Comparative Cephalometric Analysis of Angle Class II Division 1 Malocclusion between Chinese Male and Female Subjects

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ABSTRACT

Objective: To compare the craniofacial features of male and female Chinese samples with Angle Class II Division 1 malocclusion.

Materials & Method: The cephalometric radiographs were obtained from 39 Chinese subjects (mean age17.18 ± 7.1 years) with Angle Class II Division 1 malocclusion. Ten skeletal, nine dental and three soft tissue variables were investigated.

Result: The craniofacial features between Chinese genders showed statistical significant differences among only one of the twenty-two variables studied.

Conclusion: Chinese males have anteriorly long face compare to females.

Key words: Angle Class II Division 1, cephalometry, Chinese, ethnic variation

INTRODUCTION

Angle defined Class II Division 1 malocclusion as characterized by a distal relation of the lower teeth to upper to the extent of more than one-half the width of one cusp and the maxillary incisors being protrusive.[1] Class II Division 1 malocclusion are mostly caused by retrognathic mandible.[2,3] Retrognathic mandible, maxillary prognathism and reduce vertical skeletal jaw relationship are the most common characteristics of Class II Division1 malocclusion.[3] The Class II malocclusions have a strong hereditary component as etiologic factor.[4]

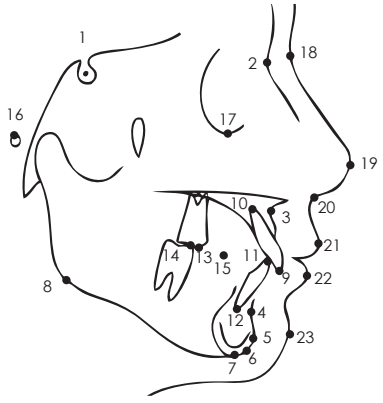
The aim of the present study was to compare the craniofacial features of male and female Chinese samples with Angle Class II Division 1 malocclusion.

MATERIALS AND METHOD

This study was carried out using lateral cephalometric radiographs of total 39 Chinese samples (12 males and 27 females) were collected from the Department of Orthodontics, Dalian Medical University, Dalian, China. Consent was obtained from all participants.

The criteria for inclusion in the sample were natural born chinese, no craniofacial deformities, no previous orthodontic treatment or maxillofacial surgery or plastic surgery.

Tracing of the radiographs were made with standard technique by hand using a sharp 3H pencil. All radiographs were traced and digitized by the principal author to minimize the error. The measurements were obtained for ten skeletal, nine dental and three soft tissue parameters. The related landmarks are shown in Figure 1. The statistical calculations were performed with Microsoft Office Excel 2003 and utilizing computer software program SPSS version 17.0. Descriptive analysis and independent student t-test were carried out on the data between the Chinese genders. Results considered to be statistically significant when p ≤0.05.



1. *Sella turcica (S)*
2. *Nasion (N)*
3. *Subspinale (A)*
4. *Supramentale (B)*
5. *Pogonion (Pg)*
6. *Gnathion (Gn)*
7. *Menton (Me)*
8. *Gonion (Go)*
9. *Incision superius (Is)*
10. *Upper incisor apex (UIA)*
11. *Incision inferius (Ii)*
12. *lower incisor apex (LIA)*
13. *Maxillary first molar mesial cusp (MxMMC)*
14. *Mandibular first molar mesial cusp (MdMMC)*
15. *Occlusal contact of the first premolars (OCPM)*
16. *Porion (Po)*
17. *Orbitale (Or)*
18. *Soft tissue nasion (N1)*
19. *Pronasale (Pr)*
20. *Subnasale (Sn)*
21. *labrale superius (Ls)*
22. *labrale inferius (Li)*
23. *Soft-tissue pogonion (Pg1)*

Figure 1: Hard tissue and soft tissue cephalometric landmarks

RESULT

The mean age of the sample was 17.18 ± 7.1 years. Comparison of craniofacial features on cephalometric parameters between Chinese genders is presented in Table-1.

Table 1: Comparison of craniofacial parameters between Chinese Male and Female subjects with Class II Division 1 malocclusion.

Parameters	Male (n = 12)		Female (n = 27)		*t*-value	*p*-value
	Mean	SD	Mean	SD		
Skeletal						
Facial Angle	81.000	3.790	82.889	3.588	-1.492	.144
Angle of Convexity	12.167	5.132	12.815	5.833	-.332	.742
A-B Plane Angle	-9.875	3.192	-10.259	3.404	.331	.742
MP Angle (GoMe - FH)	35.125	8.119	30.222	5.952	2.119	.041*
Y-axis	68.750	3.769	66.167	4.526	1.726	.093
SNA Angle	80.958	4.266	80.852	2.783	.093	.926
SNB Angle	75.167	4.469	74.518	2.694	.562	.577
ANB Angle	5.792	2.369	6.333	2.130	-.708	.483
MP Angle (GoGn - SN)	36.917	9.327	35.426	5.212	.641	.526
Occlusal Plane Angle	23.417	5.961	22.593	4.379	.484	.631
Dental						
Cant of Occlusal Plane	17.750	5.047	14.444	4.677	1.989	.054
Inter-Incisal Angle	116.583	14.600	116.167	10.910	.099	.922
L1 to Occlusal Plane Angle	65.917	8.649	66.704	8.752	-.260	.796
L1 to Mandibular Plane Angle	96.583	7.786	96.926	7.400	-.131	.896
U1-A Pg Line (mm)	10.667	3.985	11.296	2.584	-.591	.558
U1-NA Angle	25.708	11.230	26.926	6.480	-.429	.671
U1-NA Linear (mm)	6.375	3.797	6.889	2.577	-.495	.623
L1-NB Angle	32.333	8.478	30.074	7.179	.858	.396
L1-NB Linear (mm)	9.833	3.271	9.296	2.785	.527	.601
Soft tissue						
N1-Sn-Pg1	19.000	6.325	20.963	5.536	-.979	.334
N1-Pr-Pg1	43.750	5.910	44.556	4.644	-.459	.649
Z Angle	62.333	5.466	63.889	6.924	-.687	.496

** Statistically significant at p≤0.05;*

DISCUSSION

Among twenty-two values studied, only one value was statistically significant. This finding is in agreement with the literature, which has stated that gender exerts little or no effect on skeletal and dental components in Class II malocclusions.[5] Other researchers[6-8] also found no significant differences between genders while some other studies[9-11] showed significant gender differences. A study[12] concluded that, no differences were observed between genders, with the exception of mandibular ramus height, which was found to be higher in males than in females.

Mandibular plane angle; GoMe-FH were 4.9 degree larger in Chinese male than female, which is statistically significant. It is steeper in the Chinese males. This indicates that the facial vertical proportions of the Chinese males are long anteriorly and short posteriorly, while compared with female. All other variables showed statistically non significant (Table1).

In both samples the mean value for Sella-Nasion-Point A (SNA) angle suggests, a well positioned maxilla in relation to the cranial base, corroborating the previous studies[13-17] and sagittal position of the mandible (SNB) presented that it retracted in relation to the cranial base, which is relevant with other researchers[1,12] although Adams[18] reported that the position of mandible is orthognathic.

The small number of samples is the main limitation of this study.

CONCLUSION

Both male and female samples showed; retrusive mandible, skeletal open bite, increased overjet, protruded mandibular incisors. The facial vertical proportions of the males were long anteriorly and short posteriorly than female samples.

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