

# Prosthetic Management of Cleft lip and Palate Patient with Oronasal Communication - A Case Report

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## Introduction

Oral-facial clefts are birth defects in which the tissues of the mouth or lip don't form properly during fetal development. Children with clefts often don't have enough tissue in their mouths, and the tissue they do have isn't fused together properly to form the roof of their mouths.

In the United States, clefts occur in 1 in 700 to 1,000 births, making it the one of the most common major birth defects. According to the European Commission on Science Research and Development for the European Community, the incidence of these malformations is one case out of every 600 individuals. Clefts occur more often in children of Asian, Latino, or Native American descent.

A cleft lip appears as a narrow opening or gap in the skin of the upper lip that extends all the way to the base of the nose. A cleft palate is an opening between the roof of the mouth and the nasal cavity. Some children have clefts that extend through both the front and rear part of the palates, while others have only partial Clefting.

These malformations are also typically varied in terms of severity that depends mainly on the degree of structural involvement.

The Classification of these disorders is based on the incisor foramen as reference. Thus Preforamen clefts are located anterior to the incisor foramen and affect the premaxilla (Group I); post foramen Clefts are located posterior to the foramen (Group II); and transforamen clefts extend from the premaxilla to the soft palate (Group III) (1). Generally there are three different kinds of clefts:

Cleft lip without a cleft palate  
Cleft palate without a cleft lip  
Cleft lip and cleft palate together

In addition, clefts can occur on one side of the mouth (unilateral clefting) or on both sides of the mouth (bilateral clefting). More boys than girls have a cleft lip, while more girls have cleft palate without a cleft lip(2).

The good news is that both cleft lip and cleft palate are treatable birth defects. It is essential to integrate not only the different specialized fields in dental practice but also medicine, psychology, phoniatrics, etc (3).

As part of the management team, the dentist, or better still the different specialists, are responsi-

ble for supervision of all the dental aspects of the patient in course of development.

## Clinical Case

A 31-year-old male came to our office seeking an aesthetic solution for his anterior segment. He has unilateral cleft on the left side of his lip and the anterior part of his palate (Group I). About 10 years ago he underwent one surgical operation to close the soft tissues of the lip.

Extraoral examination showed upper lip and nose asymmetry secondary to the operation undergone before (Fig 1).

Intraoral examination revealed evident dental malpositioning and malocclusion. Severe maxillary-mandibular discrepancy especially in the anterior segment (Severe Class II malocclusion with increased overbite-overjet relationship) (Fig 2).

As well as different dental agenesis affecting teeth # (12, 11, 21, 22, and 25), poor oral hygiene with



Fig. 3: Panoramic X-ray

heavy stain and calculus were also diagnosed. The case was consulted with a specialist in orthodontics, who recommended orthognathic surgery before any kind of prosthodontic treatment. That was explained to the patient who refused this surgery.

Upper & lower impressions were done to perform study models, thorough intraoral examination with both panoramic and periapical radiographs (Fig 3) were taken in addition to patient's photographs were done before the plastic surgery to have full set of records to make the patient's treatment plan.

Plastic Surgery were done to close the oronasal fistula and to reshape the nose.

Following the plastic surgery, the nose and the nostril were reshaped, but the oronasal fistula remains in the labial part of the vestibule (Fig 4 and 2).



Figure 1: Pre Surgical Photograph



Fig. 4: Post Plastic Surgery Photograph



Fig. 11: Final Smile

The objective of the dental treatment was to seal the oronasal communication and stabilize the margins of the defect by inserting a kind of obturator as well as replacing the missing teeth.

In Consideration to the oral hygiene for the patient with the identification of clearly deficient plaque control, I decided to apply a kind of fixed-removable pros-

thesis on telescopic crowns\* (removable under professional supervision to improve the plaque control). The labial flange of the removable prosthesis will act as an obturator to seal the remaining oronasal fistula and ensure stenting of the arch on both sides of the palatal cleft.

The definitive treatment started and consisted of the preparation of the abutment teeth (#13, 12, 11, 21, 22, and 25) with con-

movable prosthesis. This final prosthesis was tried in the patient's mouth during wax-up stage to ensure aesthetic, fit, and occlusal relation ship (Fig 9). Shade selection was done, and then finishing and placement were done after 2 days of trial stage (Fig 10).

From my point-of-view the end result was acceptable, but the patient was very excited and pleased with the final result (Fig 11).

## Discussion

This case of Cleft lip and palate allow us to review two important aspects of this pathology: 1. The causes, and 2. The existing therapeutic possibilities, particularly when prior corrective therapeutic measures have not been done at the correct time.

