International Journal of Science and Research (IJSR)
ISSN: 2319-7064
SJIF (2022): 7.942

# Correlation of First Primary Palatine Rugae with the Maxillary Canine Teeth

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**Abstract:** ***Background: The first palatine rugae, being the most prominent, have been related to the location of the canine in literature. This relationship can be used as an anthropometric measurement, for comparison between different communities and as guideline for prosthetic teeth arrangement. Introduction: Soft tissue topography of the human palate has been shown to be related to the positions of natural teeth. An understanding of these relationships allows one to arrange artificial teeth during removable or fixed prosthesis fabrication. Aim: Toanalyse the relationship between the first primary palatine rugae to the location of the maxillary canines and to compare between males and females regarding the position of rugae. Materials and methods: 100 casts were evaluated for the correlation between the primary palatine rugae and the right and left canine teeth by simple direct manual measurements with simple armamentarium (carbon pencil, scale and divider). Results and summary: Out of total 100 casts taken into consideration on the right side it showed 76% located anteriorly and 24% located posteriorly and on the left side 60% located anteriorly and 40% located posteriorly. There was no gender bias of significance (z=1.95, P=0.5). Conclusion: The results of this study indicate an anterior location of the primary palatine rugae with relation to the canine as the predominant finding in both males and females. The distal contact point of canine should be within 1 mm anterior to 1 mm posterior of the lateral border of the first primary rugae. Keywords: First palatine rugae, Primary palatine rugae, Canine teeth.***

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## 1. Introduction

Natural teeth can be related to many anatomical soft or hard tissue landmarks. Little has been mentioned about the relationship between the first primary palatine rugae and the location of the maxillary canines. Schiffman (1964) in his study found that when a line is drawn transversely through the centre ofincisive papilla, the cusp tips of maxillary canines will be 1mm anterior or posterior to this line. This relationship will not significantly change with type of arch form.[1] Watt & Likeman, in 1974 found that primary rugae appeared to be carried upward and forward following loss of all the teeth.[2] Peavey & Kendrick, 1967 in their study found that palatal rugae followed the orthodontic tooth movements in a sagittal direction.[3] Lysell, in 1955, in a longitudinal clinical study, found that teeth moved forward in relation to the rugae during growth and development over a 5-year period.[4]

Rahmani, in 1980, found that the distance between the lateral point of the first primary palatine rugae to the labial surface of canine ranged from 9-13mm.[5] The purpose of this retrospective study was to evaluate the location of primary palatine rugae in relation to distal contact points of maxillary canine teeth.

## 2. Materials and Methods

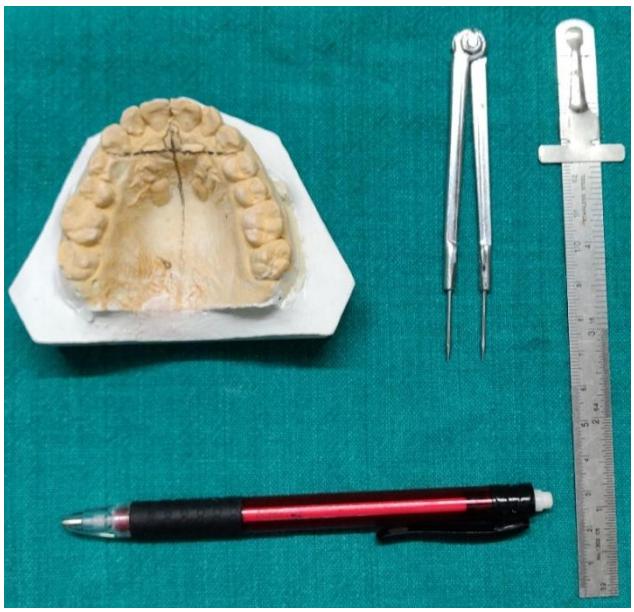
**Armamentarium:** The armamentarium for the study included a Carbon pencil, Divider, Measuring scale and maxillary dental casts selected from the institutional laboratory of prosthodontics comprising of casts belonging to 100 patients with an equal gender distribution.

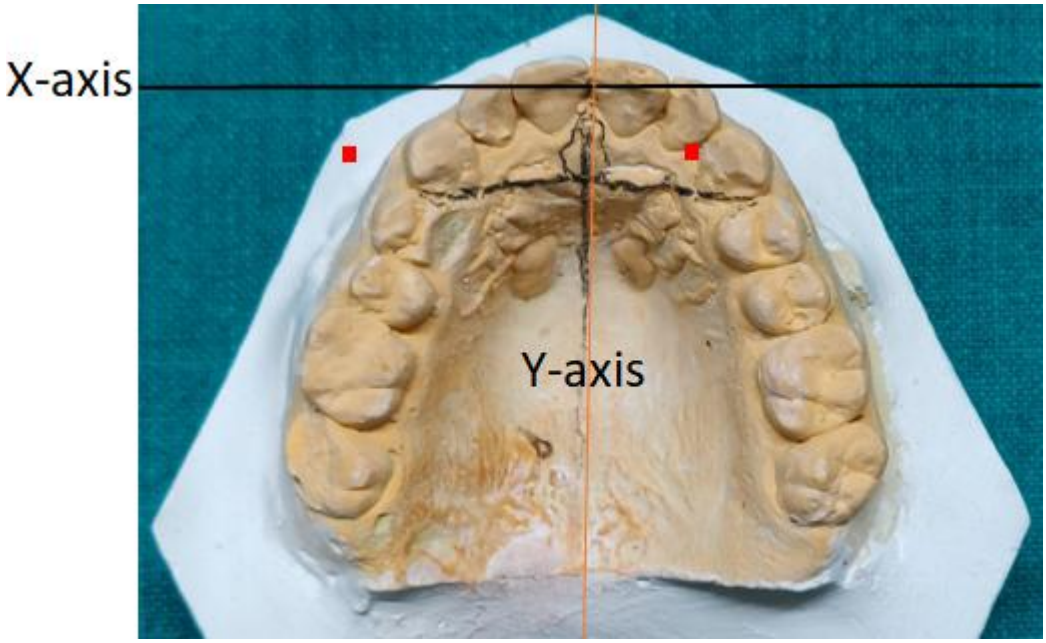
**Selection Criteria:** The selection process included casts that were intact with all details accurately recorded comprising of a complete arch with no missing teeth or visible restorations. The age range was between 20-40 years.

