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## **Study of Sexual Dimorphism in Maxillary Canine in Northern Central Region of India**

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**Abstract**--Background: The identification of a dead body may be required for following sudden and unexpected death like fire burn, railways side accident or other type of incident. Sometime body got decomposed and need for medical legal purpose. Teeth are an excellent material for anthropological, genetic, odontologic and forensic investigations and it also help for identification of sex. The teeth can be identified even when the rest of the body become decompose and not able to identification<sup>2</sup>. The Sexual Dimorphism able from tooth because the size, stature and appearance between male and female is different in both the sexes.<sup>3</sup> Objective: To investigate the accuracy with which gender can be identified by using the Maxillary Canine Index. Materials and Methods: Total 150 subjects were taken for the study purpose in which 75 are male and rest 75 are females in the department of RKDF medical collage & RKDF dental college Bhopal. This study was carried out on 150 subjects which were available. The ages of the subjects ranges between 19-25 years. The procedure for measuring the mesio-distal tooth width was performed as described by Hunter and Priest method. The inter-canine distance was measured between the tips of same arch canines. Results: Our study shows that male have greater mean mesiodistal dimensions for each tooth in comparison to females in both maxillary and mandibular arches. The mean value was greater in males as compared to females; the mean maxillary canine index of male is 6.01 mm and in female 5.89 mm. and the mean mandibular canine index is 6.7 mm in male and in female 6.8 mm in female. The level of accuracy for sex determination by using of mandibular canine index was found 65% in females and 77% in males were classified correctly. Conclusion: The standard Mandibular Canine and maxillary canine Index is a quick and easy way for determining of sex identification.

**Keywords**---Canine Width, Intercanine Distance, Forensic odontology, Sexual dimorphism, Sex determination, Mesiodistal dimensions.

## **Introduction**

The identification of a dead body may be required for following sudden and unexpected death like fire burn, railways side accident or other type of incident. Sometime body got decomposed and need for medical legal purpose. Teeth are an excellent material for anthropological, genetic, odontologic and forensic investigations and it also help for identification of sex. But the best way for identification of sex is DNA technology. Teeth are the most indestructible as compare other part of the body and exhibit the least turnover of natural structure.<sup>1</sup> The teeth can be identified even when the rest of the body become decompose and not able to identification <sup>2</sup>. The Sexual Dimorphism able from tooth because the size, stature and appearance between male and female is different in both sex.<sup>3</sup> The anthropological measurements of the skeleton and its comparison with existing standard data must then be applied and may help for existing standard data must then be applied and may help individual basis however, the gender differences are not always distinctive, when taken collectively they can give a good indication in the majority of cases.<sup>4</sup> The medico – distal diameter of mandibular and maxillary canine provides best evidences of sex determination due to dimorphism.<sup>5</sup>

## **Materials and Methods**

Total 150 subjects were taken for the study purpose in which 75 are male and rest 75 are females in the department of RKDF medical collage & RKDF dental college Bhopal

## **Study Population**

This study was carried out on 150 subjects in which 75 were male and 75 female were available. The ages of the subjects ranges between 19-25 years.

## **Instrument**

- Digital Vernier caliper

## **Inclusion criteria**

- The Subjects with normal overjet and overbite (2-3 mm),
- Tooth are caries free (canine teeth),
- There should be absence of spacing in the anterior teeth, molar and canine relationship, healthy state of gingiva & periodontium and there should be no history or clinical evidence of crown restoration and any type orthodontic treatment or any trauma.

## **Exclusion criteria**

- The Subjects having abnormal overjet.
- The tooth having caries

Tooth should be partially erupted and ectopically erupted teeth, patients with dental occlusal abnormalities (such as rotation, crowding, occlusal disharmony etc), teeth showing physiologic or pathologic wear and tear (e.g. attrition, abrasion, abfraction, erosion) and patients with deleterious oral habits (e.g. bruxism) were excluded from the study

