Indonesian Journal of Dental Medicine
Volume 1 Issue 2 2018; 66-69

Analysis of Soft Tissue Cephalometry in Skeletal Class I with Post Operation Unilateral and Bilateral CLP

Ardan Fitrianto, Thalca Hamid, Ida Bagus Narmada
Department of Orthodontics, Faculty of Dental Medicine
Universitas Airlangga
Surabaya - Indonesia

ABSTRACT

Background: *Facial appearance is an important diagnostic criterion that must be considered in orthodontics treatment plan. Orthodontics treatment is one of the dental treatments to prevent or correct tooth position abnormalities so that optimal function can be achieved including occlusion, proportional arrangement of the teeth and facial profile, as well as the harmony of facial profiles. Common facial abnormality cases include cleft lip and palate. Cleft lip and palate are caused by congenital defects and environmental factors.* ***Purpose:*** *The study was aimed to determine post-operative soft tissue cephalometric analysis of skeletal class I with post-operative of unilateral and bilateral CLP.* ***Methods:*** *This was a descriptive observational study. The subjects were secondary data from radiographic cephalometry obtained from the CLP Center Premier Hospital Surabaya and Universitas Airlangga Dental Hospital.* ***Result:*** *There was a significant difference in line angle parameters in both groups with a significant value of 0.002 (p <0.05). There were also significant differences in the Li-H line parameters in both groups with a significant value of 0.000 (p <0.05). There were H line angle and Li-H line differences in soft tissue cephalometric analysis between skeletal class I group with post-operative unilateral and bilateral CLP group.* ***Conclusion:*** *There was no difference in soft tissue cephalometric analysis between the post-operative of unilateral CLP and bilateral CLP on all parameters.*

Keyword: *Cephalometry; Cleft Lip Palate; Unilateral; Bilateral*

Correspondence: Thalca Hamid, Department of Orthodontics, Faculty of Dental Medicine, Universitas Airlangga Jl. Prof. Dr. Moestopo No. 47, Surabaya 60132 – Indonesia, Phone: +62315030255 Email: thalca@fkg.unair.ac.id

INTRODUCTION

Face is an important part of human beings. Facial appearance is an important diagnostic criterion that must be considered in an orthodontic treatment plan. Orthodontic treatment does not only improve the composition of the teeth, but in certain cases, it has a significant influence on one's facial appearance. Orthodontic treatment is one of dental treatments to prevent or correct tooth position abnormalities so that optimal function can be achieved including occlusion, proportional arrangement of teeth and facial profile, as well as the harmony of facial profile.[1]

Common facial abnormalities are cleft lip with or without a cleft palate.[2] Cleft lips and palate are the most common birth defects in developing countries. The prevalence of children aged 24-59 months having one type of abnormality reaches 0.53%, with 0.08% of them presents on children who have cleft lip and palate. The incidence of cleft lip and palate abnormalities in East Java is 4 to 7 patients per 1000 birth, and it is evenly distributed in all districts in East Java.[3]

Dental study models, cephalometric analysis, panoramic photographs, and aesthetic facial clinical assessments are needed for good treatment results. The cephalometric evaluation soft tissue on cleft lip and palate is critical both in clinical practice and research. There are several cephalometric analyzes of facial soft tissue profiles used in the orthodontic field, one of which is from Holdaway analysis. The analysis quantitatively describes the relationship between facial soft tissue and facial features.[4] The purpose of the study was to determine soft tissue cephalometric analysis of skeletal class I with post-operative unilateral and bilateral CLP.

MATERIALS AND METHODS

This was a descriptive observational study. Cephalometric photographs of patients aged 7-12 years old with skeletal class I were sorted into group one. Cephalometric photographs of patients aged 7-12 years old with post-operative unilateral CLP were sorted into group two. Cephalometric photographs of patients aged 7-12 years old with post-operative bilateral CLP were sorted into group three.

Cephalometric photographs were redrawn on tracing paper and the points on the cephalogram were determined using a pencil followed by linear and angular measurements using a protractor.

A two-variable free comparison analysis was

used to determine the difference. If the data are normally distributed, then a statistical analysis of *independent t-test* would be carried out, otherwise, *Mann-Whitney* statistical analysis would be carried out.

RESULT

There was no significant difference in facial angle parameters. There was a significant difference on H line angle parameter in both groups with a significant value of 0.002 ($p < 0.05$). It means that the large H line angle in the post-operative unilateral and bilateral CLP group was smaller than in the skeletal class I group (Table 1).

