrition.10,11 In the present case diagnosis was done, counseling regarding risk factors like diet and poor oral hygiene was done. Remineralisation with fluorides was initiated.

Restorations with glass ionomer cement, composite, stainless steel crowns, full veneer metal-ceramic crowns, fixed-removable partial dentures and implants are the different treatment options that are discussed in various studies. Extraction should be considered if teeth are non-restorable.11,12 In extraction cases, moreover an interdisciplinary approach should be planned for restoration of function in young children.

PROGNOSIS

Since the quality of enamel supporting the restoration is frail, the prognoses of restorations are poor. The need for evaluating restoration at regular intervals becomes mandatory.

TAKE AWAY POINTS

Further studies are required to shed light on causative factors and their effect; Until then, the key for a successful treatment is early diagnosis, prompt treatment and intense follow-up as soon as the teeth erupt.

REFERENCES


Fig. 7: Occlusal aspect of 46
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