The Differences Between Facial Aesthetics Improvements of Patients with Unilateral Cleft Lip & Palate with Bilateral CLP

Abstract

This literature review summarizes a series of studies on facial aesthetics improvements in individuals with unilateral and bilateral cleft lip and palate conditions. These studies assess surgical techniques, patient satisfaction, and treatment outcomes. Notably, a 2-stage palatoplasty technique with a vomer flap is found to yield favorable results for unilateral cleft lip and palate patients, underlining its reliability. Additionally, patient satisfaction is explored, revealing variations between self-assessment and clinical evaluations. The aesthetics of the nasolabial region have improved over several decades for individuals with bilateral cleft lip palate, with notable differences based on gender and professional background. The effectiveness of the computer-aided design and nasoalveolar molding for people with bilateral cleft lip/palate is also investigated, showing promising results for both modalities. Finally, the impact of the Latham-Millard protocol on dental occlusion is examined, revealing a higher prevalence of crossbites, particularly anterior crossbites, compared to conservative treatments, with statistical significance in most cases. These studies provide valuable insights into the aesthetics and treatment outcomes for individuals with cleft lip and palate conditions.

Keywords: Facial Aesthetics, Cleft Lip, Cleft Palate, Cleft lip and Palate

Introduction

Cleft lip and palate (CLP) are one of the most common “congenital craniofacial anomalies”, affecting millions of individuals worldwide(1). It encompasses a spectrum of orofacialclefting, with unilateral and bilateral CLP representing distinct variations in the extent and severity of the condition(2). It has been reported that among individuals of Caucasian descent, the occurrence of unilateral or bilateral cleft lip and palate (CLP) is estimated to be approximately 1 in 700 births(3). During the initial 9 weeks of embryonic development, the absence of fusion between the lip and/or the left and right palatal segments results in the occurrence of this craniofacial deformity(4). Clefts exhibit variations in both their severity and position, which are contingent upon the embryology and anatomy of each individual. These clefts can typically be classified into four primary groups. (1) involving the alveolus and lip (2) Including the lips and palate (3) Only involving the palate (4) Palate-only congenital insufficiencies. Congenital deficiencies of the palate in isolation have been identified (7). The allocation of frequency with respect to cleft type is distributed as follows: According to a study, the prevalence of bilateral CLP is 12%, while unilateral CLP accounts for 35% of cases. Additionally, unilateral cleft lip is observed in 18.5% of cases, while bilateral cleft lip is present in 1.5% of cases. Isolated palate cleft is found in 33% of cases(5).

From a clinical perspective, individuals who have undergone CLP repair surgery are commonly identified by abnormalities in the lip, nose, and teeth. The extent of these physical manifestations may differ among patients(6). Therefore, individuals diagnosed with CLP experience not only physical changes in their facial appearance, but also potential complications related to respiratory function, speech production, and auditory abilities(5).

Feeding difficulties commonly arise in children with CLP prior to receiving medical intervention. Consequently, the primary goal of treatment is to achieve aesthetic and functional rehabilitation at the earliest opportunity, while also facilitating normal auditory and speech development(5). The achievement of this objective necessitates an interdisciplinary approach

involving specialists from various departments, including oral and maxillofacial surgery, plastic surgery, otolaryngology, psychology, pediatrics, speech therapy, genetics, orthodontics, and neurosurgery(7).

Patients with bilateral BCLP are significantly impacted due to the inherent characteristics of this malformation(8). The palatal processes can be divided into two equal components, in which both nasal chambers are directly connected to the oral cavity, leading to an increased size of the space(9). Primary repair procedures frequently lead to secondary development disturbances, which can manifest as upper lip deformation, nasal shape abnormalities, and asymmetrical nose appearance(10).

