ISSN: 2581-5989
Impact Factor: 1.5
PubMed - National Library of Medicine - ID: 101738774

*International Journal of Dental Science and Innovative Research (IJDSIR)*

*IJDSIR : Dental Publication Service*

*Available Online at: www.ijdsir.com*

*Volume – 2, Issue – 1, January - February - 2019, Page No. : 32 - 35*

# A Study on Gender Determination Using Mesiodistal Dimensions of Anterior Teeth

[1]Dr. Priyanka Singh, Assistant Professor, Dept. of Oral Pathology and Microbiology, Faculty of Dental Sciences, King George's Medical University, UP, Lucknow.

[2]Dr. Sanjay Kumar Singh, Reader, Sarjug dental college & Hospital, Darbhanga, Bihar.

[3]Dr. Shaleen Chandra, Professor and Head, Dept. of Oral Pathology and Microbiology, Faculty of Dental Sciences, King George's Medical University (KGMU), UP, Lucknow.

[4]Dr. Supriya Sharma, Senior Resident, Dept. of Oral Pathology and Microbiology, Faculty of Dental Sciences, King George's Medical University (KGMU), UP, Lucknow.

[5]Dr. Pradakhshana Vijay, Senior Resident, Dept. of Oral Pathology and Microbiology, Faculty of Dental Sciences, King George's Medical University (KGMU), UP, Lucknow.

**Corresponding Author:** Dr. Priyanka Singh, Assistant Professor, Dept. of Oral Pathology and Microbiology, Faculty of Dental Sciences, King George's Medical University, UP, Lucknow.

**Type of Publication:** Original Research Paper

**Conflicts of Interest:** Nil

## Abstract

Teeth are the strongest structure in the human body. In addition to their important functions in mastication and esthetics, the teeth may also be used as a weapon and under certain conditions, may leave information as to the identity of the biter. Among the teeth, canines have consistently shown the highest sexual dimorphism. The present study has been conducted to know the significance of maxillary anterior teeth in identification of sex of an individual.

**Keywords:** mastication, canines, sexual dimorphism, maxillary, teeth.

## Introduction

Teeth are the strongest structure in the human body. In addition to their important functions in mastication and esthetics, the teeth may also be used as a weapon and under certain conditions, may leave information as to the identity of the biter. Among the teeth, canines have consistently shown the highest sexual dimorphism. Additionally, canines are among the toughest teeth and less vulnerable to disease. Dental indexes are derived from elemental mathematical combinations of linear measurements.[2,3] Sex determination constitutes an important step in constructing a postmortem profile and is useful in identifying skeletal remains. [1]

The major requirement for sex determination is that by gender prediction, identification is simplified because then missing persons of one sex need to be considered. In this sense, identification of sex takes precedence over age. There are various methods for sex determination such as Cranial bones, Pelvic bones, Radiographic methods, etc[4]

The hard tissues especially the teeth are resistant to decomposition as well as fire and have standard anatomical landmarks which can be easily recognized. The methods used are usually simple and give promising results.[5]

Multiple studies have been done on mandibular teeth and especially mandibular canines to identify the sex of an

individual as mandibular canines have proven to show the high rate of sexual dimorphism. So, this study has been conducted to know the significance of maxillary anterior teeth in identification of sex of an individual.

**Aims and objectives**

1. To predict sex of an individual using mesiodistal dimension of six maxillary anterior permanent teeth.
2. To find which tooth out of six maxillary anterior teeth predicts the sex of an individual more accurately.

**Materials Required**

- Digital vernier calliper
- Good source of light.
- Metallic scale

**Criteria for selection of patient**

Total sample size was 60 study subjects that were randomly selected from the patients who came to the outpatient department of our institution. The age of the patients was between 20-30 years with no history or clinical evidence of crown restoration, orthodontic treatment, trauma. They had complete set of fully erupted teeth. The teeth were noncarious, nonattrited and intact teeth as well as peridontally healthy. All maxillary teeth were satisfactorily aligned. After obtaining informed consent, mesiodistal dimensions of maxillary anterior teeth were measured between anatomic contact points with vernier calliper held parallel to occlusal plane. Each reading was taken up thrice and then average of the three values was obtained to minimize the error.The data collected was subjected to statistical analysis.

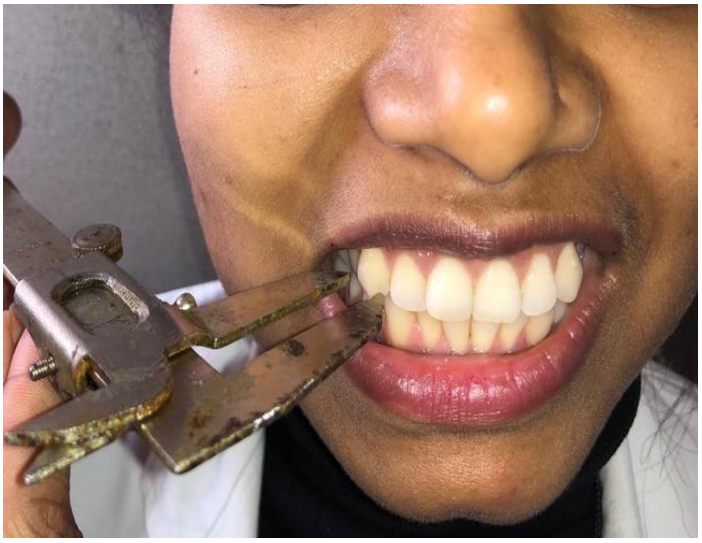

**Figure 1:** Showing measurement of Mesiodistal dimension of Maxillary anterior teeth

**Results**

Statistical analysis all six anterior permanent maxillary teeth showed that out chosen 6 teeth only two teeth were found to be statistically significant. These teeth were 13 and 23.

