VILNIUS UNIVERSITY

Laura Linkevičienė

THE DEVELOPMENT OF MAXILLA IN CHILDREN WITH CONGENITAL UNILATERAL COMPLETE CLEFT LIP, ALVEOLUS AND PALATE (FROM BIRTH TILL 5 YEARS OF AGE)

Summary of Doctoral dissertation

Biomedical sciences, Medicine (07 B)

Vilnius, 2010

The research project was carried out in Vilnius University during the period of 2000-2009

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The dissertation will be defended at the open meeting of the Doctoral Committee of Medicine of Vilnius University on 17th of June, 2010 in the Main lecture Medicine faculty.
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The summary of the doctoral dissertation was distributed on th of May, 2010.
The dissertation is available in the Library of Vilnius University.

VILNIAUS UNIVERSITETAS

Laura Linkevičienė

VAIKŲ, TURINČIŲ ĮGIMTĄ VIENPUSĮ VISIŠKĄ LŪPOS, ALVEOLINĖS ATAUGOS IR GOMURIO NESUAUGIMĄ, VIRŠUTINIO ŽANDIKAULIO RAIDOS YPATUMAI (NUO GIMIMO IKI 5-ERIŲ METŲ AMŽIAUS)

Daktaro disertacijos santrauka

Biomedicinos mokslai, medicina (07 B)

Vilnius, 2010

Disertacija rengta 2000 – 2009 metais Vilniaus universitete

Disertacija ginama eksternu

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Disertacija bus ginama viešame Medicinos mokslo krypties tarybos posėdyje 2010 m. birželio mėn. 17 d. 12 val. Medicinos Fakulteto Didžiojoje auditorijoje
Adresas: M. K. Čiurlionio g. 21, LT-03101 Vilnius, Lietuva

Disertacijos santrauka išsiuntinėta 2010 m. gegužės mėn. d.

Disertaciją galima peržiūrėti Vilniaus universiteto bibliotekoje

INTRODUCTION

Relevance of theme

According to the figures of the Ministry of Health of the Republic of Lithuania and of the Lithuanian Health Information Centre, congenital facial clefts are in the sixth and seventh place by incidence among congenital anomalies. Congenital unilateral total cleft lip, alveolus and palate (CUTCLAP) is the most prevalent form of facial clefts. News that the baby was born different from others or from what was expected is very surprising and painful for every family. The first objective in addressing this problem is providing timely information to the parents about the opportunities, progress and prognoses of treating the child (1-6). The characteristic features of patients with CUTCLAP include altered facial aesthetics, speech disorders, altered tooth eruption sequence (7-9), shape of the dental arch and number of teeth (10-13). For this reason full-rate rehabilitation of patients requires an integrated treatment process that involves different types of professionals such as maxillo-facial surgeons, orthodontists, speech therapists, geneticists, paediatric dentists and prosthodontists (14-18). This type of treatment is complicated and lasts until the patient reaches the age of majority. Good treatment outcomes are possible only when physicians, patients and their family join forces.

At present, cleft teams use a great number of CUTCLAP treatment protocols, which differ in terms of selecting the time of operations and orthodontic treatment and of applied methodologies. Standard clinical examinations are used to assess the outcomes of treatment according to different protocols. Cleft treatment centres provide treatment data of their patients. Although many trials have been conducted, to date not a single treatment protocol for congenital clefts has been recognised as the best. Even when the same treatment protocol is used, the outcomes of treatment vary. Researchers have not still found the answer to the question why treatment according to the same treatment protocol results in different maxillary growth in children. Maxilla grows sufficiently in some patients while others face maxillary growth disorders and have to undergo surgery and occlusal correction (19-22).

Factors which are relevant for maxillary growth in patients with CUTCLAP from birth till 5 years of age include congenital clefts, maxillary growth features, surgeries and early presurgical orthopedic treatment, where applied.

Scientific papers provide a broad analysis of preparatory presurgical orthopedic treatment, surgery methodologies and time of operations, but there has been no exhaustive research on overall maxillary development after surgeries to date. This type of research is important because regardless of how surgeries will be assessed, in children with CUTCLAP postponement of operations is impossible for aesthetic, functional and social reasons. At present, special focus is on defining factors which could affect the outcomes of treatment. If components of those factors that could help forecast the said outcomes are identified, it should be possible to adjust the treatment protocols and thus develop an optimal treatment protocol for each child which promises good outcomes and is the least time- and cost-consuming.

Although CUTCLAP is noted for diversity of cleft width, there has still been no comprehensive research on the influence of cleft width on maxillary measurements and on the outcomes of treatment. Primary cleft severity is not associated with the application of treatment methods, the final outcomes of treatment and prognosis. Findings collected by the Žalgiris Clinic of Vilnius University Hospital and lasting observation of patients with CUTCLAP allow examining overall maxillary development after surgeries and the potential relationship between cleft width and maxillary measurements.

Aim of research

To examine maxillary development in children with CUTCLAP who did not undergo presurgical orthopedic treatment from birth till 5 years of age and to identify the impact of congenital cleft width on maxillary measurements after performing lip and palate surgeries.

Objectives of research

1. To evaluate changes in maxillary measurements and shape in patients with CUTCLAP from 3 till 18 months of age after lip surgery at 3 months.
2. To evaluate changes in maxillary measurements and shape in patients with CUTCLAP from 3 months till 5 years of age after lip surgery at 3 months and palate surgery at 18 months.

3. To compare maxillary measurements and shape in patients with CUTCLAP at 5 years of age with maxillary measurements and shape in healthy five-year-olds.
4. To assess the anatomic variety of primary CUTCLAP.
5. To identify the relationship between primary cleft width and maxillary measurements and shape in patients with CUTCLAP at 3, 18 months and 5 years of age.
6. To identify the relationship between cleft width and occlusion in five-year-olds.

Defended statements

1. Maxillary measurements and shape change after lip and palate surgeries.
2. There also exists a great variety of cleft width.
3. Cleft severity in the different maxillary anatomic zones varies.
4. Primary cleft width has a relationship with maxillary measurements in patients at 3, 18 months and 5 years.
5. Primary cleft width has a relationship with occlusion in five-year-old patients on the transversal and sagittal plane.

Innovativeness and practical significance of research

1. Linear and angular maxillary measurements in children with CUTCLAP at 3, 18 months and 5 years of age were taken, and a study on maxillary development in children with CUTCLAP from 3 months till 5 years of age was conducted.
2. The variety of cleft width in infants at 3 months with CUTCLAP was described.
3. A new methodology to assess maxillary cleft was recommended.
4. A statistically reliable classification of cleft severity was suggested.
5. A relationship between primary cleft severity and maxillary measurements and occlusion in five-year-olds was identified.
6. It was recommended to take into account primary cleft gravity in assessing maxillary development and treatment outcomes in patients with CUTCLAP.

MATERIALS AND METHODOLOGY

Selection of subjects

The study examined patients with CUTCLAP treated at the Žalgiris Clinic of Vilnius University Hospital (VULŽK) in the period of 2000-2009. The inclusion criteria were as follows:

1. Patients born with congenital unilateral total cleft lip, alveolus and palate.
2. Patients born in January 2000 and afterwards.
3. Congenital unilateral total cleft lip, alveolus and palate was the only congenital pathology.
4. Patients born from week 38 to week 41 of pregnancy.
5. Patients without Simonart's band.
6. Patients with lip surgery performed at 3 months of age.
7. Patients with palate surgery performed at 18 months of age.
8. Patients who came for a follow-up visit to the orthodontist at 5 years of age.

Patients with CUTCLAP born in the period of 2000-2004 who came for an initial consultation to the congenital facial cleft treatment division at VULŽK and met study criteria 1, 2, 3, 4, 5, totalled 48: 29 boys and 19 girls. All these patients came for the treatment of congenital unilateral total cleft lip, alveolus and palate according to the protocol of the congenital facial cleft treatment division at VULŽK (meeting criteria 6 and 7) and for a follow-up visit to the orthodontist at 5 years of age (meeting criterion 8).

Analysis of maxillary measurements

The study employed maxillary dental casts at 3 and 18 months of age and upper jaw and lower jaw dental casts at 5 years of age in the same patients. Impressions for maxillary dental casts in patients at 3 and 18 months were taken at the operating-room under general anaesthesia (Figure 1). Upper jaw and lower jaw impressions in the same patients were taken during their visit to the orthodontist after they turned 5 years of age. Impressions in patients at 3 and 18 months of age were taken using special perforated plastic dental trays designed for newborns. Impressions in five-year-old patients were taken using plastic perforated dental trays matching the size of jaws. A-silicone base and corrective impression materials Panasil (Kettenbach, Germany) were used for impressions.

