

Study of Dental Cast and Cephalometric in Unoperated Adult UCLP Patients

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ABSTRACT

Background: Early operated patients with orofacial clefts often develop a retrusive maxilla. It is not clear whether this growth disturbance is attributed to the congenital malformation itself or to the cleft surgery or both. **Objective:** to evaluate transversal and antero-posterior maxillary development in unoperated adult patients with unilateral cleft lip and palate (UCLP). **Methods:** 68 dental casts of unoperated adult UCLP patients were compared to 24 adult controls. The casts were analysed three dimensionally using an industrial coordinate measuring machine (=CMM) (Zeiss Numerex; Carl Zeiss Stuttgart, Germany). 12 cephalograms of unoperated UCLP patients and 24 controls were available and measured for the following variables: Maxillary length, SNA, SNB, Gonial angle and SN-FH angle. The data obtained was analysed by paired t-test, level of significance was set at $p < 0.05$. **Results:** measured on dental casts, the transversal distance at the level of the second molars was significantly wider and at the level of first premolar and canine significantly smaller compared to the control group. Cephalometrically there were no significant differences for the 5 cephalometric measurements. **Conclusions:** the presence of a cleft influences the development of the maxilla: the more extensive the cleft, the more extensive the effect on the dental arch, but the compression of the maxillary arch is limited to the anterior region. Measured cephalometrically the cleft has no influence on the antero-posterior development of the maxilla. However, the sample size for the cephalometric study was small.

Keywords : unilateral cleft lip and palate (UCLP), dental cast, cephalometric

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INTRODUCTION

In Unilateral Cleft Lip and Palate (UCLP) that being operated at early childhood, when they reach maturity show major or minor alternation of the morphology of the alveolar bone and position of the teeth i.e retrusion of midfacial and distorsion of dento alveolar structure that are teeth and supporting alveolar bone. Following the initial operative treatment there are tremendous improvement, esthetically as well as functionally. But at maturity, inhibition of the maxillary development becomes obvious. Consentrations of the studies on the palatal cleft like UCLP suggest the authors believe that development abberation in the maxilla are only expected when besides lip and alveolus cleft, the palate also cleft. Transversal measurement of the maxilla is concerned in the early operated cleft lip and alveolus and palate patient only a few. Mostly conducted in cephalogram, and transversal measurement on UCLP patients are mostly focused in dental cast of babies, or deciduous dentition or mixed dentition. To our knowledge Crabb and Foster(1977) are the first try to assess dental cast on the unoperated UCLP subject.

The aims of this study is to investigated whether there is influences of the cleft as congenital malformation to the final transversal development of the maxillary in adult unoperated Unilateral Cleft Lip .



Fig. 1. More detail of unoperated adult UCLP patient

Collect UCLP Sample:

To collect UCLP patients is difficult, due to mostly of the patients suffer from upper respiratory tracks infection, and

Criteria As sample must follow as below:

1. Age must be >12
2. Complete cleft of UCLP patients died at younger age
3. No operative prosedure previous
4. No orthodontic prosedur previously

MATERIAL AND METHODS :

68 dental casts of unoperated adult UCLP patients were compared to 24 adult controls. The casts were analysed three dimensionally using an industrial coordinate measuring machine(=CMM)(Zeiss Numerex; Carl Zeiss Stuttgart, Germany). 12 cephalograms of unoperated UCLP patients and 24 controls were available and measured for the following variables: Maxillary length, SNA, SNB, Gonial angle and SN-FH angle. The data obtained was analysed by paired t-test, level of significance was set at $p < 0.005$

Measurement on dental cast



Fig. 2. 3D industrial measuring machine (=CCM)(ZeissNumerex; Carl Zeiss Stuttgart, Germany).

