

Removable Partial Denture in a Cleft Lip and Palate Patient: A Case Report

This clinical report described the oral rehabilitation of a cleft lip and palate patient with removable partial denture. Although implant-supported fixed treatment was presented as part of the optimum treatment plan to achieve the best result, the patient declined this option due to the significant financial burden. Persons with a congenital or craniofacial defect are unique, and oral problems must be evaluated individually to the most ideal treatment. The changes in appearance, function, and psychological well-being have an enormous impact on patients' personal lives and are rewarding for the maxillofacial prosthodontist providing this care.

Key Words : Denture, Partial, Removable; Cleft Lip; Cleft Palate

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INTRODUCTION

Treatment of patients with cleft lip and palate calls for a complex multidisciplinary approach with long-term involvement. The team concept remains the key to success in the care of these patients. Prosthodontists are integral members of this team because of the wide range of patient care services that they provide (1). Plastic surgeons, orthodontists, and prosthodontists are only part of the cleft palate team responsible for the medical care that, in many patients, starts shortly after birth and continues in various stages until maturity (2). Many patients with clefts that also affect the alveolar ridge present with either congenital absence of the permanent maxillary incisors, or with teeth that are in a rudimentary form, e.g., peg-shaped or small crowns and short roots. The maxillary central incisors are often hypoplastic with short roots and are severely malposed. This malpositioning, in addition to the tooth-lip relationship and the extent of hard and soft tissue deficiency, influences the esthetic appearance and phonetics (3). Thus, prosthodontists, when rehabilitating these patients, face the difficult decision of whether to use fixed or removable partial dentures (FPDs, RPDs). In patients with severe deficiency, more extensive, advanced restorative care is required to resolve functional, esthetic, and phonetic problems. There are various methods of definitive prosthetic treatment in cleft palate patients. A combination of bone grafting and implant-supported fixed or removable prostheses is an invasive treatment approach. A conservative alternative treatment could be conventional fixed or removable prostheses for patients who refuse surgical intervention (4). RPDs are especially indicated in patients with tissue deficiency, several fistulae, soft palate

dysfunction, or uncoordinated nasopharyngeal sphincter action, which can lead to hypernasal speech (3). Furthermore, it is suggested that a prosthesis may improve the psychological status of patients as well as their quality of life (5). Providing maxillofacial prosthetic treatment for patients with congenital and craniofacial defects should not only address physical and functional deficiencies but, ideally, should also consider the possible psychological effects of these deformities. Unfortunately, only 20% of cleft palate teams worldwide perform psychological assessments of these patients (6). This portion of the treatment evaluation is often overlooked or ignored and should be integrated into the overall treatment (7).

Implant-supported fixed and removable prostheses, overdentures, and traditional fixed and removable prostheses can provide more normal facial contours, an improved smile line, improved arch relationships, and improved function in patients with facial defects. The authors have observed that patients with congenital craniofacial defects often feel more positive about themselves after prosthetic treatment. Patients embarrassed by their teeth and facial appearance are frequently less motivated to maintain good oral hygiene or seek regular dental care, resulting in increased tooth loss and destruction of oral tissues; this exacerbates an existing problem. Early intervention can be extremely beneficial for the patient's well-being (7).

Prosthodontic care has a long and rich history in the care of patients with cleft lip and palate. With the increased knowledge of craniofacial growth and development and improved surgical and orthodontic treatment, today's cleft patients receive better care and in less time (8). This requires less prosthetic intervention. The RPD could be a good alternative for some cleft patients in whom there are multiple missing teeth and

an edentulous space that is too long to be spanned by a fixed restoration. This clinical report describes the rehabilitation of a cleft lip and palate patient using a RPD like an obturator.

CASE REPORT

A 45-yr-old woman born with cleft lip and palate with congenitally absent bilateral maxillary incisors was referred to the Department of Prosthodontics in the School of Dentistry, Dicle University. She underwent cheiloplasty at 7 months of age and palatoplasty at 2 yr. The missing teeth were replaced with multiple metal-ceramic FPDs 10 yr before. Clinical examination of the patient revealed poor oral hygiene and poorly fitting restorations (Fig. 1). She presented with an inadequately repaired cleft lip and palate, and severe related psychosocial problems (Fig. 2). The patient requested prostheses to improve her situation to the extent possible, believing that a better facial appearance would enhance her social wellbeing.

