



## Papillo-incisal Distance: A guide to Maxillary Anterior teeth placement during Complete Denture Fabrication in Population of Jammu Region - An Original Research

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### Abstract

**Background:** The incisive papilla is a prominent landmark for fabrication of complete denture. Many studies have been conducted to know the relationship of incisive papilla and maxillary central incisors which can be helpful for placement of maxillary central incisors in position as close as possible to natural teeth. **Material & Methods:** A total number of 100 patients were selected randomly. The incisive papilla shape was outlined and the measurements were made from the mesio-incisal edge of central incisor to the mid-point of incisive papilla. **Results:** The most common shape of incisive papilla was cylindrical. The mean Papillo-incisal distance was 12.09mm where in case of Pear-shaped papilla it was 12.15mm which is slightly different from cylindrical shape. **Conclusions:** The Papillo-incisal distance can be helpful in determining the actual position of central incisors during complete denture fabrication.

**Keywords:-** Incisive papilla, Central incisors, Complete denture, Papillo-incisal distance.

## INTRODUCTION

As soon as there is loss of teeth, there is severe loss of alveolar bone resulting in loss of facial contour. The labial contour of occlusal rim restores facial contour, lip support, and gives pleasing appearance during jaw relation. Esthetics is the main concern for patient seeking prosthetic treatment. Improper positioning of maxillary centrals incisor may result in unusual

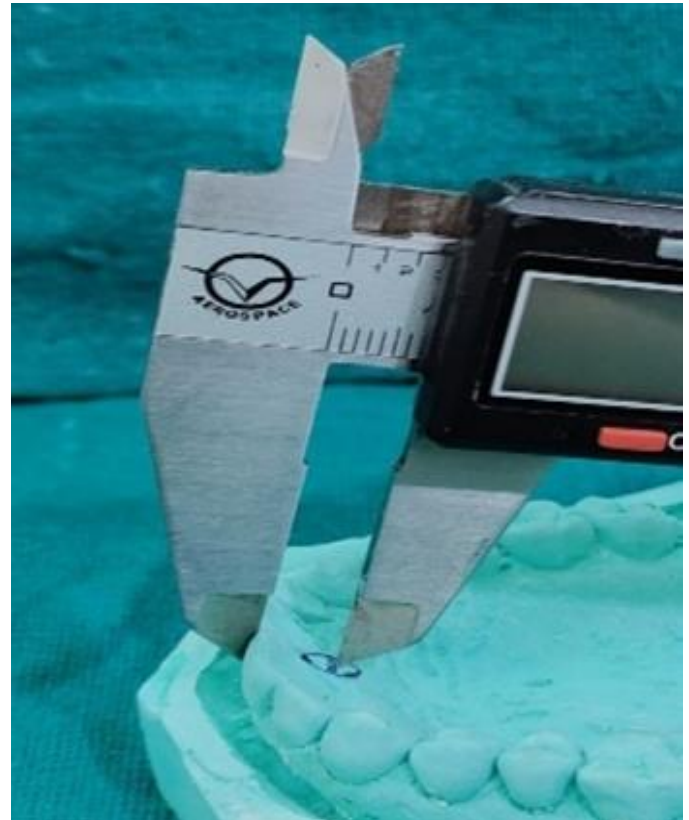
appearance and may also affect the speech of the patient. To achieve natural appearance in complete dentures, the upper anterior teeth should be positioned as near as possible to the original position preoccupied by the natural dentition. The incisive papilla is one of the most prominent landmark for assessing the position of maxillary central incisors.<sup>[1]</sup> The position of papilla in the articulated upper cast

helps to verify labial contour of occlusal rim obtained by the clinical method.<sup>[2]</sup> Underneath the papilla lies the incisive foramen through which the nasopalatine nerves and more small branches of greater palatine nerves transmit along with sphenopalatine artery supplying the mucosa of hard palate. Clinical significance of this area is that, continuous pressure on the area supplied by these nerves results in tingling sensation or numbness in this region. Many authors have proposed that the incisive papilla remains at a constant position even after tooth loss.<sup>[2,3]</sup>

## MATERIAL AND METHODS

An observational study was conducted in the Department of Prosthodontics and Crown & Bridge, Indira Gandhi Govt. Dental College, Jammu. This study was conducted on 100 dentate individuals where random sampling was done between the age of 18 to 45 years. Individuals with Angles class 1 occlusion with fully erupted teeth were selected. Any restoration or prosthesis on maxillary anterior teeth, missing teeth, attrition, or any previous history of orthodontic treatment were excluded from this study. Maxillary impressions were made with irreversible hydrocolloid material (GC IMPRECEED) and stock metal tray which were later poured with TYPE III gypsum (Ultrastone, Kalabhai Karson Pvt Ltd). On each cast incisive papilla was marked by lead pencil to determine the shape. A horizontal line was marked at the centre of incisive papilla. A second line was drawn to bisect the papilla in mid sagittal plane. To measure papillo-incisal distance mid-point of the incisive papilla and mesio-incisal edge of central incisors were marked with lead pencil. Papillo-incisal distance was measured to the tenth of a

millimetre by vernier calliper to contact the reference point mesioincisal edge and at the midpoint of the incisive papilla [Figure 1]. All measurements were made for different arch forms and analysed statistically latter on.