Facial Aesthetics Improvements Of Patients With Unilateral Cleft Lip & Palate with Bilateral CLP

Facial Aesthetics Improvements Of Patients With Unilateral Cleft Lip & Palate

The primary objective of cleft lip and palate repair is to restore the functionality of orofacial structures, thereby reducing the negative effects on language development, masticatory function, and airways(11). Additionally, the procedure strives to achieve a balanced and aesthetically pleasing nasolabial look while minimizing the presence of scars(10). The optimal surgical approach to be employed lacks consensus within the field, however, suboptimal outcomes may result in an aesthetically displeasing appearance and adversely impact an individual's self-esteem(12). A study aimed to assess the cosmetic outcomes of the nasolabial region and facial profile in infants diagnosed with complete unilateral CLP, as well as to evaluate the fistula index using the 2-stage palatoplasty technique with vomer flap(13). MThe average age of the population during the process of mixed dentition photography was determined to be 6.29 years. The Asher-McDade Index scores exhibited a range of 2.25 to 2.4 across all criteria. The reproducibility values exhibited a variety of agreement levels, varying from moderate to substantial. The prevalence of palatal fistula was found to be 21.74%, with the majority of cases occurring in the hard palate (specifically, Pittsburgh type IV), accounting for 36.67% of the total cases. The adequacy of palate function was found to be satisfactory in 79% (n=109/138) of the people surveyed, whereas the remaining 21% exhibited speech impairment. In conclusion, the

findings from the long-term follow-up indicate that the 2-stage palatoplasty regimen yields favorable outcomes, establishing it as a dependable therapeutic approach for individuals diagnosed with unilateral cleft lip and palate.

The primary aim of this research was to assess the degree of patient satisfaction regarding their facial and dental aesthetics in relation to evaluations made by clinicians(14). The study sample consisted of 61 individuals who had undergone surgical correction for UCLP, with ages ranging from 14 to 25 years. The findings indicated that the patients exhibited a modest level of satisfaction with their physical appearance. The nasal region was found to be the least acceptable facial feature, with lip appearance ranking somewhat higher in terms of satisfaction. In contrast to the evaluations made by clinicians, patients expressed lower levels of satisfaction about their own nose and lip, while reporting higher levels of satisfaction with their teeth. In relation to age, there was no significant difference observed in self-assessment between the adolescent and young adult populations. The level of satisfaction among females was found to be lower in comparison to males; however, it should be noted that this disparity did not reach statistical significance. In summary, individuals who underwent surgical repair for UCLP expressed a moderate level of satisfaction regarding their facial and dental aesthetics. Divergent viewpoints were observed between clinicians and patients in several respects. This study emphasizes the significance of patient satisfaction as a relevant measure of treatment outcomes, perhaps resulting in enhanced cleft care to align with patient expectations.

Facial Aesthetics Improvements Of Patients With Bilateral Cleft Lip & Palate

A restropresctive study investigated the facial aesthetics outcomes of patients with bilateral cleft lip palate. The patient cohort comprised individuals diagnosed with non-syndromal bilateral cleft lip palate, who were born between 1951 and 2001, and subsequently received treatment at the Department for CranioMaxillofacial and Oral Surgery at the AKH Vienna(4). The raters noted a substantial enhancement in the aesthetics of the nasolabial region across the five decades under analysis. The inter-rater reliability exhibited a range that spanned from fair to substantial. The male professionals exhibited the highest average rating, while the male non-professionals demonstrated the most stringent rating tendencies. The two female groups fell within the spectrum between these two extremes. A calibration library consisting of eight items was generated for each rating category, with the aim of optimizing inter-rater reliability using

interquartile ranges. However, the effectiveness of this approach can only be confirmed by future research studies.