## Methods

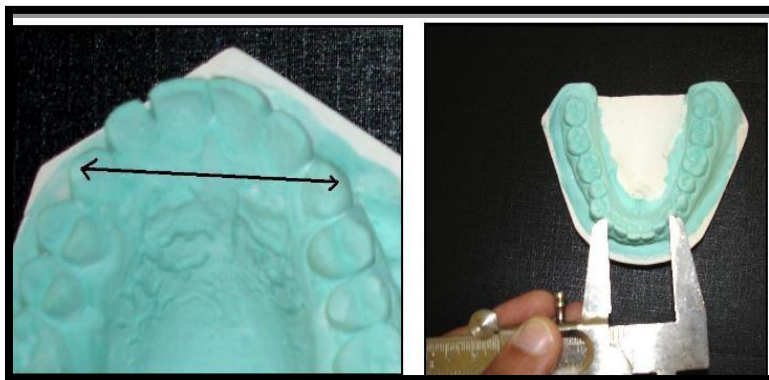
### Measurement of the Mesio-distal Width

The procedure for measuring the mesio-distal tooth width was performed as described by Hunter and Priest.<sup>7</sup> The medial and distal surfaces of the teeth were identified and the distance between the crest of curvature on the medial surface and the crest of curvature on the distal surface of canine was recorded by the divider points. The divider was then held against the digital Vernier calliper and reading should be noted.

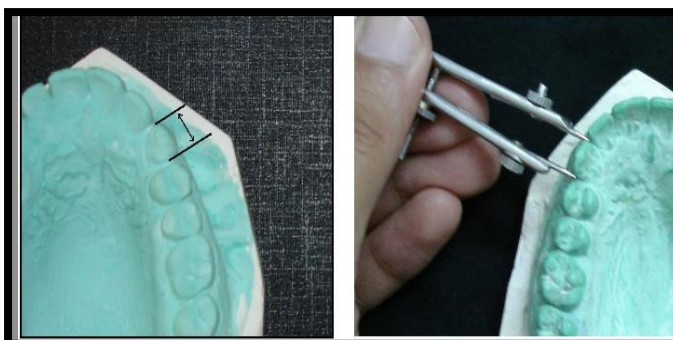
### The Measurement of the Inter-canine Distance

The inter-canine distance was measured between the tips of same arch canines. The divider points were applied to the tips of the maxillary canines. The divider was then held against the digital Vernier caliper and the reading was noted. The maxillary canine index was calculated using the formula below.<sup>8</sup>

Mesio-Distal Width of Maxillary Canine



Maxillary canine index =  
 Maxillary canine arch width



### Statistical Analysis

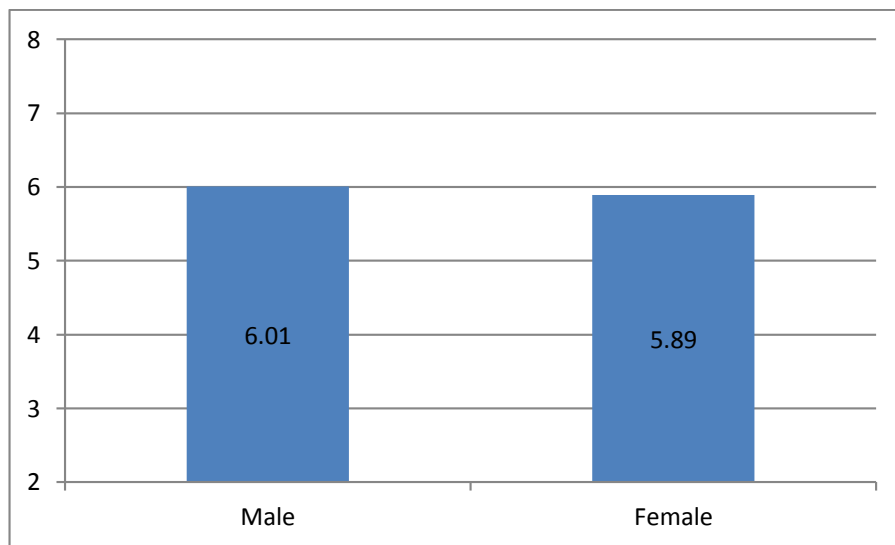
Statistical analysis was performed by using computer-based software, Statistical Package for Social Science (SPSS). Mean values of parameters were compared to determine.

