CASE REPORT

Enamel Hypoplasia and Rehabilitation of Esthetics: A Case Report

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ABSTRACT:
Enamel hypoplasia is defined as deficiency of enamel formation and is associated with hypocalcification and hypomineralisation. Enamel hypoplasia (EH) is restricted to ectodermal disturbance, associated to alterations in the organic enamel matrix which can cause the white flecks, narrow horizontal bands, lines of pits and grooves. Both the quality and quantity of the enamel is affected. These defects have been connected with genetic and epigenetic causes such as local, systemic and environmental factors. Environmental and genetic factors that interfere with tooth formation are thought to be responsible for EH. Trauma to the teeth and jaws, intubation of premature infants, infections during pregnancy or infancy, poor prenatal and postnatal nutrition, hypoxia, exposure to toxic chemicals etc. The condition presents problems of socialization, function and discomfort but may be managed if early intervention is done early both preventively and restoratively with continuing treatment into adult life. This paper presents the esthetic rehabilitation of anterior teeth affected by enamel hypoplasia.

Keywords: Enamel, Environmental hypoplasia & discoloration, Hypoplastic teeth.

INTRODUCTION
Enamel is a hard tissue that has been described as a cell less organic tissue which is incapable of regeneration. Process of amelogenesis involves cells that secrete enamel proteins which mineralize enamel to approximately 30%. Once entire thickness has been formed and structured it then acquires additional mineral content with removal of enamel proteins and water to yield a tissue made of more than 95% mineral.1,2
Many conditions produce defects in enamel structure. These occur because ameloblasts are cells particularly sensitive to changes in their environment. They include: nutritional deficiency (Vit. A, C and D), exanthematous diseases, congenital syphilis, hypocalcaemia, birth injury alongwith certain local infections, ingestion of chemicals (fluoride) and even idiopathic causes.3
Enamel hypoplasia of the environmental variety due to nutritional deficiency and systemic disease occurs as the ameloblasts are one of the most sensitive groups of cells in the body in terms of metabolic function.4
Most cases of enamel hypoplasia of this type involve those teeth that form within the first year after birth, although teeth that form somewhat later may be affected. Thus the teeth most frequently involved are the central incisors, lateral incisors, canines and first molars. Premolars along with second and third molars are seldom affected, since their mineralization does not begin by about 3 years of age or more.

CASE REPORT
A 17 year old female patient reported to the outpatient department of National Dental College and Hospital, Derabassi with the chief complaint of discoloured front teeth. Clinical examination of the oral cavity revealed bilaterally symmetrical pattern of horizontal enamel hypoplasia of upper anteriors and lower canines which were having a yellowish brown discoloration. The middle third of 11, 21 (FDI system) were involved
with cervical and incisal third intact whereas the middle and incisal third in case of maxillary lateral incisors and canines were affected. In case of mandibular canines middle third of tooth structure was involved. The enamel was lost on affected portions and underlying dentin was heavily stained. The affected portion did not have the normal contour. There was lack of contact between adjacent teeth due to reduced enamel thickness.

Medical history revealed that the patient was frequently admitted in hospital in the first 3 years of his life and the patient was subjected to parenteral and systemic antibiotics every time although she is not aware of the drugs administered.

In teeth 12, 13, 22 and 23 due to extensive tooth involvement intentional root canal treatment followed by fibre post placement, core build-up using ParaCore and all ceramic crown placement were planned. In 11, 21, 33 and 43 after conservative tooth preparations composite restorations were done. Due to the involvement of distal proximal surfaces in 33 and 43, there was mesial drifting of 34, 44 in the affected portions. So to establish proper proximal contact and contour between 33, 34, 43, 44, elastic separators were placed between them for 7 days prior to composite restorations.
DISCUSSION

Enamel hypoplasia was first used by Zsigmondy in 1894. Hypoplasia is preferable to the old term “enamel atrophy” because the condition is characterized by an underdevelopment of the enamel whereas the word “atrophy” indicates a wasting or reduction in size of a fully developed tissue or organ. Two basic types of enamel hypoplasia exist: (1) a type caused by environmental factors; and (2) a hereditary type (amelogenesis imperfecta). The environmentally induced enamel defects can be classified into 3 groups:

1. Hypoplasia
2. Diffuse opacities
3. Demarcated opacities

Usually the enamel is light yellow to grayish white in color but at the incisal edges where no dentin is present they appear slightly blue in color. Since the primary teeth enamel have opaque crystals, they appear whiter than the permanent dentition. Since enamel is semi-translucent, the color of dentin and any material underneath the enamel strongly affects the appearance of a tooth and when not fully matured, it can give rise to various clinical appearances depending on the degree of mineralization and the color of the dentin which can be seen through the enamel. The affected enamel is present on all or parts of surfaces of teeth involved. This may be in the form of pit/grooves or larger areas of missing enamel. The translucency of enamel may be affected so that diffuse opacities are visible which has no clear demarcations from the normal enamel lying next to it. Although the enamel has normal thickness the opaque area may have white/cream/yellow or brown hue. In mild environmental hypoplasia, only a few pits, grooves or fissures may be present on enamel surface. If the condition is more severe, the enamel may exhibit rows of deep pits arranged or a linear smooth surface fissure horizontally across the surface of tooth. There may be only single row or several rows indicating a series of injuries. In severe cases, a considerable portion of enamel may be absent, suggesting a prolonged disturbance in ameloblast function. Usually, a narrow zone of hypoplastic defects is indicative of enamel formation affected for a shorter time (acute); a wide zone indicates enamel formation affected for a longer time (chronic). Occasionally, the enamel defects may be the site of discolouration. Enamel hypoplasia may be visible as a distinct white spot on individual tooth. It is called as ‘Turner’s tooth’ usually a result of trauma to the tooth in its mineralisation phase. Turner’s hypoplasia is a term used to describe a permanent tooth with a local hypoplastic defect in its crown.

If the interference takes place in the first year (called the infancy period), the permanent teeth affected are the first molars, the incisors (except the maxillary lateral incisors), and the canine teeth. It is striking that the maxillary lateral incisors mineralize after the central incisors and canines, approximately after the age of 10 months. If interference takes place in early childhood (approximately 13 to 34 months) the upper laterals and premolars which begin to calcify during this period are also affected.

Enamel hypoplasia is typically caused by malnutrition, illness, infection or fever during tooth formation. Some medications like Tetracycline can also affect the teeth if they were undergoing mineralization during the time of dosage. Tetracycline reacts with calcium to form a tetracycline-calcium orthophosphate complex. Tetracycline stains have a typical clinical appearance of yellowish to brownish-gray stained teeth. Exposure to chemicals chiefly fluorides in large quantities at a young age may interfere with tooth formation. The appearance varies from localized white, opaque spots, pitting to
generalized white or brown discolorations. Here the patient’s geographic location of a high fluoride area can help in diagnosis. The exact reason for the cause of enamel hypoplasia may not be determined in all cases. In our case, conservative composite restorations were done on 11, 21, 33 and 43 because of limited tooth destruction. This is supported by case done by Martos et al 2012. In case of 12, 13, 22 and 23 due to extensive tooth destruction, intentional root canal treatment followed by fibre post placement was done. Core build-up in these teeth was done using ParaCore. In a study done by Agrawal and Mala 2014, dual cure composite material ParaCore was found superior to other core materials in terms of different physical properties. Then to provide optimum esthetics, all ceramic crowns were placed on them.

Since enamel hypoplasia usually manifests before the age of three years, so any trauma happening later than that will not lead to enamel defects, because calcification of enamel has already occurred.

REFERENCES