ORIGINAL RESEARCH

# Assessment of Anteroposterior Arrangement of Maxillary Anterior Teeth in Complete Denture Fabricated by Students

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## ABSTRACT

**Background:**

This study was conducted to assess complete denture fabricated by students for the antero-posterior arrangement of maxillary anterior teeth and to evaluate patient satisfaction level regarding esthetics and phonetics.

**Materials and methods:**

Study was conducted on complete denture of 100 patient (50 male and 50 female) and distance between incisive papilla to incisal edge of maxillary central incisor was investigated using modified divider, further measured by using metal scale. Esthetics and phonetics satisfaction level was recorded by both patient and expert using VAS scale.

**Result:**

The recorded data was analyzed stastically and found out that overall patients were more satisfied than experts regarding esthetics and phonetics.

**Conclusion:**

The present study strongly reports that although distance between incisive papilla and central incisor are varied yet patient are satisfied with esthetics and phonetics and thus incisive papilla cannot be alone taken as a guide in teeth arrangement.

**Keywords:** Arrangement of anterior teeth, Esthetics, Incisive papilla, Incisal edge, Phonetics.

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## INTRODUCTION

Esthetics is a primary concern for patient seeking prosthodontics treatment.[1] When natural teeth are lost, it becomes difficult to arrange the teeth in their original position in the complete denture.[2] In patients with complete denture, the suitability of artificial teeth depends on dentists ability to provide adequate support to the upper lip by maintaining an undistorted philtrum and nasolabial grooves and ensures proper contact of the upper and lower lips at the vermilion border.[1]

Some investigators have studied the horizontal relationship between incisive papilla and maxillary central incisors and measured the papilla incisor distance in dentate subjects to extrapolate this distance as a guide to place maxillary central incisors in complete dentures. Based on this premise, incisive papilla is recognized as an important landmark in complete denture construction.[3]

A variety of guides has been suggested for arranging teeth and is called biometric guides. The palatal gingival margin, scar line, inner surface of the maxillary denture border corresponding to cephalometric point subspinale, and incisive papilla are used. Incisive papilla is reported to be a reliable anatomic landmark in the arrangement of anterior teeth. Hence, incisive papilla is used as biometric guide in teeth arrangement.[2]

There is a need to find out whether these suggested guides are being utilized by students during the teeth arrangement and also to document the patient satisfaction and expert opinion regarding the esthetics of those dentures.

## MATERIALS AND METHODS

The study was conducted on 100 edentulous patients consisting of 50 males and 50 females with a age group of 50–65 years wearing complete dentures for 3–4 months fabricated by students from the outpatient section of the Department of Prosthodontics and Crown and Bridge and Implantology, School of Dental Sciences, Krishna Institute of Medical Sciences, Deemed University (KIMSDU). A modified divider was used to measure the distance between the incisive papilla and incisal edge of maxillary central incisors. The recorded distance was measured with the help of metal scale.

### Inclusion Criteria

Patients with class 1 jaw relationship having proper neuromuscular control and the ones who received complete dentures from the department not more than 6 months of period were included in the study.

### Exclusion Criteria

Patients having temporomandibular joint disorders, alveolar ridge resorption, damaged denture, worned, fractured, and repaired denture and patients wearing complete denture for more than 6 months were excluded from the study.[4]

### Methodology

The selected patients were made to sit on the dental chair comfortably in upright position. After obtaining their written consent to participate in the study, the details regarding esthetics and phonetics satisfactory level about the newly constructed prostheses were recorded as it was reported by the patient using visual analog scale (VAS). The patient was encouraged to frank opinion about his/her new denture and was assured that the identity would be kept confidential. The questions were asked in his/her own mother tongue. Regarding esthetics, patient was asked whether he/she feels pressure at the philtrum, whether they feel lip fullness, how they feel their facial appearance in mirror after wearing dentures and regarding phonetics patient was asked to pronounce saraswati, six, mississippi, sasa, etc. A single expert was taken in the study, whose opinion regarding the position of maxillary anterior teeth in the complete dentures and esthetics and phonetics satisfactory level was recorded using VAS scale.

