

Case Report / Olgu Sunumu

Renewed Overdenture Prosthetic Restoration in a Child with Ectodermal Dysplasia: Case Report

Ektodermal Displazili Çocuk Hastada Yenilenen Overdenture Protetik Restorasyon: Vaka Sunumu

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ABSTRACT: Ectodermal dysplasia is a genetic disorder that occurs in the embryological period due to abnormal development of structures originating from the ectoderm such as teeth, skin, hair, nails, and sweat glands. Oligodontia and anodontia can be seen in many children with this disorder. Prosthetic restorations are essential for these patients to restore chewing and speech function. Furthermore, dentures must be replaced at regular intervals following growth and development. In this case, the restoration, which was initially placed two years ago, was replaced with a removable upper denture and an overdenture on a mandibular implant, following the same plan due to lack of retention and incompatibility, thus improving the patient's quality of life.

Keywords: Anodontia, ectodermal dysplasia, oligodontia, overdenture denture, removable partial denture

ÖZET: Ektodermal displazi; embriyolojik dönemde diş, deri, saç, tırnak, ter bezleri gibi ektodermden kaynaklı yapıların anormal gelişimiyle oluşan genetik bir bozukluktur. Bu bozukluğa sahip birçok çocukta oligodonti ve anodonti görülebilmektedir. Bu tip hastalarda çiğneme ve konuşma fonksiyonunu sağlamak için protetik restorasyonlar zorunlu olmaktadır. Ayrıca büyüme gelişmeyi takiben protezlerin belirli aralıklarla yenilenmesi de gerekmektedir. Bu vakada da 2 sene önce yapılmış olan üst çene hareketli bölümlü protez, alt çene implant üstü overdenture protez restorasyonun retansiyon eksikliğinden, uyumsuzluğun dolayı aynı planlama uygun olarak yenilenmesi ve böylece hastanın yaşam kalitesinin artırılması amaçlanmıştır.

Anahtar Kelimeler: Anodonti, ektodermal displazi, hareketli bölümlü protez, oligodonti, overdenture protez

INTRODUCTION

Ectodermal dysplasia is a genetic disorder that affects structures originating from the ectoderm (such as skin, hair, nails, teeth and sweat glands). Clinically, hypohidrosis due to the absence or deficiency of sweat glands, as well as sparse hair, light-colored scalp and hypodontia in teeth can be seen. Other prominent features include a prominent forehead, flat nasal bridge and periorbital hyperpigmentation. Intraoral findings include oligodontia or anodontia, shape anomalies in teeth, enamel hypoplasia, asymmetric alveolar ridge height or resorption, maxillary retrusion and deep palate (1). In ectodermal dysplasia, dental anomalies, severe forms of anodontia depending on the severity of the anomaly, or only dental deformities (conical or peg-shaped teeth) can be seen. In cases of anodontia, the development of the alveolar bone supporting the teeth may also be inadequate. This causes occlusal vertical dimension loss and an old facial appearance (2). For all these reasons, prosthetic rehabilitation is required in ectodermal dysplasia patients. Because tooth loss causes chewing problems, which affects nutrition and speech. In addition to functional problems, it also causes aesthetic and psychological problems. In addition, since the jaw-face development continues in pediatric patients, the prostheses made must be followed up and renewed if necessary. All these are necessary for patients to live a more ideal life (1,2).

This case describes the prosthetic replacement of a child with ectodermal dysplasia associated with severe oligodontia after a 2-year period due to growth and development.

CASE REPORT

A 13-year-old female patient presented to XXX Faculty of Dentistry. Her medical history revealed ectodermal dysplasia and that she had undergone a removable partial denture in the upper jaw and a locator-supported overdenture in the lower jaw two years prior (Figures 1, 2, 3). As the patient's jaw and facial development continued, the retention of the dentures decreased, and she was experiencing difficulty chewing compared to her previous condition. Therefore, it was decided to replace the patient's removable dentures. Because the crowns were found to fit well during the planning process, they were not replaced. The prosthetic plan was determined to remain consistent with the previous denture, with a removable partial denture in the upper jaw and a locator-supported overdenture in the lower jaw. In the first session, informed consent was obtained from the patient's parents and measurements were taken with alginate (Cavex cream alginate, normal set, Netherlands) for the diagnostic model. A personalized spoon was made from acrylic based on the same model, and the edges were shaped using the personalized spoon. A type silicone (Detax, Detaseal function impression, Germany) was used to take measurements for the metal skeleton. An acrylic base was also made for the model obtained for the metal skeleton (Figure 4). Using these acrylic bases, a wax wall was created to adjust the patient's interocclusal distance and record the intermaxillary relationship. A tooth trial was performed in the next session (Figures 5,6).

