COMPARISON OF DENTAL ARCH WIDTHS IN CLASS II DIVISION I AND CLASS II DIVISION 2 MALOCCLUSION

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ABSTRACT

The dental arch width is of significant interest to orthodontists. The literature confirms a significant difference among the arch width dimensions among the established type of class II malocclusions. The purpose of this study was thus to compare dental arch widths in Class II/1 with Class II/2 malocclusion subjects. The Intercanine, Interpremolar and Intermolar widths were measured on 100 dental casts (50 class II/1 and 50 class II/2 malocclusion subjects). The data was developed on SPSS 16 for windows. Independent-samples t-test was applied for comparison of the groups. The mandibular Interpremolar width was found out to be significantly narrower whereas Intermolar width was larger in class II/2 sample. No significant differences were documented for maxillary Intercanine and Interpremolar widths, whereas the Intermolar arch width was significantly larger in class II/2 subjects. Lower Interpremolar width was significantly narrow in class II/2 malocclusion and the maxillary and mandibular Intermolar arch width was significantly larger in class II/2 malocclusion.

Key Words: Dental arch width, Class II div 1 malocclusion, Class II div 2 malocclusion.

INTRODUCTION

Class II is a common type of malocclusion that displays a diversity of skeletal and dental pattern.1-3 Dental class II malocclusion show with posteriorly related lower teeth to upper and is further classified as Class II division 1 and division 2 types. Amongst these, the Class II/1 malocclusion is more common, while very reticent data is available for Class II/2 malocclusion.4-8

The dental arch width is of significant interest to orthodontists for diagnoses and treatment planning in order to achieve desirable dental esthetics and stability of the occlusion.9,10 The literature confirms a significant difference among the arch width dimensions among the established type of class II/1 and class II/2 malocclusions.11-14 Numerous studies advocate that the deficient growth in transverse plane of maxilla and extreme deep bite may result in deficient growth of mandibular dentoalveoaler segment in antero-posterior dimension in class II/1 and class II/2 malocclusion.15-18 A number of treatment options have been suggested by the present-day orthodontics for the correction of these discrepancies of the dental arches.19 The present study was carried out to determine the difference between dental arch widths of class II/1 and class II/2 malocclusion in our region for a better understanding of diagnosis and treatment planning.

PURPOSE OF THE STUDY

To compare the Dental arch widths in patients with Class II division 1 and Class II division 2 malocclusion.

METHODOLOGY

The study was carried out on 100 dental casts of patients with age range 16-20 years. (50 class II/1 and 50 Class II/2 malocclusion, both genders). Demographic data of patients were recorded and the measurements were taken using vernier scale. Following criteria was
Comparison of dental arch widths

used: Class II div 1 malocclusion: All teeth present except third molars, class II canine and full cusp class II molar relation, over jet more than 5 mm, proclined upper incisors. Class II/2 malocclusion: All teeth present except third molars, class II canine and full cusp class II molar relation, retroclined upper incisors.

The following measurements were used in this study:

**Maxillary cast**

Maxillary Intercanine width (UC-C): Distance between the cusp tips of right and left maxillary permanent canines.

Maxillary Interpremolar width (UP-P): Distance between buccal cusp tips of right and left maxillary permanent first premolars.

Maxillary Intermolar width (UM-M): Distance between the mesiobuccal cusp tips of right and left maxillary permanent first molars.

**Mandibular cast**

Mandibular Intercanine width (LC-C): Distance between the cusp tips of right and left mandibular permanent canines.

Mandibular Interpremolar width (LP-P): Distance between buccal cusp tips of right and left mandibular permanent first premolars.

Mandibular Intermolar width (LM-M): Distance between the mesiobuccal cusp tips of right and left mandibular permanent first molars.

**STATISTICAL ANALYSIS**

The mean and standard deviation for each parameter was computed using the SPSS Version 16 for Windows. Class II/1 and Class II/2 measurements were compared using independent t-test. Randomly selected 50 casts were remeasured after one week of first measurement and was compared with the first measurements to find out any method error using paired t-test.

**RESULTS**

No statistically significant difference was found between the first and the second measurements. Table 1 indicates the results of comparison between dental arch widths in class II/1 and class II/2 malocclusion. Although lower Intercanine was narrow in class II/2, however to an insignificant extent. The mandibular Interpremolar width was found out to be significantly narrower while Intermolar width was larger in class II/2 sample. No significant differences were documented for maxillary Intercanine and Interpremolar dental arch width, whereas the Intermolar arch width was significantly larger in class II/2 subjects.

**TABLE 1: COMPARISON OF DENTAL ARCH WIDTHS**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Class II/1 (n=50)</th>
<th>Class II/2 (n=50)</th>
</tr>
</thead>
<tbody>
<tr>
<td>UC-C</td>
<td>34.1 ± 2.1</td>
<td>34.3 ± 1.2</td>
</tr>
<tr>
<td>UP-P</td>
<td>39.9 ± 2</td>
<td>40.5 ± 1.9</td>
</tr>
<tr>
<td>UM-M</td>
<td>50.1 ± 2.4</td>
<td>52.7 ± 1.4*</td>
</tr>
<tr>
<td>LC-C</td>
<td>28.3 ± 2.3</td>
<td>29.3 ± 1.3</td>
</tr>
<tr>
<td>LP-P</td>
<td>34.3 ± 2.5</td>
<td>32.9 ± 1.9*</td>
</tr>
<tr>
<td>LM-M</td>
<td>44.5 ± 2.5</td>
<td>46.8 ± 1.1*</td>
</tr>
</tbody>
</table>

*Significant value (p < .05)

**DISCUSSION**

The present study was conducted to compare the dental arch widths in Class II division 1 and Class II division 2 malocclusion patients. The mean age of the study sample was 18.54±2.3 years.

The results of current study indicated no significant difference between the upper and lower Intercanine dental arch widths among the two groups.
These results were similar to Christofer\textsuperscript{19} and Joel\textsuperscript{20} while in contrary to Usyal\textsuperscript{8} study where lower Intercanine width was significantly narrower in class II/2 malocclusion.

The present study indicated statically significant narrow lower Interpremolar arch width in class II/2 than the Class II/1 malocclusion subjects. Similar results were indicated by Usyal.\textsuperscript{8} No significant difference was found in upper Interpremolar widths among the both malocclusion groups. These findings were in agreement to studies conducted by other investigators.\textsuperscript{5,10-21}

The current study showed that both the upper and lower Intermolar widths were significantly narrower in class II/1 malocclusion. These findings were however slightly different to other studies\textsuperscript{10-21} that revealed narrow Intermolar widths but to an insignificant level. The results were however were in agreement with Usyal\textsuperscript{8} study where class II/2 malocclusion subjects also had significantly larger maxillary Intermolar widths.

CONCLUSION

Although lower Intercanine was narrower in class II/1 as compared to class II/2, however the differences were insignificant.

Lower Interpremolar width was significantly narrow in class II/2 malocclusion subjects.

The maxillary and mandibular Intermolar width was significantly larger in class II/2 than class II/1 malocclusion.

The dental arch widths show significant variation for certain parameters among the class II/1 and class II/2 malocclusion and therefore shall be considered while planning treatment.

REFERENCES


9 Sayin MO, Turkkahraman H. Comparison of Dental Arch and Alveolar Widths of Patients with Class II, Division 1 Malocclusion and Subjects with Class I Ideal Occlusion. Angle Orthod 2004; 74: 356-60.