Before the procedure, trays were coated in a thin layer of adhesive *Universal Adhesive* (Heraeus Kulzer, Germany). Within five minutes after coating with adhesive, the base and corrective impression materials were mixed and, following the manufacturer's recommendations, instant double-layer impressions were taken. The same doctor (Laura Linkevičienė) took all the impressions. Removed from mouth, the impression was disinfected with *Solarsept* (Borer Chemie, Switzerland) solution and sent to the laboratory, where dental casts were produced from white super plaster *Fuji Rock* (GC, Tokyo, Japan) in 2 hours. After one hour dental casts were separated from impressions, polished and prepared for scanning. Dental casts were produced by the same dental technician.

Figure 1. Taking the impression under general anaesthesia in a three-month-old infant

After taking impressions in five-year-old patients, they were given to clench a 1.5 mm-thick wax roller to assess the upper jaw and lower jaw relation.

The same researcher (Laura Linkevičienė) assessed all the dental casts. On plaster maxillary dental casts points were marked with a 0.5 mm-thick pencil. The anatomical points chosen to assess anterior and posterior maxillary parameters of dental casts in toothless infants and of deciduous occlusion have also been described and used by other authors (59, 68, 155, 156). On maxillary dental casts in a three-month-old infant (Figure 2) the following points were marked:

I – incisor point located on the alveolar crest, on the line connecting the frenulum and *os incisivum* (Lat.);

C – canine point, the intersection of the lateral sulcus and the alveolar crest on the non-cleft side;

C – canine point, the intersection of the lateral sulcus and the alveolar crest on the cleft side;

T – Stillman's point, the posterior point of the alveolar crest on the non-cleft side;

T – Stillman's point, the posterior point of the alveolar crest on the cleft side;

A- marginal point on the alveolus of the major cleft segment;

A- marginal point on the alveolus of the minor cleft segment;

W- point on the widest spot of cleft hard palate on the major segment side;

W- point on the widest spot of cleft hard palate on the minor segment side;

The boundaries of the hard palate were marked.

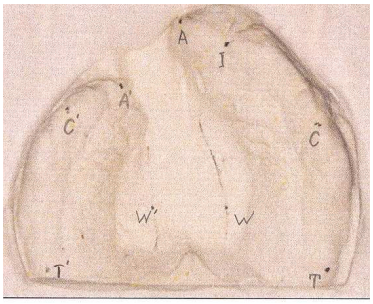


Figure 2. Maxillary dental cast in a three-month-old infant with points marked for analysis

On maxillary dental casts in eighteen-month-old infants (Figure 3) the following points were marked:

I – incisor point located between the contact surfaces of central incisors;

C – canine point, the intersection of the lateral sulcus and the alveolar crest on the non-cleft side;

C – canine point, the intersection of the lateral sulcus and the alveolar crest on the cleft side;

T – Stillman's point, the posterior point of the alveolar crest on the non-cleft side;

T – Stillman's point, the posterior point of the alveolar crest on the cleft side;

A- marginal point on the alveolus of the major cleft segment;

A- marginal point on the alveolus of the minor cleft segment;

W- point on the widest spot of cleft hard palate on the major segment side;

W- point on the widest spot of cleft hard palate on the minor segment side;

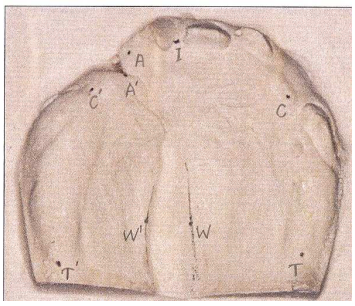


Figure 3. Maxillary dental cast in an eighteen-month-old child with points marked for analysis

On maxillary dental casts in five-year-olds (Figure 4) the following points were marked:

I – incisor point located between the contact surfaces of central incisors;

C – canine point, the top of deciduous canine on the non-cleft side;

C – canine point, the top of deciduous canine on the cleft side;

T – Stillman's point, the posterior point of the alveolar crest on the non-cleft side;

T – Stillman's point, the posterior point of the alveolar crest on the cleft side;

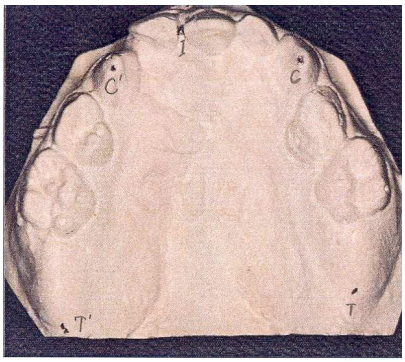


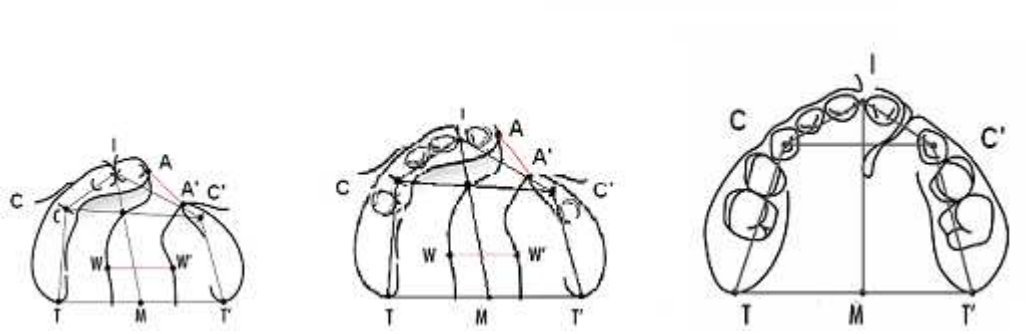
Figure 4. Maxillary dental cast in a five-year-old patient with points marked for analysis

Dental casts in patients from all age groups with marked points were scanned and ported to the digital system for analysing diagnostic casts, "Concret" (Germany). During computer-aided analysis of dental casts, points previously marked with the pencil were replicated. After points have been marked, the computer application computed distances between points, took angular measurements and provided maxillary graphic imaging and computed measurements. The anatomic maxillary measurements selected for assessment in our study are shown in Figure 5 whereas their definitions are provided in Table 1. Maxillary shape was measured and analysed in a graphic image

of maxilla generated by a standard computer application. Angles selected for assessment are shown in Figure 6 while their definitions are provided in Table 2.

Table 1. Maxillary measurements and their definitions

Maxillary measurements	Definition
Maxillary length	distance from incisor point to point M located in the centre of line TT`
Maxillary anterior length	distance from incisor point directed to point M down to the intersection with the line connecting canine points
Maxillary anterior lateral length on the cleft side	distance from incisor point to canine point on the cleft side
Maxillary anterior lateral length on the non-cleft side	distance from incisor point to canine point on the non-cleft side
Maxillary posterior lateral length on the cleft side	distance from canine to Stillman's point on the cleft side
Maxillary posterior lateral length on the non-cleft side	distance from canine to Stillman's point on the non-cleft side
Intercanine width	distance from canine points on the non-cleft and cleft sides
Maxillary posterior width	distance between Stillman's points on the non-cleft and cleft sides
Alveolar cleft width	distance between the posterior point on the alveolus of the major cleft segment and the posterior point on the alveolus of the minor cleft segment
Maximum palatal cleft width	distance on the widest spot of cleft hard palate between the most remote points on the non-cleft and cleft sides

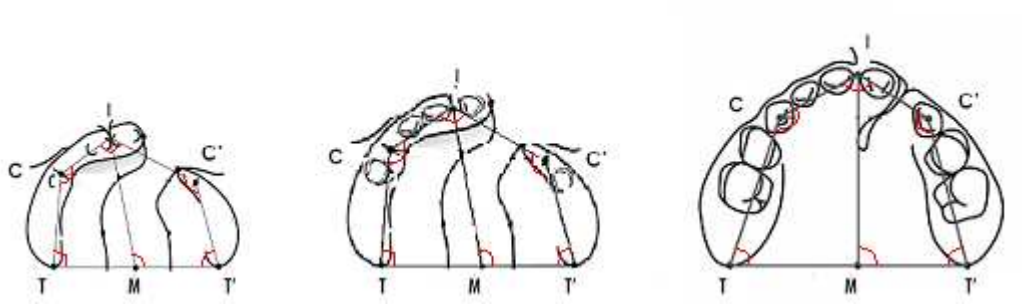


3 months 18 months 5 years

Figure 5. Scheme of maxillary measurements in patients at 3, 18 months and 5 years of age.

Table 2. Angular maxillary measurements and their definitions

Angular maxillary measurements	Definition
ICT angle	angle between lines of anterior lateral length and posterior lateral length on the non-cleft side
IC`T`angle	angle between lines of anterior lateral length and posterior lateral length on the cleft side
CTT`angle	angle between posterior lateral length and the line of posterior maxillary width on the non-cleft side
C`T`T angle	angle between posterior lateral length and the line of posterior maxillary width on the cleft side
CIC`angle	angle between lines of anterior lateral lengths on the non-cleft and cleft sides
IMT`angle	angle between IM line and the posterior maxillary width line on the cleft side



3 months 18 months 5 years

Figure 6. Scheme of angular maxillary measurements in patients at 3, 18 months and 5 years of age.

