A Comprehensive Esthetic and Conservative Approach for Anterior Teeth with Enamel Hypoplasia

Nitin Rastogi, Ashish Agarwal, Mayank Shah

ABSTRACT

Enamel hypoplasia (EH) is a defect in tooth enamel that results in less quantity of enamel than normal. The defect can be a small pit or dent in the tooth or can be so widespread that the entire tooth is small and/or mis-shaped. The complexity and intensity of the dental deformity lesions will conduct the ideal treatment-associating conservative techniques. This article presents a case report of a restorative treatment of enamel hypoplasia using hybrid composite resin to mask color alteration and enamel defects. An esthetic appearance that respects the tooth polychromatic and the self-esteem of the patient can be achieved with this approach.

Keywords: Composite resins, Dental restoration, Enamel hypoplasia, Enamel defects.


Source of support: Nil

Conflict of interest: None

INTRODUCTION

Hypoplasia is defined as a quantitative defect of enamel visually and is histomorphologically identified as an external defect involving the surface of the enamel and associated with reduced thickness of enamel. This type of defect may cause tooth sensitivity, may be unsightly or may be more susceptible to dental cavities. Some genetic disorders cause all the teeth to have enamel hypoplasia (EH). Enamel hypoplasia can occur on any tooth or on multiple teeth. It can appear white, yellow or brownish in color with a rough or pitted surface. In some cases, the quality of the enamel is affected as well as the quantity. Environmental and genetic factors that interfere with tooth formation are thought to be responsible for EH. This includes 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 and a variety of hereditary disorders. Treatment options depend on the severity of the EH on a particular tooth and the symptoms associated with it. The most conservative treatment consists of bonding a tooth colored material to the tooth to protect it from further wear or sensitivity.

CASE REPORT

A 22-year-old female patient was referred to the Institute of Dental Sciences, Bareilly, Uttar Pradesh, reporting a visual discomfort from the presence of irregularities and discoloration in the maxillary incisors. Dental history and clinical examination revealed that she had a soft form of EH. Clinical examination also evidenced an enamel defect in the maxillary canines, lateral and central incisors, with rough surfaces with irregular limits that principally involve the middle third of the crown. No positive history of trauma was present. Patient belongs to low socioeconomic strata.

The clinical situation revealed that it was not possible to re-establish esthetics and function without the use of a restorative procedure. The position and pattern of the enamel irregularities, the occlusion and a tooth remnant with a large substrate suggested that a composite resin restoration would be a reliable option for this case. The patient was systemically healthy, presented an overall plaque index and gingival index of below 10% and the restorative area was free from visible plaque. A slight enameloplasty, using a spherical 1015 F diamond bur and manual instruments, was performed on both the irregularities and the limits of the tooth defect. The regularization of the defects created a good substrate that was favorable for adhesive restorations.

The color was recorded using the Vitapan classical scale, and the shade A2/A3 was considered as the initial color. Briefly, the dental surface was acid etched (35% phosphoric acid), rinsed for 30 seconds and dried with absorbent paper. A two-component adhesive system (AdheSE, Ivoclar Vivadent AG, Schaan, Liechtenstein) was applied on the dentin and the enamel and was light-cured for 10 seconds with an intensity of 1400 mW/cm². A two-component adhesive system was applied on the dentin and on the enamel. A combination of
the incremental and stratified layering technique was used to fill the tooth using a highly esthetic nanohybrid composite resin, IPS-Empress (Ivoclar Vivadent AG) (Fig. 3). The composite was added in increments of 1.5 to 2 mm and was light-cured after every layer, according to the manufacturer’s instructions. First, the dentin was simulated with a thin layer of a microhybrid composite (DA 3) and a final layer with an enamel composite (EA 2). The contouring was refined using 30-blade carbide trimming bur, and the final polishing was performed with a high-luster polishing paste using goat-hair brushes and cotton buffs. Patient was advised not to take the food stuffs which may cause staining of the restored teeth. Four months after the restoration, a good final aspect was observed and the smile view exhibited an imperceptible restoration (Fig. 4).

DISCUSSION

Hypoplasia is quantitative or qualitative defect in enamel synthesis. Enamel hypoplasia can occur on any tooth or on multiple teeth. Clinically, hypoplasia of enamel is seen as a break in continuity of enamel with the reduction in its layer, can appear white, yellow or brownish in color with a rough or pitted surface. Both dentitions could be affected by enamel hypoplasia; however, the incidence is more severe in permanent dentition. Hypoplasia is most common in the permanent, or adult, teeth and represents episodes of arrested growth in infancy or childhood, while these teeth were still developing. Once the enamel forms, it can no longer be affected. A variety of environmental and genetic factors have been shown to contribute to the formation of these defects, including malnourishment, mechanical trauma, racial or ethnic background, and lack of prenatal care. Significance of EH includes: poor esthetic, tooth sensitivity, malocclusion and structurally damaged tooth particularly vulnerable to dental caries.

Hypoplasia was categorized into the following types by Silberman et al:

- **Type I hypoplasia**: Enamel discoloration due to hypoplasia
- **Type II hypoplasia**: Abnormal coalescence due to hypoplasia
- **Type III hypoplasia**: Some parts of enamel missing due to hypoplasia
- **Type IV hypoplasia**: A combination of previous three types of hypoplasia.
Treatment options depend on the severity of the EH on a particular tooth and the symptoms associated with it. The most conservative treatment consists of bonding a tooth colored material to the tooth to protect it from further wear or sensitivity. In some cases, the nature of the enamel prevents formation of an acceptable bond. Less conservative treatment options, but frequently necessary include use of stainless steel crowns, permanent cast crowns or extraction of affected teeth and replacement with a bridge or implant.

An early diagnosis and treatment planning as well as prognostication is required. Following approaches can be useful:

- Risk recognition
- Early diagnosis
- Anticipation of early cries posteruption break out
- Remineralization and desensitization
- Restoration and extraction
- Maintenance.

Various treatment protocols may be performed, depending on the level of involvement and the severity of the lesions. Usually, these approaches include: enamel microabrasion, esthetic conservative restorations and dental whitening. Composite resin restorations are fully capable of reproducing the appearance of a natural tooth with highly esthetic outcomes.

Restoration with glass ionomer cement, composite, stainless steel crown, full veneer metal ceramic crown, fixed removal partial dentures and or implant are the different treatment options that are discussed in various treatment studies. Extraction should be considerable if teeth are not restorable.

CONCLUSION

This case report demonstrates that restorative rehabilitation, in addition to promoting health, may provide a more favorable esthetic appearance for the smile, matching the tooth polychromatic and raising the self-esteem of the patient.

REFERENCES