The causes of such malformation are highly diverse, though; 3 major groups can be considered:

- Genetic Factors: that can be classified as (Syndromic and Non-Syndromic Oral Clefts) according to the way factors be manifested clinically. Syndromic Clefts such as that happen in association with other Syndromes as Ectodermal Dysplasia (4), and Van der Woude Syndrome (5). Non-Syndromic clefts are not related to syndromes rather than it happens due to gene alteration and causes isolated type of cleft lip and palate. Such as the sporadic forms of cleft lip and palate in areas of Venezuela.
- Environmental Factors such as maternal smoking habits (6), tobacco smoking (7), and parent age (8). Folic acid (9), Zinc and Vitamin B deficiency in pregnant women (9) are other related causes of such malformations.
- Multifactor causes that include interactions between

thesis on telescopic crowns\* (removable under professional supervision to improve the plaque control). The labial flange of the removable prosthesis will act as an obturator to seal the remaining oronasal fistula and ensure stenting of the arch on both sides of the palatal cleft.

\*The telescopic crowns are double-crowned prosthodontic system allow cross stenting of the dental arch and this being limited to the anterior maxillary segment for this case (1).

From the beginning the patient was informed that the aesthetic and the functional outcomes would not be ideal due to the severe maxillary and mandibular malocclusion, and he accepted the suggested treatment plan.

Prior to the prosthetic treatment, elective endodontic treat-

ment was carried for teeth (#11, 12) as significant teeth structure would be trimmed for these teeth to achieve parallelism with other abutment teeth that is a crucial aspect when working with telescopic crowns.

The primary crowns are double-crowns made from high precious gold (24 Karat) and tested on the prepared teeth to ensure adequate fitness and increase the frictional lock (Fig 6). The Primary crowns were cemented in the patient mouth (Fig 7), and then the super structure was tested for fitness (Fig 8). By obtaining the correct fit, second impression was done to position the primary crowns with respect to the oral structure of the patient.

A new model was obtained for elaboration of the final fixed-re-



Fig. 2: Intra oral Photograph before dental



Fig. 5: Anterior Teeth Preparation



Fig. 6: Telescopic Crowns "Outer Layer" in place



Fig. 7: Telescopic Crowns "inner layer" cemented in place



Fig. 8: Super structure tested for fitness



Fig. 9: Wax up model

genetic and environmental factors such as genetic alteration of specific gene accompanied by maternal smoking habits, clearly predisposes to development of oral clefts.

The therapeutic possibilities regarding the management of orofacial clefts, most kids who are born with these conditions can have reconstructive surgery within the first 12 to 18 months of life to correct the defect and significantly improve facial appearance. Children with oral clefting often undergo dental and orthodontic treatment to help align the teeth and take care of any gaps that exist because of the cleft.

Routine dental care may get lost in the midst of these major procedures, but healthy teeth are critical for a child with Clefting because it is needed for proper speech.

Children with cleft palate often have an alveolar ridge defect and defects can:

- Displace, tip, or rotate permanent teeth
- Prevent permanent teeth from appearing
- Prevent the alveolar ridge from forming

These problems can be fixed by grafting bone onto the alveolus, which allows the placement of the child's teeth to be corrected orthodontically.

Orthodontic treatment usually involves a number of phases, with the first phase beginning as the permanent teeth start to come in. In the first phase, which is called an orthopalatal expansion, the upper dental arch is rounded out and the width of the upper jaw is increased. A device called an expander is placed inside the child's mouth. The widening of the jaw may be followed by a bone graft in the alveolus.

The orthodontist may wait until the remainder of the child's permanent teeth comes in be-

fore beginning the second phase of orthodontic treatment. The second phase may involve removing extra teeth, adding dental implants if teeth are missing, or applying braces to straighten teeth.

In about 25% of children with a unilateral cleft lip and palate, the upper jaw growth does not keep up with the lower jaw growth. If this occurs, the child may need orthognathic surgery to align the teeth and help the upper jaw to develop.

For these children, phase-two orthodontics may include an

A plastic Surgery where done to seal the oronasal fistula and to reshape the nostril. But, orthognathic surgery to correct the jaw relation was refused by the patient.

From the Prosthetic point of view, a number of treatment possibilities exist for cleft patients. One option is a Removable Prosthesis as reported in different studies, including overdentures on natural teeth (as in our case) (10-12).

Prosthesis may prove necessary in some patients to seal residual cleft palate or correct an

on both sides of the palatal cleft.

2. Improve plaque control that is essential for the treatment prognosis. The fact that the patient may remove the secondary structure facilitates hygiene of the dental abutments when compared with cleaning difficulties associated with a conventional fixed bridge.