Table 1. Results of data analysis on angular point parameters.

Parameter	Post operation CLP unilateral and bilateral Mean ± SD	Skeletal class I Mean ± SD	Comparison between group
Facial angle	83.96 ± 4.459	85.33 ± 2.855	0.186
H Line Angle	9.26 ± 6.746	11.00 ± 1.387	0.002

* Significant with a value of $p < 0.05$

Table 2. The results of data analysis on linear point parameters.

Parameter	post-operative unilateral and bilateral CLP Mean ± SD	Skeletal class I Mean ± SD	Comparison between the groups
Pn – H Line	4.74 ± 4.966	5.00 ± 1.941	0.802
Depth of the upper lip sulcus	2.85 ± 2.931	2.52 ± 0.802	0.573
Li – H Line	4.74 ± 2.297	1.63 ± 1.079	0.000
Depth of lower lip sulcus	2.22 ± 1.968	3.15 ± 0.907	0.033
Pog – Pog’	12.59 ± 2.062	12.41 ± 1.824	0.728
Upper Lip Strain	9.96 ± 4.381	10.59 ± 1.421	0.483

* Significant with a value of $p < 0.05$

The results of the analysis of the two groups in linear parameters is presented on table 2. There were significant differences in the Li-H line parameters in two groups with a significant value of 0,000 with $p < 0.05$. It means that the distance between Li-H lines in the post-operative unilateral and bilateral CLP group was greater than in skeletal class I group. Other groups of linear parameters (Pn - H line, depth of upper lip sulcus, depth of lower lip sulcus, Pog–Pog' and upper lip strain) have no significant differences.

There was no difference in soft tissue cephalometry between the post operation CLP unilateral group compared to the with bilateral group on all parameters

Table 3 showed results of the analysis of the two groups of angular point parameters. There were no significant differences in the two groups on both facial angle parameters and H line angle parameters.

There were no significant differences in either group in the Pn-H line, depth of the upper lip sulcus, Li-H line, depth of lower lip sulcus, Pog-Pog’ and upper lip strain (Table 4).

Table 3. Results of data analysis on angular point parameters.

Parameter	Post-operative unilateral CLP	Post-operative bilateral CLP	Comparison between the groups
Pn – *H Line*	3.29 ± 4.94	6.22 ± 3.67	0.141
Depth of the upper lip sulcus	2.85 ± 2.931	2.52 ± 0.802	0.076
Li – *H Line*	4.36 ± 2.44	5.78 ± 1.92	0.155
Depth of lower lip sulcus	1.86 ± 1.96	2.67 ± 2.12	0.359
Pog – Pog’	12.21 ± 1.85	13.44 ± 2.29	0.171
Upper Lip Strain	10.64 ± 4.01	10.00 ± 4.87	0.733

* Significant with a value of $p < 0.05$

Table 4. The results of data analysis on linear point parameters.

Parameter	Post-operative unilateral CLP	Post-operative bilateral CLP	Comparison betweenthe groups
Facial angle	84.36 ± 4.27	84.44 ± 4.82	0.964
H Line Angle	10.71 ± 6.46	9.11 ± 6.77	0.575

* Significant with a value of $p < 0.05$

DISCUSSION

Soft tissue was analysed using Holdaway analysis. The average of facial angle of the skeletal class I group was 85.33°, while the average of facial averages of the post-operative unilateral and bilateral CLP groups was 83.96°. The *Independent t-test* showed there were differences but not significant.

The results showed that no significant differences were found. H line angle angular parameters of post-operative unilateral and bilateral CLP group were smaller than the skeletal class I group. The mean of H line angle size of post-operative unilateral and bilateral CLP group was 9.26°, while the skeletal class I group was 11.00°. *Independent t-test* showed that there were significant differences between the skeletal class I group and post-operative unilateral and bilateral CLP group.

