

CORRELATION OF MAXILLARY CANINE POSITION WITH COMMISSURE OF LIP AND INTERPUPILLARY VARYING DISTANCE

Type of manuscript: Research article

Running title: correlation of maxillary canine position with commissure of lip and interpupillary varying distance.

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Total number of words: 2635

ABSTRACT:

AIM: The aim of this research is to measure the correlation of maxillary canine position with commissure of lip and interpupillary varying distance.

MATERIAL AND METHOD: Two hundred and fifty individuals participated in this study aged from 19 to 30 years. The measurements were made by using a precise digital vernier calliper with precision of 0.01 mm and the possibility of measuring distances from 0 to 150 mm.

BACKGROUND: There must be clear-cut concepts of the appearance of the acceptable "normal" face in order to create an esthetic prosthetic restoration. One area of concern is the guide to be used for the placement of the cuspid teeth. Two guides in use are : (1) the interalar distance, which supposedly represents the distance between the cuspid tips, and (2) the distance between the corners of the mouth, which supposedly represents the distance between the distal surfaces of the cuspids. The basic goal of complete denture therapy is to achieve the maxillary frontal teeth restored to optimal dentolabial relations in relation with the overall facial appearance. To achieve this goal, the dimension, morphology and arrangement of the frontal teeth must be in proportion to the facial dimension for proper esthetics. In completely edentulous patients, it is a real challenge for a dentist to successfully place the denture teeth in the exact position as natural teeth and conform to the normal physiological oral teeth and activities.

REASON: This investigation was undertaken to determine the relationship of the maxillary cuspids to the corners of the lips and the interpupillary distance.

INTRODUCTION:

Esthetics is one of the best major concerns for patients seeking complete removable prosthesis for their missing teeth. The basic goal of complete denture therapy is to achieve the maxillary frontal teeth restored to optimal dentolabial relations in relation with the overall facial appearance. To achieve this goal, the dimension, morphology and arrangement of the frontal teeth must be in proportion to the facial dimension for proper esthetics. In completely edentulous patients, it is a real challenge for a dentist to successfully place the denture teeth in the exact position as natural teeth and conform to the normal physiological oral teeth and activities. During bite registration, while fabricating complete denture, various guide lines, such as center line, high lip line, smile line and canine line, are marked on the bite blocks. These guidelines assist the clinician in determining the correct distoproximal size of the frontal teeth. The situation of these lines depends on reference to certain unequivocal facial points of interest, for example, intercommissure, interalar, the labial frenum, bizygomatic width and interpupillary distance. [1-5] In the absence of pre-extraction records, [6] these facial and oral anatomical landmarks can be of more important for the clinician. The relative position of the canine while arranging the artificial denture teeth is critically important as it supports the corner of the mouth. Furthermore, it is the turning point of the dental arch which makes its position as the principal factor in considering complete denture esthetics [7-9]. This also can provide valuable information for selecting the distoproximal size of maxillary anterior teeth. A few rules are proposed for denoting the canine line

on the maxillary bite block. Some studies have proposed that the rough area of the distal surface of the upper canines can be demonstrated by marks made on the upper chomp obstruct at the edge of the mouth. The canine line can likewise be set apart by broadening the vertical parallel lines from the sidelong surface of the alae of the nose on to the labial surface of the upper bite block which shows the estimation of the position of the tip of the upper canine.[8,9] Also, the projection of a line drawn from the inward canthus of the eye to the alae of the nose goes through the upper canine.[10] Several studies have led the examinations in the previous 4 to 5 decades for denoting the canine line. The anthropometric estimations of the face and the joined width of maxillary front teeth are connected.[2,11,12] They have suggested a proportion between the facial size and the tooth measure that could be utilized as a guide in choosing artificial denture teeth. Yet, the principle disadvantage of these estimations is that the delicate tissue estimations are subjective to change. The answer for this issue is the utilization of stable facial references and that are not subjective to change. One of such stable facial milestone is the interpupillary distance,[13,14] which does not adjust after the age of fourteen.

