



Treating a Patient of Amelogenesis Imperfecta by Minimally Invasive Direct Composite Veneering Using Nanohybrid Composite – A Case Report

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Abstract

Amelogenesis imperfecta (AI) is a hereditary disorder of enamel formation, affecting both the permanent and deciduous dentitions. It can be classified into hypoplastic, hypomaturation and hypocalcified types and presents with different hereditary patterns. Amelogenesis imperfecta affects the quality and quantity of enamel. Patients usually suffer from oral complications and poor dental esthetics, which directly affect their quality of life. Function and esthetics can be restored with different restorative materials, such as ceramic and composite resin. Dentists need to be aware of the best material to use for each patient.

Keywords: *Amelogenesis imperfecta, APR, APT*

Introduction

The term Amelogenesis imperfecta (AI) describes genetically and clinically heterogeneous group of conditions arising due to mutations in a couple of genes that are essential for normal enamel formation. Mutations in the genes change the quantity and/or quality of enamel in the milk and permanent dentitions. Initially AI had been classified only according to the phenotype or the appearance. Recently the classifications include the phenotype and the mode of inheritance together.

The previous classification systems described AI as Four phenotypes:

- 1) hypoplastic,
- 2) hypomaturation,
- 3) hypocalcified,
- 4) hypoplastic-hypomaturation.

But now at least 14 AI subtypes have been identified considering together phenotype and mode of inheritance.¹⁻³ The prevalence of AI has been found to vary from 0.14% to 0.007% depending on the population examined.

AI subtype may be different still the patients have identical oral complications and compromised dental esthetics. All patients have dentition that may be discolored, sensitive, or susceptible to either preeruption or posteruption disintegration.^{3,4}

AI impacts the quality of life and self-esteem of affected people. In these patients, the condition is found to significantly affect psychological discomfort in relation to physical, psychological, and social disabilities.⁵

This article is aimed at describing minimally invasive techniques for the treating a young adult

male patients with AI based on conservative and adhesive treatments using direct composite veneering

Case Report

A young male patient in his early thirties presented to the department of Conservative dentistry and Endodontics of Bhojia dental college and hospital (Baddi, HP) with the complaint of discoloured dentition since childhood.

After clinical examination enamel was found to be porous, with generalized mottling and generalized discoloration of complete dentition (posterior and anterior). The enamel layer was easily distinguishable from the underlying dentin but was generally thin. The patient was not satisfied with the appearance of his dentition. Goals of the treatment were to prevent further tooth deterioration, improve esthetics, and restore oral functions.

Initially Oral prophylaxis to remove all hard deposits was done. After that upper and lower impressions of the patient were made and poured with dental stone to obtain study casts. A full wax-up was performed on the study casts, and a direct mock-up was carried out in the patient's mouth with an auto-mixing, self-curing resin (luxatemp).

Intraoral examination also found that lower lateral incisors of the patient were mesiolingually rotated that were build to the desired positions and alignments for asthetic pre-contouring (APR) as asthetic pre-evaluative temporaries (APT) to reduce actual enamel preparation to achieve minimally invasive procedure.

Severely malformed and soft enamel was removed and anterior incisors were restored, one by one, respecting the following protocol: enamel surface etched slightly longer with phosphoric acid for one min, rinsed with air/water spray for 30 seconds, dried for 60 seconds, two layers of adhesive (Single Bond2) applied and light-cured for 15 seconds. Low translucency or dentine shades of a nanohybrid composite (Tetric -N ceram, Ivoclar) were used to mask heavy enamel discoloration followed by the high translucency enamel shades. The contours and the dimensions of every single tooth were reresored

using "OptraSculpt pad (Ivoclar)" a modelling instrument with special foam pad attachments to facilitate the non-sticky placement and efficient contouring of anterior composite materials also with a reference scale on the instrument handle for recording the axis alignment and the width of the anterior teeth

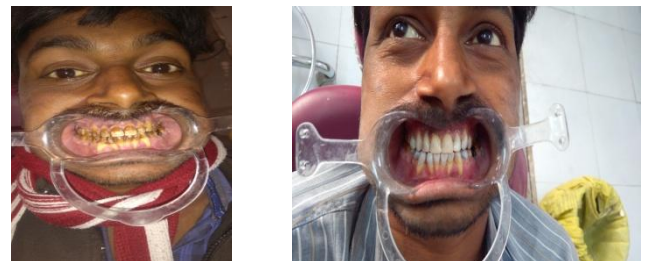


Fig. 1 (a) Preoperative patient photograph
(b) Postoperative patients photograph



Fig. 2 A pretreatment close-up view of the patient's dentition

Discussion

The biggest challenge for clinicians is to restore aesthetics and functions a young patient with AI. The options of treatment differs mainly on the basis of age of the patient, type of AI, severity of the disorder, and intraoral actual presentation.^{6,7} The literature suggests treatment options as composite resins, crowns made of stainless steel, all-ceramic crowns, and laminate veneers.^{2,3}

Most commonly recommended treatment for AI is the conventional crowns.^{8,9} this option is an invasive treatment consequently resulting in removal of considerable amount of healthy tooth structure. ceramic crown's design require an optimal tooth preparation that dictates further tooth-tissue loss and injury to the pulp, especially younger subjects.¹⁰ The depth and extent of the lesion decides whether to keep or remove enamel layers. The appearance of

the enamel during tooth preparation plays a decisive role.⁷

Many studies have advocated the use of all-ceramic crowns,^{4,10} but others advised minimally invasive treatments, including composite resin and laminate veneers.⁹ Composite resins can substitute tooth hues via stratified placement and use of various tints and opaquer to enhance the esthetic value. Success of direct composites over a longer time depends on patient selection, location and size of the cavity, choice of material, and conservative technique. Risks for failure include fracture and partial loss and change of shade of tooth restorations.

Conclusions

Treating patient of Amelogenesis Imperfect using direct composite resins has its own advantages of being minimally invasive, time saving avoiding certain lab procedures and its own disadvantage of less structural integrity, easy surface discoloration. But with the advent of newer and more advanced materials it successfully can be used to restore aesthetics and functions of a patient with AI.

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