

PROSTHETIC REHABILITATION OF AMELOGENESIS IMPERFECTA- RESTORING FUNCTION AND ESTHETICS-A CASE REPORT

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ABSTRACT

The treatment of amelogenesis imperfecta (AI) with an anterior open bite (AOB) is a challenge for the clinician and often requires a multidisciplinary team of specialists. The specific objectives of this treatment were to enhance esthetics and to restore masticatory function. Treatment included removal of few teeth, lengthening of the maxillary and mandibular clinical crowns, and placement of anterior and posterior metal ceramic fixed partial dentures. Subsequent prosthodontic therapy consisted of 28 metal supported-ceramic crowns whereby a solid interdigitation, a canine guidance, and consistent and regular contacts between tooth crowns could be achieved to assure a good functional and esthetic oral situation. The tooth preparation techniques guaranteed minimally invasive treatment. The patient's mood was affected very positively.

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AMELOGENEZİS İMPERFEKTALİ HASTALARIN PROTETİK TEDAVİSİ-FONKSİYON VE ESTETİĞİN SAĞLANMASI-VAKA RAPORU

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ÖZ

Amelogenezis İmperfekta'nın ön açık kapanışla beraber görüldüğü vakalar klinisyenler için komplike ve multidisipliner yaklaşım gerektiren durumlardır. Özellikle çiğneme fonksiyonunu yeniden kazandırmak ve estetiği sağlamak öncelikli hedefi oluşturmaktadır. Tedavi protokolü bazı dişlerin çekilmesi, maksiler ve mandibular dişlerin klinik kron boylarının uzatılması ve dişlerin metal destekli seramik kronlarla restore edilmesini içermektedir. İyi bir fonksiyon ve estetiği sağlamak amaçlı kanin rehberliği ve 28 metal destekli seramik kronların birbirleri ve karşılıklı uyumlu ve çakışmasız kontakt ilişkilerinin sağlanması esastır. Diş preparasyonu minimum doku uzaklaştırılması prensipleri dahilinde gerçekleştirilmiştir. Hastanın ruh hali tedavi sonucunda olumlu yönde değişmiştir.

Sorumlu Yazar

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INTRODUCTION

Genetically determined and rare dysplasia of the enamel formation are known as amelogenesis imperfecta (AI) and have been classified into several groups by various authors¹⁻⁴. Although amelogenesis imperfecta has been categorized into four broad groups primarily based on phenotype-hypoplastic, hypocalcified, hypomaturational, and hypomaturational-hypoplastic, at least 15 subtypes of amelogenesis imperfecta exist when phenotype and mode of inheritance are considered. According to the literature, AI patients, regardless of subtype, have similar oral complications: abnormal formation of enamel, teeth with abnormal colour; yellow, brown or grey, higher risk of dental caries, tooth sensitivity, poor dental esthetics, and decreased occlusal vertical dimension^{2,5}.

The trait of amelogenesis imperfecta can be transmitted by an autosomal dominant, autosomal recessive, or X-linked mode of inheritance. The distribution of AI types is known to vary among different populations. In a study in Sweden, 63% of the cases were inherited as autosomal dominant. In contrast, in a study in the Middle East, the most common prevalent type of AI was found to be autosomal recessive⁴. The estimated prevalence of AI depends on diagnostic criteria as well as population, and is estimated to be between 1:700 and 1:14000.¹ Even though AI is by definition a disorder of enamel, it has been associated with several other dental anomalies including disturbances in eruption, congenitally missing teeth, anterior open bite (AOB), pulpa calcifications, pathologic root and crown resorption, and taurodontism. The incidence of AOB in patients with AI varies from 24% to 60%.¹

Restoration of these defects is important not only because of esthetic and functional concerns, but also there may be a positive psychological impact for the patient. Treatment planning for patients with AI is related to many factors; the age and socioeconomic status of the patient, the type and severity of the disorder, and the intraoral situation at the time the treatment is planned^{2,5}.

CASE REPORT

A 20-year-old man previously diagnosed with hypomaturational amelogenesis imperfecta presented for treatment in the Department of Prosthodontics at Ankara University. Primary concerns of the patient included dissatisfaction with the size, shape, shade of his teeth, food

accumulation, bad odour and poor masticatory efficiency.²

Prior to the treatment, a detailed dental, medical, and social history was obtained from the patient. Clinical examination of the patient revealed functional Angle Class I Dental relationship with open-bite and multiple diastemas (Figure 1). With evidence of gingivitis, oral hygiene was not judged satisfactory at the first visit, although the patient demonstrated a good knowledge of enhancing oral hygiene. The patient reported that his 16-year-old brother had also suffered from the same disease (Figure 2).

Before the treatment, complete treatment plan was explained to the patient. All factors, including the amount of tooth structure removal, soft tissue surgery, need for endodontic therapy, extractions of teeth, expected clinical longevity, and duration of treatment were discussed with the patient and fully signed consent was obtained.

In the first phase of treatment, oral prophylaxis was



Figure 1. After crown lengthening intraoral view



Figure 2. Patient's 16-year-old brother's intraoral view

CLINICAL DENTISTRY AND RESEARCH

performed followed by a root planning. The patient was placed on a 0.12 % chlorhexidine gluconate oral rinse, with a recommended use of twice daily. In the second phase of treatment, extractions of 26 and 46 carried out. Endodontic treatment was performed on the left upper second molar teeth.