The previous fixed restorations were removed (Fig. 3). The radiographic examination showed reduced periodontal sup-

port of all teeth. All teeth were extracted after periodontal treatment except the mandibular right first premolar, maxillary right canine, first premolar, second molar and maxillary left second molar. Following a dental prophylaxis and oral hygiene instructions, the patient was placed on a 0.12% chlorhexidine gluconate oral rinse (Periogard Oral Rinse; Colgate Oral Pharmaceuticals, Canton, MA, U.S.A.) with twice daily recommended use.

To satisfy the patient's primary concerns, a treatment plan was developed that included placement of metal-ceramic crowns of mandibular right first premolar, maxillary right canine and first premolar. Considering the clinical situation, maxillary and mandibular RPDs were determined to be the treatment of choice. Although a plan of implant treatment was presented to the patient as part of the primary treatment option, the patient declined these treatment modalities due to the financial burden.

Maxillary and mandibular complete-arch impressions were made using irreversible hydrocolloid impression material (Jeltrate, Alginate, Fast Set; Dentsply Intl, York, PA, U.S.A.). Diagnostic casts were fabricated from Type IV dental stone



Fig. 1. Pretreatment intraoral view.



Fig. 2. Frontal view of patient before rehabilitation.



Fig. 3. View during the healing period after extraction.



Fig. 4. Post-treatment intraoral view.



Fig. 5. View of content and well-rehabilitated patient.

(Silky-Rock; Whip Mix Corp, Louisville, KY, U.S.A.) and mounted on a semi-adjustable articulator (Articulator #3140; Whip Mix Corp) using a face-bow transfer (#8645 Quick Mount Face-Bow; Whip Mix Corp) and a centric relation record (Take 1 Bite; Kerr Corp, Orange, CA, U.S.A.). The articulator was programmed using protrusive and lateral records (Copr wax Bite Wafers; Heraeus Kulzer, South Bend, IN, U.S.A.). The occlusal scheme was developed through a diagnostic waxing.

Mandibular right first premolar, maxillary right canine and first premolar teeth were prepared for metal-ceramic restorations. Laboratory-processed provisional restorations (Tempdent, Weil-Dental, Rosbach, Germany) were fabricated and cemented with zinc-oxide eugenol (TempBond; Kerr Corp). Irreversible hydrocolloid impressions (Jeltrate, Alginate, Fast Set; Dentsply Intl) of the provisional restorations were obtained and poured in Type IV dental stone (Silky-Rock; Whip Mix Corp). A custom incisal guide table was fabricated from acrylic resin (Pattern Resin LS; GC America).

Definitive impressions of the prepared teeth were obtained using hydrophilic addition silicone impression material (Elite HD+, Zhermack, Rovigo, Italy). Working casts were generated from Type IV die stone (Jade Stone; Whip Mix Corp) and mounted onto the articulator using interocclusal records (Take 1 Bite; Kerr Corp). The FPDs (Ivoclar Vivadent) were fabricated in a licensed dental laboratory. Following the normal clinical sequence, the marginal fitting and esthetic appearance of veneers were verified. A trial evaluation of the metal substructure, prior to glazing of the ceramic material, enabled final occlusal refinement. The crowns were cemented with zinc polycarboxylate cement (Poly F Plus; Dentsply DeTrey GmbH, Konstanz, Germany) using the manufacturer's recommended powder/liquid ratio.