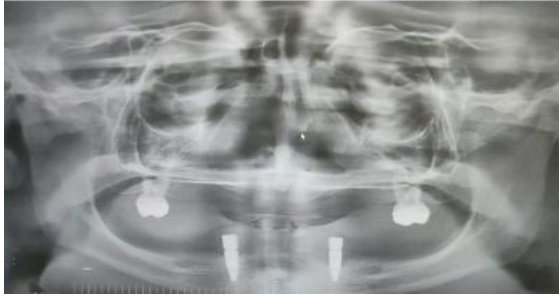


Figure 1. Pre-treatment panoramic film image.



Figure 3. Intraoral image of previous prosthetic restoration.



Figure 5. Tooth arrangement in the articulator.

In the delivery session, locators were placed inside the base at the location of the lower jaw implants, as in the previous prosthesis, and the prosthesis was delivered after checking the edge fits (Figures 7,8,9). The patient's routine check-ups continue every 6 months



Figure 2. Extraoral image of the previous prosthesis use before treatment.



Figure 4. Prepared acrylic base and metal framework.



Figure 6. Intraoral image of the wax teeth try-in.

DISCUSSION

Hereditary syndromes such as ectodermal dysplasia lead to aesthetic deficiencies and functional anomalies in the orofacial region. These structural disorders negatively affect the psychological adaptation and physiological development of the affected individuals.



Figure 7. Intraoral renewed prosthetic restoration delivery image



Figure 8. Extraoral image of the renewed prosthetic restoration.

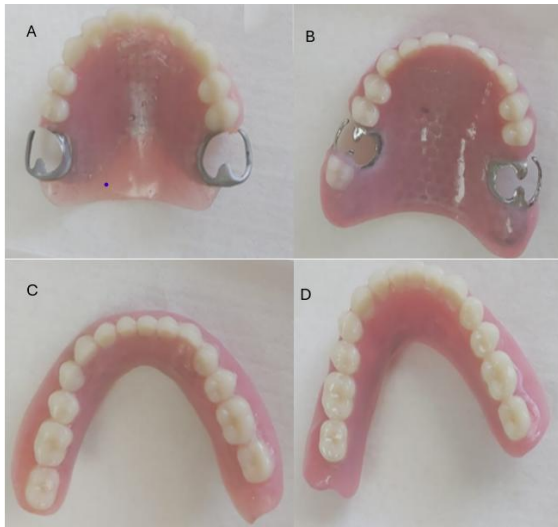


Figure 9. Image of the previous upper jaw prosthesis (A), Image of the renewed upper jaw prosthesis (B), Image of the previous lower jaw prosthesis (C), Image of the renewed lower jaw prosthesis (D).

Therefore, it is of great importance to start treatment early. For an optimal treatment process, the coordinated collaboration of a multidisciplinary team consisting of pediatrics, psychology, otolaryngologists, and speech-language therapists is necessary. Dentists also play an important role in the rehabilitation of aesthetic, functional and phonetic deficiencies within this team.

Dental treatment planning should be shaped according to the severity of the disorder, the patient's age, developmental process and the condition of the oral structure (3).

Patients with ectodermal dysplasia may experience problems such as hypodontia, conical teeth, enamel hypoplasia, and xerostomia from an early age. This situation requires pediatric dentists to develop a comprehensive treatment plan that includes both preventive and restorative approaches during the treatment process. Pediatric dentists create long-term treatment plans to ensure the functional, aesthetic, and psychological well-being of the patient. During this process, the preservation of existing teeth and the maintenance of oral hygiene are supported by behavioral guidance methods. Preventive measures such as fissure sealants, topical fluoride applications, dietary adjustments, and restoration of existing cavities may be included in treatment planning. Depending on the severity of tooth loss and the position of existing teeth, coordinated treatment planning with different disciplines such as prosthetic rehabilitation, orthodontic adjustments, and jaw surgery may also be required (4,5).