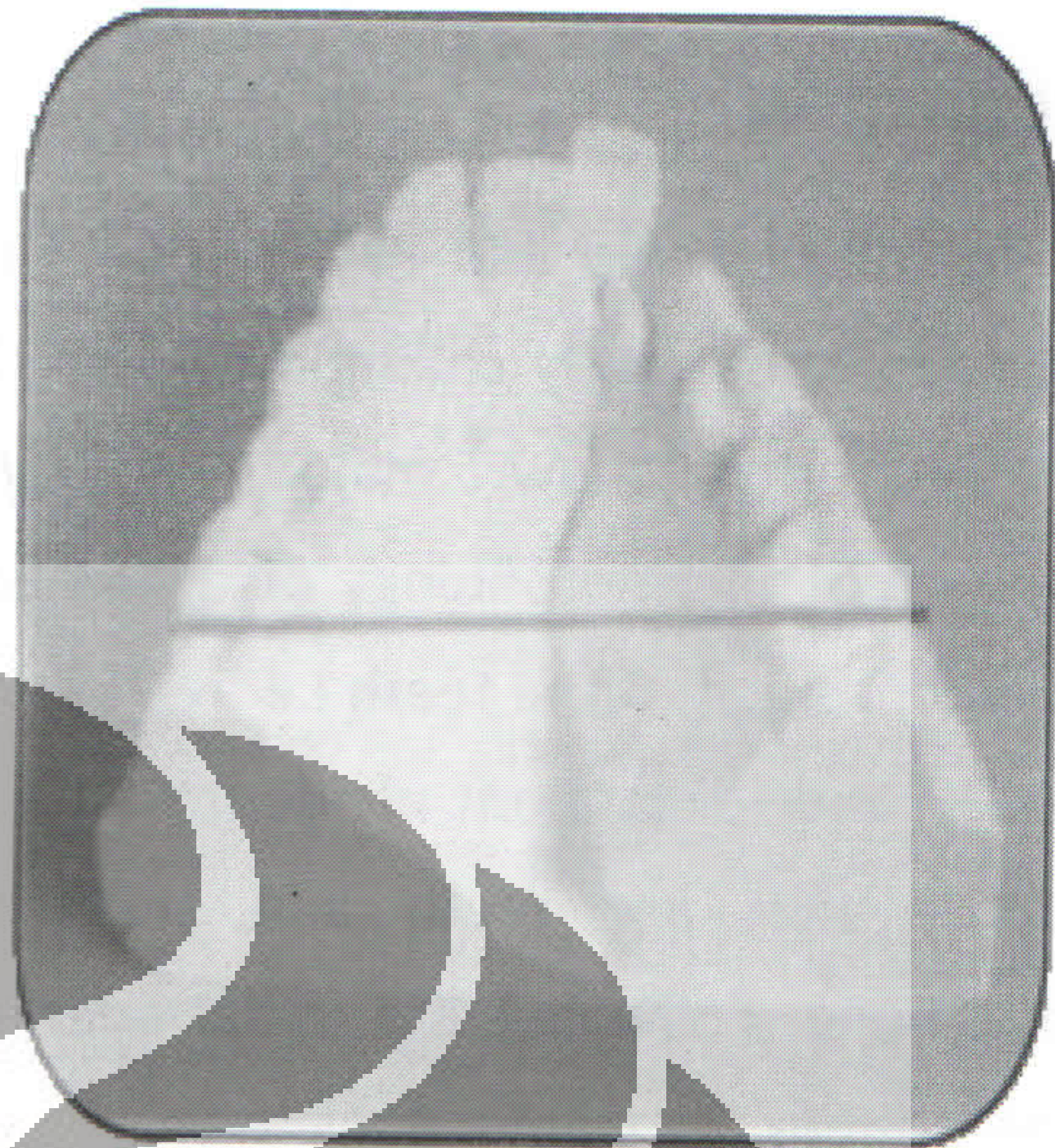


Fig. 4 Shows the measurement line



Fig. 3 Every tip of buccal cusp each side we put 1 point i.e At molar, 2 point to be measured, and at premolar and canine only 1 point