| Sr. No. | Tooth | Mean value male | Mean value female | SD male | SD female | p value |
|---|---|---|---|---|---|---|
| 1 | 11 | 8.57 | 8.37 | 0.821 | 0.526 | 0.11379 |
| 2 | 12 | 6.69 | 6.69 | 0.654 | 0.635 | NA |
| 3 | **13** | 7.63 | 7.38 | 0.604 | 0.641 | **0.051** |
| 4 | 21 | 8.57 | 8.51 | 0.521 | 0.518 | 0.28448 |
| 5 | 22 | 6.8 | 6.83 | 0.699 | 0.678 | 0.75000 |
| 6 | **23** | 7.72 | 7.45 | 0.569 | 0.639 | **0.028** |

The results of the study showed that 13 and 23 showed sexual dimorphism whereas other teeth 11,12,21,22 did not show any statistically significant sexual dimorphism.

**The accuracy of gender determination using 13**

When the level of accuracy for sex determination was measured using 13 separately for males and females it was found that 44 % females were classified correctly and 54% males were classified correctly.

**The accuracy of determining gender using 23**

When the level of accuracy for sex determination was measured using 23 separately for males and females it was found that 60% females were classified correctly and 60% males were classified correctly.

**The accuracy of determining gender using 13 &23**

When the level of accuracy for sex determination was measured using 13 & 23 together for males and females it was found that 63% females were classified correctly and 59% males were classified correctly.

**Percent dimorphism**

The percent to which the tooth size of males exceeded that of females was expressed as the male/female ratio minus 1.00. In our study only tooth which showed significant percent dimorphism are 13 & 23.

**Discussion**

Sexual dimorphism refers to the systemic differences in form (size, shape, color) between individuals of different sexes in the same species. Sexual dimorphism refers to those differences in size, stature and appearance between male and female that can be applied to dental identification. (Keisu 1990).It is useful tool to distinguish them especially in forensic investigations. Teeth are extremely durable even when the rest of the body undergoes decomposition and when bodies are damaged beyond recognition. Teeth of various species especially humans are known to exhibit sexual dimorphism. So they are an invaluable additional tool to determine sex on fragmentary adult skeletons. Of all the teeth in the human dentition, the canines are the least frequently extracted teeth possibly because of the relatively decreased incidence of caries and periodontal disease.[6] Canines have been recovered from human remains in extreme conditions such as air disasters and hurricanes. There are different theories but according to Moss, it is because of greater thickness of enamel in males due to long period of amelogenesis as compared to females. Because of the Y chromosome producing slower male maturation. [7,8] In our study, we found that only canines showed statistically significant sexual dimorphism in accordance with the study conducted by Hashim HA and Murshid ZA in 1993. [9]

**Conclusion**

Sex determination using teeth has been in use long time. Use of maxillary canine's specially left maxillary canine alone can be used for sex determination successfully. But combined use of both right and left maxillary canines can be used for determination of sex with 63% accuracy rate. Canines not only serve as corner stone's of mouth but also corner stone's in sex determination in forensic investigations especially where fragmentary remains are encountered. Canines serve as key teeth for personal identification.

**References**

1. Singh K, Anandani C, Bhullar RK, Agrawal A, Chaudhary H *et al*. Teeth and their Secrets - Forensic Dentistry. J Forensic Res 2012;3:141.

2. Acharya AB,Mainali S. Are dental indices useful in sex assessment. J Forensic Odontostomatol 2008;27:2:53-59.

3. Prabhu S, Acharya AB. Odontometric sex assessment in Indians. Forensic Science International 2009;192:129.e1–129.e5.

4. Dahberg AA. Dental traits as identification tools. Dent Prog 1963;3:155-160.

5. Rao NG,Rao NN,Pai ML et al mandibular canine index- a clue for establishing sex identity.Forensic Sci Int 42:1989:249-254.

6. Kaushal S, Patnaik VVG. Sex determination in North Indians using mandibular canine index. JIAFM 2004;26(2):971-973.

7. Vito CD,Sauders SR. A Discriminant function analysis of deciduous teeth to determine sex.J.Forensic Sci 1990:35:845-858.

8. Acharya BA, Mainali S. Univariate sex dimorphism in the Nepalese dentition and use of discriminant functions in gender assessment. Forensic Sci Int 2007:173:47-56.

9. Hashim MA,Murshid ZA :mesiodistal tooth width :a comparision between saudi males and females, part1. Egypt Dent 1993;39;343-346.