

Treatment of developmental defects of enamel

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Abstract

Developmental defects of enamel are encountered daily in our dental practice. The management of enamel hypomineralized lesions may be challenging, especially as esthetic concern around the young population is increasing. Resin infiltration, a new technique firstly proposed to halt caries progression in the posterior segment, showed a strong positive esthetic effect in the treatment of developmental defects with different etiologies. Future *in-vivo* studies are needed to evaluate the longterm color stability, in order to provide a strong clinical recommendation. *Clin Ter 2021; 172 (1):e55-56. doi: 10.7417/CT.2021.2282*

Key words: developmental defects of enamel, enamel hypomineralization, Icon, Resin infiltration, color stability

Dear Editor,

Developmental defects of enamel are encountered daily in our practice (1). The patients who present the alteration in the color of the enamel of the upper teeth, come with esthetic concerns and often require a minimally invasive treatment with affordable costs (2). The age of patients with the above pathology is increasingly younger compared to the past, this behavior can be linked to the new level of awareness of dental esthetics that younger generations have achieved, expanding the request around this type of treatment. Moreover, the use of social media like Instagram, Facebook and others has widespread the consciousness among a young population of a good looking smile and several studies report on the social impact of developmental defects of enamel on the perceived quality of life (3,4).

Developmental defects of enamel may involve pre-eruptive and post-eruptive etiologies. The pre-eruptive defects are: fluorosis, coeliac disease and malabsorption disorders, traumatic hypomineralization and molar incisor hypomineralization (MIH). The post-eruptive defects are the early caries lesions, frequently found after the removal of fixed orthodontic appliances (5), with a multifactorial

etiology, accounting for: environmental, lifestyle and diet factors (6-11).

Post-eruptive enamel defects are characterized by whitish halo located around the orthodontic brackets with opaque, matte, chalky white areas.

Pre-eruptive defect may present a more complex clinical aspect with different colors (white/cream and yellow/brown) and can appear as demarcated or diffuse opacities, lines or patchy, diffuse confluent opacities, or a combination of the previous features, or frankly hypoplastic. When the etiology involves a systemic disruption the defects are with symmetrical involvement of groups of homologous teeth (12,13).

The prevalence of permanent dentition ranges from 10% to 49%, depending on the Index used to collect the data. The clinical indices used to categorize enamel defects can be divided into (i) specific fluorosis indices (Dean/WHO, Tylstrup and Fejerskov, and TSIF indices) and (ii) descriptive indices (the Al-Alousi and the Developmental Defects of Enamel Index, the Modified DDE Index), with no etiological assumption (5).

Until recently, treatments like fluoride or caseine phosphopeptide have been used. However, the esthetic outcomes are often hindered by patient compliance, which is a specific concern in a young population. In addition, the aesthetic result after these procedures may be not acceptable (5,14).

A new minimally invasive treatment has recently been proposed that utilizes resin infiltration, comparable to dental sealants with regard to the minimally invasive approach (15). A recent study by Mazur et al. showed that resin infiltration has a strong positive aesthetic effect on hypomineralized enamel lesions in cases presenting with early caries lesions and developmental defects of enamel in a population of young adults. The efficacy of the treatment by Icon was objectively recognized and substantiated by spectrophotometric technology (16).

Besides, plenty of clinical and *in-vitro* studies showed the efficacy of Icon procedure in patients with enamel hypomineralization with different etiologies: i) coeliac disease (17); ii) post-orthodontic white spot lesions (18); iii) fluorosis (19).

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In cases where the micro-architecture of the defect within the enamel layer shows a deeper configuration and the outer side of the lesion has a smaller area than the floor of the lesion itself, as in certain types of hypomineralization of traumatic origin, and severe cases of fluorosis as in MIH, where the dentine-enamel junction may be involved, the Icon procedure is not effective alone. In these cases, the lesion is reached by resin infiltration after some cycles of sandblasting or milling aimed to remove the outer hypermineralized layer of enamel. This technique has been described by several Authors and called “deep enamel infiltration” (20,21).

The *in-vitro* color stability of this technique over time has shown controversial results (22,23). Although, the resin infiltration stability in *in-vivo* cases was evaluated as good (14), further future research is needed to validate it both in *in-vivo* than in *in-vitro* studies.

In conclusion, the new technique of resin infiltration, a product initially developed to halt caries in the posterior segment, has proven its efficacy in enamel hypomineralized lesions treatment, with a strong positive esthetic effect on enamel color abnormalities. Further investigations are necessary to explore the long-term stability of the esthetic outcome to provide a strong clinical recommendation.

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