Occlusion analysis in five-year-old patients

Occlusion was evaluated in five-year-old patients by adjusting their dental casts according to impressions on the clenched wax roller (Figure 7).

Figure 7. Dental casts in five-year-old patients adjusted according to impressions on the clenched wax roller

Occlusion on the sagittal and transversal plane was evaluated separately. Analysis of occlusion in the sagittal direction revealed horizontal incisal overlap: the distance between the incisal ridge of the maxillary central incisor to the vestibular surface of the maxillary central incisor is measured in parallel with the occlusal plane. Incisor relation was assessed according to the Huddart scoring system. It is a five-point scale from (–3) to (+1). Incisor relation (-3), (-2) is assessed as very poor and poor respectively and is attributed to group 3. Incisor relation (-1) is assessed as satisfactory and is attributed to group 2. Incisor relation 0, (+1) is assessed as good and perfect respectively and is attributed to group 1 (Figure 8).

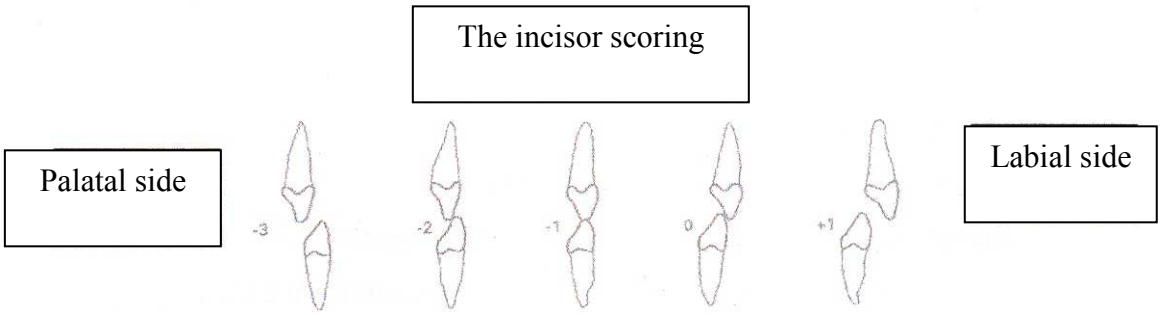


Figure 8. Incisor scoring according to the Huddart scale.

When analysing occlusion in the transversal direction, the relationship between the first and second deciduous molars and canines was assessed. The relation of upper and lower teeth was scored according to the Huddart scale. Scoring of maxillary and mandibular first and second deciduous molars and canines in the same patients was summed up, score (-9), (-8), (-7), (-6), (-5) was assessed as very poor and attributed to group 3, score (-4), (-3), (-2), (-1) was assessed as satisfactory and attributed to group 2, score 0, 1, 2, 3 was assessed as good and perfect attributed to group 1 (Figure 9).

To compare the jaw measurements in five-year-old patients, a control group of thirty healthy five-year-olds was included. The dental arches of patients in the control group matched the described regular features of dental arches and occlusion in five-year-olds (136, 157, 158). The same maxillary measurements were taken in patients of the control group as in patients with CUTCLAP.

In our study we also found in what way linear and angular maxillary measurements and occlusion in five-year-old patients depend on groups of cleft width identified in two anatomic zones: narrow, medium and wide. It was assessed whether there existed statistically significant differences between the different cleft width groups and maxillary anatomical measurements and occlusion.

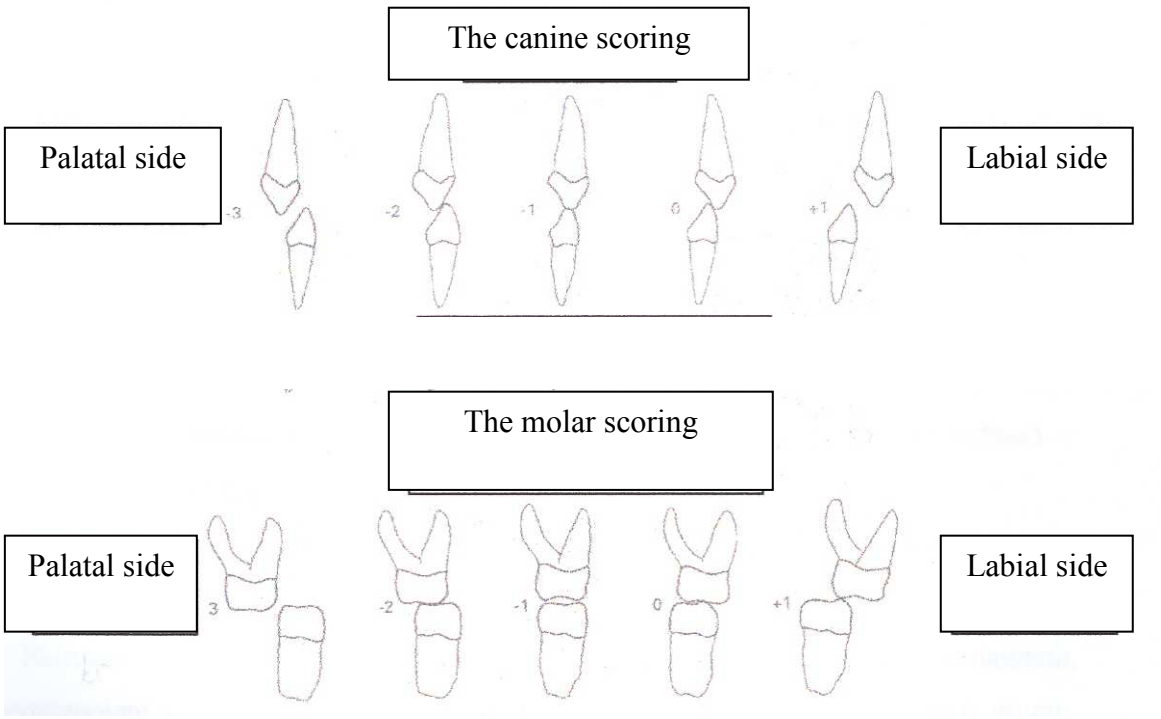


Figure 9. Canine and molar relation scoring according to the Huddart scale

Statistical analysis

Collected data were ported to the computer and analysed. Statistical analysis was carried out using the statistic package (SPSS 15.0 for Windows). Prior to statistical analysis, we found that the obtained parameters of measurements were distributed symmetrically and conformed to the normal law of distribution.

Descriptive statistics methods were used for classification and graphic imaging of findings. Using the SPSS procedure *Frequencies* for continuous values, key indicators of the central trend (mean, mode and median) and their dispersion characteristics (rank and standard deviation) were computed. Mean variance between groups was assessed using the multifactor dispersive analysis (ANOVA). Variance at not more than 0.05 significance level was considered as statistically reliable. Using the variance line analysis method, cleft widths at alveolus and at hard palate were divided into three groups: narrow, medium and wide. The relationship between cleft width group and maxillary measurements was assessed along with its nature and strength. Since comparative

groups were small and classified according to the ordinal scale, we applied the ranking correlation technique by adapting Spearman nonparametrical correlation.

RESULTS

Maxillary development from 3 months till 5 years of age

During the study, changes in maxillary measurements in patients with CUTCLAP from 3 months till 5 years of age were analysed. In examined patients lip surgery was performed at 3 months and palate surgery at 18 months of age. Changes in mean maxillary linear measurements (intercanine width, maxillary posterior width, maxillary anterior lateral length on the non-cleft and cleft sides, maxillary posterior lateral length on the non-cleft and cleft sides, maxillary anterior length and total maxillary length measurements) by measurement period are provided in Diagram 1. The obtained changes in mean maxillary angular measurements by measurement period are provided in Diagram 2. The variation scheme of maxillary size and shape is provided in Figure 10.

Diagram 1. Changes in maxillary linear measurements (mm) in patients with CUTCLAP from 3 months till 5 years of age.