After crown cementation, preliminary impressions were made with irreversible hydrocolloid (Kromopan; Lascod SpA, Florence, Italy) for RPDs. Custom trays were fabricated with autopolymerized acrylic resin (Duracryl; Spofa Dental, Prague,

Czech Republic), and definitive impressions (Zetaplus, Thixoflex; Zhermack, Rovigo, Italy) were made. Maxillomandibular records were made, and the casts were mounted in an articulator. The artificial teeth were arranged in wax for trial evaluation. The occlusion and position of the prosthetic teeth were evaluated intraorally, and the necessary corrections were made before processing the dentures. Instructions were given to the patient and she maintained a soft diet for the first few days to facilitate accommodation; the necessity of regular cleaning and maintenance was also explained. The patient was instructed to remove the dentures at night and to present the following day and once a week for a period of two months for inspection and possible corrections and adjustment (Fig. 4).

In addition to oral hygiene instructions, the patient was prescribed a topical 1.1% neutral sodium fluoride (Prev-Dent; Colgate Oral Pharmaceuticals) with recommended daily use. Recall evaluations at four-month intervals occurred for a period of one year, and the patient did not experience any complication associated with the oral rehabilitation. The patient's esthetic and functional expectations were also satisfied. At follow-up sessions after completion of treatment, the patient reported her great satisfaction with the outcome, and her family described her resultant more extroverted character (Fig. 5).

DISCUSSION

The RPD treatment selected, albeit invasive, is more conservative than the considered alternatives. Other treatment methods involving implant-supported fixed dentures are considerably more radical and have greater incidence of clinical complications than conventional removable prosthodontics (9, 10). Furthermore, this patient's limited financial resources precluded the selection of a costly treatment. Therefore, RPDs were used, the patient's oral hygiene was maintained to an acceptable level, and both the esthetic and functional results of the restorations were satisfactory.

When evaluating a patient with congenital abnormalities, the initial steps involve inspection of appropriate occlusal vertical dimension (OVD). Insufficient OVD may be secondary to lack of teeth, abraded and worn teeth, altered anatomy intraorally and extraorally, or inadequate arch development. Maxillary and mandibular RPDs are used to restore OVD, function, and esthetics. Many variables determine the appropriate OVD to restore functional occlusion and facial support in each patient. These processes include an evaluation of speaking space, interocclusal distance, facial contours, lip contours, speech, condition of remaining teeth, and occlusion. A thorough assessment evaluates the need for periodontal care, endodontic treatment, orthodontic treatment, oral and maxillofacial surgery, or plastic surgery either prior to or during the maxillofacial prosthetic treatment. Other factors, such as work and/or family commitment, may contribute to the course of

the prosthetic and other treatments selected. Treatment such as orthognathic surgery, bone grafts, and orthodontics, which would require more treatment time, may not be possible options (7). To illustrate, this 45-yr-old woman presented with an inadequately repaired cleft lip and palate. The patient desired only prostheses to improve her situation to the extent possible, and maxillary and mandibular RPDs were fabricated.

For some patients, it may be better to consider a more expedient treatment that obtains a high degree of success versus a long-term complicated treatment involving multiple procedures and increased expense during the critical development phase of adolescence or young adulthood. The more expedient treatment can give an individual more immediate esthetic, functional, and psychological support.

The treatment of patients with congenital craniofacial defects presents psychosocial as well as technical challenges. In the general population, physical attractiveness contributes to a positive self-concept and social wellbeing (11). The research of social psychologists describes the self-fulfilling nature of social stereotypes: appearance forms the basis for responses and impressions by others, which then influence individual behavior (12). Research has shown that global self-esteem is highly determined by assessment of one's own physical presentation, as well as by comparisons with the attractiveness, ability, intellectual skills, and social acceptance of other people (13). Unusual facial features exacerbate the social challenges of meeting new people and getting along with others (14). Lowered self-esteem, speech defects, decreased academic performance, and social isolation may result from merely "looking different" from one's peers. These factors can contribute to inappropriate acting out and impaired social interactions (15).

A combination of fixed, implant-supported and removable prostheses in conjunction with other dental and medical treatment is often necessary to obtain the maximum and ideal outcome for the patient. Maxillofacial prosthetic treatment allows these patients to feel more normal, and to have better self-esteem, greater opportunity to fulfill their potential socially, and improved employment possibilities (16).

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