Coincidence of facial midline with dental midline in Chennai population

Ashish R. Jain*

ABSTRACT

Aim: The aim of the study was to find out the coincidence of facial midline and dental midline in Chennai population.

Background: The facial midline is defined by the landmarks such as nose, philtrum, and chin aligned in a straight line. It should be in the center of the face and should coincide with the dental midline. The dental midline is the mid-sagittal of maxillary and mandibular arches when teeth are in maximum intercuspation.

Materials and Methods: A total of 50 participants are selected inside the Saveetha Dental College institution. The facial and dental midline is observed whether they are coincident or not up to certain millimeter. The facial midline is examined by marking the point at nasion and pogion through the tip of the philtrum. The examination was carried out using a different thread of dental floss for a different patient.

Result: The majority of the population has the coincidence of facial midline with the dental midline which is 86% to be exact. Therefore, the remaining 14% of the population has no coincidence of dental midline with facial midline with 10% dental midline shift to the left and 4% dental midline shift to the right.

Conclusion: The dental midline and facial midline for the majority of the population are coincided with each other. Therefore, it was concluded that the facial midline can be taken as a reliable guide for the establishment of the maxillary dental midline in Chennai population.

KEY WORDS: Esthetics, Dental midline, Dental prosthesis, Facial midline, Smile

INTRODUCTION

Smile is the primary presentation of our identity, and it has been acknowledged that it is the best gift anyone can give. The balanced smile midline has incredible importance in esthetic value because since smile is the first thing people notice when verbal interaction occurs. The balanced smile relies on the incident of facial also, dental midlines individually. The facial midline is characterized by the landmarks such as nose, philtrum, and chin aligned in a straight line. It should be at the center point of the face and should harmonize with the dental midline.

Dental midline is the crucial component in smile outline and ought to be parallel to the long axis of the face. Moreover, it should be perpendicular to the incisal plane and perpendicular to papilla. Establishing dental midline perpendicular to the face is the first and crucial step while manufacturing fixed or removable prosthesis. If the facial midline is in line with the dental midline, it will greatly contribute to the esthetics of the face. This will give the patient a sentiment symmetry and balance.

Much has been written regarding the diagnosis of dentofacial asymmetries; however, the esthetic significance of dental symmetry and midline location has not been decided decisively. In a study reporting on dental esthetic self-evaluation by 10–13-year-old, Graber and Lucker found that overjet and dental crowding or spacing were considered to be more significant than midline deviations in deciding self-satisfactory with dental appearance. Conversely, Hulsey found that symmetry was a standout among the most important factors in characterizing an alluring smile. The degree of asymmetry that falls outside of the limit of esthetic acceptability is constructed mainly from the subjective opinion in light of the fact that no absolute or even acknowledged principles exist by which a judgment of abnormality can be made.

Apart from the esthetic value that we treasured the most, if the facial and dental midline is not coinciding

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Received on: 18-02-2018; Revised on: 16-03-2018; Accepted on: 22-05-2018
with each other, it will lead to other complication such as temporomandibular joint problem.\[16\] In addition to that, this may also affect the process of fabrication of the prosthesis.\[17\] However, the objective of the present study was to determine the coincidence of dental midline with facial midline in Chennai population.

**MATERIALS AND METHODS**

An aggregate number of 50 subjects were chosen from Saveetha Dental College. The subjects’ age range for the selection is from 18 to 25 years. In addition, there was the irregular choice for male and female subjects, no settled extent was proposed. All the subjects had permanent dentition of all tooth from second molar to second molar in maxilla. The sample size was calculated using the following formula:

$$\text{Sample size} = \frac{Z^2 \times (p) \times (1-p)}{c^2}$$

Where:
- $Z = Z$ value
- $p = \text{percentage picking a choice}$
- $c = \text{confidence interval}$.

**Correction for Finite Population**

$$\text{new sample size} = \frac{1+\frac{ss}{\text{pop}}}{1+\frac{ss}{\text{pop}}}$$

Where: $\text{pop} = \text{population}$

The sample size was arrived with n Master software Version 2.0 by applying the following details in the above formula [Table 1]:

In this study, not every subject was accepted for participation; only subjects without any major deformity were accepted. Therefore, subjects with midline diastema, congenital or acquired maxillofacial deformity were not selected for this study. In addition to that, the subjects who had experienced any orthodontic treatment, the absence of anterior natural teeth or presence of prosthodontically replaced maxillary anterior teeth were likewise not incorporated into the investigation. Before taking data from the subjects, an informed written consent was retrieved from each of them.

Each of the subjects was analyzed by one evaluator independently. Moreover, the evaluator will analyze 10 subjects per day to avoid eye fatigue. The subjects were examined to confirm whether maxillary dental midline coincides with facial midline. Moreover, the facial midline of the subjects was analyzed by marking the points between nasion and pognion including center of philtrum with the assistance of scale or dental floss [Figure 1].