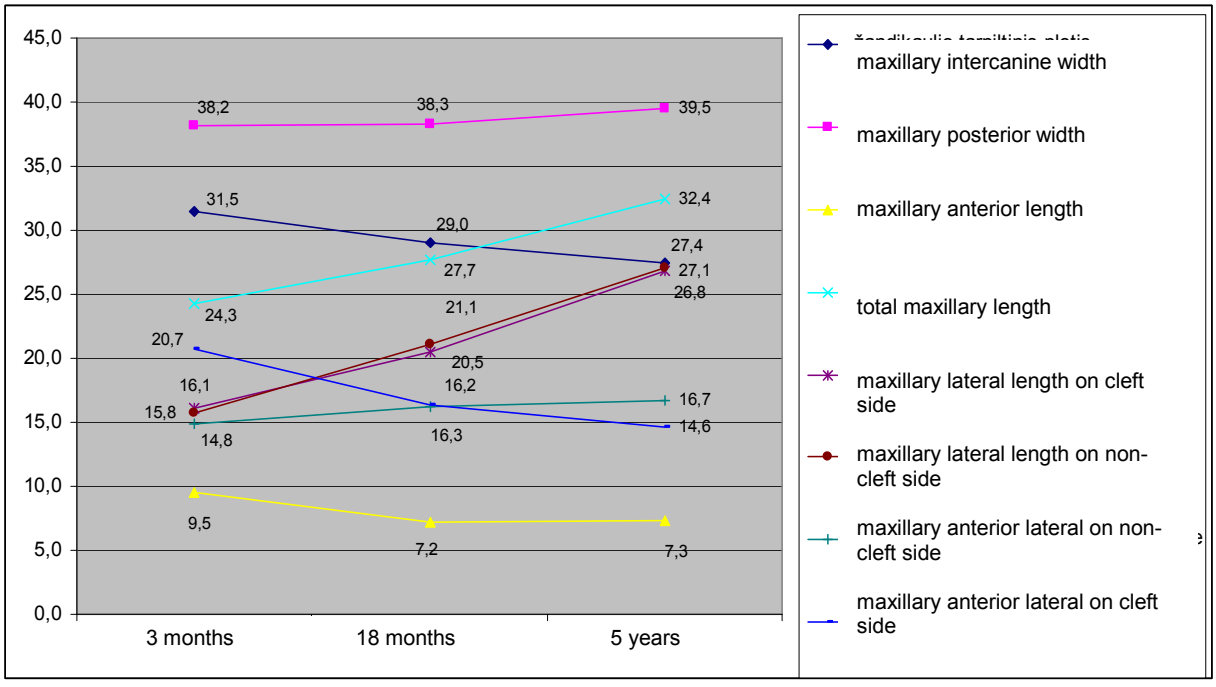
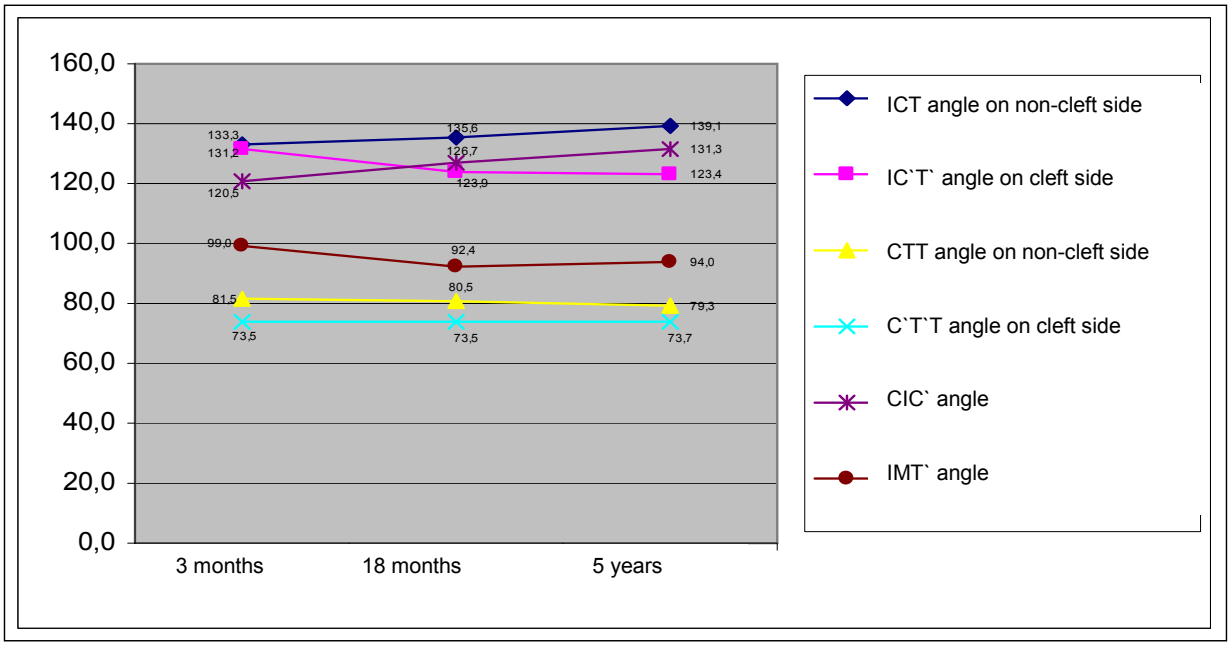


Diagram 2. Changes in maxillary angular measurements (in degrees) in patients with CUTCLAP from 3 months till 5 years of age.



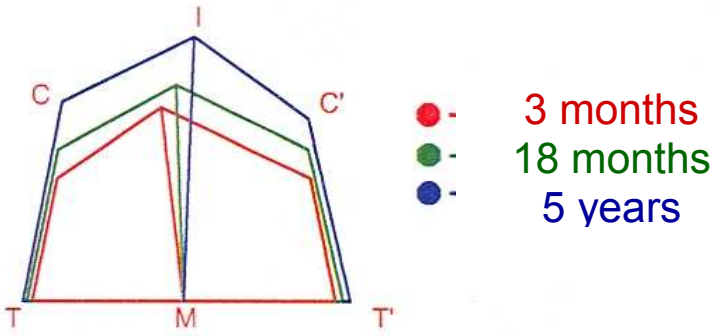


Figure 10. Variation scheme of maxillary size and shape

Comparison of maxillary measurements in five-year-old patients with CUTCLAP with those in the control group

Maxillary measurements in five-year-old patients with CUTCLAP were compared with those in the control group. The control group included healthy children whose shape of dental arch and deciduous occlusion met the normal occlusion criteria (157, 158). Obtained findings show that there exist statistically reliable differences in maxillary intercanine width, maxillary posterior width, maxillary anterior length and maxillary anterior lateral length on the non-cleft and cleft sides measurements in five-year-old patients with CUTCLAP and in children in the control group. No statistically significant difference between maxillary posterior lateral length on the non-cleft and cleft sides and total maxillary length measurements in patients with CUTCLAP and in the control group was found. A comparison scheme of maxillary size and shape in patients with CUTCLAP and in healthy children is provided in Figure 11.

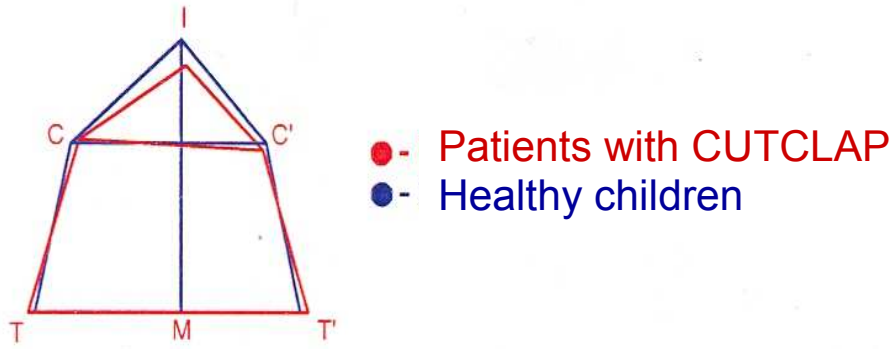


Figure 11. A comparison scheme of maxillary size and shape in patients with CUTCLAP and in healthy children.

Cleft width distribution

Cleft width was measured in two maxillary zones: at alveolus and maximum cleft width at hard palate in patients at 3 months and at 18 months of age. After applying the variation line

analysis, cleft width measurements in both anatomical zones in three-month-old infants were divided into narrow, medium and wide cleft groups. We identified narrow clefts alveolus as those with measurement up to 6.2 mm, medium from 6.3 mm to 9.2 mm and wide from 9.3 mm. We broke down clefts hard palate by width into narrow with measurement up to 8.7 mm, medium from 8.8 to 10.5 mm and wide from 10.6 mm. Combinations of alveolar and palatal cleft width groups are provided in Table 3. A statistically reliable difference between these two measurements was found, i.e. palatal and alveolar cleft width groups mismatched (χ^2=13,125, ll=4, p=0.011).

Table 3. Combinations of alveolar and palatal cleft width groups

Alveolar cleft width groups	Palatal cleft width groups			
	Narrow	Medium	Wide	Total
Narrow	8	7	1	16
	50.0%	43.8%	6.3%	33.3%
Medium	7	3	6	16
	43.8%	18.8%	37.5%	33.3%
Wide	1	6	9	16
	6.3%	37.5%	56.3%	33.3%
Total	16	16	16	48
	100.0%	100.0%	100.0%	100.0%

Correlation between maxillary measurements and cleft width

In our research we looked for the relationship between maxillary linear and angular measurements in patients at 3, 18 months and 5 years of age and occlusion and cleft width in patients at 5 years in two anatomical zones. It was assessed whether there existed statistically significant differences between the different cleft width groups and maxillary anatomical measurements and occlusion.

