Patterns of skeletal class II in patients reporting to Ayub Dental Section

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Abstract—Researchers have used a variety of techniques to distinguish between the distinct elements of malocclusion. While some academics have used various indices to determine prevalence, the majority of researchers have followed Angle’s categorization. Individual malocclusion studies, such as those looking at class II or class III malocclusion, have employed cephalometric analysis. Objectives: There is currently a lack of information in the literature about the prevalence of malocclusion in the Abbottabad region generally in the
city among people of different ages that might benefit from orthodontic services. This study's goal was to assess local population skeletal class II patterns in order to better treat patients at the appropriate time by utilizing variations in skeletal class II patterns' growth periods. Methodology: From February 2022 to April 2023, the Department of Orthodontics at Ayub Dental Section, Abbottabad, conducted this retrospective (cross-sectional) study. The institutional ethical committee at Ayub Medical College in Abbottabad gave its approval to the plan. On a specially created proforma, data for 100 patients were collected using prior records. Patients of either gender who had skeletal class II jaw relationships with any dental relationships and were between the ages of 8 and 35 were required to meet the inclusion criteria. Patients with pathology, maxillofacial trauma, or orofacial syndromes were disqualified from the research. Results: 35 men (35% of the total) and 65 women (65%) were present. With a mean age of 15.65+4.12 years, their chronological ages varied from 10 to 33 years. The second decade (69%) was the age group with the highest frequency (Table I). Short mandible with high angle (60%) and short mandible with normal vertical pattern (9%) were the two most prevalent patterns in skeletal class II patients. The short mandible is the most prevalent class II pattern among the skeletal class II population, as seen in Table II. Table III displays the mean and standard deviation of class II patients' composite cephalometric analysis. Conclusion: Short mandibles (60%) and steep mandibular planes (36%) are the most prevalent patterns in the local population according to composite cephalometric.

Keywords—lateral cephalogram, short mandible, retrognathia.

Introduction

Researchers have used a variety of techniques to distinguish between the distinct elements of malocclusion. While some academics have used various indices to determine prevalence, the majority of researchers have followed Angle's categorization. Individual malocclusion studies, such as those looking at class II or class III malocclusion, have employed cephalometric analysis. Malocclusion is the second most frequent dental defect after caries and can cause functional issues as well as negative effects on young people's psychological development. A disorder characterized by abnormalities in tooth location, number, shape, and developmental position of teeth beyond normal limits is referred to as malocclusion. Malocclusion is described as "The mal-relationship between arches in any plane."

Malocclusions may occur for a variety of causes, including hereditary, environmental, or a mix of both, as well as local factors including poor dental hygiene practices, tooth growth in terms of location, shape, and form. Treatments for malocclusion are frequently performed throughout adolescence, when the permanent dentition is beginning to emerge. There has not been much research done in Pakistan to determine the prevalence of malocclusion and its
constituent parts, particularly employing cephalometric analysis. Instead of improper tooth positioning in relation to the jaws, skeletal class II is caused by anteroposterior jaw size or position disparity. Mandibular deficit or maxillary excess are two neatly differentiated types of skeletal class II malocclusion. Skeletal class II manifests in a variety of ways, including maxillary excess with lower facial height (LFH) that is lowered, increased, or normal; mandibular deficiency with LFH that is decreased, raised, or normal; and combination of maxillary excess & mandibular deficiency with any pattern of lower facial height.

Although several techniques have been employed to identify skeletal class II patterns, the Cephalometric Analysis is the most useful. Orthodontists can determine skeletal class II patterns by clinical examination, but they cannot assess the degree of malocclusion through this method. Skeletal class II with mandibular deficit is more common among Asian populations. There is currently a lack of information in the literature about the prevalence of malocclusion in the Abbottabad region generally in the city among people of different ages that might benefit from orthodontic services. This study's goal was to assess local population skeletal class II patterns in order to better treat patients at the appropriate time by utilizing variations in skeletal class II patterns' growth periods.

Methodology

From February 2022 to April 2023, the Department of Orthodontics at Ayub Dental Section, Abbottabad, conducted this retrospective (cross-sectional) study. The institutional ethical committee at Ayub Medical College in Abbottabad gave its approval to the plan. On a specially created proforma, data for 100 patients were collected using prior records. Patients of either gender who had skeletal class II jaw relationships with any dental relationships and were between the ages of 8 and 35 were required to meet the inclusion criteria. Patients with pathology, maxillofacial trauma, or orofacial syndromes were disqualified from the research. For each patient, a traced and analyzed lateral cephalogram was employed. An examination of composite cephalometry was done. Six parameters (five angular and one linear measurement) were utilized to assess patient vertical growth patterns, while three angular measurements and five linear measures were employed to assess sagittal relationship (Table I). In addition to the clinical examination, the diagnosis of various skeletal class II patterns included consideration of face type, facial divergence, chin position, and gummy grin. For a statistical analysis of the age mean, standard deviation, and gender ratio, the results from the completed questionnaire were then input in SPSS version 24.0.