The relationship of between pupillary separation and distoproximal width of upper frontal teeth and proposed that it could help in the choice of the artificial teeth[15]. They found that the inter pupillary separation could help dependably for the choice of maxillary frontal teeth. The North American population found no connection between's intercommissural width, interalar width and interpupillary width[4]. Four distinctive racial gatherings and found a feeble connection between's intercommissural width and disto-proximal surfaces of canines were also seen[16]. In any case, some [17,18] discovered positive connection between's intercanine tip width and interalar width in their examinations. Past investigations have demonstrated that the canine position depends on facial anatomical structures, henceforth may identify with an individual race. Not very many examinations with respect to the intercanine width to the facial milestones have been led in Asian individuals particularly Indians. The goal of this examination was to decide the connection between's maxillary intercanine width and the facial historic points including interpupillary separate and intercommissural width in a gathering of focal Indian individuals. The point was additionally to figure the proportion between the deliberate factors, which could be useful in clinical practice.

MATERIALS AND METHODS:

Two hundred and fifty individuals participated in this study aged from 19 to 30 years. The growth of the craniofacial system and the teeth had to be completed for each individual. The sample consisted of 139 males and 111 females. Individuals with occlusal and orthodontic anomalies, any asymmetry of the face, extractions and fillings on the frontal teeth were excluded from the study. None of the participants had crowding or spacing and fixed crowns on any of the frontal teeth in the upper or the lower jaw.

The measurements were made by using a precise digital vernier calliper with precision of 0.01 mm and the possibility of measuring distances from 0 to 150 mm. The interpupillary distance (DMP) and intercommissural width(DCM) measurements were made by one observer, directly on the participants. During the measurement, they sat comfortably in a dental chair in an upright position and, before the beginning of the measurement, they were required to widely open and close their mouth several times and to move their lips to allow fatigue of the surrounding muscles to relax, during the measurement.

During the DMP measurements, the distance between the mid-pupils of the eyes was recorded. During the DCM measurement, the participant had to be relaxed, to look into the distance, the mandible was in the rest position and the lips had to be unstretched. The distance between the width of the distal surface of maxillary canine is measured by the observer.

The following variables were measured for each participant: DMP—distance between mid-pupils of eyes, DCM—distance between corners of the mouth, CWC — combined width of upper frontal teeth. All the collected data were statistically analysed by using the statistics. The mean values (\bar{x}) and standard deviation (SD) were calculated. Descriptive statistics were carried out for all 250 participants and then separately for the male and female subjects.



INTERPUPILLARY DISTANCE



INTERCOMMISSURAL WIDTH



**COMBINED WIDTH OF MAXILLARY
ANTERIOR-CANINE POSITION**

OBSERVATION AND RESULTS:

Gender-wise distribution of study subjects is shown in Graph 1. There were 56% of male and 44% of female. Mean values and standard deviations of the measured variables (DMP, DCM and CWC) are presented in Table 1 for all participants.

Statistical analysis showed significant difference for all the variables between males and females ($p < 0.01$), i.e. males, had significantly higher values than females. The average age was 22.57 with a range from 19 to 30 years.

The mean values of DMP, DCM and CWC for the whole sample were 62.26 ± 1.97 mm, 51.79 ± 1.56 mm, and 45.04 ± 4.21 mm respectively.

For males, the mean values of DMP, DCM and CWC were 62.69 ± 2.11 mm, 52.25 ± 1.63 mm and 45.59 ± 3.83 respectively; whereas for females, the mean values were 61.82 ± 1.70 mm, 51.30 ± 1.33 mm and 44.46 ± 4.52 mm respectively.