It was found that intercanine width, maxillary posterior width, total maxillary length, maxillary posterior lateral length on the non-cleft side and on the cleft side as well as maxillary anterior lateral length on the non-cleft side did not depend on alveolar cleft width. This means that

in all cleft width groups (narrow, medium and wide) these measurements did not show statistically significant differences.

Whereas maxillary anterior length in different alveolar cleft width groups was statistically significantly different. Maxillary anterior length was approximately 8.5 mm in three-month-old infants with narrow cleft, 9.4 mm with medium cleft and 10.1 mm with wide cleft. There was a statistically significant difference between narrow and wide cleft groups. Fifteen months after lip surgery, when the effects of surgery are very distinct, differences between cleft groups decreased to statistically unreliable ones. In five-year-olds, however, statistically reliably different maxillary anterior lengths were observed in different cleft width groups. Mean maxillary anterior length was 6.7 mm in the narrow cleft group, 7.3 mm in the medium cleft group and 7.9 mm in the wide cleft group.

Maxillary anterior lateral length on the cleft side in different alveolar cleft width groups was at variance, too. In three-month-old infants it was 18.8 mm in the narrow cleft group, 20.7 mm in the medium cleft group and 22.5 mm in the wide cleft group. A statistically significant difference was found between narrow and wide cleft groups. After lip surgery at 18 months of age differences between these groups became statistically unreliable, but re-emerged after the patients turned five. Meanwhile maxillary anterior lateral length on the cleft side was 13.4 mm in the narrow cleft group, 14.5 mm in the medium cleft group and 15.7 mm in the wide cleft group.

Examination of the relationship between palatal cleft width and maxillary measurements revealed that intercanine width in different cleft width groups was statistically reliably different. In three-month-old infants mean intercanine width was 30.7 mm in the narrow cleft group, 29.2 mm in the medium cleft group and 34.5 mm in the wide cleft group. In eighteen-month-olds mean intercanine width was 29 mm in the narrow cleft group, 27.5 mm in the medium cleft group and 30.3 mm in the wide cleft group. In five-year-olds, mean intercanine width was 28.6 mm in the narrow cleft group, 26.2 mm in the medium cleft group and 27.3 mm in the wide cleft group. In three-month-old infants, maxillary posterior width was statistically reliably different in all palatal cleft width groups. It was 38 mm in the narrow cleft group, 36.9 mm in the medium cleft group and 39.6 mm in the wide cleft group. In eighteen-month-olds and five-year-olds this measurement, however, was not statistically reliable in the different cleft groups.

Maxillary anterior lateral length on the cleft side in three-month-old infants statistically reliably differs between the different palatal cleft width groups. It was 19.7 mm in the narrow cleft group, 18.8 mm in the medium cleft group and 23.4 mm in the wide cleft group. In eighteen-month-

olds this measure was 16.5 mm in the narrow cleft group, 15.1 mm in the medium cleft group and 17.3 mm in the wide cleft group. At 5 years, however, no statistically reliable difference between the different groups persisted.

Maxillary anterior length, total maxillary length, maxillary posterior lateral length on the non-cleft and cleft sides and maxillary anterior lateral length on the non-cleft side measurements do not differ in the different palatal cleft width groups.

In assessing the relationship between maxillary shape and alveolar cleft width, a difference was observed only in three-month-old patients. Whereas ICT angle and IMT` angle statistically reliably differed between narrow, medium and wide clefts alveolus. In patients at 18 months and 5 years of age the measurements of ICT angle and IMT` angle did not differ in the different alveolar cleft groups.

Assessment of the relationship between maximum palatal cleft and maxillary shape revealed that in three-month-old infants IC`T` angle and IMT` angle differed statistically reliably in the different cleft width groups. In patients at 18 months and 5 years of age IC`T` angle and IMT` angle did not differ in the different cleft groups. Maxillary measurements which differ in patients at 3, 18 months and 5 years with different cleft widths are provided in Table 4.

Table 4. Maxillary measurements which differ in patients at 3, 18 months and 5 years with different cleft widths

Age of patient	Alveolar cleft width	Maximum palatal cleft width
3 months	Maxillary anterior length	Maxillary intercanine width
	Anterior side on the cleft side	Maxillary posterior width
	ICT angle	Maxillary anterior side on the cleft side
	IMT`angle	IC`T`angle
		IMT`angle
18 months		Maxillary intercanine width
		Maxillary anterior side on the cleft side
5 years	Maxillary anterior length	Maxillary intercanine width
	Maxillary anterior side on the cleft side	

Assessment of occlusion in five-year-old patients and its relationship with primary cleft measurements

After applying the correlation line analysis, alveolar cleft width and maximum palatal cleft width in patients with CUTCLAP were broken down into three cleft width groups: narrow, medium and wide cleft. Deciduous occlusion in patients with CUTCLAP was assessed according to the Huddart and Bohenheim scoring system and was also divided into 3 groups: 1 – perfect and good, 2 – satisfactory and 3 – poor and very poor. After applying Pearson correlation of nonparametric analysis, a relationship between different cleft and occlusion groups was identified. According to Spearman correlation of nonparametric analysis for nonparametric values the strength of relationship was assessed. A very strong relationship was found between deciduous occlusion on

the transversal or sagittal planes in primary cleft width groups (at 3 months) and at 5 years. There is a relationship between alveolar cleft width and occlusion on the sagittal plane, and statistically reliable differences between groups were found (χ^2=13,873, ll=4, p=0.008). Meanwhile no relationship was identified between occlusion on the transversal plane and alveolar cleft width (χ^2=1,894, ll=4, p=0.755). There was no relationship between palatal cleft width and occlusion on the sagittal plane, and the differences between groups were not found to be statistically significant (χ^2=5,763, ll=4, p=0.218). There is a relationship between palatal cleft width and occlusion on the transversal plane, and statistically reliable differences between groups were found (χ^2=13,306, ll=4, p=0.01).

After applying Spearman correlation, it was found that there existed a statistically reliable (p= 0.001) medium-strength (rho=-0,478) relationship between alveolar cleft width and occlusion on the sagittal plane, i.e. the wider the cleft alveolus, the better the occlusion on the sagittal plane. Using the same technique it was found that there existed a statistically reliable (p= 0.001) above average strength (rho=0,520) direct relationship between palatal cleft width and occlusion on the transversal plane, i.e. the wider the cleft palate, the poorer the occlusion on the transversal plane.

Conclusions

1. After lip surgery performed at 3 months of age, until 18 months maxillary intercanine width decreases, maxillary anterior part and anterior side on the cleft side shorten whereas maxillary posterior part widens and the posterior lateral lengths on the cleft and non-cleft sides and anterior lateral length on the non-cleft side lengthen. After lip surgery, maxillary anterior shape changes whereas posterior maxillary shape remains unaltered.

2. From 18 months till 5 years of age, after performing lip surgery at 3 months and palate surgery at 18 months, all maxillary measurements increase except for intercanine width and anterior lateral length on the cleft side. After lip and palate surgeries, changes to maxillary shape remain the same as after lip surgery.

3. Statistically reliable differences in measurements of maxillary intercanine width, maxillary posterior width, maxillary anterior length and maxillary anterior lateral length on the non-cleft

and cleft sides in five-year-old patients with CUTCLAP and in children in the control group were found.

4. There exists a great variety of primary cleft width. We identified narrow alveolar clefts as those with measurement up to 6.2 mm, average from 6.3 mm to 9.2 mm and wide from 9.3 mm. We broke down palatal clefts by width into narrow with measurement up to 8.7 mm, average from 8.8 mm to 10.5 mm and wide from 10.6 mm. Palatal cleft and alveolar cleft width groups not always coincide.

5. A statistically reliable correlation was found between maximum primary alveolar and palatal cleft width and maxillary shape and measurement in children at 3, 18 months and 5 years of age.
6. A very strong correlation was found between deciduous occlusion on the transversal or sagittal planes in primary cleft width groups (at 3 months) and at 5 years. The wider the cleft alveolus at 3 months, the better the occlusion scoring on the sagittal plane. The narrower the cleft palate, the better the occlusion scores on the transversal plane.

Practical recommendations

1. Cleft width in patients with CUTCLAP should be measured in two different maxillary anatomical zones: at alveolus and at hard palate.
2. It is recommended to break down cleft width into three groups: narrow, medium and wide cleft.
3. Patients with a narrow cleft alveolus and a broad cleft palate at 3 months of age fall into the group of the worst treatment prognosis until 5 years of age and should therefore come for an orthodontist's consultation before they turn 5. Findings from our study show that patients with a wide cleft alveolus and a narrow cleft hard palate at three months of age have the most favourable outcomes of maxillary development after surgeries until 5 years of age.
4. Maxillary anterior shape undergoes most substantial changes after lip and palate surgeries and is at most variance from that in children of the control group, therefore special focus should be placed on the restoration of its shape.
5. In assessing the treatment outcomes in patients with CUTCLAP one needs to take account of primary cleft severity, which has a relationship with maxillary measurements and may

condition different treatment outcomes in patients treated according to the same treatment protocol.