**RESULTS**

The data obtained from the study were carefully recorded and tabulated into a table for better understanding. The analysis of the data has shown that the dental midline for the majority of the population was coinciding with the facial midline which is 86%. However, 14% of the population were showing noncoincident dental midline with facial midline [Table 2].

Among the males, 27 of them shows coincidence of facial midline with dental midline, while 1 shows deviation to the right and 3 of them shows deviation to the left. For females, 16 shows coincidence of facial midline with dental midline while 1 shows deviation to the right and 2 shows deviation to the left. That makes a total of 43 subjects show coincidence of facial midline with dental midline, while 2 subjects had deviation to the right and 5 subjects had deviation to the left.

**Table 1: The required number of sample size used for the study**

<table>
<thead>
<tr>
<th>Single proportion - absolute precision - finite population correction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expected proportion</td>
</tr>
<tr>
<td>Precision (%)</td>
</tr>
<tr>
<td>Desired confidence level (1-alpha)%</td>
</tr>
<tr>
<td>Population size</td>
</tr>
<tr>
<td>Required sample size</td>
</tr>
</tbody>
</table>

**Table 2: The coincidence of facial midline and dental midline**

<table>
<thead>
<tr>
<th>Coincidence</th>
<th>Male frequency</th>
<th>Female frequency</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coincide</td>
<td>27</td>
<td>16</td>
<td>43 (86)</td>
</tr>
<tr>
<td>Right shift</td>
<td>1</td>
<td>1</td>
<td>2 (4)</td>
</tr>
<tr>
<td>Left shift</td>
<td>3</td>
<td>2</td>
<td>5 (10)</td>
</tr>
<tr>
<td>Total</td>
<td>31</td>
<td>19</td>
<td>50 (100)</td>
</tr>
</tbody>
</table>
Among the 14% population of noncoincident of dental midline with facial midline, 4% of the population (compared to the full population, 50), shows the deviation of the dental midline to the right, while 10% of the population shows shifting of the dental midline to the left. This show that shifting of the dental midline to the left is more than shifting of dental midline to the right.

**DISCUSSION**

In general, facial symmetry is one of the facial esthetic characteristic trademarks. As indicated by the brilliant proportion, the excellence of the face relies on alignment, symmetry and the proportion of face. To accomplish a symmetrical smile while fabricating fixed or removal prosthesis is compulsory. The facial component coincides with maxillary dental midline essentially adds to the aesthetic.

The reason for this study was to take out norm and relation of facial midline with the dental midline among the population of the Saveetha Dental College. The facial midline can be utilized as a guide for constructing the maxillary dental midline while replacing the front teeth during prosthodontic treatment.

Among the population, we found that 86% of them have coincided dental midline with facial midline, while 14% indicated noncoincidence with 10% shifting to the left and 4% shifting to the right.

Amid this investigation, nasiom, focal point of philtrum, and pogonion were utilized to decide the facial midline; they are the landmarks of the facial midline. The results of this present investigation are in concurrence with the outcome acquired in the investigation directed in Riyadh, Saudi Arabia. In that study, they have found that 88.10% of the population is indicating coincidence of dental midline with facial midline. Similar study by Mavani et al. and Shyagali et al. showed the similar result (90% and 70% of coincidence).

Nowadays, there is a lot of description that has been described to explain the causes of facial midline shift. In fact, the genetic and environmental factors may affect the facial midline. On top of that, contribution from the soft tissue, dental and skeletal components prompting facial asymmetry ought to be assessed. Moreover, the significant of facial midline shift can be seen in multiple neurofibromatosis as well as hemifacial macrosomia. In addition to that, other genetically disorders that may cause congenitally missing tooth as well as severe deviations due to functional asymmetry. Other than that, orthodontic treatment also can be applied for skeletal imbalances problem in the developing stage. Moreover, the asymmetrical face can be corrected by doing surgery as it may help in repositioning the

Orthodontic treatment can be done for subjects with a congenitally missing tooth as well as severe deviations due to functional asymmetry. Other than that, orthodontic treatment also can be applied for skeletal imbalances problem in the developing stage. Moreover, the asymmetrical face can be corrected by doing surgery as it may help in repositioning the
Moreover, stereophotogrammetry utilizes and treatment plan are necessary so that facial asymmetry can be treated successfully without any complications. In addition to that, a precise diagnosis can be produced by evaluating the contributions from soft tissue, dental element, and skeleton element in detail. On top of that, before planning the treatment plan, the clinician should aware about the patient’s complaints and desires since they may vary from unlikely expectations to an aggregate absence of concern even if the chronic discrepancies are present. Thus, the intervention with treatment plan should be considered in the less chronic contributions from soft tissues, dental element, and skeleton element. Furthermore, the degree to which treatment ought to be coordinated at addressing the facial asymmetry relies on the extent of deviation, different attributes of the subjects and the danger and expenses related with different treatment alternatives proposed to rectify the recognized deviation. In addition to that, the clinician must know about the patient’s expectations while treating such cases and assess the cost to benefits proportion of the different treatment modalities to accomplish the most ideal results.

REFERENCES


Source of support: Nil; Conflict of interest: None Declared