

Prosthodontic Management of a Patient with Oligodontia: A Case Report

SUMMARY

Oligodontia or severe hypodontia is a rare developmental dental anomaly which is described as congenital absence of 6 or more teeth excluding the third molars. In this case report, the treatment of a 31-year-old woman with congenital absence of 9 permanent teeth is described. The treatment with occlusal appliance and fixed a partial dentures ended up in functional and aesthetic results.

Keywords: Oligodontia; Fixed Partial Denture

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CASE REPORT (CR)

Balk J Dent Med, 2014; 18:52-56

Introduction

Hypodontia is a congenital absence of 1 or more permanent teeth excluding third molars¹⁻⁴ and it's prevalence varies from 3.5% to 6.5% in permanent dentition, and approximately 1% in primary dentition⁵. Oligodontia or severe hypodontia is defined as a congenital absence of 6 or more teeth excluding the third molars^{3,5-7}, which may occur either alone or along with a systemic disorder, such as ectodermal dysplasia³. Genetic factors, environmental factors, endocrine disturbances, or viral diseases, such as rubella or scarlet fever, and nutritional deficiencies (vitamin B) during pregnancy may play an important role for oligodontia^{1,3,8}.

Several studies examining a relationship between missing teeth and skeletal pattern^{9,10} revealed that, while increasing number of missing teeth results in a decrease in the mandibular plane angle, a reduction in facial height results in a less aesthetic facial appearance. Therefore, oligodontia associated with or without syndromes results in not only functional but also psychosocial problems, especially for young people^{5,11}.

Treatment may contain space closure by orthodontic therapy, removable or fixed partial dentures, and extraction of primary retained teeth, osseointegrated dental implants or combination of these^{4,12-18}.

For successful treatment, an interdisciplinary approach is suggested. In this case report, a prosthodontic management of a 31-year-old female patient with oligodontia is described.

Case Report

A 31-year-old woman complaining about the appearance of her teeth was referred to Yeditepe University Faculty of Dentistry. The intraoral examination revealed the absence of 9 permanent teeth, which were maxillary left lateral incisor, maxillary right and left first premolars, maxillary right and left second premolars, mandibular right and left lateral incisors, mandibular right and left second premolars. Also, 4 retained primary teeth, maxillary right and left primary canines, maxillary left primary second molar, mandibular left primary second molar, were detected that were proved by panoramic radiograph (Figs. 1-3). Loss of vertical dimension of occlusion was also detected^{19,20}. Oligodontia was diagnosed considering clinical and radiographic features. There was no family history of oligodontia.

A lateral cephalometric radiograph was taken and digitalized by Dolphin Imaging Software 9.0 (Dolphin

Imaging, Los Angeles, California). Analysis of the cephalometric film disclosed rotation of the mandible upward, resulting in the appearance of decreased vertical dimension of occlusion.



Figure 1. Intraoral anterior view before treatment



Figure 2. Extra-oral view before treatment



Figure 3. Panoramic radiograph before treatment

The presence of minimal plaque, calculus, and gingival inflammation in periodontal examination and amalgam restorations in the mandibular right first molar, mandibular left first molar and maxillary left primary second molar were also detected.

Complete rehabilitation of dentition, including restoration of vertical dimension of occlusion and missing teeth was planned and the patient was informed. Dental implants were considered to replace missing teeth. The patient preferred fixed partial dentures to dental implants regarding to their cost. Occlusal appliance therapy was planned for restoration of vertical dimension of occlusion prior to fixed partial dentures therapy²¹.

Due to the fact that primary teeth were not favourable for fixed prosthodontic abutments, they were extracted⁴. Initial periodontal treatment, including scaling and root planning with hand instruments and ultrasonic scalers, besides oral hygiene instructions, was completed on consecutive 2 visits.

After the initial therapy, flap operation was performed for crown lengthening. The sutures were removed 1 week after surgery. To begin prosthetic treatment, recall visits were scheduled weekly consecutive 1 month of healing period. The mandibular right and left first molars and maxillary right first molar were endodontically treated during this period.

After the healing period, the impressions of maxillary and mandibular arches were taken with an irreversible hydrocolloid material (Kromopan, Lascod, Italy). Impressions of maxillary and mandibular arches were poured with stone (OCTA-MOL, Heraeus Kulzer Hanau Germany type3). Self curing acrylic (Meliodent Bayer UK Ltd Newbury, Berkshire UK) base palates and occlusal rims (Tenatex Red Kemdent Associated Dental Products Ltd, Purton, Swindon Wiltshire, UK) were made. Clinical determination of vertical dimension was obtained using technique described by Niswonger¹⁷. A centric relation position of the mandible was obtained by bilateral manipulation^{22,23}. Base palates and occlusal rims were used to interocclusal records. After the face-bow (Rotofix, Girschbach, Germany) transfer, the maxillary stone cast was mounted in a semi-adjustable articulator (Artex TK, Girschbach, Germany). Interocclusal records were used for articulation mandibular stone cast. The occlusal appliance was constructed on the mandibular cast with self-curing orthodontic resin²⁴ (Fortex, 2000 RS Rapid Simplified International Dental Surgical and Polymer Suppliers England). The occlusion appliance was applied on the mandibular dental arch and occlusal adjustments were performed by using articulation paper. The patient had been observed for 4 weeks while using the occlusal appliance. Throughout this period, required adjustments and modifications were performed^{21,26}.