Santrauka

ĮVADAS

Temos aktualumas

Lietuvos Respublikos sveikatos apsaugos ministerijos ir Lietuvos sveikatos informacijos centro duomenimis, įgimti veido nesuaugimai tarp įgimtų anomalijų Lietuvoje pagal dažnumą užima 6-7 vietą. Įgimtas vienpusis visiškas lūpos, alveolinės ataugos ir gomurio nesuaugimas (ĮVVLAGN) yra dažniausiai pasitaikanti veido nesuaugimo forma. Žinia, kad kūdikis gimė ne toks kaip visi ar ne toks, kokio buvo laukta, yra labai netikėta ir skaudi kiekvienai šeimai. Pirmas uždavinys sprendžiant šią problemą - laiku suteikti informaciją tėvams apie vaiko gydymo galimybes, eigą ir prognozes (1-6). Pacientams, turintiems ĮVVLAGN, būdinga pakitusi veido estetika, sutrikusi kalba, pakitusi dantų dygimo seka (7-9), dantų lanko forma bei dantų skaičius (10-13). Todėl pilnavertei pacientų reabilitacijai reikia kompleksinio gydymo, kuriame dalyvautų įvairių sričių specialistai: veido ir žandikaulių chirurgai, ortodontai, logopedai, genetikai, vaikų odontologai bei odontologai ortopedai (14-18). Toks gydymas yra sudėtingas ir užtrunka iki paciento pilnametystės. Geri gydymo rezultatai galimi tik suvienijus gydytojų, paciento bei jo šeimos narių pastangas.

Šiuo metu taikoma daugybė ĮVVLAGN gydymo protokolų, kurie skiriasi operacijų bei ortodontinio gydymo laiko parinkimu ir taikomomis metodikomis. Standartiniais klinikiniais tyrimais vertinami gydymo pagal skirtingus protokolus rezultatai. Veido nesuaugimų gydymo centrai pateikia savo pacientų gydymo duomenis. Nors tyrimų atlikta daug, iki šiol nėra geriausiu pripažinto įgimtų nesuaugimų gydymo protokolo. Net taikant tą patį gydymo protokolą gydymo rezultatai skiriasi. Iki šiol tyrėjai neranda atsakymo į klausimą, kodėl gydant pagal tą patį protokolą vaikų viršutinis žandikaulis auga skirtingai. Dalies pacientų viršutinis žandikaulis auga pakankamai, o kitiems dėl augimo sutrikimo tenka žandikaulį operuoti ir koreguoti sąkandį (19-22).

Pacientų, turinčių ĮVVLAGN, viršutinio žandikaulio augimui nuo gimimo iki 5-erių metų yra svarbūs šie veiksniai: įgimtas nesuaugimas, žandikaulio augimo ypatumai, chirurginės operacijos bei ankstyvas ikichirurginis ortopedinis gydymas, jeigu toks yra taikomas.

Mokslinėje literatūroje plačiai nagrinėjamas paruošiamasis ikioperacinis ortopedinis gydymas, chirurginio gydymo metodikos, operacijų laikas, bet iki šiol nėra atliktų viršutinio žandikaulio kompleksinės raidos po chirurginių operacijų išsamių tyrimų. Tokie tyrimai yra svarbūs, nes nepaisant to, kaip bus vertinamos chirurginės operacijos, gydant vaikus, turinčius

ĮVVLAGN, dėl estetinių, funkcinių ir socialinių priežasčių operacijų atidėjimas negalimas. Šiuo metu ypač daug dėmesio skiriama numatyti veiksniams, kurie galėtų paveikti gydymo rezultatus. Nustačius veiksnių sudedamąsias, galinčias padėti prognozuoti gydymo rezultatus, galima koreguoti gydymo protokolus ir taip sudaryti kiekvienam vaikui optimalų, žadantį gerus rezultatus ir mažiausiai laiko bei finansinių sąnaudų pareikalausiantį gydymo protokolą.

Nors ĮVVLAGN būdinga nesuaugimo pločio įvairovė, iki šiol nėra išsamių tyrimų, kokį ryšį pirminis nesuaugimo plotis (pamatuotas kūdikiui, kol dar nėra atliktos jokios gydomosios procedūros) daro viršutinio žandikaulio matmenims ir gydymo rezultatams. Pirminio nesuaugimo sunkis nesiejamas su gydymo metodų taikymu, galutiniais gydymo rezultatais ir prognoze. Vilniaus universiteto ligoninės Žalgirio klinikoje sukaupti duomenys bei ilgalaikis pacientų, turinčių ĮVVLAGN, stebėjimas leidžia nagrinėti kompleksinę viršutinio žandikaulio raidą po chirurginių operacijų ir galimą nesuaugimo pločio ryšį su viršutinio žandikaulio matmenimis.

Darbo tikslas

Ištirti vaikų, turinčių ĮVVLAGN, kuriems nebuvo taikytas ikichirurginis ortopedinis gydymas, viršutinio žandikaulio raidą nuo gimimo iki penkerių metų amžiaus ir nustatyti įgimto nesuaugimo pločio ryšį su viršutinio žandikaulio matmenimis ir sąkandžiu, atlikus lūpos ir gomurio plastines operacijas.

Darbo uždaviniai

1. Įvertinti pacientų, turinčių ĮVVLAGN, viršutinio žandikaulio matmenų ir formos pokyčius nuo 3 mėnesių iki 18 mėnesių amžiaus, atlikus lūpos plastinę operaciją 3 mėnesių amžiaus.
2. Įvertinti pacientų, turinčių ĮVVLAGN, viršutinio žandikaulio matmenų ir formos pokyčius nuo 18 mėnesių iki 5-erių metų amžiaus, atlikus lūpos plastinę operaciją 3 mėnesių ir gomurio plastinę operaciją 18 mėnesių amžiaus.

3. Palyginti 5-erių metų pacientų, turinčių ĮVVLAGN, viršutinio žandikaulio matmenis ir formą su sveikų 5-erių metų vaikų viršutinio žandikaulio matmenimis ir forma.
4. Nustatyti pirminio ĮVVLAGN anatominę įvairovę.
5. Nustatyti pirminio nesuaugimo pločio ir viršutinio žandikaulio matmenų ir formos ryšį 3, 18 mėnesių ir 5-erių metų pacientams, turintiems ĮVVLAGN.
6. Nustatyti pirminio nesuaugimo pločio ryšį su penkiamečių pacientų, turinčių ĮVVLAGN, sąkandžiu.

Ginamieji teiginiai

1. Po lūpos ir gomurio plastinių operacijų keičiasi viršutinio žandikaulio matmenys ir forma.
2. Egzistuoja didelė nesuaugimo pločio įvairovė.
3. Skirtingose viršutinio žandikaulio anatominėse zonose nesuaugimo sunkis skirtingas.
4. Pirminis nesuaugimo plotis turi ryšį su 3, 18 mėnesių ir 5-erių metų pacientų viršutinio žandikaulio matmenimis.
5. Pirminis nesuaugimo plotis turi ryšį su 5-erių metų pacientų sąkandžiu skersinėje ir išilginėje plokštumose.

Darbo mokslinis naujumas ir praktinė reikšmė

1. Išmatuoti 3, 18 mėnesių ir 5-erių metų vaikų, turinčių ĮVVLAGN, viršutinio žandikaulio linijiniai ir kampiniai matmenys, atliktas vaikų, turinčių ĮVVLAGN, viršutinio žandikaulio raidos tyrimas nuo 3 mėnesių iki 5-erių metų amžiaus.
2. Aprašyta 3 mėnesių kūdikių, turinčių ĮVVLAGN, viršutinio žandikaulio nesuaugimo pločio įvairovė.
3. Rekomenduota nauja metodika viršutinio žandikaulio nesuaugimui įvertinti.
4. Pasiūlyta statistiškai patikima nesuaugimo sunkio klasifikacija.
5. Nustatytas ryšys tarp pirminio nesuaugimo sunkio ir 5-erių metų vaikų viršutinio žandikaulio matmenų ir sąkandžio.

6. Rekomenduota atsižvelgti į pirminį nesuaugimo sunkį vertinant pacientų, turinčių ĮVVLAGN, viršutinio žandikaulio raidą ir gydymo rezultatus.

MEDŽIAGA IR METODAI

Tiriamųjų atrinkimas

Darbe tirti Vilniaus universiteto ligoninės Žalgirio klinikoje (VULŽK) 2000-2009 metais gydyti pacientai, turintys ĮVVLAGN. Pacientai į tyrimą įtraukti pagal šiuos kriterijus:

9. Pacientai, gimę su įgimtu vienpusiu visišku lūpos, alveolinės ataugos ir gomurio nesuaugimu.
10. Pacientai, gimę 2000 sausio mėnesį ir vėliau.
11. Vienpusis visiškas lūpos, alveolinės ataugos ir gomurio nesuaugimas buvo vienintelė įgimta patologija.
12. Pacientai, gimę nuo 38 iki 41 nėštumo savaitės.
13. Pacientai, neturintys Simonarto jungties.
14. Pacientams lūpos plastinė operacija atlikta 3 mėnesių amžiaus.
15. Gomurio plastinė operacija atlikta 18 mėnesių amžiaus.
16. Pacientai atvyko kontrolinio vizito pas ortodontą 5-erių metų amžiaus.