A study was conducted to assess the facial aesthetics outcomes of nasoalveolar molding (NAM) and computer-aided design NAM (CAD/NAM) in individuals diagnosed with bilateral cleft lip/palate (CLP)(15). The evaluation of the alterations detected in the interlabial gap and nasolabial aesthetics was conducted with standardized 2-dimensional pictures. A study was conducted to examine the link between alterations in dental arches and the aesthetic appearance of the face outside the mouth cavity. Both modalities demonstrated enhancement in nasolabial aesthetics prior to the lip surgery. There was no statistically significant disparity observed between the NAM and CAD/NAM groups in any of the characteristics that were investigated. Both therapies demonstrated efficacy in the management of newborns diagnosed with bilateral cleft lip and palate.

Facial Aesthetics Improvements Of Patients With Unilateral Cleft Lip & Palate with Bilateral CLP

The objective of this study was to examine and compare the impact of the Latham-Millard presurgical orthopedics, gingivoperiosteoplasty, and lip adhesion protocol with conservative treatment on palatal and dental occlusion in individuals with complete bilateral and complete unilateral CLP(16). In the cohort of individuals diagnosed with complete bilateral cleft lip and palate, a total of 21 patients had treatment following the Latham-Millard technique, whereas the remaining 49 patients received conservative treatment. Additionally, palatal cleft closure was typically performed between 18 and 24 months of age, in the majority of cases. The Latham-Millard treatment was conducted between the years 1980 and 1996. In patients with bilateral clefts, this procedure entailed the application of a stable palatal orthopedic device to retract the projecting premaxilla and achieve alignment with the alveolar segments shortly after birth. Palatal alignment was performed in all patients, regardless of whether they had unilateral or bilateral cleft. Additionally, gingivoperiosteoplasty and lip adhesion procedures were carried out. The surgical operation for correcting lip abnormalities was conducted at an age range of 6 to 8 months, while the closure of the palate was performed between 8 and 24 months of age. The specific technique employed for palatal closure involved the utilization of the von Langenbeck approach, which incorporated a modified vomer flap. All study participants exhibited cleft lips

and palates, categorized as either bilateral or unilateral. Within these categories, participants were further split based on whether they had undergone the Latham-Millard regimen or conservative treatment. The study subsequently ascertained the prevalence of anterior or buccalcrossbites among each of the four fundamental groups at four distinct age brackets, namely around 3, 6, 9, and 12 years of age. While a few of the children were enrolled in the study at or slightly before the age of 6, all participants in the groups of 9-year-olds and 12-year-olds had previously been part of the 6-year-old group. Additionally, all 12-year-olds had also been involved in the sample immediately preceding their current age group. Across all age groups, a higher proportion of patients who underwent treatment using the Latham-Millard regimen exhibited the development of crossbites compared to those who received more conservative treatment approaches. This disparity was observed in cases with both anterior and buccalcrossbites, as well as in both bilateral and unilateral clefts. The results of chi-square tests examining the disparities in crossbite frequency between the Latham-Millard protocol and conservative treatment revealed that in 75% of the comparisons (12 out of 16), there was a statistically significant increase in the occurrence of crossbite cases following the Latham-Millard protocol treatment compared to the conservative procedure. The chi-square values pertaining to the disparities in outcome between the two treatment procedures indicate that the anterior crossbites exhibited higher values compared to the buccalcrossbites. This suggests that the Latham-Millard protocol, in comparison to the conservative method, is more prone to negatively impacting the anterior crossbites rather than the buccalcrossbites. The study found statistically significant variations in crossbite frequency between the conservative and protocol treatment groups for individuals with an anterior crossbite, but not for patients with a buccalcrossbite, among those born with a bilateral cleft.

Conclusion

The findings of the analysis indicate that in cases of both complete UCLP or BCLP, the prevalence of anterior crossbite and buccalcrossbite is notably greater when utilizing the Latham-Millard presurgicalgingivoperiosteoplasty, orthopedics, and lip adhesion protocol, as opposed to the conservative approach of nonsurgical orthopedics without gingivoperiosteoplasty treatment. This difference in frequency is statistically significant, except for the ages of 3 and 12. The

observed deviation in the bilateral buccal example can be ascribed to the limited size of the experimental sample, hence reducing the level of confidence.

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