Measurement in cephalometric

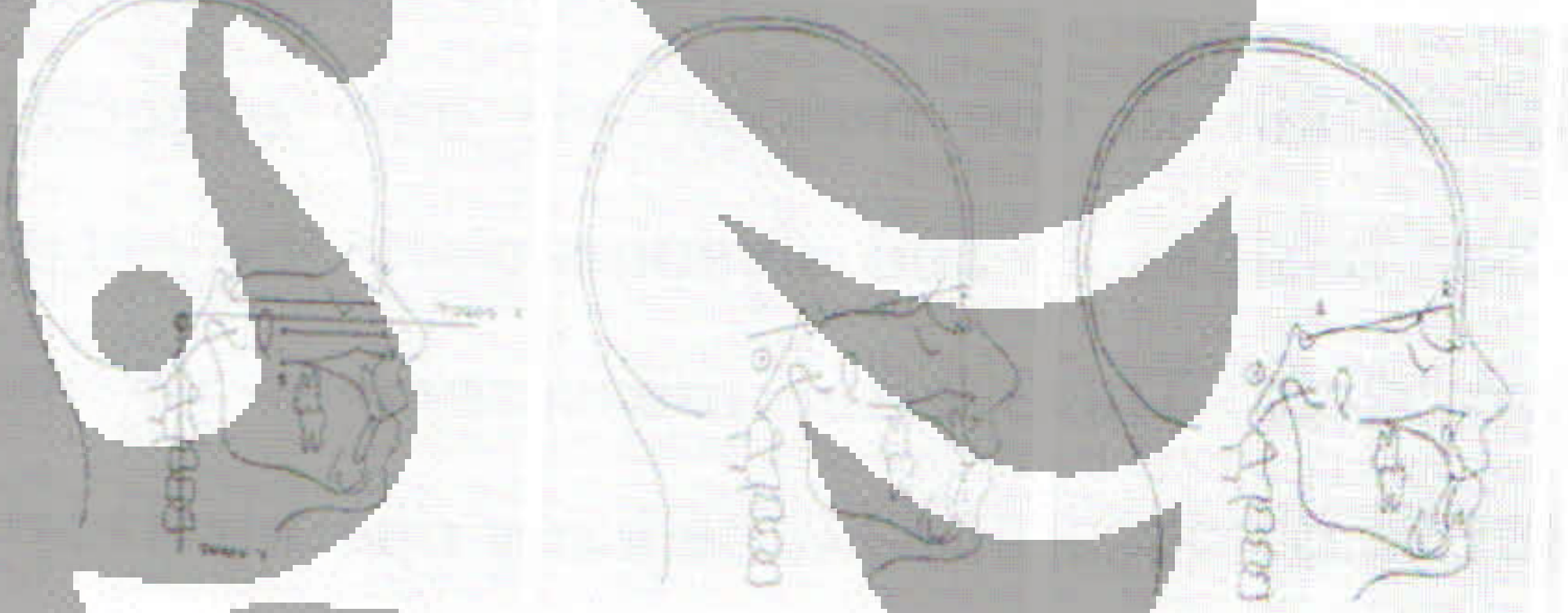


Fig. 5 In cephalometric study we measured: Maxillary length, SNA, SNB,

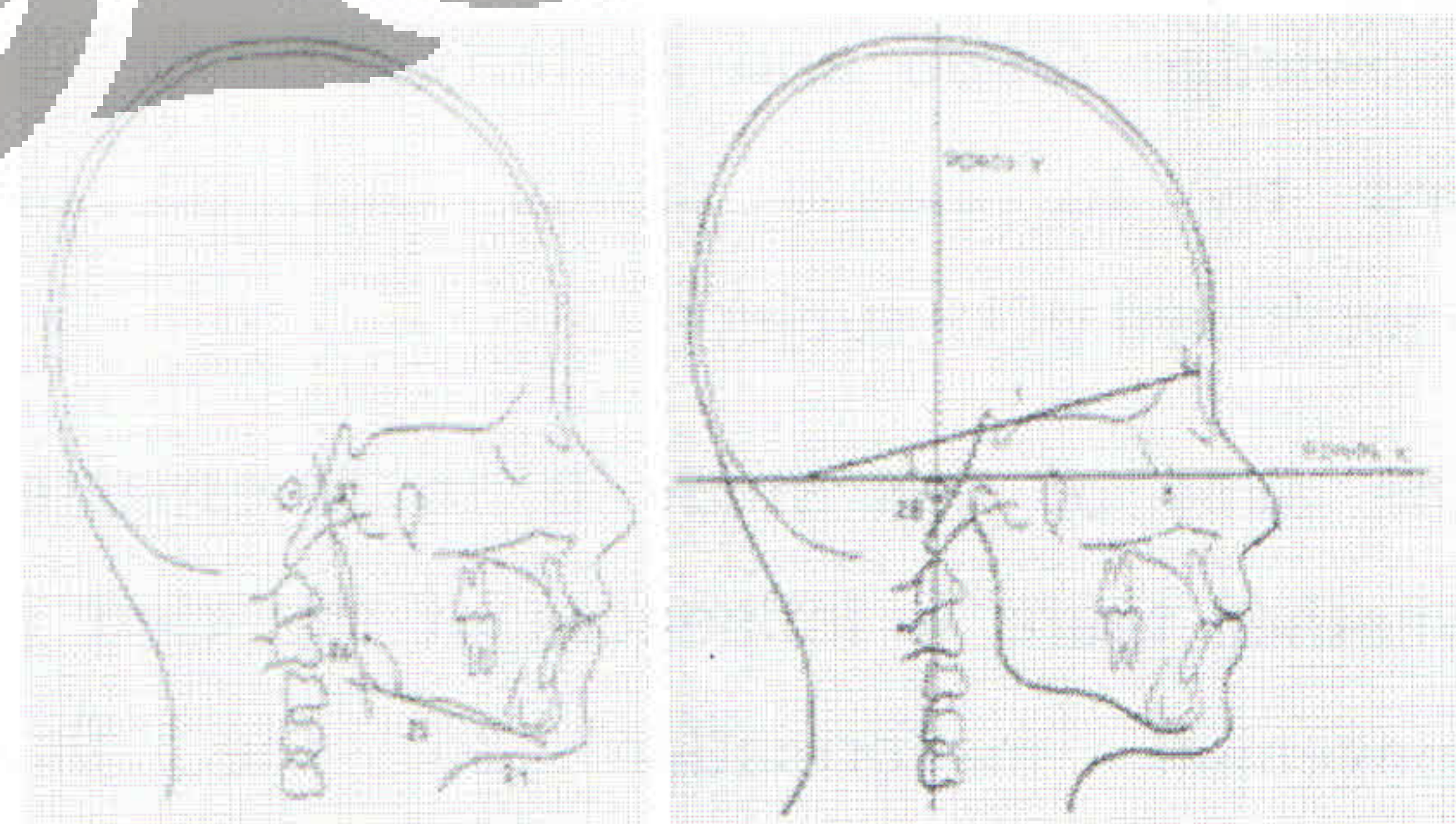


Fig. 6
Gonial angle, SN-FH

RESULT :

Table 1. The transversal measurement of the dento alveolar component on the maxillary arch width of the unoperated adult UCLP subject are summarized in table 1.