All teeth were prepared with chamfer finish line. Provisional restorations were fabricated. For fixed partial dentures, the preliminary impressions of

maxillary and mandibular arches were taken with a condensation silicone (Zetaplas ISO Spec.4828 Type 0-Putty Consistency ADA Spec19 Type 1- Very High Viscosity Zhermack, Badia Polesine, Italy). Low viscosity hydrocompatible condensation silicone was used in the wash technique (Oranwash L ISO Spec 4823 Type 3 -Light- bodied Consistency ADA Spec.19 Type 1 Low viscosity, Zenmarck Badia Polesine, Italy). Then provisional restorations were cemented. Impressions of maxillary and mandibular arches were poured with type 4 dental stone (Prima-Rock; Whip Mix Corp, Louisville, KY USA). Base palates and occlusal rims were used to record vertical dimension of occlusion. A centric relation position of the mandible was recorded. After the face-bow (Rotofix, Girschbach, Germany) transfer, the

maxillary stone cast was mounted in a semi-adjustable articulator (Artex TK, Girschbach, Germany). Interocclusal records were used for articulation mandibular stone cast. The cast metal-ceramic fixed partial dentures (Nickel-Chrome Wiron 99 BEGO, Bremen, Germany-ceramics Matchmaker Porcelain, Davis & Schottlander Davis Ltd Letchworth, Herts, England) were constructed. Group function was achieved in the fixed partial dentures. Anterior guidance was obtained. The cast metal-ceramic fixed partial dentures were cemented (Figs. 4 and 5). Function and aesthetics were achieved at the end of the treatment. Another lateral cephalogram was taken after the treatment and superimposed on the SN plane with the initial one to determine skeletal, dental, and soft tissue changes after rehabilitation of the patient (Fig. 6).



Figure 4. Intra-oral anterior view after treatment



Figure 5. Extraoral anterior view after treatment

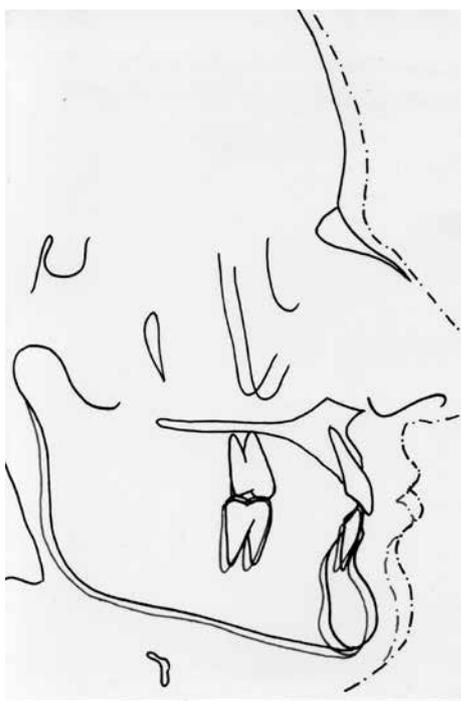


Figure 6. Superimposition of initial and final lateral cephalometric films

Discussion

The unpleasant appearance, missing teeth, and extensive vertical overlap in patients with oligodontia may cause psychosocial and functional problems. Therefore, the primary goal in treatment is to improve appearance, mastication and speech^{1,27}. There are various treatment approaches in oligodontia cases, like space closure by orthodontic therapy, extraction of primary teeth, application of removable or fixed partial dentures, osseointegrated dental implants or combinations of these^{12,16,28}. Treatment alternatives may be chosen according to patient's age, intraoral findings such as position, number and quality of the remaining teeth and patient's financial situation.

As an option, orthodontic treatment may be used to correct the malocclusion, eliminate small spaces and support the remaining teeth in a more feasible place for removable partial denture. Excellent results are provided when permanent teeth number and its clinic characteristics are adequate to support and retain fixed partial denture.

Although usage of dental implants are disputable in paediatric dentistry because of ongoing dental and skeletal growth in a child, successful aesthetic and functional reconstruction of occlusion can be achieved in adults³. In this case, orthodontic treatment's sole inadequacy and patient's unwillingness to it eliminated orthodontic treatment as an option. It also went for osseo-integrated implants as the patient could not afford it.

There are important differences between primary and permanent teeth. A primary tooth has a shorter crown, the occlusal table is narrower, enamel and dentin layers are thinner and the pulp is larger in relation to the crown size. That is why extraction of primary teeth was decided to avoid clinical problems^{1,3,5}.

Decrease in vertical dimension of the face was observed due to the counter-clockwise rotation of the mandible, resulting in poor facial aesthetics. Several studies have observed that increasing numbers of missing teeth results in a decrease in the mandibular plane angle and a reduction in facial height^{9,10}. According to the findings from the lateral cephalometric analysis, and clinical finding, vertical dimension of occlusion was restored with an occlusal appliance therapy for better aesthetics and function before the construction of the fixed prosthesis. Occlusal appliance is used as an auxiliary tool in dentistry^{25,29}.

This case report describes prosthodontic management of a 31-year-old female patient with oligodontia. The occlusal vertical dimension was restored by using occlusal appliance. After the trial period, fixed partial dentures were cemented. Satisfactory aesthetic and functional requirements were provided. Soft tissue profile changed in a good manner after the increase in vertical dimension of the face.

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