



INTERDISCIPLINARY TREATMENT OF AMELOGENESIS IMPERFECTA: A CASE REPORT

AMALOGENEZİS İMPERFEKTANIN İNTERDİSİPLİNER TEDAVİSİ: VAKA RAPORU

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ABSTRACT

This clinical report describes an interdisciplinary (orthodontics and prosthodontics) treatment approach of an adolescent male subject with amelogenesis imperfecta. Fixed orthodontic treatment was applied to the maxillary teeth and the active orthodontic treatment lasted for 15 months. After a retention period of 6 months, metal-ceramic fixed partial dentures were prepared. The prosthetic restoration produced good functional and esthetics results and patient pleasure.

Key Words: Amelogenesis imperfecta, fixed orthodontic therapy, prosthodontic restoration.

ÖZET

Bu klinik çalışma, amelogenesis imperfektalı adolesan erkek bir hastanın ortodontik-protetik tedavisini göstermektedir. Hastanın üst diş kavsine 15 ay süre ile sabit ortodontik tedavi uygulandı. Altı aylık pekiştirme tedavisi sonrasında metal-seramik sabit protezler hazırlandı. Protetik restorasyon ile iyi bir fonksiyonel ve estetik sonuç ile birlikte hasta memnuniyeti elde edildi.

Anahtar Kelimeler: Amelogenesis imperfekta, sabit ortodontik tedavi, sabit protetik tedavi

INTRODUCTION

Amelogenesis imperfecta (AI) is a hereditary disorder that disturbs the formation of dental enamel both in primary and permanent dentition.^{1,2} Prevalence of this problem varies from 1:7000 to 1:14000, according to the population studied.³ This condition causes the teeth to be unusually small, discolored, pitted or grooved, prone to rapid wear and breakage. Amelogenesis imperfecta is generally classified as hypoplastic, hypocalcified, and hypomature, although many classification have been described in the literature.³

Esthetic improvements and functional rehabilitation of these cases are very important, since main concerns of these patients are their appearance and oral functions. Appropriate treatment applications produce a decrease in dental hypersensitivity and improvements in esthetics and function as well as a positive psychological influence.⁴

An interdisciplinary treatment approach is essential for diagnosis, treatment planning and excellent functional and esthetic outcomes. Orthodontics, prosthodontics, and restorative dentistry are the disciplines for the desired outcomes.

A number of studies have been reported about the early or late orthodontic interventions in amelogenesis imperfecta.⁵⁻¹⁰ However, orthodontic treatment with fixed appliances has been disregarded in these cases. In literature, there is only one case report treated by fixed orthodontic appliances.⁸ In general, removable appliances are used to correct the possible malocclusions seen in these cases.^{5-7,9,10} It is well known that excellent functional and esthetics outcomes can be obtained only by fixed orthodontic mechanics.¹¹ The advantages of fixed appliances can be summarized as follows: to move teeth effectively in all three planes of space, to move teeth bodily, and to torque teeth in buccolingual direction. For these

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reasons, edgewise appliances produce the finest and most stable occlusion.

This clinical report describes an interdisciplinary treatment approach including fixed orthodontic and prosthodontic treatment of a patient having AI and orthodontic disorders.

CLINICAL REPORT

A male patient, 16 years and 5 months of age, was referred to orthodontic department with the complaint of displeasure from size, shape, sensitivity, and malocclusion of his teeth and of poor masticatory efficiency. Medical, dental and social history revealed that: (I) there is no contradiction for dental therapy and (II) unfavorable social condition related to the appearance of his teeth. Orthodontic examination showed that the patient had super Class I molar relationship in the right side and Class I molar relationship in the left, mild skeletal Class III relationship, moderate spacing between the maxillary incisors and some crowding in premolar and canine areas. Upper left canine tooth could not erupt into to the arch due to crowding. Stainless steel crowns were present on the first molars (Figures 1, 2).

An interdisciplinary (orthodontics and prosthodontics) treatment approach was planned. Orthodontic treatment objectives were to correct crowding/ spacing, to improve facial profile, and to achieve a good functional Class I occlusion. No orthodontic treatment was planned for mandibular dentition. Pre-adjusted fixed edgewise appliances (0.018" X 0.022") were banded and bonded to the maxillary teeth. After the correction of crowding and spacing problems, rectangular stainless steel arch wires were used to obtain proper incisor torque and to coordinate the dental arches (Figure 3). The remaining spaces were distributed equally between the incisor teeth. The fixed appliances were kept in the mouth 1 year and 3 months. After the debanding and debonding procedures, removable retainers were used for 6 months to maintain the obtained results.

Prosthodontic treatment phase began for the construction of metal-ceramic restorations. Laboratory- processed provisional restorations were fabricated at an increased occlusal vertical dimension (3.0 mm), lined with methyl methacrylate acrylic resin (Major C&B-V Dentine, Major, Moncalieri, Italy) and cemented with zinc-oxide eugenol (Temp-Bond; Kerr Corp). The patient wore the provisional restorations at



Figure 1. Pre-treatment intra-oral photographs



Figure 2. Pre-treatment orthopantomography

the newly established occlusal vertical dimension for 6 months without complications. Definitive impressions of the prepared maxillary and mandibular anterior teeth were obtained using vinyl polysiloxane impression material (Elite H-D; Zhermack). Working models were obtained from Type IV die stone (Bego Bremer Goldschlagerei Herbst GMBH Germany, 6124166) and mounted to the articulator with interocclusal records. Full arch metal-ceramic fixed dentures were planned due to financial restrictions of the patient. Full arch metal-ceramic fixed partial dentures (Ivoclar Vivadent) were fabricated, and after the control and adjustment of occlusal relationships, they were cemented with glass ionomer cement (Meron, Voco, Cuxhaven, Germany) (Figure 4). Recall evaluations at 6-month intervals were done for a period of 1 year, and the patient did not complain from tooth sensitivity or any other complication associated with the oral rehabilitation. The patient's esthetic and functional expectations were also implemented.

outcomes.¹¹ Fixed appliances can move teeth effectively in all three planes of space by bodily movement and controlled torque in an arch. For these reasons, the edgewise appliance, if properly placed and adjusted, can produce the finest and most stable finished occlusion.

The reasons of avoidance from fixed orthodontic treatment may be the difficulty in bonding procedures and reduced bond strength of brackets due to hypo-plastic and hypo-calcified enamel structure. In the present study, the brackets were bonded to the teeth by reduced etching time. Hiraishi et al¹³ showed that extended etching time had an adverse effect on micro-tensile bond strength.

After the completion of orthodontic treatment, the patient referred to prosthetic department for metal-ceramic restoration. The patient was satisfied with his new fixed partial dentures, and controlled at 6-month intervals for tooth sensitivity or any other complication associated with the oral rehabilitation. No abnormal situation was noted during the treatment and observation periods.



Figure 3. Intra-oral photographs of the case during orthodontic therapy



Figure 4. Post-treatment intra-oral photographs of the case

DISCUSSION

Several treatment alternatives have been proposed for the treatment of AI.^{2,5,10,12} Removable appliances are usually preferred during the orthodontic treatment phase. However, it is well known that fixed orthodontic appliances have some advantages to obtain excellent functional and esthetics

As a conclusion, this case report describes the functional and esthetic rehabilitation of a patient with AI by means of fixed orthodontic treatment and metal-ceramic restorations.

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