**Method:** Only the first primary palatine rugae were taken into consideration in this study. To locate the first primary rugae an X-axis was marked passing from distal contact point of one canine to other, and a Y-axis was marked passing from the mesial contact point of central incisors at the midline, bisecting the incisive papilla, the mid-palatine raphae and extending posteriorly. The most prominent palatine rugae which measured a minimum of 5 mm in length on the X-axis, and with a width broader than two adjacent rugae on Y-axis were selected as the first primary rugae for analysis.

On each cast, the location of first primary palatine rugae which was anterior or posterior to the base line was determined for both males and females.

The distance between lateral tip of primary palatine rugae and distal contact point of canine was measured for both right and left sides and the mean value was calculated and tabulated for each cast.






## 3. Results

Measurements showed that on the right side of the casts (n=100) showed seventy six (76%) located anteriorly and twenty four (24%) located posteriorly; the difference in the frequency was not significant (z=1.95, P=0.49). On the Left side of the casts (n=100) showed sixty (60%) located anteriorly and fourty (40%) located posteriorly; difference infrequency was not significant (z=1.95, P=0.5).

On the right side, the horizontal distance from lateral tips of first primary rugae to canine contact point showed means 9.28 and 9.25 mm.

On the left side, showed means of 9.5 and 9.1 respectively.

**Table 1:** Mean (+/-s. d.) values of horizontal distances from lateral tips of first primary palatine rugae to canine contact points in fifty subjects

| Rugae | Mean (mm) | Range (mm) |
|---|---|---|
| Right side<br>Anterior (n=76)<br>Posterior (n=24) | <br>9.28<br>9.25 | <br>7-13<br>7-12 |
| Left side<br>Anterior (n=60)<br>Posterior (n=40) | <br>9.5<br>9.1 | <br>7-15<br>8-11 |

Chi-square=0.388, P-value>0.05 these results showed there is equal or slight significant difference between anterior or posterior positioning of primary palatine rugae for males and females.

Out of 100 casts measured, 60 casts showed complete anterior location of primary palatine rugae with regard to X-axis, 24 casts showed posterior, and 16 casts showed mixed location of rugae on right and left sides.

## 4. Discussion

Natural teeth can be related to many anatomical soft or hard tissue landmarks. Literature has proposed various methods and guidelines to arrange the maxillary and mandibular anterior teeth which are;

1) Cephalometrics
2) Incisive papilla as a landmark
3) Lip lines
4) Ala-tragal line
5) Inter-pupillary line
6) Canine eminence
7) Retromolar pad as a base for occlusal plane and arranging mandibular anterior teeth.

This article highlights the role of primary palatine rugae position which influences the anterior teeth arrangement.

From the results it was clear that the primary palatine rugae has an equal probability of being located anteriorly or posteriorly with regard to X-axis with slight more favourable towards anterior region. It has equal or slight significant difference between males and females. Moreover, topography of the primary palatine rugae varied for anterior and posterior rugae with almost symmetrical for posteriorly positioned rugae. The topography of lateral borders of primary palatal rugae also varied slightly when positioned anteriorly to baseline.

The age of the subjects appeared to be unrelated to the frequency distributions of anteriorly and posteriorly positioned rugae, so if age had induced any movement of the canine teeth this study does not rule out any primary palatine rugae movement along with it.

In most of the study samples the lateral borders of first primary rugae are positioned equidistantly from the distal contact points of the canine teeth, at about mean of 10mm. All the linear measurements were made parallel to the occlusal plane of the casts; but not along the surface of the palatal vault.

Position of an artificial canine tooth depends on numerous functional and aesthetic factors which is unique to each patient. As a consequence, only as a guide-line is it suggested that the distal contact point of maxillary canine should be within 1 mm anterior to 1 mm posterior to the lateral border of the first primary rugae.

## 5. Conclusion

By the above-mentioned results it was concluded that an anterior location of the primary palatine rugae with relation to the canine as the predominant finding in both males and females.

As a guide-line is it suggested that in arranging artificial teeth the distal contact point of canine should be within 1 mm anterior to 1 mm posterior of the lateral border of the first primary rugae.

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