

Effect of Surgical Manipulation in Morphometric Growth of Maxillofacial Area at Children with Congenital Lip and Palate Splits At I and II Period of Childhood

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ABSTRACT

Congenital malformations of the face, jaws and teeth are quite frequent, and, often, severe diseases, which are one of the complex problems of maxillofacial surgery and surgical dentistry. Recently, the number of children with congenital malformations, including faces and jaws, has been found to be progressively increasing worldwide. In particular, congenital crevices of the upper lip and palate - account for about 13% of all congenital malformations of a person.

KEYWORDS: Mandible, maxillae, nasolabial angle, cleft, cephalometric analysis, morphometry, lip and palate defect.

INTRODUCTION

Congenital cleft of the lip and palate (CCLP) is one of the most common malformations of the maxillofacial region. According to the World Health Organization (WHO), the birth rate of children with cleft lip and palate in the world is on average 1:600 [1, 22].

Assessing the physical development of the child population is an important criterion in the medical examination and is important primarily for pediatric doctors, secondly for general practitioners and, of course, for educators. In recent decades there has been a tendency to deteriorate physical development indicators, especially in environmentally disadvantaged agricultural and industrial regions [4, 21].

The assessment of the state of physical development is impossible without the data of anthropometric indicators of different age groups. According to the results of research by R. Amanullayev, the birth rate of children with congenital crevices of the upper lip and palate in large regions of Uzbekistan is on average 1 case per 745 live births. The highest rates were observed in the Aral region, which is 1 case per 540 live births. The study and evaluation of these changes, their systematization leads to a decrease in the proportion of maxillofacial pathologies, contributes not to the harmonic development of the child. The most significant increase in the frequency of disorders of health and development, including the dentate system and bite among the younger generation occurs in the I and II period of childhood. In Uzbekistan, some progress has been made in protecting public health, reducing diseases, including the tooth system and with congenital cleft lips and palate among children. However, there were some problems in the health system. Among them, the study of the morphometric characteristic of the craniofacial region in children with congenital cleft lips and palate was important.

For effective integrated equipment of children with CCLP, it is necessary to periodically accelerate the dynamics of only segments [7, 24].

The development and growth of the nasal and maxillary complex in patients with CCLP is a widely discussed topic in any surgical procedure. The studies of Graber [13] report three-dimensional changes in the upper jaw in patients with complete defects of the lip and palate, as well as in patients after surgery.

In class III patients, a tendency was found to shift the bite, cross the anterior and posterior bites, and defects in the midline of the face. Two factors have been shown to cause abnormal person morphology in CCLP patients undergoing surgery: internal defect development and iatrogenic factors resulting from surgical manipulation.

Bishara et al. [5] reported that maxillary deformation in patients with CCLP was caused by internal factors, but most authors noted that internal jaw factors were secondary to surgery [6, 8, 15]. If maxillary deformation is a complication of surgery, it is important to determine the optimal duration and treatment conditions to close the defects of the lip and palate. Determining the cause of stunting in patients with CCLP has been the subject of a large number of studies, and the initial consensus now is that the iatrogenic effect of surgery is a relatively important factor [9, 17]. CCLP patients had a slight increase in the upper jaw prior to surgery, leading to more attention to studying iatrogenic factors. Some authors believe that the main factor in stunting is the operation carried out in the sky [15]. In patients with palate defects, the mean value is usually taken into account in the growth assessment criteria and then correlated with other patients with palate and palate defects or with a normal population [11, 18, 20]. It is important to indicate the mean value of treatment outcomes, but it is relatively difficult to assess individual variability. Developmental changes have been noted by many authors [14, 23]. These changes may depend on the type of crack and its complexity. To date, it has not been established whether the surgery really limits the growth of the upper and lower jaw. Therefore, to assess the effectiveness of cranial and facial growth surgeries in lip and palate defects, we conducted a study in patients with CCLP.

