

OPEN ACCESS



Journal of
Dentistry and Oral Hygiene

May 2019
ISSN 2141-2472
DOI: 10.5897/JDOH
www.academicjournals.org

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Journal of Dentistry and Oral

Table of Contents: Volume 11 Number 1 May 2019

ARTICLE

Interdisciplinary treatment approaches for cleft lip and palate patients to obtain esthetic and functional results

1

Dogan E., Dogan E. I. and Dogan S.

Full Length Research Paper

Interdisciplinary treatment approaches for cleft lip and palate patients to obtain esthetic and functional results

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Received 24 February, 2019; Accepted 15 April, 2019

The aim of this study is to present the importance of interdisciplinary treatment approaches for the patients with clefts. In this study, the treatment of four patients with cleft lip and palate were presented. After the completion of fixed orthodontic treatment, proper overjet and overbite relationships were achieved and to obtain the esthetic and functional results, two of the patients had prosthodontic treatment (one of them has removable appliance and another has fixed partial denture). Two of the patients had composite restoration on lateral incisors. Patients with cleft lip and palate require interdisciplinary treatment approaches. Functional occlusion and good dental esthetics can be achieved with a team approach, well-established diagnosis and correct treatment plan.

Key words: Cleft lip and palate, interdisciplinary treatment, esthetic, function.

INTRODUCTION

Cleft lip and palate (CLP) is a congenital abnormality that is seen approximately one in 700 to 800 births around the world. CLP is the most frequently occurring congenital anomaly and the etiology is still largely unknown. It is believed that multifactorial etiology with genetic and environmental factors play an important role. Depending on the defect, patients may have problems in feeding, breathing, hearing, speaking and esthetics. So, the treatment of CLP need an multidisciplinary approach from orthodontics, plastic and reconstructive surgery, maxillofacial surgery, pediatrics, genetics, otolaryngology, social work, nursing, speech therapy, pedodontics, prosthodontics and psychology. The aim of the treatment

is to provide esthetics, function and stability. The management of patients with CLP requires prolonged orthodontic and surgical treatment and an interdisciplinary approach in providing them with optimal esthetics, function, and stability. Sequencing and timing of orthodontic/orthopedic and surgical treatment in infancy, early mixed dentition, early permanent dentition, and the treatment of after the completion of facial growth must be considered in detail (Bartzella et al., 2010; Freitas et al., 2012; Murray, 2002; Shaw et al., 2001; Haque and Alam, 2015). In patients with CLP, the orthodontic problem may occur in three planes namely, antero-posterior, transverse and vertical. In the mixed

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Figure 1. Extra-oral and intra-oral photographs of the patient. (a) Before orthodontic treatment, (b) After orthodontic treatment and (c) After prosthodontic treatment.

dentition period, rapid maxillary expansion procedures can be applied to correct the transversal problems in patients with bilateral or unilateral cleft, while face mask can be used to correct the antero-posterior discrepancy problems especially in patients with unilateral clefts. Surgical corrections alone, often do not provide complete esthetic and functional rehabilitation of the CLP patient. After the orthodontic treatment where the teeth are missing, prosthodontics is needed to complete the dental function and esthetics. Prosthetic rehabilitation aims to improve the functional and esthetic demands and provides better oral health (Freitas et al., 2013; Rygh and Tindlund, 1982; Camporesi et al., 2010). CLP is observed to have led to psychosocial distress in many different cases in terms of aesthetic obstacle in juvenile. Children who suffer from such distress tend to identify themselves as unattractive therefore communication problems occur while their psychological well-being is badly influenced. The management of children with CLP is a real challenge. Involvement of medical observation of patients suffering from cleft provide better results when they are intervened in early intrauterine period and such medical monitoring should be continued until the late adulthood. Family involvement is essential during this period. Conducting multidisciplinary approach on such patients is important to obtain better effective therapeutic result as their problems can be responded in better fashion. There is a consensus that understanding of the requirements and specialist skills of the other team members is necessary so that all members within the team can work coordinately which leads to improving outcomes (Camporesi et al., 2010; Figueiredo et al., 2016; Papi et al., 2015; Krieger et al., 2009).

The oral rehabilitation of individuals with CLP is directly related to the severity of anatomical and functional

alterations determined by the malformation and the age at treatment onset. The ideal treatment of the cleft area is closure by bone graft and orthodontics. When this is not feasible, many cases are solved with prosthetic rehabilitations (Menezes et al., 2018; Sinko et al., 2005; Rivkin et al., 2000; Suzuki et al., 2017).

MATERIALS AND METHODS

In this study 4 patients with CLP, who had prosthodontics and cosmetic dentistry treatment are presented.

Case 1

B.C was 11 years 2 months old when he referred to our clinic. He had bilateral CLP and cross-bites on each side. Maxillary central incisors teeth were lost because of the profound caries and maxillary lateral incisor teeth were missing congenitally. To correct the maxillary transversal deficiency, rapid maxillary expansion was applied for one month. Later on, to correct the deficiency of the maxilla in the sagittal dimensions, face mask was applied for six months. After all the permanent teeth had erupted at 12 years 3 months, the orthodontic treatment was given with the help of fixed appliances (Standard MBT slot 0.22" brackets) for fifteen months. When the patient was 22 years and 6 months old, he had fixed prosthodontics treatment to correct the anterior area functionally and esthetically as shown in Figure 1.

