Enamel hypoplasia or amelogenesis imperfecta - a restorative approach

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Abstract
Genetic or acquired disturbances may lead to the development of alterations on enamel structure, compromising tooth esthetics and function. This short communication aims to briefly discuss the possibility of employment of several treatment options either to Enamel Hypoplasia or Amelogenesis Imperfecta in order to achieve optimally esthetic results.

Key Words:
amelogenesis imperfecta, enamel hypoplasia, treatment options
Introduction
In general practice many professionals do not know how to differentiate Enamel Hypoplasia from other enamel alterations, such as Amelogenesis Imperfecta. Enamel Hypoplasia or Amelogenesis Imperfecta can be considered an exclusive ectodermic disturbance which can cause white flecks, narrow horizontal bands, lines of pits, grooves, and discoloration of teeth varying from yellow to dark brown\textsuperscript{1,2}. According to Alvares and Souza Freitas\textsuperscript{3}, “this alteration is probably inhibitory in nature and causes atrophy and lack of function of ameloblastic cells, leaving as a result structural defects on enamel formation”. It is true that hypoplastic teeth are a characteristic of Amelogenesis Imperfecta, but the last is only related to genetic causes, autosomal dominant or recessive genes or X-linked, i.e. it is always hereditary, affecting all the teeth on both dentitions (Figures 1 and 2). Enamel Hypoplasia can be related either to hereditary causes, affecting all the teeth on both dentitions or acquired ones, involving one or more teeth (Figure 3). When Hypoplasia is related to a hereditary cause it can be also called Amelogenesis Imperfecta.

According to the clinical findings amelogenesis imperfecta can be classified into four categories: type I, hypoplastic enamel (the most common one), type II, hypomaturated enamel, type III, hypocalcified enamel and type IV, hypomaturated-hypoplastic enamel with taurodontism\textsuperscript{4}. Bonding to teeth with affected enamel has been done successfully\textsuperscript{5-9} but any esthetic restorative treatment should pay attention to the characteristics of each type of alteration. Type I is a result of a defect in the formation of the enamel matrix showing pits at the enamel surface or severely worn teeth with exposed discolored and sclerotic dentin. Type II is associated with the retention of 2-5% of the enamel matrix proteins compared to only 0.01-1% in normal enamel\textsuperscript{10}, and clinically enamel tends to chip from the underlying dentin. Type III shows soft enamel due to a defect during mineralization and wear is common. Type IV is a combination of I and II. In less severe cases normal enamel can be found around the affected one; then adhesion procedures can be optimally performed\textsuperscript{5}. The pretreatment with sodium hypochlorite can improve bond strength to hypocalcified enamel\textsuperscript{11} but if just affected enamel is present it is advisable to remove it and bonding should be tried in dentin, usually sclerotic. Reduced bonding efficacy has been documented in sclerotic dentin due to obliteration of dentinal tubules with sclerotic casts, the presence of an acid-resistant hypermineralised layer, and the presence of bacteria on the lesion surface\textsuperscript{12}. In order to overcome these problems extending etching periods have been recommended for conventional adhesive systems\textsuperscript{13}, while the application of acids is suggested prior to self-etching adhesives\textsuperscript{12}. Tooth bleaching and microabrasion represent a first and minimally noninvasive step; after that, composite resin restorations can produce excellent esthetic results\textsuperscript{5}, but in most severe cases, porcelain veneers appear to be the best.
Enamel hypoplasia or amelogenesis imperfecta - a restorative approach

There are a great number of alternatives for the treatment of hypoplastic teeth. This communication only states this possibility but helps the clinician to understand what can be used on each case. Analyzing the benefits and limitations of each technique the professional will be able to decide the best treatment plan.

References

Fig. 4 – Porcelain veneers adhesively fixed on buccal surface of anterior teeth