GRAPH: 1

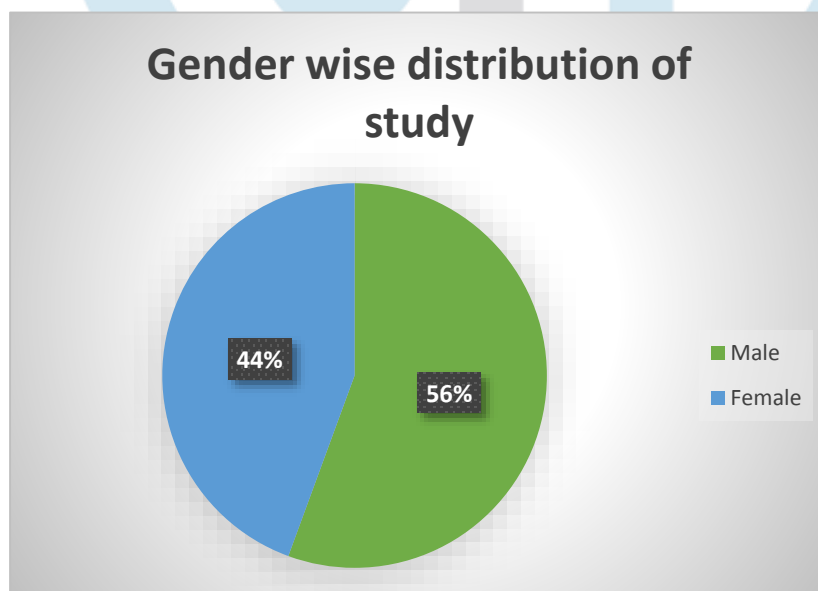


TABLE:1

VARIABLES(N=250)	MEAN \pm SD	MEDIAN	MAX-MIN
AGE(YEARS)	22.57 \pm 2.62	23(4.00)	30-19
INTERCANINE WIDTH(CWC) IN MM	45.04 \pm 4.21	44.27(5.89)	53.22-31.20
INTERPUPILLARY DISTANCE (DMP) IN MM	62.26 \pm 1.97	62.32(2.00)	67.80-58.12
INTERCOMMISSURAL DISTANCE(DCM) IN MM	51.79 \pm 1.56	52.12(2.26)	54.96-47.60

The correlations between the measured variables (DMP, DCM and CWC) were correlated (Table 2 and 3) For DMP and CWC, the correlation coefficient (R) between sexes was 0.084 (males) and -0.082 (females). For DCM and CWC, it was -0.005 (males) and -0.032 (females).

TABLE:2

CWC-DMP	CORRELATION COEFFICIENT (R)	P-VALUE
OVERALL(N=250)	0.015	0.729NS
MALE(N=139)	0.084	0.166NS
FEMALE(N=111)	-0.082	0.186NS

TABLE: 3

CWC-DCM	CORRELATION COEFFICIENT (R)	P-VALUE
OVERALL(N=250)	0.031	0.471NS
MALE(N=139)	-0.005	0.934NS
FEMALE(N=111)	-0.032	0.604NS

DISCUSSION:

Despite the fact that a flawless smile is an essential part of facial style, it ought to be in extent with all the parts of the face. The connection between different facial measurements and normal teeth could be utilized as a solid guide to accomplish an ideal style. The estimation of mesio distal width of the maxillary frontal teeth is a standout amongst the most diffraction angles in total denture treatment is expressed by Gomes et al[15]. Numerous investigations have been performed to set up strategies for assessing the consolidated mesio distal width of upper foremost teeth to enhance the entire denture feel. In past studies,[19,20] measurements were led on human extricated teeth. In any case, late studies [21-24] estimated the clinical tooth measurements utilizing throws acquired from subjects or PC based photos or intraoral assessments. While looking at these qualities, checked contrasts were noted between the real and saw measurements of the foremost teeth. This distinction was contributed by the ebb and flow of the curve and angulations of the maxillary frontal teeth, in connection to the frontal plane of the subject's photo. India is an assorted nation with different ethnic gatherings with each having distinctive facial masterles.

There is no dento facial standard for use in prosthodontics that is illustrative of the Indian populace. The present investigation expected to decide whether corresponding relationship exists between the widths of the maxillary frontal teeth, the interpupillary distance, and the intercommissural width in focal Indians. This investigation demonstrated that males have a significantly higher mean an incentive in every one of the parameters estimated than the females. This finding is in concurrence with different examinations in which sexual orientation based varieties were watched for most racial groups.[19,21,23] The reason might be because of the male physical make-up strength over the females independent of the age gathering. In this investigation, the mean intercommissural width was more noteworthy than the mean of the intercanine width estimated. This finding was like the findings of Stephan,[25] in which the DCM contrasted significantly from the CWC. It has been proposed that the distal surface of the common upper canine can be thought to be situated close to the edge of the mouth, which further can be compared to the intercanine width.[26] This rule has been utilized as a part of the choice of maxillary frontal teeth bite enrolment in complete denture treatment. Be that as it may, there are no such confirmations to recommend the legitimacy of this relationship. A few authors [2-5] have influenced endeavors to an end to a connection between the maxillary frontal teeth and facial structures. The interpupillary separate has been recommended to relate the intercanine width and has been generally utilized for the determination of maxillary frontal teeth. Because of racial varieties in facial extents, a need exists to research the connection between the intercanine width and the interpupillary remove for other racial gatherings.

