

Prosthodontic rehabilitation of a patient with amelogenesis imperfecta

Clinical Report

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ABSTRACT

Amelogenesis imperfecta has been described as a complex group of hereditary enamel defects that disturbs the enamel structure and exists independent of any related systemic disorder. A 24-year-old male patient presented with discolored and hypersensitive teeth. The aim of the treatment was to reduce dental hypersensitivity and restore esthetics and masticatory function. The maxillary and mandibular teeth were prepared and metal ceramic crowns were cemented on the prepared teeth. The final treatment result provided the patient with improved dental esthetics and functional efficiency that enhanced his self-image.

KEY WORDS: Amelogenesis imperfecta, full mouth rehabilitation, metal ceramic crowns

DOI: 10.4103/0972-4052.52864

INTRODUCTION

Amelogenesis imperfecta has been described as a complex group of hereditary enamel defects that disturbs the enamel structure and exists independent of any related systemic disorder.^[1] Both deciduous and permanent teeth are affected. The disturbance affects only the epithelial derivatives (enamel). Therefore the mesenchymal derivatives (dentine, pulp and cementum) are normal. The prevalence of Amelogenesis imperfecta in the general population is reported at between 1:700 to 1:14,000.^[2] Amelogenesis imperfecta has been classified into three groups based on clinical and radiographic features, histologic appearance and mode of inheritance: Type 1 hypo plastic - enamel is formed in reduced quantity but is relatively well mineralized; Type 2 hypo calcification - enamel is formed in normal amounts but is relatively less mineralized; and Type 3 hypo maturation - the final stages of mineralization are abnormal.^[3] The primary clinical problems associated with Amelogenesis imperfecta are esthetics, dental sensitivity and loss of vertical dimension of occlusion. The severity of dental problems experienced by the patient varies with each type of Amelogenesis imperfecta.^[4]

The clinical features distinguishing hypo plastic from hypo calcification are that in the former the enamel does not develop to normal thickness, whereas in the latter the enamel of a newly erupted tooth is of normal thickness but soft and friable, and can be easily removed from the underlying dentin. The hypo maturation type differs from the hypo calcification type in that the enamel is harder with a mottled opaque white to yellow-brown or red-brown color and tends to chip away from the underlying dentin.^[5]

Historically, treatment of patients with Amelogenesis imperfecta has included multiple extractions and fabrication of complete dentures.^[4] This treatment option is psychologically harsh especially when addressing an adolescent patient.^[6] The treatment plan for a patient with Amelogenesis imperfecta depends upon factors such as the age of the patient, his socioeconomic status, the type and severity of the disorder and the intra-oral situation at the time of presentation.

CASE REPORT

A 24-year-old male patient reported to the department

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Figure 1: Intra-oral view of the 24-year-old male patient's teeth with Amelogenesis imperfecta



Figure 2: Occlusal view of lower teeth showing severe attrition and loss of cuspal anatomy



Figure 3: Diagnostic casts mounted on Whip Mix articulator



Figure 4: Tooth prepared to receive metal ceramic crowns



Figure 5: Diagnostic wax up



Figure 6: Intra-oral view after cementation of final restorations



Figure 7: Extra-oral views of the patient after the final restorations were cemented

of prosthodontics with a chief complaint of displeasure with his present dental appearance. He also complained of sensitivity of his teeth. A detailed medical, dental and social history was obtained. Photographs and dental radiographs were made.

The patient's intra-oral examination revealed that he had all permanent teeth present. All the patient's teeth showed yellowish brown discoloration [Figure 1]. The molars were severely attrited, the enamel layer was very thin and cuspal structure was completely absent [Figure 2]. The patient's right and left upper lateral incisors were palatally placed. The patient's occlusal

vertical dimension and rest vertical dimension was assessed. The inter-occlusal rest space had increased because of attrition of posterior teeth. It was concluded that the patient likely suffered from the hypo maturation type of Amelogenesis imperfecta.

