

## ORAL REHABILITATION OF A YOUNG ADULT WITH HYPOPLASTIC AMELOGENESIS IMPERFECTA: A CLINICAL REPORT

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### Abstract

This clinical report describes the oral rehabilitation of a 20-year-old woman mental reterdate diagnosed with hypoplastic-type amelogenesis imperfecta (AI). The specific objectives of this treatment were to eliminate tooth sensitivity while enhancing esthetics and restoring masticatory function. Treatment included removal of several teeth, lengthening of the maxillary and mandibular clinical crowns, and placement of anterior and posterior metal-ceramic fixed partial dentures. One-year follow-up revealed satisfactory results.

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### Introduction

Amelogenesis imperfecta is a relatively rare group of inherited disorders characterized by abnormal enamel formation. The term amelogenesis imperfecta is reserved for hereditary defects of enamel that are not associated with defects in other parts of the body or other health problems. The prevalence of these conditions has been studied in only a few populations and has been reported to range from 1 in 700 to 1 in 15,000.<sup>1,2</sup>

Although amelogenesis imperfecta has been categorized into 4 broad groups primarily based on phenotype—hypoplastic, hypocalcified, hypomaturation, and hypomaturation-hypoplastic—at least 15 subtypes of AI exist when phenotype and mode of inheritance are considered.<sup>3,4</sup>

Hypoplastic AI is characterized by defects in the secretary process of ameloblasts that

result in thin or pitted enamel, which may be normal or altered in structure or composition. Hypocalcified AI results from an inability of crystallites to properly nucleate, which causes abnormal crystallite growth and decreased mineral content in enamel. Hypomature AI is caused by abnormal processing of the matrix proteins during maturation, resulting from either abnormal cleavage of enamel matrix proteins or abnormal proteinase activity.<sup>5</sup> Regardless of the subtype, clinical findings reveal similar oral complications, including the abnormal color and texture of the enamel, dental caries, tooth hypersensitivity, reduced occlusal vertical dimension, and abnormal esthetic appearance.<sup>6,7</sup> Other dental anomalies, including multiple impacted teeth, congenitally missing teeth, taurodontism, and an open occlusal relationship, can also be associated with the condition.<sup>4,8</sup>

There is no standard formula of care for successful treatment. While some patients may be treated with more conservative methods.<sup>9,10,11,12</sup> It has been a challenge to achieve an esthetic restoration together with a functional and stable occlusion in the most severe cases.<sup>13,14,15,16</sup>

Treatment planning for patients with AI is dependent on many factors, including the type and severity of the disorder, extent of destruction,

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and age and socioeconomic status of the patient. This report presents the complete mouth rehabilitation of a 20-year-old woman mental reterdate diagnosed with hypoplastic-type amelogenesis imperfecta.

### Clinical Report

A 20-year-old woman with features of a variant of AI was referred to the Department of Prosthodontics for oral rehabilitation. She sought to improve the appearance of her anterior teeth and her chewing ability (Fig. 1,2,3). The patient was particularly concerned about her oldlooking appearance and poor masticatory efficiency. A detailed medical, dental, and social history was obtained. She have no problem except mental retardition. Photographs and dental radiographs were made.



Fig. 1. Pretreatment

Mandibular and maxillary teeth showed very short clinical crown heights, resulting into loss of vertical dimension of occlusion. All teeth showed yellowish brown discoloration with rough irregular crowns. There was generalized dentinal hypersensitivity and generalized interdental spacing with no proximal contacts between teeth. Patient's oral hygiene was unsatisfactory. A panoramic radiograph revealed multiple impacted teeth in both arches (Fig. 4), impacted teeth of 13, 18, 23, 43, 48 were seen and extracted. Diagnostic impressions were made with irreversible hydrocolloid impression material (Tropicalgin, Zhermack, Italy) and poured in type III dental stone (Kalabhai Karson, Mumbai) to obtain diagnostic casts. Diagnostic casts were mounted on a semi adjustable articulator using facebow and centric interocclusal records.



Fig. 2. Pretreatment



Fig. 3. Pretreatment



Fig. 4. Panoramic radiograph

Using mounted diagnostic models, along with clinical and radiographic findings, the treatment plan was formulated. The patient was informed about the surgical, periodontal and restorative procedures required and all other treatment alternatives including the differences in costs, the levels of tooth structure removal, the expected clinical longevity, the time period necessary to conclude the treatment, and the

possible esthetic result. Treatment plan included operated of alveoplasty on the upper posterior arch for sufficient intermaxillar distance, extraction of 13,18,23,43,48 and followed by crown lengthening of all teeth with very short clinical crown heights and finally full mouth rehabilitation by metal-ceramic restorations.