Results

35 men (35% of the total) and 65 women (65%) were present. With a mean age of 15.65±4.12 years, their chronological ages varied from 10 to 33 years. The second decade (69%) was the age group with the highest frequency (Table I). Short mandible with high angle (60%) and short mandible with normal vertical pattern (9%) were the two most prevalent patterns in skeletal class II patients. The short mandible is the most prevalent class II pattern among the skeletal class II population, as seen in Table II. Table III displays the mean and standard deviation of class II patients' composite cephalometric analysis.
Table 1
Age Distribution of the participants

<table>
<thead>
<tr>
<th>Age (Years)</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8-10</td>
<td>7 (7)</td>
</tr>
<tr>
<td>11-20</td>
<td>69 (69)</td>
</tr>
<tr>
<td>21-30</td>
<td>19 (19)</td>
</tr>
<tr>
<td>31-40</td>
<td>5 (5)</td>
</tr>
</tbody>
</table>

Table 2
The frequency of certain skeletal class II patterns

<table>
<thead>
<tr>
<th>Skeletal pattern</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short mandible</td>
<td>60</td>
</tr>
<tr>
<td>Maxillary excess</td>
<td>36</td>
</tr>
<tr>
<td>Composite</td>
<td>4</td>
</tr>
</tbody>
</table>

Table 3
Analysis of composite cephalometric

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>S.D+</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sagittal Analysis</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SNB</td>
<td>65.73</td>
<td>2.47</td>
</tr>
<tr>
<td>SNA</td>
<td>72.23</td>
<td>2.80</td>
</tr>
<tr>
<td>ANB</td>
<td>5.47</td>
<td>0.48</td>
</tr>
<tr>
<td>SN-Length</td>
<td>51.3</td>
<td>6.53</td>
</tr>
<tr>
<td>AO-BO</td>
<td>1.67</td>
<td>0.60</td>
</tr>
<tr>
<td>Mand-Length</td>
<td>53.48</td>
<td>7.06</td>
</tr>
<tr>
<td><strong>Vertical Analysis</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SN- Pt</td>
<td>7.12</td>
<td>2.67</td>
</tr>
<tr>
<td>SN-Mand angle</td>
<td>23.82</td>
<td>6.07</td>
</tr>
<tr>
<td>FMA</td>
<td>17.40</td>
<td>5.13</td>
</tr>
<tr>
<td>MMA</td>
<td>17.11</td>
<td>6.19</td>
</tr>
<tr>
<td>LAFH/TAFH</td>
<td>46.18</td>
<td>3.18</td>
</tr>
<tr>
<td>Y-Axis</td>
<td>57.57</td>
<td>5.05</td>
</tr>
</tbody>
</table>

Discussion

Instead of referring to malposition of the teeth in relation to the jaws, the term "skeletal class II" refers to one originating from anteroposterior disproportion in size or discrepancy in position of the jaws. At de’Montmorency, Waheed-ul-Hamid\textsuperscript{12} used 100 patients to perform a research on the prevalence of the skeletal components of malocclusion. Although he looked at all forms of malocclusion, his skeletal class II data suggest that retrognathic mandibular (29%) and high angle (38%) instances were the most frequent patterns. The findings of the study are pretty comparable to those of ours. Through the use of computer-based statistical methods, Moyers\textsuperscript{13} conducted a research in which various varieties of class II malocclusion were identified, including six types in the anteroposterior dimension of the face and five types in the vertical utilising cephalometric analysis. His
research found that small mandibles and squarish faces with a somewhat high tilt were most prevalent. Early dentofacial characteristics of class II malocclusion were studied longitudinally from deciduous to mixed dentition by Syverson et al. They also came to the conclusion that class II findings were the most common due to small mandibles and vertically increasing lower anterior facial height, which supports our study. Using anteroposterior and vertical Cephalometric analysis, Plaza et al investigated various malocclusion patterns in the Chinese population. His research revealed that small mandibles and steeper mandible planes had the highest percentages.

**Conclusion**

Short mandibles (60%) and steep mandibular planes (36%) are the most prevalent patterns in the local population according to composite cephalometric.

**References**


