

### G3 Implications of Canine Width, Inter-Canine Distance, and Facial Dimensions in Forensic Identification

*Kewal Krishan, PhD\*, Panjab University, Dept of Anthropology, Sector 14, Chandigarh 160 014, INDIA; Vaibhavi Sharma, MSc, Panjab University, Dept of Anthropology, Sector 14, Chandigarh 160 014, INDIA; and Tanuj Kanchan, MD, All India Institute of Medical Sciences, Jodhpur, Bansi Industrial Area, Phase 2, Dept of Forensic Medicine, Jodhpur, Rajasthan 342 005, INDIA*

After attending this presentation, attendees will understand the significance of canine width and inter-canine distance in forensic examinations, especially with reference to sexual dimorphism and two-dimensional facial reconstructions.

This presentation will impact the forensic science community by presenting the utility of important parameters in forensic odontology (i.e., canine width and inter-canine distance) in sexing of the human remains and in assessment of facial dimensions that are likely to assist in two-dimensional facial reconstructions.

Teeth are the most durable and hardest part of the human body. Consequently, dental evidence is recovered most often from mass disaster sites and crime scenes. Dental evidence is considered as valuable substantiation in the process of identification of human remains. In some terrorists' attacks, high-explosion blasts, and high-impact natural disasters, the dental and facial parts are available to Disaster Victim Identification (DVI) teams for identification purposes. In such situations, the dental evidence acts as sole and, thus, important evidence. A few studies are available on canine width, inter-canine distance, and their relationship with some facial measurements. Canine and inter-canine distance may be helpful in the prediction of the remains' sex. Studying the relationship of the inter-canine distance in addition to certain facial dimensions may be helpful in two-dimensional facial reconstructions in forensic identification. Therefore, the main objectives of the present study were to determine the sex differences with respect to canine width and inter-canine distance and to ascertain whether inter-canine distance may be used to estimate certain facial dimensions.

This study was conducted on 240 adult participants (120 males and 120 females) belonging to Himachal Pradesh State of North India. In addition to the canine width and inter-canine distance, the facial dimensions, such as bizygomatic width, physiognomic facial height, morphological facial height, bigonial distance and intercommissural distance, inter canthal distance, outer canthal distance, and tragus-to-wall distance, were measured with standard anthropometric instruments. The descriptive statistics were performed and the Karl Pearson's correlation coefficient was calculated to study the correlation between the measurements. Sex differences in the measurements were statistically analyzed. The mean canine width (mesio-distal crown width) was found to be greater in males than females on both the right and left sides. The sex differences were statistically significant. Similarly, the inter-canine distance was found to significantly larger in males than females in both maxillary and mandibular arches. Significant correlation was observed between maxillary inter-canine distance and intercommissural distance in both sexes; however, the correlation between mandibular inter-canine distance with physiognomic height and intercommissural distance was found to be significant only in females. In males, the correlation between inter-canine distance and facial measurements was not found to be significant. Prediction equations were calculated between inter-canine distance and facial measurements using regression analysis. The regression models were derived to predict facial measurements.

This study confirms the sex-discriminating potential of the dental measurements and concludes that certain facial dimensions can be estimated from the inter-canine distance, thus making it a useful tool in situations in which facial dimensions are not available for facial reconstruction.

**Forensic Odontology, Personal Identification, Dental Evidence**