Case 2

M.B was 14 years old when treatment began. Maxillary lateral incisors teeth were congenitally missing, maxillary left central incisors tooth was extracted before and secondary alveolar bone graft was not applied. Upper left canine was changed the way of the eruption. The orthodontic treatment started at the age of 14 years 3 months. Standard MBT Slot 0.22" brackets were applied to correct the position of the teeth for eighteen months. The treatment was



Figure 2. Intra-oral and extra-oral photographs of the patient. (a) Before orthodontic treatment, (b) Fixed orthodontic appliance, (c) After orthodontic treatment and (d) Ortopantomographs and removable appliance.

finished at the age of the 16 years old. The removable appliance was applied until 18 years old to protect the space of anterior region and to provide esthetic for the patient as shown in Figure 2.

Case 3

M. A was 9 years old when he referred to our clinic. Maxillary left lateral incisor tooth was missing congenitally and the shape of the lateral tooth was small on the right side. The orthodontic treatment started at the age of 15 years 2 months. After the completion of orthodontic treatment in twenty two months with the help of fixed appliances (Standard MBT slot 0.22" brackets), the patient had the cosmetic treatment at the age of 17 years and 2 months old as shown in Figure 3.

Case 4

R.G was 9 years old. He had cross-bites on right side and anterior. The shape of the right maxillary lateral incisor tooth was small. Rapid maxillary expansion was applied to correct the transversal deficiency on maxilla for one month. When patient was 13 years and 3 months old the orthodontic treatment began and fixed orthodontic appliance (Standard MBT slot 0.22" brackets) was applied. After the completion of orthodontic treatment in fifteen months, the composite restoration was done on maxillary lateral incisor tooth as shown in Figure 4.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given

his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed. The authors declare the principles outlined in the Declaration of Helsinki have been respected while conducting the current investigation.

DISCUSSION

Patients with CLP undergo various problems. CLP affects the esthetics and function. These defects usually present with anomalies such as variations in tooth number, tooth shapes, and their positions. In CLP patients, one dental anomaly belongs to 83.3% of the patients and lateral tooth agenesis was found in 87.8%. Congenitally missing anterior teeth especially missing the lateral incisors, are common in bilateral and unilateral cleft palate patients. In some cases canines and central incisors may also be affected. Teeth suffering from such problems tend to show malformation as well as malposition. The bone support of teeth adjacent to the cleft is generally compromised (Moore and Mc Cord, 2004; Suzuki et al., 2017; Vig and Mercado, 2015; Tome et al., 2016). However, in recent years, alveolar distraction treatment have been applied to close this area, but there is limited indication for this procedures. Generally prosthetic treatments are used to close this area. In this study, there were missing teeth on maxillary anterior region in Case 1 and 2. In the Case of 3 and 4, there was malformation of



Figure 3a, b and c. Intra-oral and extra-oral photographs of the patient. (a) Before orthodontic treatment, (b) Fixed orthodontic appliance and (c) After orthodontic treatment and composite restoration.



Figure 4a and b. Extra-oral and intra-oral photographs of the patient. (a) Before orthodontic treatment and rapid maxillary expansion appliance (b) After orthodontic treatment and composite restoration.

the shape of maxillary lateral teeth.

The ideal treatment of the cleft area is achieved by closing the area with bone graft but when this is not feasible, many cases are solved with prosthetic rehabilitations. Treatment planning should be done carefully in a multidisciplinary way to maintain the oral health, proper esthetics and function for patients with CLP. By replacing the missing teeth with the help of prosthodontics, the patients achieve better esthetics, speech, mastication and the gap between oral and the nasal cavity is closed. So, if the surgery, orthodontic and periodontal treatments are good enough, good prosthodontics treatment can be achieved with a good esthetics and function. When the prosthetic treatment is well planned and prepared, ideal oral and dental hygiene can be achieved without causing any damage in teeth

and periodontal structures. The results not only enhance the esthetics, but can also be instrumental in the psychological and social acceptance of the cleft palate patients (Murray, 2002; Haque and Alam, 2015; Rygh and Tindlund, 1982; Camporesi et al., 2010; Figueiredo et al., 2016; Moore and Mc Cord, 2004).

It is important for the cleft patients to have good prosthodontic treatment where prosthodontics treatment is counted as a retention protocol as well. Even though, the ideal treatment of the cleft area is closing it by bone graft and orthodontics, many cases are rehabilitated with a variety of prosthetic appliances (Bartzella et al., 2010; Freitas et al., 2012, 2013; Shaw et al., 2001; Suzuki et al., 2017; Vig and Mercado, 2015; Tome et al., 2016; Moore and Mc Cord, 2004).

In Case 1, the prosthodontic treatment was done by

getting support from the abutment teeth. In this case, when prosthetic restorations were completed, function, marginal integrity, and esthetics were achieved. In Case 2, removable appliance was applied because of the age of the patient (16 years old). When he was 18 years old, fixed partial denture was planned. A removable appliance was mostly used which is a temporary form of tooth replacement. Although it provides good esthetics, it rest on soft tissues of the palate and causes irritation. In the Cases 3 and 4 the shape of the lateral incisor teeth were corrected with the help of composite restoration and it is sufficient for the patients.

Conclusion

CLP is the most frequent and important congenital deformity of the craniofacial region. The treatment of CLP patients is a very long process. Successful functional and esthetic results can be achieved with a good diagnosis and interdisciplinary approach. CLP patients frequently have congenitally absent teeth and shape disorder, especially in maxillary lateral incisor teeth. Each cleft case should be considered with a specific rehabilitation strategy, which includes multidisciplinary treatment planning by surgeons, orthodontists, prosthodontists and cosmetic dentistry.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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