A treatment plan was drawn with the following aims: improving the esthetics, increasing the vertical dimension of occlusion, restoring the masticatory function and reducing hypersensitivity of attrited teeth. It was planned to extract the patient's upper lateral incisors which were palatally placed, as the patient was not keen to undergo orthodontic treatment due to its long duration. The extracted lateral incisors would be replaced by metal ceramic fixed partial dentures. Fabrication of metal ceramic crowns for the rest of the teeth was planned. The treatment plan was explained to the patient and he accepted it.

The patient was placed on an intensive oral hygiene program because of his inadequate oral hygiene. Complete maxillary and mandibular arch impressions were made using irreversible hydrocolloid (Zelgan 2002; Dust free Alginate, Dentsply DeTrey GmbH, Konstanz, Germany). Diagnostic casts were fabricated from type 3 dental stone (Lab stone; Kalabhai Karson, Mumbai, India) and mounted on a semi-adjustable articulator (Whip Mix articulator; Model 8500, Whip Mix corporation, Louisville, USA) using a face bow transfer (Quick mount face bow; Model 8645, Whip Mix corporation, Louisville, USA) and centric relation record using base plate wax (Modeling wax; Hindustan company, Hyderabad, India) lined by zinc oxide eugenol impression paste (DPI impression paste; Mumbai, India) [Figure 3]. The articulator was programmed using protrusive and lateral records. It was planned to increase the vertical dimension of occlusion by 2 mm using occlusal splint for a period of 4 weeks. Phonetics and Niswonger's technique were used to establish the new vertical dimension of occlusion.

Maxillary and mandibular posterior teeth were prepared to receive metal ceramic crowns [Figure 4]. The occlusal scheme was developed through diagnostic waxing [Figure 5]. Provisional restorations (Protemp II Temporization material; 3M ESPE Dental products, St. Paul, USA) were fabricated from the diagnostic wax up. The provisional restorations were cemented on the prepared tooth using non-eugenol temporary cement (Temp-bond cement; Kerr, USA). The patient wore the

provisional restorations at the new vertical dimension of occlusion for 6 months.

Definitive impressions of the prepared maxillary and mandibular posterior teeth were obtained using polyvinylsiloxane impression material using putty wash technique (Reprosil; Dentsply India, Bangalore, India). Final casts were generated from type 4 die stone (Kalrock; Kalabhai karson PVT.LTD, Mumbai, India) and mounted on the articulator using inter-occlusal records made of hard base plate wax lined with zinc oxide eugenol impression paste. The metal ceramic crowns for the maxillary and mandibular posterior teeth were fabricated and evaluated intra-orally. Any occlusal corrections were carried out prior to glazing and the glazed crowns were cemented with resin cement (RelyX ARC Adhesive Resin Cement; 3M ESPE, USA).

Subsequently maxillary and mandibular anterior teeth were prepared to receive metal ceramic fixed partial dentures and metal ceramic crowns. Definitive impressions of the prepared maxillary and mandibular anterior teeth were obtained using polyvinylsiloxane impression material using putty wash technique. Final casts were generated from type 4 die stone and mounted on the articulator using inter-occlusal records. Two anterior 3 unit fixed partial dentures replacing maxillary right and left lateral incisors were fabricated, evaluated intra-orally, adjusted, and cemented with resin cement. Individual metal ceramic crowns were fabricated for the lower anterior teeth, evaluated and cemented. The outcome of the treatment in terms of function and esthetics satisfied the expectations of both the patient and the dentist [Figures 6, 7]. The patient was monitored at three month intervals for one year and then once a year for check up.

DISCUSSION

There are several alternatives for treatment of Amelogenesis imperfecta. The most predictable and durable esthetic option is to restore the affected teeth with complete crowns. Though this treatment option is an invasive one involving removal of substantial tooth structure, it is still more conservative than other considered alternatives, which involve extraction of remaining teeth and placement of removable prosthesis. This treatment option, however, requires the patient to maintain meticulous oral hygiene.

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