2000-2004 metais gimusių pacientų, turinčių ĮVVLAGN, atvykusių pirminei konsultacijai į VULŽK įgimtų veido nesuaugimų gydymo poskyrį ir atitikusių tyrimui nustatytus 1,2,3,4,5 kriterijus, buvo 48: 29 berniukai ir 19 mergaičių. Visi šie pacientai atvyko gydytis įgimto lūpos ir gomurio nesuaugimo pagal VULŽK įgimtų veido nesuaugimų gydymo centro protokolą (atitiko 6 ir 7 kriterijus) ir kontrolinio vizito pas ortodontą 5-erių metų amžiaus (atitiko 8 kriterijų).

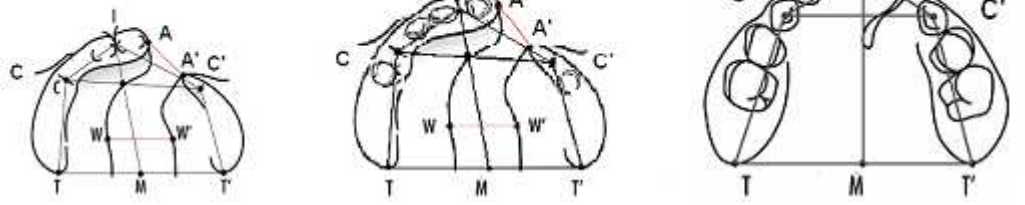
Viršutinio žandikaulio matmenų analizė

Tyrimui naudoti tų pačių pacientų 3 bei 18 mėnesių amžiaus viršutinio žandikaulio modeliai ir 5-erių metų amžiaus viršutinio ir apatinio žandikaulių modeliai. Atspaudai viršutinio žandikaulio modeliams 3 ir 18 mėnesių pacientams buvo nuimti operacinėje, taikant bendrąją nejautrą. Tų pačių pacientų viršutinio ir apatinio žandikaulių atspaudai buvo nuimti vizito pas

ortodontą metu, kai jiems suėjo 5-eri metai. Penkerių metų pacientams nuėmus atspaudus, duota sukąsti 1,5 mm storio vaškinį volelį santykiui tarp viršutinio ir apatinio žandikaulio užfiksuoti. Modelius vertino tas pats tyrėjas (Laura Linkevičienė). Ant gipsinių viršutinio žandikaulio modelių 0,5 mm storio pieštuku pažymėti taškai. Pasirinkti anatominiai taškai, skirti įvertinti bedančių naujagimių ir pieninio sąkandžio modelių priekinius ir galinius viršutinio žandikaulio duomenis, yra aprašyti bei naudoti ir kitų autorių (46, 57, 152, 171). Visų amžiaus grupių pacientų modeliai su pažymėtais taškais buvo nuskenuoti ir perkelti į skaitmeninę diagnostinių modelių analizės sistemą ,,Concret" (Vokietija). Modelių kompiuterinės analizės metu atkartoti prieš tai pieštuku pažymėti taškai. Pažymėjus taškus, kompiuterinė programa apskaičiuoja atstumus tarp taškų, išmatuoja kampinius matmenis, pateikia viršutinio žandikaulio grafinį vaizdą ir apskaičiuotus matmenis. Mūsų tyrime vertinimui pasirinkti viršutinio žandikaulio anatominiai matmenys pavaizduoti 1 paveiksle, o jų apibrėžimai pateikti 1 lentelėje. Viršutinio žandikaulio forma išmatuota ir išanalizuota standartinės kompiuterinės programos sudarytame viršutinio žandikaulio grafiniame vaizde. Viršutinio žandikaulio linijiniai matmenys matuoti milimetrais, o kampiniai matmenys laipsniais. Vertinimui pasirinkti kampai pavaizduoti 2 paveiksle, o jų apibrėžimai pateikti 2 lentelėje.

1 lentelė. Viršutinio žandikaulio linijiniai matmenys ir jų abibrėžimai

Viršutinio žandikaulio matmenys	Apibrėžimas
Viršutinio žandikaulio ilgis	atstumas nuo kandžių taško iki taško M, esančio viduryje linijos TT`
Žandikaulio priekinės dalies ilgis	atstumas nuo kandžių taško, išvesto į tašką M, iki susikirtimo su linija, jungiančia iltinius taškus.
Žandikaulio priekinės dalies šoninis ilgis nesuaugusioje pusėje	atstumas nuo kandžių taško iki iltinio taško nesuaugusioje pusėje
Žandikaulio priekinės dalies šoninis ilgis suaugusioje pusėje	atstumas nuo kandžių taško iki iltinio taško suaugusioje pusėje
Žandikaulio galinės dalies šoninis ilgis nesuaugusioje pusėje	atstumas nuo iltinio iki Stilmano taško nesuaugusioje pusėje
Žandikaulio galinės dalies šoninis ilgis suaugusioje pusėje	atstumas nuo iltinio iki Stilmano taško suaugusioje pusėje
Tarpiltinis plotis	atstumas tarp iltinių taškų suaugusioje ir nesuaugusioje pusėse
Žandikaulio galinis plotis	atstumas tarp Stilmano taškų suaugusioje ir nesuaugusioje pusėse
Alveolinės ataugos nesuaugimo plotis	atstumas tarp kraštinio taško didžiojo nesuaugimo fragmento alveolinėje ataugoje ir kraštinio taško mažojo nesuaugimo fragmento alveolinėje ataugoje
Kietojo gomurio didžiausias nesuaugimo plotis	atstumas plačiausioje kietojo gomurio nesuaugimo vietoje tarp labiausiai nutolusių taškų suaugusioje ir nesuaugusioje pusėse

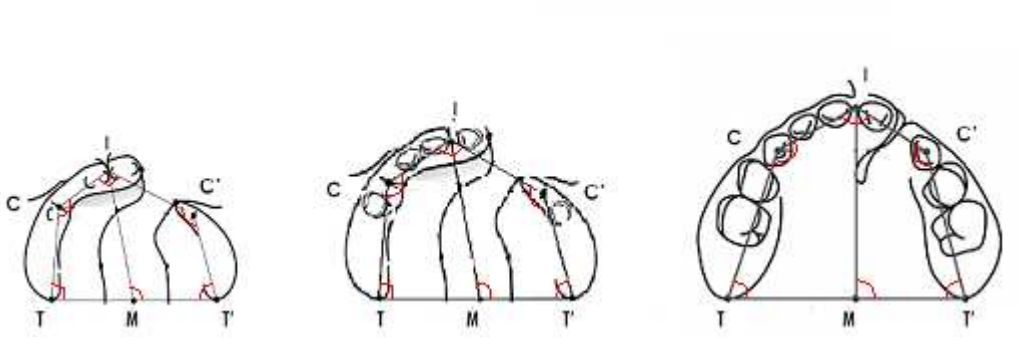


3 mėnesių 18 mėnesių 5 metų

1 paveikslas. Viršutinio žandikaulio linijinių matmenų schema 3, 18 mėnesių ir 5-erių metų amžiaus pacientams.

2 lentelė. Viršutinio žandikaulio kampiniai matmenys ir jų apibrėžimai

Viršutinio žandikaulio kampiniai matmenys	Apibrėžimas
Kampas ICT	kampas tarp priekinės dalies šoninio ilgio ir galinės dalies šoninio ilgio linijų suaugusioje pusėje
Kampas IC`T`	kampas tarp priekinės dalies šoninio ilgio ir galinės dalies šoninio ilgio linijų nesuaugusioje pusėje
Kampas CTT`	kampas tarp galinės dalies šoninio ilgio ir žandikaulio galinio pločio linijos suaugusioje pusėje
Kampas C`T`T	kampas tarp galinės dalies šoninio ilgio ir žandikaulio galinio pločio linijos nesuaugusioje pusėje
Kampas CIC`	kampas tarp priekinės dalies šoninių ilgių linijų suaugusioje ir nesuaugusioje pusėse
Kampas IMT`	kampas tarp linijos IM ir žandikaulio galinio pločio linijos nesuaugusioje pusėje



3 mėnesių 18 mėnesių 5 metų

2 paveikslas. Viršutinio žandikaulio kampinių matmenų schema 3, 18 mėnesių ir 5-erių metų amžiaus pacientams

