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Assessment of Complete Cleft (CLP) Patients' Occlusion at Age of Five

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SUMMARY

This study evaluates dental occlusion of five year old children with unilateral cleft lip and palate (UCLP) patients with the occlusion of noncleft children. 70 dental casts of five year old children from Latvia were studied. 35 of them got complex treatment in Riga CLP center and 35-were noncleft from kindergarten groups.. All UCLP patients had surgically closed lip an palate; 31 patient had presurgical orthopedics, 17 patients had orthodontics treatment in primary dentition. 5 Year Old's Index were used to assess dental arch relationship from CLP patients. Measurements of dental arch length, canine arch width and molar arch width were taken similar to Bland and Altman method.

Key-words: UCLP, 5 year old index, jaw dimentions

INTRODUCTION

Complete cleft is congenital anomaly that is seen after birth and is associated with esthetic and functional problems. Cleft patients' facial morphology and occlusion differs from their noncleft contemporaries.

2-4 maxillo-facial surgical interventions have been performed; presurgical orthodontic treatment of infants, orthodontic treatment in the primary dentition; regular speech therapist's lessons to provide adequate speech for the cleft patients at the age of 5 were done. It is known that surgical operations, orthodontic treatment, heredity and environment's influence facial growth and development. CLP patients' rehabilitation can be effective by applying complex treatment – surgical, orthodontic and speech therapist's lessons.

Typical 5 – year - old complete cleft patients has the following characteristics:

- with operated lip and desirable esthetic nasal appearance (fig.1);
- with understandable speech without nasality that demonstrates the closing of velopharingeal space during phonation (there exists possibility of the relapse during further growth);
- good functional and esthetic occlusion (fig.2).

The aim of the study

- to compare complete CLP patients and noncleft children jaws development at the age of 5;
- to assess the influence of the complex treatment on complete CLP patients' facial growth.

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MATERIALS AND METHODS

Dental plaster casts of 70 five – year - old children

- 35 of them from operated (lip and palate surgery) UCLP patients;
- 35 noncleft children from kindergarten groups as a control group.

There were 13 females and 22 males in each group.

7 patients (20%) from CLP group had one-stage palate closure; 28 patients (80%) had two-stage palate closure; 31 patients (88,6%) had presurgical orthopedic treatment and 17 patients (48,6%) had orthodontic treatment in primary dentition.

All children from control group had no orthodontic treatment done before.

CLP patients occlusion in 5 years can differ if there are too low growth potentials or there is not successful orthodontic treatment. Than they can be with reverse overjet or crossbite (fig.3).

All the UCLP patients have been operated in Riga CLP center. Lip and palate surgery have been performed by the some two surgeons. (Table 1).

Figure 1. 5-year-old UCLP patients, external view.

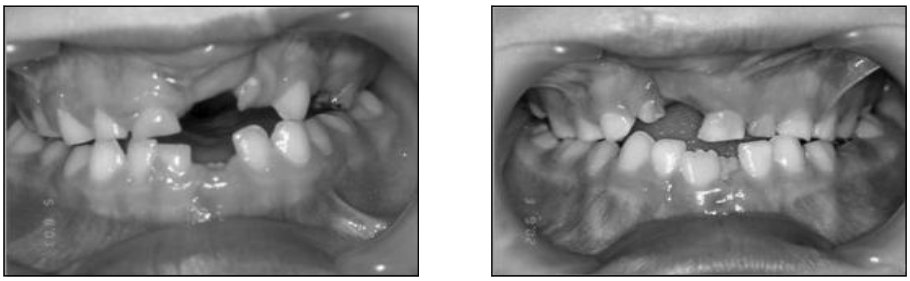

Figure 2. 5-years-old patient with CLP occlusion, intraoral view.

Figure 3. View of dental models. A – reverse overjet canine, crosbite, B – positive overjet, C – positive overjet (models from non cleft group).

The dental arch relationship of the 5 – year - old models were assessed using the 5 – Year– Olds'Index which consists of 5 general features (Table 2).