In children with ectodermal dysplasia, especially in cases of hypodontia and anodontia, it is recommended that prosthetic treatment be initiated as soon as possible to provide positive psychological effects, prevent potential resorption/atrophy of the alveolar bone, and control the vertical dimension, which can be severely affected by complete or partial tooth loss. While no specific timeframe is available for initiating treatment, Pigno et al. suggest that the first prosthesis can be made when the child starts school, thus improving the child's appearance and allowing time to adapt to the prosthesis. Kupietzky and Houpt, however, argue that prosthetics can be made for a 3-year-old patient and that this early restoration of facial appearance is necessary for normal psychological development. Prosthetic restorations are considered suitable for children between the ages of 3 and 5, as long as they are compliant. However, these prostheses should be replaced at regular intervals depending on growth (6,7,8). While some researchers state that these renewals should be done every 6 months or annually, others decide to change the prosthesis as needed during follow-ups (9,10). In children with oligodontia or anodontia, prosthetic restorations may need to be changed many times until growth and development are completed. Removable partial dentures are frequently preferred in patients with ectodermal dysplasia where oligodontia and anodontia are seen; these prostheses can be modified and easily changed during the growth process. However, the biggest difficulty in such prostheses is to maintain facial height and ensure retention and stability of the prosthetic restoration (11,12). In order to overcome these problems, dental implants have been used.

However, the use of dental implants is generally postponed until growth is complete, as implants do not participate in the growth process and may remain infraoccluded over time. Nevertheless, in cases of complete edentulism in patients with ectodermal dysplasia, implants can be placed in the anterior region of the mandible. This is because the symphysis region of the mandible closes at approximately 2 years of age and the distance between the canines changes very little between the ages of 12 and 15 (12). Treatment guidelines published by the National Ectodermal Dysplasia Foundation state that implants are recommended only for the anterior portion of the mandible in school-aged children, i.e., older than 7 years of age (7,13). On the other hand, implant application is not recommended in the maxilla. Because implants placed along the line passing through the midpalatal suture may limit the transverse development of the maxilla while the growth process continues. Therefore, the recommended age for maxillary implant placement is generally 18. For all these reasons, a standard protocol for implant placement in developing children has not yet been established (14). Oesterle et al. have stated that the safest time for implant placement is the lower part of the descent curve of the pubertal growth curve, which can be determined by cephalometric radiographs, serial height measurements, or wrist radiographs (7,13).

Removable partial or complete dentures applied to patients with ectodermal dysplasia may require rearrangement or replacement when the vertical dimension of occlusion decreases and changes in mandibular position occur due to the growth process. It is quite difficult to provide

denture retention and stability in these patients. Dryness in the oral mucosa, underdeveloped maxillary tuberosity and alveolar crests are the main limiting factors in terms of denture retention and stability. Therefore, in prosthetic treatment planning, the aim should be to spread the denture base over the widest possible area and to distribute occlusal loads in a balanced manner. The occlusal relationship of the denture should be in full harmony with the patient's existing occlusal structure. Conditions such as oligodontia or anodontia may cause atrophy in the alveolar ridges, decrease in the vertical dimension, significant mandibular protrusion and Class III intermaxillary relationship. Therefore, prosthetic rehabilitation initiated at an early stage is considered as a functional and esthetically effective treatment approach that increases the patient's quality of life (8,15).

In conclusion, dental treatment of patients with ectodermal dysplasia is a long-term and complex process. Early prosthetic treatments applied in childhood, especially under the age of 5, provide nutrition, speech development and social adaptation. Prosthetic rehabilitations applied are removable partial or complete dentures, regardless of age; in addition, if there are existing teeth, clasps are usually used to increase the retention of the denture. Interforaminal implants are recommended to increase the stability of the denture in the mandible; implant survival in childhood varies between 4 and 26 years in various case reports. While these treatments provide temporary solutions, permanent treatments are usually performed after the individual reaches adulthood (16,17). In adults, fixed or removable implant-supported

restorations are preferred, and bone grafting is often required during this process. Treatment success depends on oral hygiene, prosthesis adaptation and regular renewal processes. The renewal interval of prostheses varies between 1-3 years for complete dentures and 1-6 years for removable partial dentures (17).

CONCLUSION

In patients whose jaw and face development continues, the prosthetic restoration must be renewed during 6-month and annual check-ups in prosthetic treatments. This must be done especially in removable prosthetic restorations. As a result, prosthetic treatments are essential in oligodontia-anodontia patients in order to ensure the patient's comfort and to be compatible with body development. We renewed the prosthetic restoration by considering the facial profile, chewing function and aesthetics in accordance with the development of our patient.

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Author contributions: The authors took an active role in all stages of this study. The conceptualisation and design of the study was carried out by K.M. Data collection, analysis and interpretation processes were carried out by M.S.D. and K.M. The writing, critical revision and finalisation of the manuscript were provided by M.S.D. and K.M. All authors reviewed and

approved the final version of the manuscript and agreed to the accuracy of the content.

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