There were significant differences between skeletal class I group and the CLP group. The result supports other studies that report that there are effects of surgical procedures on anteroposterior growth and maxillary development in children with CLP as a result of fibrous formation.[5]

The maxilla in the CLP was smaller, and it was located more posteriorly and superiorly. Concerning the growth and development of CLP patients in puberty, it is stated that maxilla tends to experience retrusion during puberty.[6] There is limited maxillary growth in CLP. Growth inhibiting factors can be caused by two main factors: iatrogenic factors as a result of surgery, and intrinsic factors of patients due to developmental disorders.[7] In several studies it is said that in some individuals, the retrogenic maxilla may present due to developmental deficiencies.[5] There was limited development of anteroposterior maxilla in individuals with cleft lip and palate, usually caused by previous plastic surgery procedures. Lip reconstruction which causes scarring can block the development of the anterior maxilla. Surgical procedure on lips and palate can actually cause anterior and lateral maxillary contraction, so that in the end, the surgical procedure tend to result anterior and posterior cross bite. Developmental limitations in the maxilla can cause a skeletal class III pattern with an anterior cross bite.[8]

This study also found a significant difference in the linear parameters of Li-H line distance. The distance between labrale inferius and H line in the post-operative unilateral and bilateral CLP group was greater than skeletal class I group. This happened because the H line was formed from the tangent point between the soft tissue pogonion point and the labrale superius point formed, more erectly in patients with cleft lip and palate. This occurred because patients with cleft lip and palate the supernatural labrale point is located more posterior than that in skeletal class I sufferers.[9] This problem arose due to impaired maxillary growth and growth of teeth. Impaired maxillary growth can be seen as a less developed retardation of the middle part of the face, often a combination of heavy lateral compression in the arch of the jaw and giving rise to dense teeth. This deficiency in the development of the middle face will result in maxillary retrusion, which results in more mandibular prognosis, transverse skeletal dysplasia, vertical direction dysplasia.[2]

While common dental problems are missing teeth or supernumerary teeth, special care is needed to treat them.[10] Clefts in the CLP usually extend between the lateral incisors and the canines because they do not appear or disappear so the crossing is often anterior or posterior.[11]

In this study, there were no significant differences in facial angle, Pn - H line, depth of upper lip sulcus, depth of lower lip sulcus, Pog–Pog' and upper lip strain parameters.

Mandibular morphology in this case GoGn, no differences were found in either group. There was no significant difference in mandibular length between the groups with cleft lip and palate and no-cleft groups.[12]

There were differences in soft tissue cephalometric analysis between skeletal class I group with post-operative unilateral and bilateral CLP group. The difference were in the parameters H line angle and Li-H line. The study showed that there was no difference in soft tissue cephalometrc analysis between the post-operative unilateral and bilateral CLP group on all parameters.

REFERENCES

1. Kocadereli I. Changes in Soft Tissue Profile After Orthodontic Treatment with and without Extraction. Am J Orthod Dentofac Orthop [Internet]. 2002;jul;122(1);67-72
2. Proffit W, Field H. Contemporary Orthodontic. 3rd ed. America: Mosby Year Book; 2000.
3. Agus S. Penanganan Bibir Sumbing (CLP) secara Paripurna [Internet]. Surabaya; 2012. Available from: id.scribd.com/doc/163768056/penanganan-Bibir-Sumbing-Full-Text
4. Yusra Y, Widhayanti D, Widijanto S. Evaluasi Jaringan Lunak Fasial Abang-None Jakarta. Majalah Ilmiah Kedokteran Gigi Fakultas

Kedokteran Gigi Universitas Trisakti. 2005;5–12.
5. Mariana M, Milene A, Cristiane B, Enio M. Base of The Skull Morphology and Class III Malocclusion in Patient with Unilateral Cleft Lip and Palate. Dent Press J Orthod. 2014;20(1):79–84.
6. Berkowitz S. Cleft Lip and Palate. 2nd ed. Germany: Springer; 2006. 63–65 p.
7. Wu T, Ellen W, Chen P, Huang C. Craniofacial Characteristics in Unilateral Complete Cleft Lip and Palate Patients with Congenitally Missing Teeth. Am J Orthod Dentofac Orthop. 2013;144(3):385–6.
8. Fonseca R. Oral Maxillofacial Surgery. WB. Sounder; 2017.
9. Jacobson A. Radiographic Cephalometry from Basic to 3-D Imaging. New Malden, Surrey, UK: Quintesence Publishing Co, Inc; 2006.
10. Albery E, Hathorn I, Pigott R. Cleft Lip and Palate a Team Approarch. Bristol: Wright; 1986. 8,9,21.
11. Rose EL. Orthodontic Treatment of The Patient with Complete Cleft of Lip, Alveolus and Palate. 2000.
12. 13. Jyosna P, Chandrashekar H. Cephalometric Profile Evaluation in Patient With Cleft and Lip Palate. Int J Contemp Dent. 2011;2(4):68.