

## AN INTERDISCIPLINARY APPROACH IN A PATIENT WITH AMELOGENESIS IMPERFECTA: A CLINICAL REPORT AND LITERATURE REVIEW\*\*

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### Abstract

This clinical report describes an interdisciplinary approach for the coordinated treatment of a 20-year-old woman patient diagnosed with amelogenesis imperfecta. The treatment objective was to restore masticatory function, to reduce dental sensitivity and improve the facial esthetics.

A multidisciplinary team approach treatment is recommended, including periodontology, orthodontics, endodontics, and prosthodontics. Prosthodontic treatment included composite laminate veneers and metal-ceramic fixed partial dentures.

After treatment the patient was regularly recalled during the 25-months postoperative period. Radiographic and clinical examinations at recall revealed no evidence of complications associated with the restored teeth or their supporting structures.

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### Introduction

Amelogenesis imperfecta (AI) is an inherited disorder affects both the primary and

permanent dentitions and independent of any related systemic disorder<sup>1-2</sup>.

AI is characterised by enamel defects, these defects can be observed in the quality and quantity of the enamel<sup>2-4</sup>. The malformed enamel can be unusually thin, soft, rough, friable and stained. The inheritance patterns include autosomal or X-related dominant or recessive. The incidence of amelogenesis imperfecta is reported to vary between approximately 1/700 and 1/16,000<sup>5-7</sup>.

Researchers have demonstrated that it is possible to delineate at least 15 distinct types of amelogenesis imperfecta using a combination of clinical, radiological, histological and hereditary

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findings 1<sup>6-8</sup>. With these findings 4 broad groups can be classified as hypocalcified, hypoplastic and hypomaturation, and hypomaturation-hypoplastic<sup>9</sup>.

The different forms of amelogenesis imperfecta are thought to reflect differences in the timing, during amelogenesis, when the disruption occurred. The earliest defect affect formation of the dentino-enamel junction, a severe defect might block subsequent enamel formation and cause enamel agenesis, where there is almost no clinical or radiographic evidence of enamel<sup>8-10</sup>.

The physiologic and psychosocial value of prosthetic dental rehabilitation in patients with amelogenesis imperfecta has been emphasized. Prosthetic treatment is important due to reduce dental sensitivity, improve the occlusion and esthetics<sup>6,11</sup>.

The treatment plan for patients with amelogenesis imperfecta is related to many factors including the age of the patient, the type and severity of disorder, intraoral situation, and the socioeconomic status of the patient at the time the treatment plan is developed<sup>1,12,13</sup>.

Financial constraints, severity, subtype and/or other priorities may restrict patients from choosing the most desirable treatment. Prosthetic solutions for AI include removable partial dentures, fixed partial dentures, and endosseous implants<sup>13,14</sup>.

In this case, a team consisting of a pedodontist, an orthodontist, a periodontologist, and a prosthodontist were involved in the management of the patient over a 6-months period. Treatment included preventive advice, periodontal therapies, one phase of orthodontic treatment, endodontic treatment, composite laminate restorations in the anterior region and metal-ceramic fixed partial dentures in the posterior region.

Treatment of different AI types depends on the specific AI type and the character of the affected enamel. Thus the dentist has to diagnose the condition as early as possible to offer early intervention and balance the decision for early intervention and long-term survival of the restorations<sup>15</sup>.

### Case Report

A 20-year-old woman was referred to the Department of Prosthodontics at Dicle University

Faculty of Dentistry, for treatment of sensitivity, attrition of her teeth, and reduced masticatory function (Fig.1). A detailed medical, dental, and social history was obtained. The patient was submitted to clinical and radiographic evaluation in order to establish a treatment plan. Photographs, panoramic and cephalometric radiographs were obtained.



Figure 1. Preperiodontal therapy appearance

The patient's mandibular right second premolar had been extracted due to caries. The enamel layer was thinner and nearly absent in the occlusal portion of the molars than in corresponding non-affected teeth. The enamel was in these cases so soft that it was often lost soon after eruption. Enamel pit defects were present in the anterior teeth. It was yellowish Brown (Fig. 2 A).



Figure 2A. Postperiodontal therapy appearance.

Due to the complex needs of the patient, an interdisciplinary treatment was developed. First, periodontal therapy was done. Therapy was done 3 weeks (Figs. 2 B, 2 C). Then the patient was evaluated orthodontically by using the casts, radiographs and their clinical appearance. Because of financial constraints full mouth orthodontic therapy was not applied. The axis of

maxillary left and right central incisor was corrected by Roth technique<sup>8</sup>. Orthodontic treatment of the patient lasted approximately 1 months, brackets was removed (Figs. 3 A).



**Figure 2 B.** Pretreatment occlusal views.



**Figure 2 C.** Pretreatment occlusal views.



**Figure 3 A.** After orthodontic therapy. Direct composite resin laminates were formed.

A treatment plan was developed with the following aims: to restore masticatory function, to improve the esthetics for prosthodontics.

Diagnostic casts were made. Casts were mounted in centric relation in a semi-adjustable articulator. The patient had canine-protected occlusion.

Porcelain laminate veneers are relatively expensive, for this reason direct resin composite laminate veneers were formed of the maxillary central incisors and mandibular anterior teeth (Clearfil AP-X; Kuraray Co Ltd) (Fig. 3 B).



**Figure 3 B.** Posttreatment frontal view of teeth.

For excessive abrasion of the patient's maxillary left and right lateral incisor and canine incisor teeth root canal treatments were done. After root treatment post placement were done. Maxillar left and right lateral, left and right canine, left end right first and second premolars, and mandibular right first premolar and molar teeth were prepared and metal-ceramic fixed partial dentures were made.

Impressions for prepared teeth were made with silicone material (Elite H-D; Zhermack).

Metal-ceramic fixed partial dentures were placed on teeth to modify the occlusion cemented with zinc-polycarboksilate cement (Adhesor<sup>®</sup> Carbofine, Spofa Dental a.s, Westendstraße, Frankfurt, Germany) using the manufacturer's recommended power/liquid ratio (Figs 3 C, 3 D).

Clinical examination 25 months after treatment revealed no evidence of disorders associated with the restored teeth or their supporting structures.





Figure 3 C. Lateral view of teeth.



Figure 3 D. Lateral view of teeth.

### Conclusions

The function and esthetics of this patient were improved with the combined periodontal, orthodontic, restorative, and prosthodontic treatment. Although the combination of full arch orthodontic therapy and ceramic laminates was presented as part of the optimum treatment plan to achieve the best occlusal and esthetic result, the patient declined this option due to the significant financial burden.

Metal-ceramic fixed partial dentures and direct resin composite laminate veneers can be a reversible, relatively inexpensive method of treatment for amelogenesis imperfecta patients with a reduced number of teeth and limited finances.

The treatment improved esthetics and oral function and established a more favorable plane of occlusion.

### Declaration of Interest

The authors report no conflict of interest and the article is not funded or supported by any research grant.

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