The double crown concept and the intrinsic design facilitate both teeth and prosthesis stability over the long term and ensure favorable masticator force transmission. However, in any case; and regardless of the rehabilitation approach adopted, prosthodontic maintenance is essential component of long term patient care, and serves to maintain adequate chewing and speech function, and facial aesthetics.

### References

1. José Félix Mañes Ferrer, Amparo Martínez González, Begoña Oteiza Galdón, Kheira Bouazza Juanes, Francisco Benet Iranzo, Ana Candel Tomás. Telescopic crowns in adult case with lip and palate cleft. Update on the etiology and management. *Med Oral Patol Oral Cir Bucal*; 11:E558-62.
2. Spina V. Classificação das fissuras labio-palatinas: sugestão de modificação. *Rev Hosp Clin Fac Med* 1972;27:5-6
5. Moore D, McCord JF. Prosthetic dentistry and the unilateral cleft lip and palate patient. The last 50 years. A review of the prosthodontic literature in respect of treatment options. *Eur J Prosthodont Restor Dent* 2004; 12:70-4.
4. Suzuki K, Hu D, Bustos T, Zlotogora J, Richieri-Costa A, Helms JA et al. Mutations of PVRL1, encoding a cell-cell adhesion molecule/herpes virus receptor, in cleft lip/palate-ectodermal dysplasia. *Nat Genet* 2000; 25:427-30.
5. Burdick AB. Genetic epidemiology and control of genetic expression in van der Woude syndrome. *Craniofac Genet Dev Biol Suppl* 1986; 2:99-105.
6. Fallin MD, Hetmanski JP, Park J, Scott AF, Ingersoll R, Fuernkranz HA et al. Family-based analysis of MSX1 haplotypes for association with oral clefts. *Genet Epidemiol* 2005; 25:168-75.
7. Meyer KA, Williams P, Hernandez-Diaz S, Cnattinguis S. Smoking and the risk of oral clefts: exploring the impact of study designs. *Epidemiology* 2004; 15:671-8.
8. Bille C, Skytthe A, Vach W, Knudsen LB, Andersen AM, Murray JC, et al. Parent's age and the risk of oral clefts. *Epidemiology* 2005; 16:311-6.
9. Schubert J, Schmidt R, Syska E. B group vitamins and cleft lip and cleft palate. *Int J oral maxillofac Surg* 2002; 31:410-5.
10. Sykes LM. Prosthodontic treatment of edentulous adult cleft palate patient. *SADJ* 2003; 58:64, 68-72.
11. Stronge SM. Adolescent dentistry: multidisciplinary treatment for the cleft lip-palate patient. *Pract proced Aesthet Dent* 2002; 14:353-8.
12. Pham AV, Abarca M, De Mey A, Malevez C. Rehabilitation of a patient with cleft lip and palate with extremely edentulous atrophied posterior maxilla using zygomatic implants: case report. *Cleft palate Craniofac J* 2004; 41:571-4.
13. Iiada T, Mukohayama H, Inoue T, Oki m, Suzuki R, Ohyama T et al. Model analysis of the maxillary dentition in cleft lip and palate patients before and after bone grafting. *J Med Dent Sci* 2001;48:87-94
14. Kawakami S, Yokozeki M, Horiuchi S, Moriyama K. Oral rehabilitation of an orthodontic patient with cleft lip and palate and hypodontia using secondary bone grafting, osseointegrated implants, and prosthetic treatment. *Cleft Palate Craniofac J* 2004; 41:279-84.
15. Isono H, Kaidi K, Hamada Y, Kokubo Y, Ishihara M, Hirashita A, et al. The construction of bilateral clefts using endosseous implants after bone grafting. *AM J Orthod Dentofacial Orthop* 2002; 212:405-10.



Fig. 11: Final Prosthesis in the mouth

operation called an osteotomy on the upper jaw that moves the upper jaw both forward and down. This usually requires another bone graft for stability.

These individuals pose the greatest prosthodontic challenge, as reflected by the patient presented in this study.

In our case, an adult patient with cleft lip and palate came to our clinic looking for aesthetic treatment for his clefts. The cleft lip was surgically corrected in his childhood, but neither bone grafting to close the oronasal communication where done nor orthognathic surgery. An oronasal fistula remains in the palate the matter that causes him problems with chewing, swallowing, breathing, phonation and aesthetic.

inadequate pharyngeal vault that complicate speech (13).

Another management option is conventional fixed prosthesis involving teeth stented on both sides of the cleft, thereby contributing to restore functional loading capacity (15).

Implants are another option when placed in the inserted bone tissue (14-15).

As long as the alveolar cleft did not receive a bone graft, Implants was not the treatment of choice in such a case.

A kind of fixed-removable prosthesis on telescopic crowns was the treatment of choice to achieve two objectives.

1. Seal the remaining oronasal fistula and stenting of the arch

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