MATERIALS AND METHODS

Sh.A. Kambarova scientific research was carried out at the Department of Surgical Dentistry of BDTI in Bukhara. Patients with CCLP were selected. 20 patients (14 men, 6 women, age: 5.6 ± 2) were divided into 2 groups. The 1st group included 10 people (9 men and 1 woman) with CCLP based on middle age. The average crack size was 5.3 ± 2.3 mm. Group 2 (control group (CG)) included 10 patients with defects (9 women, 1 man) first class.

The patients' parents were informed of the surgical procedure and the studies that needed to be done and their consent was obtained. In patients, the wall of the medial fracture segment is retropositive and laterally displaced. The cross section of the segment moved forward without compression. The cleft alveoli face upwards. Nasal congestion is observed in several patients. The base of the nose wing is retropositive in the slot area and defective. The alveolar slit is shifted to the side, while the anterior wall and the axillary depression of the maxilla are visible.

All patients had a Millard- I.A. Kozin and uranoplasty according to the Frolova-Makhkamova method (velloplastic surgery at 3 months, lip and uranoplasty at 6 months). Cephalometric measurements were carried out at the age of 6-7 years. A comprehensive cephalometric analysis was performed to measure different growth parameters of the head and face region. Linear and angular measurements were used, which were recorded on an individual map.

An individual patient map with all the information has been developed. All data were analyzed and primary normal measurements were obtained. Data obtained in addition to the mean standard deviation analysis showed statistically significant associations and a 95% confidence interval. $P < 0.05$ ($P > 0.05$) was taken into account. All measurements were repeated

8 weeks after the initial measurements to detect errors associated with linear measurements. Analysis of repeated measurements showed no differences between them.

RESULTS AND DISCUSSION

Measurements were obtained from CCLP patients and compared with CG participants. The perpendicular of the nazion and facial height to point A was higher in patients with CCLP than in CG participants ($P = 0.088$) ($P = 0.778$). Measurements of the remaining variables were higher in CG participants than in CCLP patients. The only differences are the length of the maxilla (condyle - point A) ($P = 0.026$), the length of the mandible (condylion-gnation) ($P = 0.045$), the upper 1 point ($P = 0.001$), the lower 1 point A to the pogonion ($P = 0.038$), the thickness of the upper lip ($P < 0.001$) and the deformation of the upper lip no correlation was observed between fracture size and its effect on maxillas retrusion.

In this study, the nasolabial angle was analyzed relative to CG participants in analog patients. In the group of patients with CCLP, low nasolabial angles were observed, and the lack of muscle development caused deformation of the lips and palate as a result of their flattening and curvature towards the cleft. These deformations are usually accompanied by a downward displacement of the collumella point near the lips. [13] In patients with CCLP, this angle is more acute, but does not correspond to 90-120 °. Lack of apparent difference between CCLP and CG patients may lead to upper lip deformation and retraction due to reconstructive surgery or upper incisor retraction and flattening of the subbasal region [14]. Other researchers observed that nasal deformities in patients correlated with diastasis between lip fragments and that the alveolar process of the maxilla was located in different provisions. However, other studies have shown that the bulge of the maxilla is smoothed, which leads to lower values of the angle A [17]. Other studies have confirmed the retrusion of high incisors in patients with CCLP [18]. In patients with CCLP, the distance between the maxillas an incisor is relatively small, CG which in turn can lead to large differentiation of the nasolabial angle.