The 5 – Year – Olds' Index has been utilized for samples with the age ranges from 5 to 6,4 years (Atack et al, 1997a). The index is used to assess surgical outcomes and jaws morphology between the centres, so it is impossible to predict the future growth for an individual patient.

RESULTS

The most of our cleft patients have positive overjet with an open bite tendency around cleft site. Reverse overjet was seen for 8 patients (fig. 4).

The dental arch measurements were taken similar to Bland and Altman method. We compared (fig.5):

- arch length;
- canine arch width
- molar arch width in both jaws for the UCLP patients and their noncleft controls at the age of 5.

DISCUSSION

Maxillar and mandibular jaw dimensions between UCLP patients and controls do not differ significantly -in spite of the congenital deficiency of maxillary growth and surgical intervention. That causes jaw collapse. The differences of the dental arch parameters between the two groups are not considerable (as it is seen in the table)/ The data from the literature (1; 2; 3; 9) presents more remarkable differences of the complete Cleft patients' upper jaw measurements if they are not treated orthodontically in the primary dentition. Surgically untreated UCLP patients demonstrate that the structures affected by the cleft have had normal growth potential

Table1. Summary of the ages at which operations were done in two etaps for UCLP patients.

Operation	Mean age (months)
Lip closure	7,6 (usually 4 months)
Soft palate	26 (usually 10 months)
Hard palate	49 (usually 36 months)

Table 2. Features of Models in the 5-Year-Old`s Index.

Group	General features	Predicted Long - Term Outcome
1	Positive overjet with average inclined or retroinclined incisors no crossbites or openbites	Excellent
2	Positive overjet with average inclined or proinclined incisors unilateral crossbite (crossbite tendency ± open bite tendency around cleft site)	Good
3	Edge to edge bite with average inclined or proinclined incisors, or reverse overjet with retroinclined incisors unilateral crossbite ± open bite tendency around cleft site	Fair
4	Reverse overjet with average inclined or proinclined incisors unilateral crossbite ± bilateral crossbite tendency ± open bite tendency around cleft site	Poor
5	Reverse overjet with proinclined incisors Bilateral crossbite Poor maxillary arch from and palatal vault anatomy	Very poor

Table 3. Comparison of maxillary and mandibular jaw dimensions between UCLP patients and controls at the age of 5.

	Cleft patients		Control group		P value for difference
	Mean	SD	Mean	SD	
Maxillary dimensions (mm)					
Arch length	25.91	2.68	22.47	1.63	0,001
Canine width	26.93	0.54	28,97	1,06	0,09
Molar width	37.80	0.72	39.40	0.32	0,001
Mandibular dimensions (mm)					
Arch length	24,38	1.69	20.1	1.62	0,001
Canine width	23.65	0.28	24.17	0.33	NS
Molar width	32.61	1.57	33.83	1.21	0,001

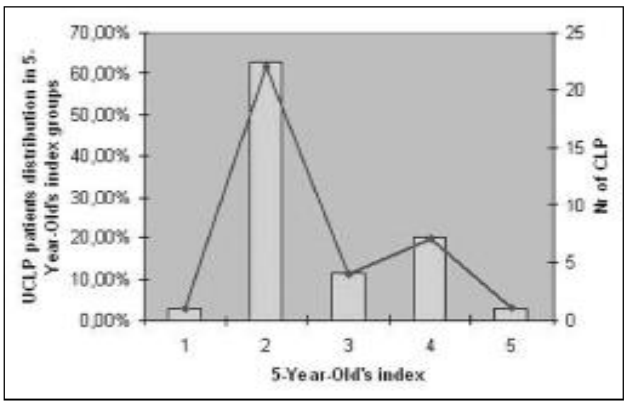

Figure 4. Results of 5 – Year – Olds' Index (UCLP patients). 3,1% (n=1) of patients had an Index 1 and Index 5, 59,4% (n=19) were assessed as having Index 2, but 12,5% (n=4) and 21,8 (n=7) had Index 3 and 4, respectively.

