

DETERMINING THE POSITION OF ARTIFICIAL TOOTH IN RELATION TO THE BASE OF THE PALATAL RUGAE: A PILOT STUDY

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ABSTRACT:

The palatal rugae area is a prominent landmark in the maxillary arch and its position lie constant throughout the life and therefore it can be used as a guideline for the placement of artificial teeth in the maxillary arch.

METHODS: 50 subjects were randomly selected and were evaluated for the position of the palatal rugae.

RESULTS: 35 casts showed that the base of rugae lies on the distal margin of the 2nd premolar. 9 casts showed that the base of the rugae lies on distal half of the 2nd premolar. 6 casts showed that base of the rugae lies on mesial half of the 2nd premolar.

Conclusion : Thus in artificial teeth arrangement 2nd premolar can be place in relation to the base of the palatal rugae. This will also guide us in the selection of proper size and form of the artificial teeth set.

Key words: palatal rugae, teeth arrangement, anatomical landmarks.

INTRODUCTION:

Esthetic tooth placement and physiological tooth arrangement are biological compatible and desire as end products of proper complete denture construction. Proper placement of teeth should be functional as well as esthetically pleasing ^[1].

Many anatomical landmarks in the maxillary arch decide the position for the placement of artificial teeth. The incisive papilla decides the placement of central incisors, canine eminence decides the placement of canine, and the maxillary tuberosity decides the position of last molar in the maxillary arch ^[2]. In horizontal plane the anterior teeth are

aligned in relation to the inter-pupillary line and posterior teeth in relation to the ala-tragus line. Mostly under ideal conditions and ridge relations these anatomical landmarks will guide for the placement of artificial teeth as natural as possible ^[3]. Sometimes there may be different forms of arches where the teeth shows spacing or crowding, which may require the alteration of the tooth structure during arrangement of artificial teeth. This study is done to find out the position of teeth in relation to the palatal rugae in natural dentition, which will guide us in the placement of the artificial teeth in the maxillary arch.

AIMS AND OBJECTIVE:

AIM: The aim of this study is to find the relation between the palatal rugae area and the artificial teeth placement in the maxillary arch.

OBJECTIVES:

1. To measure the distance from the incisive papilla to the base of the rugae.
2. To determine the position of the base of rugae to the corresponding maxillary teeth.
3. To determine the guide lines for teeth arrangement in maxillary arch with relation to the base of the palatal rugae edentulous arch.
4. Selection of proper size and form of teeth.

MATERIALS AND METHODS:

Materials used:

Maxillary dentulous cast

Graphite pencil

Metal scale

Brass wire

Divider

The study comprised of 50 dentulous cast of patient ranging from age 20-40 years, both male and female. 28 dentulous casts of male subject and 22 dentulous casts of female subjects were selected for the study.

Inclusion Criteria:

1. Completely dentulous subject with all teeth present till 2nd molar.
2. Adult male and female subjects of age group 20-40 years.

Exclusion Criteria:

1. Crowding with upper anterior teeth
2. Spacing with upper anterior teeth
3. Missing of any tooth.
4. Any palatal defect.
5. Any prosthesis in maxillary arch.

PROCEDURE:

Considering the above inclusion and exclusion criterias,50 subjects were randomly selected who reported to the department of prosthodontics, Rural Dental College, Loni. Out of 50 subjects, 28 were males and 22 were females.

Impressions were made with irreversible hydrocolloid (alginate) and cast was poured in type III gypsum product (dental stone).

The measurements were marked on the cast (Fig.1). Point A was the center most point on the incisive papilla. Point B was marked corresponding to the posterior most point on the last rugae. Point C was marked in between the 2 fovea palatine in the mid line. Line 1 was a mid-line in the mid palatine suture region which was drawn on the cast from point A to point C. Line 2 was horizontal line which

was marked on the cast over point B which was then extended on the adjacent teeth and land area of the cast. This line 2 was then compared and correlated with the corresponding teeth.

RESULTS:

The following data was tabulated and comparisons were done:

No. of maxillary cast	Gender	Position of line 2 on teeth of the maxillary cast.
20	Male	Distal margin of 2 nd premolar
15	female	Distal margin of 2 nd premolar
5	male	Distal half of 2 nd premolar
4	female	Distal half of 2 nd premolar
3	male	Mesial half of 2 nd premolar
3	female	Mesial half of 2 nd premolar

The above table show that out of 50 casts, 35 casts showed that the base of rugae lies on the distal margin of the 2nd premolar. 9 casts showed that the base of the rugae lies on distal half of the 2nd premolar. 6 casts showed that base of the rugae lies on mesial half of the 2nd premolar. In majority cases the base of the rugae lies on distal margin to the 2nd premolar of the maxillary cast.

