

Rehabilitation of Teeth Affected By Amelogenesis Imperfecta In Mixed Dentition Period

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Abstracts: Amelogenesis Imperfecta (AI) is a hereditary developmental disorder affecting deposition, calcification or maturation of dental enamel in both the primary and permanent dentitions. Patients usually present tooth sensitivity as well as problems in chewing function and esthetics. In addition, dissatisfaction with the teeth appearance is often found, affecting the patient's social life. Oral rehabilitation of children with primary or mixed dentition is complex, since no definitive treatment can be done during periods of growth and until the end of eruption of the permanent dentition is accomplished. The purpose of this paper is to describe a case of hypoplastic amelogenesis imperfecta in a 9-year-old girl whose dissatisfaction with the appearance of her teeth led to impaired social functioning. Since the patient was in the mixed dentition stage, a temporary treatment aiming to improve dental esthetics, preserve oral function and allow for the recovery of the patient's self-confidence was performed. This approach markedly decreased the patient's dental hypersensitivity and improved functional chewing and esthetics. Positive psychological influence of the treatment on this patient was also observed. [Saurabh K et al NJIRM 2012; 3(2) : 167-172]

Key words: Amelogenesis imperfecta, Mixed dentition, Mouth rehabilitation, Dental esthetics

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Introduction: Amelogenesis imperfecta (AI) consists of a diverse group of genetically determined enamel defects not associated with any other systemic disorder. AI results from single-gene mutations that follow autosomal dominant, autosomal recessive or X-linked patterns of inheritance.^{4,20} All or some of the teeth in both primary and permanent dentition are affected.^{4,15,20} AI can occur as 3 main types, depending on the stage of enamel formation primarily affected: (1) hypoplastic; (2) hypomaturation; and (3) hypocalcified. The differential diagnosis among these 3 types is usually based on clinical and radiographic evaluation and on the mode of inheritance of the trait, as determined from family pedigrees.^{15,20} An affected individual may be classified as having one type of AI and, at the same time, have areas in one or more teeth that show enamel defects characteristic of other forms of AI, due to environmental and/or other genetic challenges. Recently, molecular studies and mutational analyses have established a correlation between AI and certain genes encoding specific enamel proteins.¹⁶ Alterations in the amelogenin gene (AMELX) are responsible for X-linked AI, whereas mutations in the enamelin gene (ENAM), enamelysin gene (MMP-20) and kallekrein-4 gene

(KLK-4) cause hypoplastic or hypomaturation AI with the autosomal pattern of inheritance.^{3,5,6,16} Genes responsible for the autosomal-dominant hypocalcified AI, however, have not been identified yet.¹⁶ In addition to the compromised appearance of their teeth, AI patients may face chewing function problems due to dental sensitivity and the reduced clinical crowns caused by attrition or incomplete eruption. Anterior open bite is also a common finding associated with AI.^{9,10,17,19}

Another aspect that cannot be underestimated is the psychological impact on patients since this pathology generally gives the teeth an unsatisfactory appearance. Therefore, patients may show low self-esteem and excessively introspective behaviour, which affects their socialization.^{2,10} A study conducted by Coffield et al¹ aimed to associate AI with a negative psychosocial outcome. The results showed that more AI patients reported being teased about their teeth and being unhappy with the colour, shape, and size of their teeth than did the unaffected patients. They also presented higher levels of social avoidance and distress, and fewer subjects with AI were married or in a committed relationship. Also found among AI patients were higher levels of dysfunction, discomfort, and disability attributable

to oral conditions and higher levels of fear of negative evaluation, especially at younger ages.

Case report : A 9-year-old girl sought treatment at the department of pedodontics, Manipal College of Dental Sciences, Manipal. Her chief complaint was the yellowish coloration of her teeth, which according to her father, made her ashamed of smiling and had a negative influence on her relationship with other children. Her medical history was insignificant. The clinical examination showed that the primary maxillary and mandibular canines and maxillary and mandibular molars were present along with permanent maxillary and mandibular incisors and permanent maxillary and mandibular first molars. The enamel surface of both primary and permanent teeth were yellowish brown and rough (Figure 1). The permanent teeth were not completely erupted. The patient also had complaints regarding sensitivity to cold or heat.