In the third phase, periodontal surgery was designed. Gingivectomy and gingivoplasty were performed in the all of the maxiller and mandibular teeth area to adjust the height of the cervical line. After the surgery, the patient was given postsurgical instructions and oral hygiene was reinforced. The sites were allowed to heal for 3-4 weeks.

Under local anesthesia, all teeth were prepared with chamfer margins of 0.5 to 0.7 mm circumferentially and a occlusal reduction of 1.5 mm (Figure 3). Complete arch impressions were made with an irreversible hydrocolloid for both the fabrication of acryilic provisional restorations in the laboratory in order to keep the margins healthy and well shaped, and obtainment of the diagnostic cast models. The provisional restorations were fabricated on a semiadjustable articulator and subsequently were cemented with zinc oxide eugenol cement (Temporary cement, Cavex, NL). The anterior guidance was established with the diagnostic wax up and it was incorporated in the temporary restorations. After 3 days, the provisional restorations of maxillary and mandibular teeth were removed and final impressions were made with an additional silicone impression material (Xantopren and Optosil Comfort, Heraeus, Germany).The working casts were mounted on a articulator and the framework for each tooth waxed individually.

A trial evalution of the metal substructure, prior to glazing of the ceramic material, enabled final anterior guidance and occlusal refinement (Figure 4). The crowns were cemented with a zinc polycarboxylate cement (Poly-F Plus, Dentsply De Trey, USA) using the manufacturer's recommended power/liquid ratio (Figure 5).

Subsequent prosthodontic therapy consisted of 28 metal supported-ceramic crowns whereby a solid interdigitation, a canine guidance, and consistent and regular contacts between tooth crowns could be achieved to assure a good functional and esthetic oral situation.

At the 1 and 3-year recall, the situaiton was esthetically,clinically, and radiologically unchanged, and no pathology associated with the rehabilitation was detected (Figure 6).



Figure 3. Tooth preparation of maxillar and mandibular teeth



Figure 4. Framework for each tooth, waxed individually for maxilla and mandibula



Figure 5. Intraoral views after prosthodontic rehabilitation with all metal-supported porcelain crowns.

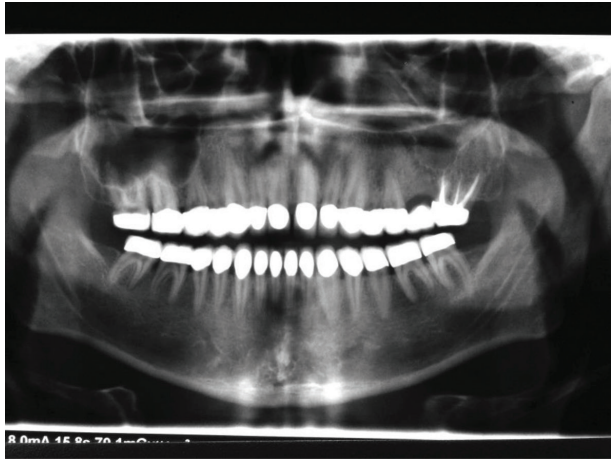


Figure 6. 2nd year follow-up panoramic radiograph of the patient

DISCUSSION

The extensive rehabilitation of a young patient with a generalized AI in combination with an AOB is a challenge for any clinician, and a multidisciplinary team of dentists needs to be involved in the care plan. Several factors have to be taken into consideration, including the often young age of the patient, the quality and quantity of existing enamel and tooth substance, the periodontal condition, the long-term prognosis and stability of the result, and the total cost of treatment.^{1,6}

The need for crown lengthening is dictated by dental and patient factors. After crown lengthening it should be possible to replace the restoration margins above, or at, the gingival level. It is well documented in the literature that this creates a more favorable condition to allow periodontal health. Hence, periodontal health is cornerstone of any successful restorative procedure.^{4,7}

Management of AI in the young adult using fixed prosthodontics is not a novel approach, but is possibly an underutilized one. The fixed prosthodontic treatment selected, albeit invasive, is more conservative than other considered alternatives.^{5,8}

Other treatment methods involving extractions of remaining teeth and placement of removable prostheses or extractions of remaining teeth combined with implant-supported fixed or removable prosthodontics are considerably more radical and have greater incidence of clinical complications than conventional fixed and removable prosthodontics.^{1,3,6}

Amelogenesis Imperfecta patients are mostly act like a "social phobia" disorder patients characterized by intense fear in social situations, causing considerable distress and impaired ability to function in at least some parts of daily life.⁹ These fears can be triggered by perceived or actual scrutiny from others. While the fear of social interaction may be recognized by the person as excessive or unreasonable, overcoming it can be quite difficult. Some people suffering from social anxiety disorder fear a wide range of social situations while others may only show anxiety in performance situations. The reason of that situation is the mainly lack of self confidence because of unesthetic appearance. When the esthetic appearance restores, the self-confidence and being at peace with the social life comes after.

CONCLUSION

This clinical report described the oral rehabilitation of a young adult patient affected by hypomaturational amelogenesis imperfecta. After lengthening the clinical crowns of the posterior teeth, the rehabilitation included multiple anterior and posterior metal-ceramic fixed partial dentures to eliminate tooth sensitivity, improve esthetics, psychology and restore function.

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CLINICAL DENTISTRY AND RESEARCH

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