Variable	N	Mean	S.D	SE of mean	Maxi	Mini	P-value
B171-271 Unilateral	143	59.27	3.378	.282	68.50	48.52	ns
Control	143	58.76	2.671	.570	63.75	53.63	
B172-272 Unilateral	154	59.37	3.434	.277	68.65	46.47	ns
Control	24	58.88	2.795	.571	63.73	53.27	
B161-261 Unilateral	151	56.59	3.064	.249	64.42	45.88	ns
Control	24	56.32	2.570	.525	60.38	50.93	
B162-262 Unilateral	151	55.24	3.105	.253	62.48	44.55	ns
Control	24	54.93	2.574	.526	58.49	49.40	
B151-251 Unilateral	157	49.25	2.923	.233	56.30	37.89	ns
Control	24	48.70	2.282	.466	52.40	44.37	
B141-241 Unilateral	163	43.78	2.773	.217	50.08	37.07	ns
Control	24	43.96	2.134	.436	47.50	39.50	
B131-231 Unilateral	162	34.26	3.939	.309	43.94	21.77	*sign
Control	24	36.11	1.920	.392	39.37	32.5	

Measured on dental casts, the transversal distance at the level of the second molars was significantly wider and at the level of first premolar and canine significantly smaller compared to the control group.

Table 2. Cephalometric measurement between UCLP patients compared to the control

Variable	Point to be measured	UCLP sample group			Control group			t-value	sig
		Median	SD	SD.X	Median	SD	SD.X		
Max Length	1-2/29-3	3.60	2.40	0.3946	3.40	2.50	0.2906	0.4081	ns
Gonial angle	27-26/25-24	124.00	8.80	1.4467	122.50	7.00	0.8137	0.9036	ns
SNA	1-2-7	84.30	4.00	0.6576	85.00	3.70	0.4301	0.8908	ns
SNB	1-2-18	79.70	3.50	0.5754	81.00	3.70	0.4301	1.8096	ns
SN-FH	5-6/1-2	0.74	0.06	0.0099	0.76	0.04	0.0046	1.8340	ns

Cephalometrically there were no significant differences for the 5 cephalometric measurement variables.

DISCUSSION

The number of the analyzed patients is sufficient to allow reliable conclusion on this topic in transversal measurement on dental cast. As this study to investigate whether there are influences of surgery on the final development of adult UCLP patients, there are no publications dealing with the transversal measurements of the dento-alveolar part of the maxilla on the early operated in adult UCLP patients. Therefore comparison between early operated and unoperated adult of the UCLP is for these reason not really possible. In our sample up to the level of the second premolar the transversal dimensions of the maxilla of the UCLP group are not significant different from the transversal dimensions on the non-cleft population. This is in accordance with the finding of Bishara et al (1985)¹³ but is in contradiction with the findings of Innis (1962)¹², who has found a compression in the premolar area of the maxilla. The samples in both studies were too small and the analysis especially of Innis is insufficient to allow reliable conclusions. The same remark are also for the publications of Widanto and Latief (1988)¹⁴, Widanto (1989).¹⁴

In this study the maxillary inter first premolar and inter-canine width is significant smaller in the unoperated UCLP group. The cause of this reduction on the inter first premolar and inter-canine width is not clearly understood. The result of the present study support the observation of Bishara et al (1985)¹³ that the

effect of the UCLP is limited to the part of the dento-alveolar fragment being in the vicinity of the cleft.

The cephalometric analysis there were no significant differences between UCLP and control in the 5 cephalometric measurements. This is in accordance with the study of Bishara et al (1985)¹³ and Hardjowasito and Latief (1988),¹⁴ Hardjowasito W (1989),¹⁵ cephalometrically the cleft has no influence on the antero-posterior development of the maxilla. However, the sample size for the cephalometric study was small.

CONCLUSION

The presence of a cleft influences the development of the maxilla: the more extensive the cleft, the more extensive the effect on the dental arch, but the compression of the maxillary arch is limited to the anterior region. Measured cephalometrically the cleft has no influence on the antero-posterior development of the maxilla. However, the sample size for the cephalometric.

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