Fig. 1

Radiographic examination comprised periapical and panoramic X rays. The panoramic radiography showed that both primary and permanent teeth had thin enamel, whose radiodensity was higher than that of the dentine (Figure 2). The diagnosis of hypoplastic AI was established based on clinical and radiographic data as well as on the exclusion of other possible etiologic factors, such as trichodonto-osseous syndrome, dental fluorosis, or acquired enamel defects.

Initial treatment consisted of oral hygiene instructions, dietary counselling, impression for study casts and filling of the carious molar with glass ionomer cement. After a healing period of two weeks, the permanent maxillary and mandibular first molars were restored with posterior composite, and the permanent maxillary

and mandibular incisors received direct composite veneers (Figure 3).

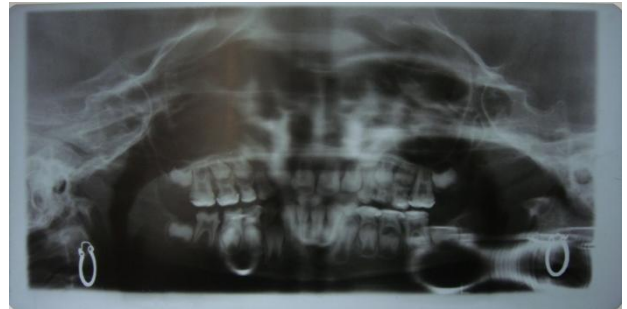


Fig. 2



Fig. 3

After the first phase of treatment, the patient and her family were satisfied with the results. The patient's motivation to change oral hygiene behaviour was confirmed by the improvement of her gingival health and reduction in tooth sensitivity. She was put on a 3-month recall regimen for routine preventive treatment, as the absence of the remaining permanent teeth precluded the performance of any other treatment.

Discussion: When treating AI child patients, professionals should adopt a comprehensive approach and plan a treatment capable of satisfying both patients and parents. The treatment implies motivation and involvement on the part of the young patient and the family. It is, thus, extremely important that all the steps and treatment options be carefully explained to the patients' families, along with the difficulties related to the rehabilitation process. The bonding between the restorative material and the defective enamel is one of the main obstacles during the rehabilitation of an AI patient. For all types of AI, according to Seow and Amaratunge,¹⁴ it is possible to obtain an etched surface after the use of 37%

phosphoric acid. Some types, however, lend themselves to better etching and bonding than others. It has been shown that an enamel treatment with 5% sodium hypochlorite for 1 minute, after acid conditioning, enhanced enamel bond strength in cases of hypocalcified AI.^{13,18}

According to the type of AI and the patient's age, many treatments have been proposed and various strategies may be used to overcome the compromised esthetics and function. There is general agreement that, when the patient is in primary or mixed dentition, the main goal is to provide a treatment that can reestablish esthetics and chewing function and reduce dental hypersensitivity and attrition until the patient approaches adulthood—when a permanent treatment can be planned.^{8,11,12} Transitional treatment can be obtained by placing stainless steel crowns on permanent and primary molars and strip crowns or direct and indirect composite veneers on anterior teeth.^{7,8,15,20} Some authors have also suggested the use of anterior stainless steel crowns with veneered facings.^{12,15,20}

A new protocol of laboratory-fabricated composite crowns and veneers luted adhesively on primary teeth without previous tooth preparation by rotary instruments has also been proposed.¹⁷ The use of porcelain-fused-to-metal crowns in posterior teeth and porcelain crowns or veneers in anterior teeth are recommended for permanent treatment.^{10,15,19,20} The simple treatment protocol followed in the case report helped the patient gain a functional and psychological satisfaction.

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