Penkiamečių pacientų sąkandžio analizė

Sąkandis vertintas 5-erių metų pacientų, jų modelius užfiksavus pagal sukąsto vaškinio volelio įspaudus. Atskirai vertintas sąkandis išilginėje ir skersinėje plokštumose. Analizuojant sąkandį išilgine kryptimi, nustatytas horizontalus kandžių persidengimas: nuotolis tarp viršutinio žandikaulio centrinio kandžio kandamojo krašto iki apatinio žandikaulio centrinio kandžio prieanginio paviršiaus matuojamas lygiagrečiai su okliuzine plokštuma. Kandžių santykis įvertintas pagal Huddart skalę. Tai penkiabalė skalė nuo (–3) iki (+1). Kandžių santykis (-3), (-2) vertinamas atitinkamai kaip labai blogas ir blogas ir priskirtas 3 grupei. Kandžių santykis (-1), vertinamas kaip patenkinamas ir priskirtas 2 grupei. Kandžių santykis 0, (+1) vertinamas atitinkamai kaip geras ir puikus ir priskirtas 1 grupei. Analizuojant sąkandį skersine kryptimi, vertintas pirmųjų ir antrųjų pieninių krūminių dantų ir ilčių santykis. Viršutinių ir apatinių dantų santykis vertintas pagal Huddart skalę. Viršutinio ir apatinio žandikaulių pirmųjų ir antrųjų pieninių krūminių dantų ir ilčių santykio to paties paciento vertinimai buvo susumuoti, santykis (-9), (-8), (-7), (-6), (-5) įvertintas kaip labai blogas ir blogas ir priskirtas 3 grupei, santykis (-4), (-3), (-2), (-1) įvertintas kaip patenkinamas ir priskirtas 2 grupei, santykis 0, 1, 2, 3 įvertintas kaip geras ir puikus ir priskirtas 1 grupei.

Norint palyginti penkiamečių pacientų ir sveikų vaikų žandikaulio matmenis buvo surinkta kontrolinė trisdešimties sveikų penkiamečių vaikų grupė. Kontrolinės grupės pacientų dantų lankai atitiko aprašytus taisyklingus penkiamečių dantų lankų požymius ir sąkandį (154, 172, 173). Kontrolinės grupės pacientų išmatuoti tie patys viršutinio žandikaulio matmenys, kaip ir pacientų, turinčių ĮVVLAGN.

Atlikdami savo tyrimą, mes taip pat nustatėme ryšį tarp 5-erių metų pacientų viršutinio žandikaulio linijinių bei kampinių matmenų bei sąkandžio ir nustatytų dviejose anatominėse vietose nesuaugimo pločio grupių: siaurų, vidutinių ir plačių. Buvo vertinama, ar yra statistiškai reikšmingų skirtumų tarp skirtingą nesuaugimo plotį turinčių pacientų viršutinio žandikaulio anatominių matmenų bei sąkandžio.

Statistinė duomenų analizė

Surinkti duomenys buvo perkelti į kompiuterį ir analizuojami. Statistinė duomenų analizė atlikta naudojant statistinį paketą (SPSS 15.0 for Windows). Prieš atlikdami statistinę analizę, nustatėme, kad mūsų gauti matavimų parametrai yra simetriškai pasiskirstę ir jie atitinka normalų pasiskirstymo dėsnį.

Duomenų susisteminimui ir grafiniam vaizdavimui naudoti aprašomosios statistikos metodai. Panaudojus SPSS procedūrą "Dažniai" (angl. *Frequencies*) tolydiems dydžiams, buvo apskaičiuoti pagrindiniai centrinės tendencijos rodikliai (vidurkis, moda, mediana) ir jų išsibarstymo charakteristikos (rangas ir standartinis nuokrypis). Vidurkių skirtumui tarp grupių įvertinti taikyta dviejų faktorių dispersinė analizė (ANOVA). Statistiškai patikimu buvo laikomas ne didesnio nei 0,05 reikšmingumo lygmens skirtumas. Naudojant variacinės eilutės analizės metodą nesuaugimo pločiai alveolinės ataugos srityje ir kietojo gomurio srityje buvo suskirstyti į tris grupes: siauri, vidutiniai ir platūs. Įvertintas nesuaugimo pločio grupės ir viršutinio žandikaulio matmenų ryšys, jo pobūdis ir stiprumas. Kadangi lyginamosios grupės buvo nedidelės ir buvo sugrupuotos pagal ordinalią skalę, taikėme ranginės koreliacijos metodą, tam pritaikydami Spirmeno (angl. *Spearmen*) neparametrinę koreliaciją.

Išvados

1. Po lūpos plastinės operacijos atliktos 3 mėnesių amžiaus, iki 18 mėnesių amžiaus mažėja viršutinio žandikaulio tarpiltinis plotis, žandikaulio priekinės dalies ilgis ir žandikaulio priekinės dalies šoninis ilgis nesuaugimo pusėje, o žandikaulio galinis plotis, galinės dalies šoninis ilgis nesuaugusioje ir suaugusioje pusėse ir priekinės dalies šoninis ilgis suaugusioje pusėje didėja. Po lūpos plastinės operacijos keičiasi priekinės žandikaulio dalies forma, galinės žandikaulio dalies forma nepakinta.

2. Nuo 18 mėnesių iki 5-erių metų amžiaus, atlikus lūpos plastinę operaciją 3 mėnesių ir gomurio plastinę operaciją 18 mėnesių amžiaus, didėja visi viršutinio žandikaulio matmenys, išskyrus tarpiltinį plotį ir žandikaulio priekinės dalies šoninį ilgį nesuaugusioje pusėje. Po lūpos ir gomurio plastinių operacijų viršutinio žandikaulio formos pokyčiai išlieka tokie patys, kaip po lūpos plastinės operacijos.

3. Nustatyti statistiškai patikimi 5-erių metų amžiaus pacientų, turinčių ĮVVLAGN, ir kontrolinės grupės vaikų tarpiltinio pločio, žandikaulio galinio pločio, žandikaulio priekinės dalies šoninio ilgio nesuaugusioje ir suaugusioje pusėse ilgio matmenų skirtumai.

4. Egzistuoja didelė pirminio nesuaugimo pločio įvairovė. Alveolinės ataugos siaurais nesuaugimais įvardijome tuos, kurių matmuo yra iki 6,2 mm, vidutiniais – nuo 6,3 mm iki 9,2 mm, plačiais nuo 9,3 mm. Kietojo gomurio nesuaugimus pagal plotį suskirstėme į siaurus, kurių matmuo iki 8,7 mm, vidutinius - nuo 8,8 iki 10,5 mm, ir plačius – nuo 10,6 mm. Kietojo gomurio ir alveolinės ataugos nesuaugimo pločio grupės tam pačiam pacientui ne visada sutampa.

5. Nustatytas statistiškai patikimas ryšys tarp pirminio alveolinės ataugos bei kietojo gomurio didžiausio nesuaugimo pločio ir viršutinio žandikaulio matmenų ir formos 3, 18 mėnesių ir 5 metų amžiaus vaikams.

6. Nustatyta, kad egzistuoja labai stiprus ryšys tarp pirminio nesuaugimo pločio grupių ir 5-erių metų pieninio sąkandžio išilginėje ar skersinėje plokštumoje. Kuo platesnis alveolinės ataugos nesuaugimas 3 mėnesių amžiaus tuo geresnis sąkandžio išilginėje plokštumoje įvertinimas. Kuo siauresnis kietojo gomurio nesuaugimas tuo geresni sakandžio skersinėje plokštumoje rezultatai.

Praktinės rekomendacijos

1. Pacientų, turinčių ĮVVLAGN, nesuaugimo plotis turėtų būti matuojamas dviejose skirtingose anatominėse viršutinio žandikaulio vietose: alveolinės ataugos srityje ir kietojo gomurio srityje.

2. Rekomenduojama skirstyti nesuaugimo plotį tris grupes: siauro, vidutinio, plataus nesuaugimo.

3. Pacientai, kurie 3 mėnesių amžiaus turėjo siaurą alveolinės ataugos nesuaugimą ir platų kietojo gomurio nesuaugimą priskiriami blogiausios gydymo prognozės iki 5-erių metų amžiaus grupei, todėl turėtų atvykti gydytojo ortodonto konsultacijai anksčiau nei sukaks 5-erių metų. Mūsų tyrimo duomenimis, palankiausius viršutinio žandikaulio raidos po chirurginių operacijų rezultatus iki penkerių metų turi pacientai, kurie būdami 3 mėnesių amžiaus turėjo platų alveolinės ataugos nesuaugimą ir siaurą kietojo gomurio nesuaugimą.

4. Priekinės viršutinio žandikaulio dalies forma labiausiai pakinta po lūpos ir gomurio plastinių operacijų ir labiausiai skiriasi nuo kontrolinės grupės vaikų, todėl jos formai atkurti turėtų būti skiriamas ypatingas dėmesys.

5. Vertinant pacientų, turinčių ĮVVLAGN, gydymo rezultatus reikia atsižvelgti į pirminį nesuaugimo sunkumą, kuris turi ryšį su viršutinio žandikaulio matmenimis ir gali lemti pagal tą patį gydymo protokolą gydomų pacientų skirtingus gydymo rezultatus.

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Spausdinti darbai

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