Crown Dimensions of Maxillary Molar teeth For the Adult Sudanese and their benefits

Mahmoud Satte *, Mahmoud Sheikh Satte **

* Department of Anatomy, Faculty of Medicine, Najran University, Najran, 55461, KSA
** Asst/Prof., Anatomy Department, Medical College, Najran University, Najran, 55461, KSA

DOI: 10.29322/IJSRP.13.02.2023.p13419
http://dx.doi.org/10.29322/IJSRP.13.02.2023.p13419

I. INTRODUCTION

H uman permanent maxillary molar teeth are present on the posterior part of the upper jaws; with three teeth on each right and left side. There are basic international dental terms used for describing the morphology and morphometrics of the molar teeth. The mesial refers to the surface of the teeth toward the front of the mouth, distal refers to the side of teeth toward the back of the mouth, buccal refers to the surface of the teeth toward the cheek, lingual refers to the side of the teeth toward the tongue, and occlusal refers to the surface of downward, crown refers to the part of the teeth which is visible on the mouth [1]. Many studies have applied the metric of the crown dimensions of permanent maxillary molars teeth on different populations and showed that can help a lot in forensic and dental medical fields such as gender determination in sudden and unexpected death, floods, explosions, fires, and accidents [2, 3, 4]. This study aimed to evaluate the crown dimensions and their advantages for the extracted adult Sudanese maxillary molar teeth.

II. MATERIALS AND METHODS

Several 120 healthy permanent maxillary molar teeth (not affected by caries) were collected after their extraction for other pathological reasons for adult Sudanese patients (age range=26-48 years) in Dental Hospital, Khartoum state, Sudan. The ethical importance of the patients is taken during sample collection. Extracted molar teeth include 20 male and 20 female first maxillary molars, 20 male and 20 female second maxillary molars, and 20 male and 20 female third maxillary molars. Each extracted tooth kept in a plastic box contains 10% formalin solution, with a capacity of 200ml. The name and type of the teeth were identified before their removal from the mouth cavity. The age and gender of each patient were written on the outer surface of each box. The metric design in millimeters for each tooth was measured on crown mesiodistal (MD) and buccolingual (BL) dimensions by using Vernier caliper (Figures 1, 2). The data values were analyzed by the SPSS ((Statistical Package for the Social Sciences) program.

III. RESULTS

In general, we revealed that the mean value of the crown dimensions of all maxillary molar teeth are bigger in males than females, and the buccolingual crown dimensions are larger than mesiodistal in both genders. The first maxillary molar teeth are the largest one followed by the second while the third molar is the smallest one.

The mean values of the buccolingual crown dimensions for the male was 10.10, 9.90, and 9.70 for the first, second, third maxillary molar teeth respectively, while for the female was 9.90, 9.70, 9.60 for the first, second, third maxillary molars teeth respectively (Table 1).

The mean values of the mesiodistal crown dimensions for the male was 9.80, 8.80, and 8.60 for the first, second and third maxillary molars respectively while for the female was 9.65, 8.60 and 8.50 for the first, second and third maxillary molar teeth respectively (Table 1).
Table 1: Statistical analysis of the crown dimensions of maxillary molar teeth for adult Sudanese

<table>
<thead>
<tr>
<th>Male and Female</th>
<th>BLCDOM1</th>
<th>MDCDOM1</th>
<th>BLCDOM2</th>
<th>MDCDOM2</th>
<th>BLCDOM3</th>
<th>MDCDOM3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>10.10</td>
<td>9.80</td>
<td>9.90</td>
<td>8.80</td>
<td>9.70</td>
<td>8.60</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>1.07</td>
<td>.94</td>
<td>.93</td>
<td>.63</td>
<td>1.00</td>
<td>.61</td>
</tr>
<tr>
<td>Minimum</td>
<td>8.50</td>
<td>8.00</td>
<td>8.50</td>
<td>7.50</td>
<td>7.00</td>
<td>8.00</td>
</tr>
<tr>
<td>Maximum</td>
<td>11.50</td>
<td>11.00</td>
<td>11.00</td>
<td>9.50</td>
<td>10.50</td>
<td>9.50</td>
</tr>
<tr>
<td>Female</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>9.90</td>
<td>9.65</td>
<td>9.70</td>
<td>8.60</td>
<td>9.60</td>
<td>8.50</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>.80</td>
<td>.78</td>
<td>.97</td>
<td>1.10</td>
<td>1.19</td>
<td>.91</td>
</tr>
<tr>
<td>Minimum</td>
<td>8.50</td>
<td>9.00</td>
<td>7.50</td>
<td>7.00</td>
<td>7.50</td>
<td>7.00</td>
</tr>
<tr>
<td>Maximum</td>
<td>11.00</td>
<td>11.00</td>
<td>11.00</td>
<td>10.00</td>
<td>11.00</td>
<td>10.00</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>10.00</td>
<td>9.72</td>
<td>9.80</td>
<td>8.70</td>
<td>9.65</td>
<td>8.55</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>.93</td>
<td>.85</td>
<td>.93</td>
<td>.87</td>
<td>1.07</td>
<td>.75</td>
</tr>
<tr>
<td>Minimum</td>
<td>8.50</td>
<td>8.00</td>
<td>7.50</td>
<td>7.00</td>
<td>7.00</td>
<td>7.00</td>
</tr>
<tr>
<td>Maximum</td>
<td>11.50</td>
<td>11.00</td>
<td>11.00</td>
<td>10.00</td>
<td>11.00</td>
<td>10.00</td>
</tr>
</tbody>
</table>

