

Prosthetic Dentistry Possibilities in Patients with Cleft Deformities of The Palate and Alveolar Ridge: A Case Report

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Abstract

A 56 year old man presented with one-sided cleft palate, affecting alveolar ridge in the upper left canine region. Patient was unable to eat and drink without having the food fall out through his mouths opening into his nose. During first visit, patient underwent x-ray analysis to identify how deeply the bone damage has affected his maxilla. It revealed deep bone penetration, connecting the base of the nose with the mouth. We suggested one of the most effective methods for treating these types of cases – a removable partial denture, which was made to work as an obturator at the same time, closing the space, which causes difficulties to the patient. This case report represents a rare presentation and treatment of cleft palate by using removable partial dentures (RPDs) to close the gap, connecting the patient's mouth with the nose structures.

Keywords: Cleft palate, dental, prosthodontics, dentures, removable dentures;

1. Introduction

The most common congenital defects involving face and jaws are orofacial clefts, affecting approximately 1,2/1000 births [1, 2]. Mostly, clefts come as isolated nonsyndromic deformities (~70%) , but it can also be seen as frequent symptoms of monogenic syndromes (~6%) [3, 4]. Although often causes cannot be identified [3], it is noted that certain teratogens (aspirin, cigarette smoke (hypoxia), 275ilantin, 6 – mercaptopurine, ethyl alcohol) play major role in facial deformities development [1].

People with facial cleft deformities tend to have broad spectrum of physical dysfunctions, including

speaking, biting and chewing foods, drinking through straw, food falling out of their mouths. However, speech impairment is distinguished as main factor affecting the quality of life [5].

Today medicine offers numerous surgical and non – surgical treatment options at early stages of life that have minimal residual manifestations and help to retrieve physiological functions and aesthetics [6, 7]. The American Cleft Palate – Craniofacial Association highlights the importance of assembling interdisciplinary team in order to achieve adequate treatment, successful results and longevity [8].

Prosthetic treatment should be considered as part of rehabilitation since various prosthetic obturators can be provided in order to close existing defect both in newborns and adults [9, 10]. The purpose of this case report is to present possible prosthetic treatment in patient with cleft palate and alveolar ridge.

2. Case presentation:

The clinical case we report here is of a 56-year-old male patient, with previous medical history of heart diseases and pulmonary tract problems, which were insignificant, for current pathology. Patient came into Lithuanian University of Health Sciences Maxillofacial Orthopaedics clinic with problems during mastication. Patient has asked for help, because every time he masticates, food and fluids are flowing through his nose. Extraoral examination has shown protruding lower jaw, lower lip was bigger than the upper one, side profile shown protruding occlusion of the lower jaw teeth. Intraorally, multiple caries lesions were found, gums were inflamed, they were bleeding on probing, patient's hygiene was poor. Patient had no canine in his left side in upper jaw and no incisors. In frontal teeth region, we could observe a hole connecting the mouth with the nose. Bite was pathological with an Angle's third class malocclusion (Picture 1).



Picture 1. Patients bite and upper jaw.

Orthopantomogram has shown both soft tissue and bone defect of the upper jaw alveolar ridge in the front teeth area connecting mouth and nasal cavities of the left nostril. Nasal septum was intact with slight deformation. (Picture 2).



Picture 2. Orthopantomogram.

To extend clinical evaluation, both, upper and lower jaw alginate (“Alligat fast set”, Kulzer) impressions were taken in order to manufacture diagnostic plaster (I class) model casts (Picture 3). Casts were thoroughly examined and after consulting with dental technician, possible treatment ways were discussed. Depending on patient’s disagreement with any treatment that would involve surgery and his current financial situation, we suggested treatment with removable partial dentures.



Picture 3. Plaster cast.

Treatment was begun by taking alginate (“Alligat fast set”, Kulzer) functional impression of upper jaw with individual tray that was made on diagnostic plaster model. All functional movements were performed during the making of impression in pursuance of clear soft tissue contour. Functional impression was used as a mold to make a working plaster (III class) cast.

On the next appointment teeth color was determined. Then, using individual wax bite registration material patient’s central occlusion was fixated and transferred onto articulator. Initial wax partial denture was made by dental technician and tested in vivo by performing horizontal, sagittal and vertical lower jaw movements. The final denture was made with an obturating part, to close the space which leads to the food being pushed into the nasal cavity (Picture 4).



Picture 4. Removable partial dentures with obturating parts.

By making this RPD, patient's smile aesthetics were highly improved considering that the patient was very happy with the final result. RPD restored biting function and greatly enhanced phonetic ability (Picture 5). After 24 hours few base corrections were made. As one week of usage has passed, patient reported no longer having a problem of food flowing to the nasal cavity. No further corrections were needed.



Picture 5. Removable partial dentures in the mouth of the patient.

3. Discussion:

Alveolar cleft treatment should be performed as early in the patients life as possible – if available, within the first few days of birth [8]. There are various methods, that are being used to treat these cases, when people are still young, one of them being computer assisted distraction osteogenesis, which was concluded as an effective method, to completely close the cleft by Zhang et al. [11]. Although, this method is invasive and requires intervention.

Alveolar cleft should always be treated with the help of a team of specialists, which should involve not only prosthodontists, but also audiologists, neurosurgeons, psychologists, plastic surgeons, etc. [8].

When treating kids with cleft palate and holoprosencephaly (they have wide midline clefts) hard-setting acryl is very useful, because they have protrusive positioning of tongue (which affects the surgical result) [15]. In our case we used removable partial denture made of hard plastic, which helped closing the oronasal communication.

Also, orthodontic treatment can be very challenging, take a long time and often requires orthognathic surgery. Nevertheless, this type of treatment can be successful and can yield positive results, one of which was described by Hameed et al. when the full course of orthodontic treatment for a cleft lip/palate patient

took 3.4 years and 44 visits, but it was successful and gave positive results to the patient [12].

Plastic surgeons can be involved by treating cleft palate with fat grafting procedure, to help these patients without the need of removable partial dentures, although, this is also an invasive surgical procedure, which can cause complications, and should be considered very carefully according to its specific indications [13]. To repair maxillary cleft, hybrid obturator can be used to improve quality of life, by providing adequate functional and aesthetic conditions and reducing airspace through sealing of the oronasal communication [14].

Some patients can be treated with non-removable obturators, one of which was described in Borzabadi et al. article, as an obturator which can be used in times when the surgical closure of the fistula is not feasible and a removable device fails to succeed - such non-removable obturator can also be used for treatment of malocclusion, it maintains space and also preserves molar anchorage [16]. Fixed prosthesis on implants can also be used as a treatment method for cleft palate obturations, as Lopes et al. described in their work, a case of 6 implants were used for fixed prosthetic dentures, and in order to make a guiding plane for the insertion of a removable palatal obturator, which improved speech and patients ability to swallow [17].

4. Conclusion.

All cleft palate treatments and obturations should be treated as early in persons life as possible. However, undiagnosed, and untreated patients need their space between the nose and mouth space closed with prosthetic obturators, which can also be in a form of removable partial dentures. Clinicians should consider the bone structure deformations around the cleft, and customize the denture accordingly.

Soft polyvinylsiloxane materials can be used to relin the denture if hard plastics fail to obturate the space, and food continues to fall through the space connecting mouth with patients nose. While treating cleft palate in adulthood can be challenging, prompt treatment, and obturators can be the only way to assure a qualitative life of the patient.

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