According to treatment plan extraction of 13, 18, 23, 43, 48 and alveoplasty was done followed by peridontal treatment. 0.12% chlorhexidine gluconate mouthwash twice a day was prescribed to the patient and instructions regarding proper oral hygiene maintenance were given. Crown lengthening of required teeth was completed using surgical stent as a guide. After 2 weeks of healing, patient was recalled.



**Fig. 5.** Teeth Preparation

Maxillary and mandibular anterior and posterior teeth were prepared for metal-ceramic restorations. Laboratory- processed provisional restorations were fabricated at an increased occlusal vertical dimension (1.0 mm), lined with methyl methacrylate acrylic resin (Alike TemporaryC&B Resin;GC America, Alsip, Ill), and cemented with zinc-oxide eugenol (Temp- Bond; Kerr Corp). The patient wore the provisional restorations at the newly established occlusal vertical dimension for 3 months without complications. Irreversible hydrocolloid impressions (Jeltrate, Alginate, Fast Set; Dentsply Intl) of the provisional restorations were obtained and poured in Type IV dental stone (Silky-Rock; Whip Mix Corp).

Patient was kept under observation for a period of 3 months. At 3 months recall visit on examination and questioning patient did not reported any discomfort and she was very happy with esthetic and function with temporaries at increased vertical dimension of occlusion. As

patient was comfortable with raised vertical dimension of occlusion, it was decided to proceed with permanent restorations.

Mandibular and maxillary all temporaries were removed, gingival tissue was retracted using pre-impregnated retraction cord (PD dental products) and final impressions were made in vinyl polysiloxane impression material (Aquasil soft putty and light body, Dentsply). Impressions were poured in type IV dental stone (Silky-Rock; Whip Mix Corp) to obtain working casts. Working casts were mounted on the semi-adjustable articulator using facebow record and centric interocclusal record. Metal copings (KeraN, Germany) were fabricated and tried intraorally to check marginal accuracy and fit. Ceramic (d-Sign, Ivoclar Vident, Liechtenstein) build up was carried out followed by bisque trial. The patient's natural occlusal scheme (canine-protected occlusion) and anterior guidance were preserved in the definitive restorations to decrease lateral forces on the posterior dentition. After minor adjustments metal ceramic crowns were glazed, polished and cemented with zinc-polyacrylate cement (Poly F Plus; Dentsply DeTrey GmbH, Konstanz, Germany) (Fig. 6) according to manufacturer's power/liquid ratio.



**Fig. 6.** Posttreatment

Instructions regarding maintenance of proper oral hygiene were given to the patient and patient was recalled for evaluation at an interval of a month for 3 months.

At recall visits, patient was very happy with improved esthetic and function by oral rehabilitation. On clinical examination soft tissues were healthy and restorations in satisfactory function without any complications.

## Discussion

The prosthetic rehabilitation of AI patients has been previously presented in several case reports.<sup>11,12,17</sup> Historically, patients with AI have been treated with extractions or with the construction of complete removable dentures. These options are psychologically harsh when the problem must be addressed in adolescent patients. Currently the different materials and methods for restorative procedures are available and have made it both exciting and confusing for dental practitioners. It should be pointed out that, limitations exist, and the application of techniques are not universal.<sup>18</sup> The treatment for patients with amelogenesis imperfecta is related to many factors including the age of patients, the socio-economic status, the type and severity of the disorder, its intra oral manifestation and aesthetic and functional demands.

Treatment plan should have common goals i.e. functional, aesthetic and longevity of restoration, yet the approaches being slightly different. Adhesive restorative techniques, over-dentures, porcelainfused- to metal crowns, fixed partial dentures, full porcelain crowns, and inlay/onlay restorations are all used for the prosthodontic treatment of AI patients.<sup>12,13,18</sup>

This clinical report describes the use of all-ceramic and metal-ceramic restorations for rehabilitation of a patient with hypoplastic type of AI. The restoration of aesthetics and function in patients with AI can be achieved by making an accurate diagnosis, meticulous treatment planning, together with a dedicated team approach involving different disciplines in dentistry.

**In conclusion**, AI is a serious problem that can result in reduced oral health-related quality of life and causes some physiological problems. From this point of view, people with AI need extensive treatment. While planning the treatment, the age and the socioeconomic status of the patient, type and the severity of the disorder should be taken into consideration. In these cases, multidisciplinary approach is important for treatment success. In the present case, the patient tolerated well the use of dentures after the routine controls.

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