The VAS is a psychometric response scale. It is a measurement instrument for subjective characteristics or attitudes that cannot be directly measured. When responding to a VAS item, respondents specify their level of agreement to a statement by indicating position along a continuous line between two endpoints.

Dentures fabricated by students were assessed for:

1. Position of incisal edge of central incisors from posterior border of incisive papilla using a modified divider [Figures 1 and 2].
2. Patient satisfactory level about the esthetics and phonetics of his/her dentures was recorded as follows:
   i. Good
   ii. Fair
   iii. Poor
3. An expert opinion regarding the position of maxillary anterior teeth in the present denture in terms of esthetics and phonetics was recorded as follows:
   i. Good
   ii. Fair
   iii. Poor

**Figure 1:** Measuring distance using modified divider

**Figure 2:** Distance measured from posterior aspect of incisive papilla

**Table. 1: Overall esthetics satisfaction level**

| Gender | Patient opinion | Expert opinion | Chi-square statistics | *P* |
|---|---|---|---|---|
| Male | | | | |
| Good (very happy) | 76 | 60 | 6.454 | 0.0397* |
| Fair (happy) | 22 | 34 | | |
| Poor (not satisfied) | 2 | 6 | | |
| Female | | | | |
| Good (very happy) | 65 | 40 | 22.202 | <0.0001* |
| Fair (happy) | 35 | 45 | | |
| Poor (not satisfied) | 0 | 15 | | |

*Indicates significantly associated according to Chi-square test where *P*<0.05

## RESULTS

Among the total population of 100 patients, 50 were male and 50 were female.

### Esthetics

Patient satisfaction related to appearance of face after receiving the denture and overall expert opinion

categorized in range of good, fair, and poor are as follows:

Here, both male and female patients were significantly satisfied with their esthetics than expert as per Chi-square test and *P* value [Table 1].

### Phonetics [Table 2]

Male patient were more satisfied than expert whereas in female, expert was more satisfied than patient.

### In Male [Table 3]

In the range of 6–9 mm, patients were significantly satisfied with their esthetics than the expert.

Whereas, in the range of 13–15 mm, patients were significantly satisfied with their phonetics than the expert.

**Table2: Overall phonetics satisfaction level**

| Gender | Patient opinion | Expert opinion | Chi-square statistics | *P* |
|---|---|---|---|---|
| Male | | | | |
| Good (very happy) | 52 | 46 | 0.9928 | 0.6087 |
| Fair (happy) | 36 | 38 | | |
| Poor (not satisfied) | 12 | 16 | | |
| Female | | | | |
| Good (very happy) | 40 | 50 | 2.36 | 0.3071 |
| Fair (happy) | 45 | 35 | | |
| Poor (not satisfied) | 15 | 15 | | |

### In Female [Table 4]

In 6–9 mm range, female patients are significantly satisfied with their esthetics and phonetics than the expert. Whereas in 10–12 mm, patients were significantly satisfied regarding their esthetics than the expert according to Chi-square statistics test where $P < 0.05$.

Patients are happy and satisfied than the expert at all the different anteroposterior distance between incisive papilla and central incisor.

## DISCUSSION

Achieving patient satisfaction is the ultimate goal of dental operator along with achieving efficient mastication, good esthetics, and comfortable speech.

Marinus *et al*. evaluated the patient-dentist relationship after the completion of treatment. Patient opinion toward treatment and expectation from the denture was recorded with the help of questionnaire.