DISCUSSION:

Various anatomical landmarks are considered during arrangement of artificial teeth. Maxillary anterior teeth are arranged first followed by the posterior teeth arrangement. Anterior teeth are arranged in relation to the incisive papilla and canine prominence, and posterior teeth are arranged accordingly. In this study, base of the rugae was considered as a constant landmark for the position of the natural teeth. It was observed that out of 50 samples studied 35 casts showed the line

extending from base of the palatal rugae was on distal margin of the 2nd premolar. 9 casts showed that the line was extending on the distal half of the 2nd premolar and 6 casts showed that the line was extending on the mesial half of the 2nd premolar. For selection of anterior teeth the consideration of size of face, form of the face, interarch-space, lip length and size of arch is done whereas for posterior teeth the inter arch space and the size of the arch is considered but in majority of the cases in spite of these anatomical landmarks, the selection and arrangement of artificial teeth is still confusing. If pre extraction records are not available and artificial teeth selection is done randomly then arrangement of artificial teeth is done improperly. Teeth size and arch size may not correspond with each other. as previously known palatal rugae is a stable landmark which is not altered even after trauma or orthodontic tooth movements.^[4] This study was therefore done to find out the position of teeth in relation to the palatal rugae. This

relation will give additional guideline for the selection and arrangement of the posterior teeth in proper position.

During teeth arrangement if size and form of the teeth is not accurate then arrangement of the teeth is done without considering anatomical landmarks then arch may become very small or wide and also occlusal table size will vary. Ideally the last molar should end just in front of the maxillary tuberosity, but this is not the case every time. The reason that occlusion has always been a consideration in the complete denture prosthesis is because the adoption of good occlusal practice has a significant and immediate impact on the overall success of the treatment, as it affects denture stability^[5]. Arrangement of the posterior teeth can be done anteriorly decreasing the span of the occlusal table (Fig. 2), from the finding of the study the base of the rugae can be taken as landmark that provides a guide for the placement of 2nd premolars, thereby providing proper spacing for the posterior molars.

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CONCLUSION:

Anatomical landmark plays a very important role in arrangement of teeth. Placing of anterior teeth in the arch is guided by incisive papilla and canine prominence, and posterior teeth by the maxillary tuberosity. In this study base of palatal rugae was considered as a constant landmark in natural dentition. The result of this study will act as a one of the anatomical landmark in the arrangement of artificial teeth in complete denture prosthesis. It was shown that in majority casts the base of the rugae lied in distal margin of the maxillary 2nd pre molar. Thus in artificial teeth arrangement 2nd premolar can be place in relation to the base of the palatal rugae. This will also guide us in the selection of proper size and form of the artificial teeth set

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FIGURES:

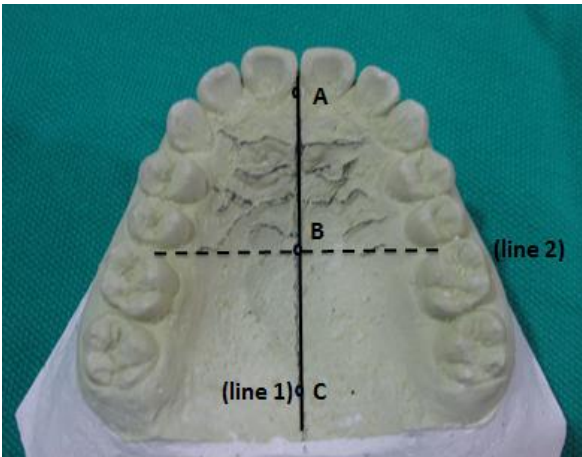


Fig 1. Marking showing on the cast where point A: incisive papilla; Point B: posterior most point on the last rugae; Point C: in between the 2 fovea palatine in the mid line. Line 1: mid-line in the mid palatine suture region drawn from point A to point C. Line 2: horizontal line over point B extending on the adjacent teeth and land area of the cast.



Fig.2 :- Arrangement of the posterior teeth done anteriorly reducing the span of the occlusal table