**Figure 1:** Showing measurement of Papillo-incisal distance from mesio-incisal edge to midpoint of incisive papilla.

## RESULTS

During the study, eight shapes of incisive papilla were observed in all the subjects. Overall, cylindrical shape of incisive papilla was the most common (n=30) followed by pear shape (n=25), flame shape (n=20) and round shape (n= 15). Double shaped (n=2), bowling (n=2) and notched shaped papillae (n=1) were relatively less common shape [Table1].

Ovoid arch form was the most prevalent arch form with a total of 45 (45.0%) samples followed by square (n=30; 30.0%) and tapered (n=25; 25.0%) arch forms respectively. The Papillo-incisal distance in square form had minimum mean value (11.89±1.62 mm) whereas tapered form had maximum mean value (11.55±1.75

mm). For ovoid form, the mean distance was 12.25± 1.39 mm. Analysis of variance did not show a significant difference among arch forms (p=0.058). As analysed, statistically, there was no significant difference among different arch forms with respect to shape of incisive papilla.

**Table 1:** Comparison of Papillo-incisal distance for different shapes of incisive papilla.

| S. No. | Most common incisive Papilla Shape | N  | Mean (mm) | SD   |
|--------|------------------------------------|----|-----------|------|
| 1.     | Pear                               | 25 | 12.15     | 1.49 |
| 2.     | Cylindrical                        | 30 | 12.09     | 1.42 |
| 3.     | Flame                              | 20 | 12.03     | 1.43 |
| 4.     | Dumble                             | 5  | 11.95     | 1.37 |
| 5.     | Round                              | 15 | 11.73     | 1.47 |
| 6.     | Notch                              | 1  | 11.88     | 1.38 |
| 7.     | Bowling                            | 2  | 12.05     | 1.33 |
| 8.     | Double                             | 2  | 11.95     | 1.43 |

**Table 2:** Comparison of Papillo-incisal distance for different arch forms.

| S.no. | Arch Form | N  | Mean (mm) | SD   |
|-------|-----------|----|-----------|------|
| 1.    | Ovoid     | 45 | 12.25     | 1.39 |
| 2.    | Square    | 30 | 11.89     | 1.62 |
| 3.    | Taper     | 25 | 11.55     | 1.75 |

## DISCUSSION

The present study was conducted to measure the distance between incisive papilla and central incisor in different individuals with different shapes of papilla in population of Jammu region. The incisive papilla is an immobile structure and usually does not shift in adult life. In present study the midpoint of the incisive papilla was taken as the reference point for measuring the papillo-incisal distance because it is a reliable landmark as it is definable and subject to least change in the edentulous state.<sup>[4]</sup> In dentulous patients, incisive papilla is seen in various shapes and this change will be

more in a long papilla compared to a short papilla.

Watt and Likeman found that the papilla moved forward by about 1.6 mm because of maxillary alveolar bone resorption and the incisive fossa lies slightly posterior to the papilla. The center/middle or the base/posterior border of the papilla are mostly used as reference for papilla incisor measurements.<sup>[5]</sup> Harper in 1948, after extensive longitudinal studies on pre-extraction and post extraction models showed that the positional relationship of incisive papilla to the natural teeth offers valuable data in the treatment of edentulous patient.<sup>[1]</sup> He recognized that the

incisive papilla is a dependable landmark to position the maxillary central incisors in both horizontal and vertical planes in complete denture and also the horizontal distance between the papilla and central incisor was not less than 5 mm and not more than 8 mm. After a decade, McGee recommended to set the labial surface of central incisors 8 mm anterior to the papilla.<sup>[6]</sup> Hickey, Boucher and Woelfel in 1962 recommended that the labial surface of central incisors in dentures should be 8-10 mm anterior to the middle of papilla.<sup>[7]</sup>

Martone in 1963 recommended that incisors should be placed 10 mm in front of the incisive papilla.<sup>[8]</sup> Mavroskoufis and Ritchie believed that the incisive papilla is a stable landmark for arranging the labial surfaces of central incisors 10 mm anterior to the incisive papilla.<sup>[9]</sup> Mersel A et al measured horizontal as well as vertical distance between the posterior border of incisive papilla and the mesial edges of the central incisors. Nelson contended that the alignment form was a much more important factor than the outline form of the teeth.<sup>[10]</sup>

In the present study, when compared the distance between incisive papilla and mesio-incisal edge of maxillary central incisor for different shapes of incisive papilla [Table 1] combining arch forms in [Table 2], pear shaped

have maximum mean distance (12.15mm) round shape have minimum mean distance (11.73mm). Previous studies showed less distance. The variation of results may be due to the ethnic difference also.<sup>[11,12]</sup> Papillo-incisor distance is a useful biometric guide to the dentist. However, clinician should judiciously consider individual variations.

**Limitations:** The present study has certain limitations, that this study is done only in Jammu province population and the time for this study was very short. Sample size for different arch form and different shape of incisive papilla was not evenly distributed. Also, it is recommended that further studies be conducted with equal distribution of sample size on a wider population.

## CONCLUSIONS

In addition to using the incisive papilla as guide, other biometric methods, such as phonetic tests and clinical judgement should also be considered to decide the most appropriate position of central incisors in the horizontal plane.

It is also a valuable guide for the dentist as well as dental technician to set the incisor teeth in position particularly when the labial contour of the maxillary occlusal rim is ignored clinically.

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