- **BLCDOM1** = Buccolingual crown dimension of the first maxillary molar tooth
- **MDCDOM1** = Mesiodistal crown dimension of the first maxillary molar tooth
- **BLCDOM2** = Buccolingual crown dimension of the second maxillary molar tooth
- **MDCDOM2** = Mesiodistal crown dimension of the second maxillary molar tooth
- **BLCDOM3** = Buccolingual crown dimension of the third maxillary molar tooth
- **MDCDOM3** = Mesiodistal crown dimension of the third maxillary molar tooth
- **Std** = standard

Figure 1: How the bucco-lingual crown dimensions was applied
IV. DISCUSSION

Odontometric plays an important role in sex determination in forensic dentistry such as identification of the dead bodies during criminal accidents, and also knowing the personality in cases of mysterious crimes [5]. The obtained human sound extracted teeth can help a lot in education for dental students and specialists [6, 7, 8].

In this study, buccolingual and mesiodistal crown dimensions of the first, second, and third permanent maxillary molars were measured for the adult Sudanese population. The results showed that the mean value of the teeth size was bigger in the male than that of the female. A study done by Ashwini on 100 Indian populations (48 male, 52 female) presented that the buccolingual and mesiodistal crown dimensions were larger in males than in females for all maxillary molar teeth [9]. Lund and Mornstad studied a Swedish population of 29 males and 29 females, ranging in age from 14 to 38, and showed that the mean diameters for males were larger than those for females in all variables [10].

Our study showed that there was a difference between male and female crown dimensions of maxillary molar teeth and this finding can help in sex determination among adult Sudanese in forensic medicine cases. A study conducted on the adult Indian population showed that the crown dimensions are reliable indicators and can be used along with or/and instead of linear measurements in sex determination [11, 12]. The mesiodistal crown dimensions of permanent first maxillary molar teeth were used for sex identification and showed that as well founded mark for gender determination [13].

Previous studies have been carried out in different countries on the subject of measuring the crown dimension of permanent maxillary molar teeth and showed that there are differences in their measurements between populations and those results are correlated with our study on the adult Sudanese maxillary molars are different in size when compared to other nationalities and this finding can be used as evidence to determine the specific nationality in forensic medicine. The means value of the mesiodistal crown dimension of the permanent first maxillary molar for the Indian population was 10.60mm for males and 10.40mm for females [12], while in the current study for adult Sudanese was 9.80mm for the male and 9.65mm for the female, and this indicates that Indian populations molar teeth slightly large than that of the Sudanese. The study done on the Turkish population showed the mean value of Buccolingual crown dimension of first maxillary molar teeth was 11.76mm for the male and 11.40mm for the female, in our study was 10.10mm for the male and 9.90mm for the female [14].

In the present study, the measurements data of the obtained extracted sound maxillary molars teeth of the adult Sudanese are reasonably employed for teaching and researching for dental professionals and students, and also can be used in an ethical human teeth bank, therefore, are credibly used in the technical process in orthodontics. Previous studies indicated that the extracted sound teeth were used in training and research operations for dental professors and students, and also work to make a dental bank [6, 7, and 8].

V. CONCLUSIONS

This study concludes that the crown dimensions of the adult maxillary molars teeth are different in size in comparison between males and females. Therefore the obtained data can be used as evidence for gender identifications in forensic cases, however, can be sued for teaching and training dental professionals and students, however, in technical procedures during orthodontics.

REFERENCES


AUTHORS

First Author – Mahmoud Satte, Department of Anatomy, Faculty of Medicine, Najran University, Najran, 55461, KSA

Correspondence Author – Asst/Prof. Mahmoud Sheikh Satte, Anatomy Department, Medical College, Najran University, Najran, 55461, KSA. Tel.: +966553125185; E-mail: hageeg.yoo@gmail.com