

# Relationship Between Intercanthal Distance To Inter Canine Width of Maxillary Anterior Teeth in Pakistani Population



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**OBJECTIVE:** To determine the relationship of Inner canthal distance to inner canine width of maxillary anterior teeth in Pakistani population.

**STUDY DESIGN:** Cross Sectional Study

**Place & Duration:** Study was conducted over a period of six months at the department of Prosthodontics, Islamic International Dental College, Riphah International University, Islamabad

**METHODOLOGY:** A total of 500 dentate subjects were selected from the department of Prosthodontics. The exclusion criteria included the subjects with history of orthodontic treatment, extractions, drifting and attrition of the teeth. Subjects having any restoration in upper anterior segment, any facial deformity, crowding or spacing of anterior teeth were also excluded. The informed consent was taken. The patients were seated in the upright position and were asked to look straight. The inner canthal distance was measured using the digital caliper. The inner canine width was measured with the help of dental floss placed from the distal surface of canine of one side to the distal surface of the canine of the opposite side. Both the parameters were measured three times by the single person to ensure the accuracy and the mean was taken. The measurements were recorded in a predesigned Proforma.

**RESULTS:** The statistical results of this study showed that there was no correlation between the inner canthal distance and the combined mesiodistal width of maxillary anterior teeth

**CONCLUSION:** It was concluded that the inner canthal distance was not a reliable predictor to select maxillary anterior teeth width for edentulous patients in the study group

**KEY WORDS:** Intercanthal distance, Intercanine distance, Esthetics, Complete Denture, teeth Arrangement.

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## INTRODUCTION

Tooth loss can have psychological implications on individuals and it is therefore imperative that an aesthetically pleasant and functionally comfortable replacement be provided to them.<sup>1</sup> One of the major obstacle of complete denture prosthodontics is the accurate choice maxillary anterior denture teeth.<sup>2,3</sup> In past, recommendations have been described for the selection of appropriately sized

anterior teeth, but the significance but the accuracy of these guidelines is still doubtful.<sup>2,4</sup>

The Inner Canthal Distance, has been proposed to assist in the calculation of a combined width of the maxillary anterior teeth (Inner Canine Width [ICW]).<sup>5</sup> Scandrett et al evaluated ICD as a predictor of the width of maxillary anterior teeth and concluded that a single predictor is not accurate to achieve the clinical applications.<sup>5</sup>, whereas Abdullah et al studied ICD in Saudi population and showed that the Inner Canthal distance (ICD) may be used for the estimation of the combined width of the maxillary centrals, laterals and canines hence aid in tooth selection. Caucasian population has been the target population for research conducted regarding the selection of teeth for complete denture. Hence the sole objective of this study is to find the correlation of Inner Canthal distance to inter

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canine width of maxillary anterior teeth in Pakistani population. By doing so, we may obtain a biometric ratio to serve as an initial guide in selection of the maxillary anterior teeth which will aid undergraduate students and doctors of Islamic International Dental College in performing tooth selection for replacement prosthesis more efficiently.

## METHODOLOGY

The study was carried out after the approval from the hospital ethical review committee. The study design was Cross Sectional. 500 patients, both male and female reporting to the department of Prosthodontics at Islamic International Dental College were randomly included in the study. The participants were selected using non-probability, convenience sampling. The first 500 patients visiting the Prosthodontics department were selected for this study. Informed Consent was taken from the patients before proceeding. Below is the inclusion criteria.

1. Only Pakistani nationals.
2. Patients who had permanent dentition with no prior dental history of orthodontic treatment.
3. Patients with morphologically normal teeth.
4. Patients at or above 18 years of age with completed facial development.

The exclusion criteria were:

1. Teeth with the artificial prosthesis.
2. Teeth associated with gingival inflammation or hypertrophy.
3. Patients presenting with teeth malalignments/crowding of dental arches
4. Grossly carious teeth/Broken down roots of anterior teeth

Patients were made to sit on a dental chair upright and facing forward. Two investigators gathered the measurement data, one of the investigators carried out the measurements clinically and the other noted them down on a proforma. Inner Canthal Distance was recorded and measured as the distance between the medial angles (canthi) of the palpebral fissures laterally, using a Vernier caliper. Combined width of anterior teeth was recorded using a dental floss placed on the distal surface of one canine and extended to the distal surface of the other in the opposing quadrant. The length of the floss was then measured using a Vernier Caliper. Data collected was analyzed and correlated quantitatively. Data analysis was done through SPSS version 10.0. P value of <0.05 was considered as statistically significant. Pearson's correlation coefficient was calculated to assess any association between ICD and MAS.