Orthodontic treatment should be individual, as a short nasolabial space can lead to tooth removal in the maxillas arc, but at the same time other types of abnormalities are observed in the bite of CCLP patients compared to CG. The increase in reduction in the length of the conditionum point is relatively limited in CG in patients with CCLP. Mid face of hypoplasia in patients with CCLP may result from surgery. Postoperative scars interfere with normal maxillae bone growth [19]. During surgery, bone tissue is not injured, but fibrous scars in soft tissues reconstruct maxillae bone growth, and maxilla grows down and forward. Depending on the size and shape of the fracture in the area of the palate and lips, tissue mobilization occurs, so the larger the crack, the larger the scar and the slower the maxillae bone grows. Comparison of the two groups revealed a statistically significant difference in mandibles length (condylion - gnation). In other words, the condition and length of the mandible was significantly affected by the surgical procedures performed. These results are similar to previous ones [17]. Evidence suggests that mandibulae is relatively lagging, although mandibula has a normal length. Jaw retroposition in this position can be a functional reaction to changes in the mandibular complex as a result of the mandibular rotation, in which the muscle in it is remodeled and attached to the gonial region (the mandibulae is indicated by the angle and flexion of the region).

An increase in the vertical growth trend of maxillae was found in facial height measurement in patients with CCLP. The lower anterior angle of facial height was increased compared to CG patients. The results of such analyses have already been shown by other authors

previously [5, 22]. The increase in the front of the face angle may be due to active growth of the front face or passive growth of the back face. Clinical research needs to continue to develop specific protocols to treat factors impeding normal maxillae bone growth and development in patients with CCLP.

In this study, an increase in the height of the anterior lower face led to mandible being trailing [20]. In Deler's surgical practice, CCLP found that mandibles patients were small in size and relatively posterior, and at the same time eliminated lip and palate defects. This has been shown to improve patient pronunciation, but is considered a cause of relatively underdeveloped maxillae. The morphological status of mandible was found in patients with CCLP undergoing surgery, and when measuring face height, an increase in the vertical growth trend of surgical maxillae was found in patients with CCLP. The lower anterior angle of facial height was increased compared to CG patients. The results of such analyses have already been shown by other authors previously [6] The increase in the front face may be due to active growth of the front face or passive growth of the back face [24]. For CCLP, special protocols were developed to treat factors impeding normal growth and development of maxillae in patients and found no difference in statistical analysis between the two groups compared to CCLP patients who did not have the necessary practice to continue clinical trials. It was noted that the growth of the lower jaw does not depend on the method of surgery. Mandible is not directly related to cleft, but there may be changes in the growth structure of mandible due to damage to mandibles and functional factors present. Changes were estimated for maxillae and mandible, where the incisors in the mandible dental rows were relatively retroclinical and retroactive compared to the control values.

The anterior cruciate ligament is more common in patients with congenital cleft palate. After surgical procedures, it was found that the incisors were similar to the incisors in the control group. Intensive plastic surgery on the lips can cause retroclination of the incisors in the maxillae, but has nothing to do with the growth of the middle part of the face.

Mandible was found to be relatively vertical compared to the CG in the dentition, possibly due to pressure on the lower lip during swallowing and the patient's desire to achieve an even oral cavity. The two groups showed significant differences in deformation and change in the thickness of the upper lip. In the CG group, the thickness of the upper lip increased, and in the CCLP group this indicator changed significantly. The upper lip ratio improved in the CCLP group. Numerous studies have shown that changes not only in the front teeth, but also in lip tension, muscle tone and lip thickness significantly affect lip shape and condition, especially in patients with CCLP. Solid tissue therapy can alter the soft tissue response. In patients, hypertrophy of the lower lip muscles is constantly observed to achieve bilateral closure of the lips.

CONCLUSION

In patients with CCLP, the length of maxillae and mandible is shorter than in the control group due to the effect of surgical interventions. The deformation and thickness of the upper lip were also smaller than in the control group, and the posterior arrangement was also found in the anterior teeth in maxillae and mandible. This suggests that surgical procedures performed in patients with CCLP affect the growth of maxillae and mandible as well as dentition. Surgery on the lips and palate affects the growth of the maxillae and mandible, which leads to a lag in the growth effect in the basal part of the jaw.

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CONFLICT OF INTEREST

The authors declare that they have no competing interests.

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