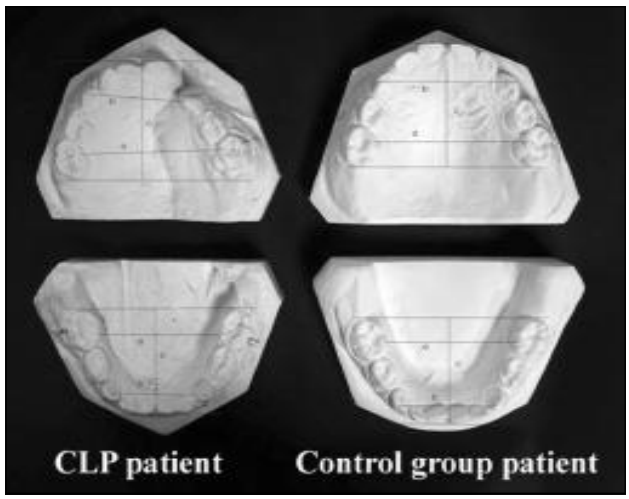

Figure 5. Dimensions of dental arch to anatomical points by Moorees (1969). a- inter molar distance, b – inter – canine distance, c- palatal lenght.

(3), but there has not been described psychological discomfort and speech development. There can be occlusal changes sagitally from the primary to the permanent dentition during the eruption of the permanent incisors (8). The direction of the erupting permanent incisor is not predictable. Orthodontic treatment is always durable and therefore it is tiring for the patients and the parents. It is easier to cooperate with the youth therefore some authors (Shaw B) consider that it's more useful to start orthodontic treatment later with the fixed appliances.

CONCLUSIONS

- Using careful surgical methods for the cleft patients, the growth potentials of maxilla in 5 year are very near to non cleft contemporaries.
- The occlusion and jaw parameters between two groups differ only slightly if cleft patients have been treated orthodontically before lip plastic and in the primary dentition.
- The results indicate that the oral cavity of UCLP patients can reach the dimensions of noncleft contemporaries in 5 year despite the surgery and the heredity.
- We did not take into account the mode of breathing and resting posture of oral cavity in this investigation.
- The current treatment protocol allows to achieve quite good facial morphology and occlusion results for the 5 year old cleft lip and palate patients.
- We have not enough patients to get statistically reliable results because we do not have enough patients in our country. So the multicenter evaluation would be desirable.

REFERENCES

1. Atack NE, Hathorn IS, Semb G, Dowell T, Sandy JR. A new index for assessing surgical outcome in unilateral cleft lip and palate subjects aged five: reproducibility and validity. *Cleft Palate Craniofac J* 1997; 34(3):242-6.
2. Prahl-Andersen B. Dental treatment of predental and infant patients with clefts and craniofacial anomalies. *Cleft Palate Craniofac J* 2000; 37(6):528-32.
3. Will LA. Growth and development in patients with untreated clefts. *Cleft Palate Craniofac J*. 2000; 37(6): 523-6.
4. Pruzansky S, Aduss H. Arch form and the deciduous occlusion in complete unilateral clefts. *Cleft Palate J* 1964; 30: 411-8.
5. Mars M, Plint DA, Houston WJ, et al. The Goslon Yardstick: a new system of assessing dental arch relationships inchildren with unilateral clefts of the lip and palate. *Cleft Palate J* 1987; 24(4): 314-22.
6. Atack N, Hathorn I, Mars M, Sandy J. Study models of 5 year old children as predictors of surgical outcome in unilateral cleft lip and palate. *Eur J Orthod* 1997;19(2):165-70.
7. Kernahan A, Rosenstein AW. *Cleft lip and palate*: a system of management. Baltimore: Williams & Wilkins; 1990.
8. Foster TD, Grundy MC. Occlusal changes from primary to permanent dentitions. *Br J Orthod*. 1986; 13(4):187-93.
9. A DiBiase AT, DiBiase DD, Hay NJ, Sommerlad BC. The relationship between arch dimensions and the 5-year index in the primarydentition of patients with complete UCLP. *Cleft Palate Craniofac J*. 2002; 39(6): 635-40.
10. Natsume N. Early orthodontic therapy of cleft lip and/or palate patients. *Plast Reconstr Surg*. 1998; 102(1): 269

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