### Results

Our study shows that male have greater mean mesiodistal dimensions for each tooth in comparison to females in maxillary arche. The mean values of maxillary canine widths in males and females on the right and left sides were compared and t-test was significant ( $P < 0.0001$ ). The mean value was greater in males as compared to females. When the level of accuracy for sex determination was measured using maxillary canine index and it was found that 52.5% females and 54.75% males were classified correctly. The mean maxillary canine index of male is 6.01 mm and in female 5.89 mm which is show in table no 1

Table 1  
Maxillary canine Index among study population

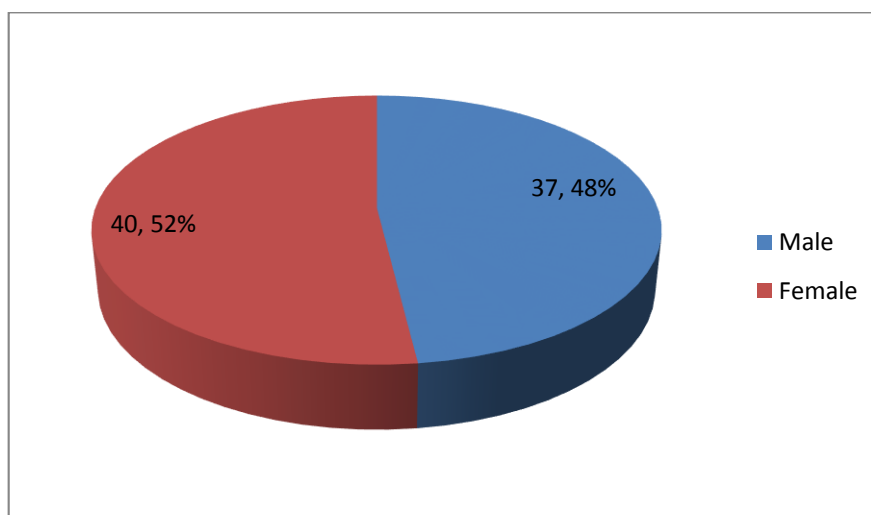
Gender	No. of subjects	Right Mean	SD	left Mean	SD
Male	75	6.01	0.5	6.12	0.4
Female	75	5.89	0.5	5.86	0.4



Bar Graph 1. Showing mean difference of Maxillary canine Index in both male and female

Table 2  
Percentage of cases correctly predicted using maxillary canine index

Gender	Total (in %)
Male	37(52.5)
Female	40(54.75)
Total	77(51.3)



Pie chart 1. Showing Percentage of cases correctly predicted using maxillary canine index in both male and female

## Discussion

For the Gender determination in damaged and mutilated dead bodies from its remain skeletal remains constitutes the foremost step for identification in medico-legal examination and bioarcheology.<sup>9</sup> some other factor also been found for bearing on tooth size the various morphometric difference between male and female tooth it may be eating habits and due to environmental factors were responsible for it.<sup>10 11 12</sup>

Garn et al found in his study on Fels Institute for correlated sexual dimorphism in canine with variable name statures weight bone age and others factor menarche in girl and the time of epiphyseal union. These correlations tell us that there should be the influence of steroidal hormones on the development of tooth and its maturation. They found that eruption is accelerated in those girl who were in maturing face and it showing effects of gonadal hormone involving and showing the relationship between sexual maturation and dental development.<sup>13</sup> Our current study telling us the comparison on 150 subject in which 75 male and 75 female in which we are successfully was found that 52.5% females and 54.75% males were classified correctly.

**Conclusion**

The standard Maxillary Canine Index is a supporting way for determining of sex in identification. It also help for identification for those skeletal who don't have pelvic & the remains of mandibular canine and whose body was complete or partially decompose.

**References**

1. Whittaker DA. An introduction to forensic dentistry. Quintessence international 1994;25:723-30.
2. Kaushal, S, Patnaik VVG, Agnihotri G. Mandibular canines in sex determination. J AnatSoc India 2003;52:119-24
3. Kiesu JA. Human adult odontometrics. In: The study of variation in adult tooth size. Cambridge University Press.1990.
4. Reddy VM, Saxena S, Bansal P. Mandibular canine index as a sex determinant: A study on the population of western Uttar Pradesh. J Oral MaxillofacPathol. 2008;12:56-9.
5. Mohammed QAR, Abdullah MA, Ashraf , Khan N. Dimorphism of mandibular and maxillary canine teeth in establishing identity SDJ, 1997;9:17-20
6. Nair P, Rao BB, Annigeri RG. A study of tooth size, symmetry and sexual dimorphism. Journal of forensic medicine and toxicology. 1999;16:10-3.
7. Hunter WS, Priest WR. Errors and discrepancy in measurement of tooth size. J Dent Res 1960;39:405-14.