The mean estimation of CWC (45.04 mm) was observed to be significantly high in male than female. This finding was relatively like the findings of Al Wazzan [12] (45.23 mm). The estimation of the mean of the CWC, higher than the pre-sent examination was accounted for in other studies. [15,18] But in a few investigations, the qualities were discovered lower than the present study. [5,27-29] The sexual orientation based varieties were likewise reported in the literature, [5,12,18] as appeared in the present examination. Yet, few examinations have demonstrated no sexual orientation based variations.[15,27] The mean DMP of the subjects in the present examination was (62.26 ± 1.97 mm) for the aggregate example, which was like the findings of Latta et al4 (63.51 mm) and Al-el-Sheik et al18 (62.31 ± 4.10). Cesario and Latta [2] found a mean estimation of 59.16 mm in the subjects of United States armed force, which was lower than the present examination. Likewise, the higher mean esteems were reported.15 The variations in the mean esteems in the detailed investigations might be because of the ethnic and racial contrasts. The interpupillary distance is also measured for the placement of endodontics microscope in chronological order[30]. In the present examination, an example of 250 subjects was researched, which uncovered an expanded DMP esteems for male than female. These sexual orientation based

varieties were additionally detailed in some studies.[15,18] The mean estimation of DCM in the present examination was 51.79 ± 1.56 mm. Ibrahimagic et al [31] found a mean estimation of 45.4 mm in their examination, which was lower than the present examination. Esan et al [29] announced a mean estimation of 74.6 ± 6.7 mm in Nigerian populace, which was higher than the present examination. The intercommissural width in four racial gatherings and observed to be 47.02 mm (White), 48.12 mm (Mulatto), 50.33 mm (Black), and 43.10 mm (Asian) respectively was considered by Varjao and Nogueira [16]. These qualities were lower than the present investigation.

The relationship between the whole three factors considered were observed to be frail. The connection coefficient (R) amongst CWC and DMP for all subjects was 0.015; though for males and females, it was 0.084 and -0.082 individually. Also, connection coefficient (R) amongst CWC and DCM for all subjects was 0.031, while for males and females it was -0.005 and -0.032 separately. The relationship of the considered factors in by and large and in the middle of the genders was observed to be not significant. Al-el-Sheik and Al-Athe I[18] found an exceedingly significant relationship ($r = 0.3036$) amongst CWC and DMP in Saudi populace and when analyzed between the genders, females indicated significant connection ($r = 0.2134$ and $p < 0.001$) than guys. The significant relationship ($r = 0.24$) amongst CWC and DCM in Nigerian populace was revealed by Esan et al [29].

In spite of the fact that the relationship found in this examination was powerless, clinicians could utilize DMP and DCM to gauge the provisional position of the canine for manufacture of complete denture prosthesis for edentulous patients. Since the canine position is influenced by numerous factors et cetera the CWC, it would be a mix-up to assert that either facial historic point, i.e. DMP and DCM was demonstrated superior by this investigational work. Satisfactory molding the impediment wax edge to accomplish ideal lip commissure and occlusal vertical measurement and after that denoting the canine line must be considered as a speculative strategy.

The final choice ought to be shown up of every patient. For the most part, facial appearance shifts between changed ethnic gatherings. Besides, it isn't conceivable to con rm that every person in this examination was local Indian. Individuals with Indian nationality might be of ethnic contrasts. Some might be a blend of Hindu, Muslim, Sikh or Isai (Christian), which are dominating religious groups in India. Besides, there may be different elements that influence the position of canine which were out of the extent of this examination. Thus, facial historic points can't be too unequivocally accentuated when a clinician intends to convey finish dentures with satisfying appearance. A mix of style and phonetics result ought to be concerned while treating complete denture patients. The utilization of the papillary midpoints and the sides of the mouth for the choice of the artificial teeth width would lead, all in all, to the determination of smaller teeth. The outcomes recommend that the strategy is mistaken for the examined populace, rendering the most exceedingly terrible stylish outcome for the Indian gathering.

CONCLUSION:

The examination decided the mean estimations of some facial parameters among focal Indians and demonstrated no immediate connection between interpupillary separate, intercommissural width, and the consolidated mesiodistal width of maxillary frontal teeth. Thusly, interpupillary remove and intercommissural width ought not be utilized as a part of marking canine line during bite registration enlistment technique. Be that as it may, these facial estimations could be utilized to build up just speculative assurance of the canine position for finish denture treatment. Esthetic and phonetic rules ought to be considered as assistant parameters in confirming the consolidated width of upper frontal teeth. Inside the constraints of this investigation, take after finding conclusions can be drawn:

- Statistically significant distinction amongst males and females exists for all the deliberate factors (DMP, DCM and CWC), i.e. Males have greater measurements than females.
- The connection coefficient between DMP-CWC and DCM-CWC was powerless and not significant when measured for all subjects and for both the genders.

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