The present study was conducted in SDS, KIMSDU, Karad, with 100 patients who had received complete dentures fabricated by undergraduate students under dentist supervision 3–6 months ago. They were selected as such, i.e., wearing dentures for not more than 6 months because recent dentures could not be recorded as patients were not adapted to the dentures and also after 6 months patients where

**Table 3: Esthetics and phonetics satisfaction level in male**

| Distance between incisal edges to post. incisive papilla | Grading scale | Patient opinion | | Expert opinion | | Chi-square statistics | *P* |
|---|---|---|---|---|---|---|---|
| | | Esthetics | Phonetics | Esthetics | Phonetics | | |
| 6-9 mm | Good | 80 | 40 | 50 | 40 | Esthetics: 21.538 | 0.0001* |
| | Fair | 20 | 40 | 45 | 45 | Phonetics: 1.008 | 0.6040 |
| | Poor | 0 | 20 | 5 | 15 | | |
| 10-12 mm | Good | 71.43 | 52.38 | 66.66 | 57.14 | Esthetics: 0.3740 | 0.5408 |
| | Fair | 28.57 | 42.86 | 33.34 | 38.10 | Phonetics: 0.5380 | 0.7641 |
| | Poor | 0 | 4.76 | 0 | 4.76 | | |
| 13-15 mm | Good | 77.77 | 66.66 | 66.66 | 33.33 | Esthetics: 4.501 | 32.298 |
| | Fair | 11.12 | 11.12 | 11.12 | 22.22 | Phonetics: 32.298 | <0.0001* |
| | Poor | 11.11 | 22.22 | 22.22 | 44.45 | | |

*Indicates significantly satisfied where *P*<0.05

**Table 4: Esthetics and phonetics satisfaction level in female**

| Distance between incisal edges to post. incisive papilla | Grading scale | Patient opinion (%) | | Expert opinion (%) | | Chi-square statistics | *P* |
|---|---|---|---|---|---|---|---|
| | | Esthetics | Phonetics | Esthetics | Phonetics | | |
| 6-9 mm | Good | 37.5 | 25 | 25 | 37.5 | Esthetics: 6.112 | 0.0471* |
| | Fair | 50 | 62.5 | 50 | 37.5 | Phonetics: 11.872 | 0.0026* |
| | Poor | 12.5 | 12.5 | 25 | 25 | | |
| 10-12 mm | Good | 83.33 | 50 | 50 | 58.33 | Esthetics: 26.781 | <0.0001* |
| | Fair | 16.66 | 33.33 | 41.66 | 33.33 | Phonetics: 3.848 | 0.1461 |
| | Poor | 0 | 16.66 | 8.33 | 8.33 | | |
| 13-15 mm | Good | - | - | - | - | | |
| | Fair | - | - | - | - | | |
| | Poor | - | - | - | - | | |

*Indicates significantly associated according to Chi-square test where *P*<0.05

patients are adjusted with dentures and they seem natural indirectly satisfied about it. Patient satisfaction toward esthetics and speech was assessed using scale. Grading scale was good, fair, and poor. Expert opinion toward esthetics and speech for the same denture was taken and recorded using same grading scale.

Good meant the denture was perfect. Fair meant the denture is well done but could be improved a bit, and poor was not acceptable and was used occasionally only.

The purpose of the study was to access the reliability of incisive papilla as a guide in arranging anterior teeth. The present study measured the distance between incisal edge of maxillary central incisors to posterior aspect of incisive papilla and recorded wide range of 6–15 mm. Where the standard range must be followed is 6–8 mm.

The patient opinion related to their esthetics satisfaction shows that 80% of patients were happy, i.e., satisfied and expert opinion also matched with the patients opinion, although the incisal edge and incisive papillary distance ranged from 6 to 9 mm.

No female patient was recorded in the range of 13–15 mm.

According to Lau and Lark, Grave and Becker, and Ehrlich and Gazit, the distance between the incisive papilla and labial surface of maxillary central incisors ranged from 12 to 13 mm when they measured from posterior border of incisive papilla.

Boucher, Murray, Martone reported that the distance between the incisive papilla and maxillary central incisors to be 8-10mm when measured from midpoint of incisive papilla.

## CONCLUSION

Within the limitation of the study, we conclude that the biometric distance between the incisive papilla and incisal edge of maxillary central incisor in complete denture patients was not used as a guide in positioning artificial central incisors in this study.

With all these different reports and the present study, records suggest that incisive papilla cannot be taken as a guide to arrange anterior teeth.

Hence, lip tolerance might play an important role in the arrangement of teeth, and further research can be done to assess the esthetics and phonetics depending on lip tolerance in complete denture patients.

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