## RESULT

A total of 500 dentulous subjects were examined to ascertain the correlation of inner canthal distance to inter canine width of maxillary anterior teeth. Out of them, 270 (54%) were males and 230 (46%) were females. The mean age of the study sample was  $34.21 \pm 11.83$  years. The average values of ICD and IPD are presented in Table 1. Amongst the 500 patients, no significant correlation was found between the Inner canine width (MAS) and Inner Canthal Distance (ICD). The result of the study is presented in Table 2.

**TABLE 1:** Mean and Standard Deviation values of Quantitative Variables i.e Age, Sex, Inter Canthal Distance (ICD) and Combined Width of Maxillary Anterior Teeth (MAS)

	AGE	SEX	ICD	MAS
N Valid	500	500	500	500
Missing	0	0	0	0
Mean	34.21		34.7685	55.3027
Std. Error of Mean	.529		.15924	.15323
Std. Deviation	11.830		3.56063	3.42631
Minimum	13		24.40	45.00
Maximum	79		64.26	69.00

**TABLE 2:** Correlation matrix for Combined Width of Maxillary Anterior Six Teeth (MAS) with Inter Canthal Distance (ICD) in Pakistani population

Pearson's correlation coefficient value (P-value)	
MAS (Maxillary anterior six teeth)	
ICD (Inter Canthal Distance)	0.142

NOTE: P-value significant at  $\leq 0.05$  level

## DISCUSSION

Improvement of facial esthetics is imperative for patients seeking prosthodontic dental care. Hence the planned prosthesis should fulfill esthetic harmony, functional efficiency and structural balance with the rest of the dentofacial structures. Achieving excellent esthetics when restoring or replacing the maxillary front teeth is the most challenging tasks in dentistry.<sup>2</sup> Selecting accurate size maxillary teeth is challenging, especially in the absence of preextraction records such as casts, photographs or extracted teeth.<sup>2,3,6</sup> Many attempts have been made to quantify the selection of anterior teeth using biometric guidelines but no universally accepted method currently exists.<sup>7</sup> This study was carried out at Islamic International Dental Hospital on 500 patients, the objective being to establish a correlation

between the between Inner Canthal Distance to Inter Canine Width of maxillary anterior teeth in Pakistani population.

The mean width of maxillary anterior six teeth MAS (55.30 mm) was found to be significantly higher than the values reported by Deogade et al (43.86 mm).<sup>5</sup>, Arun Kumar et al (48.85 mm).<sup>2</sup>, Hussain et al (46.01 mm).<sup>7</sup>, Arigbede et al (47.4 mm).<sup>8</sup>, Baleegh et al (38.37 mm).<sup>9</sup>, QQamar et al (46.01 mm).<sup>6</sup> and Mishra et al {(46.95 mm for Aryans) (45.54 mm for Mongoloids)}. The mean Inner Canthal Distance ICD (34.76 mm) was found to be higher than the values reported by Deogade et al (26.22 mm).<sup>5</sup>, Arun Kumar et al (30.23 mm).<sup>2</sup>, Arigbede et al (31.7 mm).<sup>8</sup> and Mishra et al {(34.12 mm for Aryans) (33.49 mm for Mongoloids)}.<sup>4</sup>

Pearson's correlation coefficient values (P-values) obtained from the current study reveals that when compared with the combined width of maxillary anterior six teeth, no significant correlation was found with Inner Canthal Distance (0.142).

Comparing the results of the current study with previously reported ones, it is well understood that the differences in these biometric dimensions are rooted primarily in ethnic and morphological characteristics of different population. Keeping in mind, the great individual variations in human physiognomy and morphological parameters, the application of inaccurate standards in the selection of maxillary anterior teeth would lead to unsatisfactory and unaesthetic results of complete denture therapy. Therefore, the results of specific relations of facial landmarks and width of anterior teeth must be perceived as distinctive features of the investigated population. The present study was conducted on the Pakistani population to determine the correlation between Inner Canthal Distance and the combined width of maxillary anterior teeth. The observations ruled out the existence of any correlation between Inner Canthal Distance and the combined width of maxillary anterior teeth.

### CONCLUSION

The present study suggests that no significant association was observed between the ICD and MAS of the Islamabad population.

### CONFLICT OF INTEREST

None declared.

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