Evaluation of Condylar and Ramal Asymmetry on Patients with Ectodermal Dysplasia

Tümen DS1, Callea M1, Yazgı AY1, Maglione M1, Yavuz I2, Montanari M2, Tümen EC2, Currà MG3 and Uysal E3

1Department of Orthodontics, Dicle University, Turkey
2Department of Pediatric Dentistry, Dicle University, Turkey
3Department of Technique Programs, Vocational High School, Turkey

Corresponding author: Izzet Yavuz, Department of Pediatric Dentistry, Dicle University, Turkey, Tel: +90 412 248 80; E-mail: izzetyavuz@hotmail.com

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Abstract

Objectives: To compare the condylar, ramal, condylar-plus-ramal mandibular asymmetry of patients with ectodermal dysplasia and healthy control subjects with using cone beam computerized tomography (CBCT).

Materials and methods: CBCT of 9 patients (4 girls, 5 boys) with ectodermal dysplasia and 10 healthy control subjects (5 girls and 5 boys) with normal occlusion were included to our study. Mandibular asymmetry index measurements (condylar, ramal, and condylar-plus-ramal) were made on the CBCT. The paired samples t-test was used to establish statistically significant differences between the sides for condylar, ramal and condylar-plus-ramal height measurements. Independent t test was used to determine possible statistically significant differences between the groups.

Results: There was no statistically significant difference between the right and left sides in condylar, ramal and condylar-plus-ramal height measurements of the patients with ectodermal dysplasia and normal occlusion sample. There was no statistically significant difference between the groups in asymmetry index measurements.

Conclusion: Patients with ectodermal dysplasia show similar condylar, ramal, condylar-plus-ramal measurements with healthy control subjects.

Keywords: Condylar and ramal asymmetry; Ectodermal dysplasia

Introduction

Ectodermal dysplasia (ED) is a large and complex group of disorders defined by the abnormal development of two or more structures derived from the ectodermal layer. As a result, HED patients mostly exhibit hypotrichosis, hypohidrosis, and cranial abnormalities. Patients often exhibit a smaller than normal face because of frontal bossing, and a depressed nasal bridge. Oral traits may express themselves as anodontia, hypodontia, and conical teeth. Anodontia also manifests itself by a lack of alveolar ridge development [1].

It has been proven that severe maxillary hypodontia in the permanent dentition, affects the cranial base and mandibular length in ED population [2]. In our study we decided to evaluate mandibular asymmetry due to hypodontia in ED patients (Figure 1).

Aim

Therefore our aim was to compare the condylar, ramal, condylar-plus-ramal mandibular asymmetry of patients with ectodermal dysplasia and healthy control subjects with using cone beam computerized tomography (CBCT).

Material and Methods

CBCT of 9 patients (4 girls, 5 boys) with ectodermal dysplasia and 10 healthy control subjects (5 girls and 5 boys) with normal occlusion were included to our study (Figure 2).
Figure 2: CBCT of a patient with ectodermal dysplasia

Figure 3: Mandibular asymmetry index measurements (condylar, ramal, and condylar-plus-ramal) were made on the CBCT. Reference lines were adjusted as following. Vertical line is passing from the most lateral points of condyle. Horizontal line is on the ramus tangent. Then, vertical distances of condyle and ramus were measured. According to Habets et al. [3], measurements were done and asymmetry index was calculated (Figure 3).

The paired samples t-test was used to establish statistically significant differences between the sides for condylar, ramal and condylar-plus-ramal height measurements. Independent t-test was used to determine possible statistically significant differences between the groups.

Results

Table 1: Statistically side comparisons of 2 groups

<table>
<thead>
<tr>
<th>Asymmetry Index</th>
<th>Group</th>
<th>E.D.</th>
<th>Normal</th>
<th>Right</th>
<th>Left</th>
<th>Right</th>
<th>Left</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>mean</td>
<td>SD</td>
<td>mean</td>
<td>SD</td>
<td>mean</td>
<td>SD</td>
<td></td>
</tr>
<tr>
<td>Condylar</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RAMAL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Condylar plus Ramal</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NS- not significant</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

There was no statistically significant difference between the right and left sides in condylar, ramal, and condylar-plus-ramal height measurements of the patients with ectodermal dysplasia and normal occlusion sample. There was no statistically significant difference between the groups in asymmetry index measurements (Table 1 and 2).

Table 2: Descriptive statistics and comparisons of mandibular asymmetry index values of the 2 groups

<table>
<thead>
<tr>
<th>Asymmetry Index</th>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAI</td>
<td>E.D.</td>
<td>6.909</td>
<td>6.1475</td>
<td>NS</td>
</tr>
<tr>
<td>NORMAL</td>
<td></td>
<td>3.874</td>
<td>3.6265</td>
<td></td>
</tr>
<tr>
<td>RAI</td>
<td>E.D.</td>
<td>1.587</td>
<td>1.1416</td>
<td>NS</td>
</tr>
<tr>
<td>NORMAL</td>
<td></td>
<td>2.174</td>
<td>1.4654</td>
<td></td>
</tr>
</tbody>
</table>

Discussion

The first aim of this study was to compare the condylar, ramal, condylar-plus-ramal mandibular asymmetry of patients with ectodermal dysplasia and sound patients.
Previous studies evaluated mandibular asymmetry in various malocclusion patterns [4-6]. These studies made their measurements on posteroanterior radiographies but they had some limitations of methodology and reliability [7].

Literature suggests that CBCT is more accurate in image description. In the present study CBCT was used in order to reduce visualization techniques errors [8].

Several studies documented asymmetries in condylar position in the fossa in unilateral posterior crossbite children [9,10]. There was no significant difference between the sides in our results. This contrasting result might be caused by sample selection. Most of our patients don’t have unilateral posterior crossbite.

Sezgin et al. [11] found that Class II/1 malocclusion has a significant effect on condylar asymmetry index when compared to Class II/2 and Class III malocclusion and normal occlusion types.

Our findings contradict with this study. In effect it is known that one of the main oral features of ED children is Class III malocclusion [1].

Conclusion

In effect it is known that one of the main oral features of ED children is Class III malocclusion but at the patients with ectodermal dysplasia show similar condylar, ramal, condylar-plus-ramal measurements with healthy control subjects.

This aspect has need to further studies for confirm results obtained in the present study.

References