

# CLINICAL REPORT

## Denture Phonetics Enhanced By Rugae Duplication

Lokesh S <sup>a</sup>, Brintha Jei J <sup>b</sup>, Murugesan K <sup>c</sup>, Muthukumar B <sup>d</sup>

### ABSTRACT

In edentulous patients, dentures should not only provide better function and aesthetics, but also should permit good phonetics. Phonetics is a significant factor to be taken into consideration for the denture patients. Palatal rugae contours have a very important role in phonetics, by production of linguo-palatal sounds that involves the contact between tongue and palate. By customizing palatal contours of a maxillary denture to the tongue, the patient may easily adapt to the definitive denture contour, which in turn shortens or eliminates the adjustment period for the achievement of proper speech phonetics must be considered, along with mechanics and esthetics as the integral factors in contributing to the success of a dental prosthesis. , the replication of soft tissue contours favors the formation and pronunciation of Sibilants as clearly as a normal dentate individual Proper contact between the tongue and the palate is always involved in the production of linguopalatal group of sounds This article describes a novel technique for palatal rugae transfer to a complete denture.

**Keywords:** Palatal rugae, Phonetics.

*How to cite this article: Lokesh S, Brintha Jei J, Murugesan K, Muthukumar B, Denture Phonetics Enhanced By Rugae Duplication –A Case Report. J Clin Prosthodontics and Implantology 2019; 1(2):14-16*

### INTRODUCTION

The denture should adequately provide esthetics, comfort and efficiency to the patient. Phonetics is produced by turbulence of stream of outgoing air and the tongue contacts the landmark in the palatal area<sup>1,2</sup>. Palatine rugae are associated with phonetics, taste, proprioception and adaptation. Palatal rugae is also called plica palatinae transversae which is the ridges on the anterior part of the palatal mucosa which is present on each side of the median palatal raphae and just behind the incisive papilla <sup>3,4</sup>. According to Thomas et al rugae pattern is classified based on length as primary, secondary and fragmentary rugae, based

on shape as straight, curvy, circular and wavy<sup>5</sup>. This palatal rugae also help in forensic odontology for the identification of person person because the rugae pattern is unique distinct for each person<sup>6,7</sup>. So the fabrication of denture should be with the aim to promote phonetics. This can be provided by contouring palatal portion and by transferring the palatal rugae to the final denture. This case report describes a technique to transfer the palatal rugae to the removable denture

### Case Report

A 73-year-old male patient reported to the Department of Prosthodontics, with a chief

<sup>a</sup> Postgraduate student, Department of Prosthodontics and Implantology, SRM Dental College and Hospital, Ramapuram

<sup>b</sup> Reader, Department of Prosthodontics and Implantology, SRM Dental College and Hospital, Ramapuram

<sup>c</sup> Professor, Department of Prosthodontics and Implantology, SRM Dental College and Hospital, Ramapuram

<sup>d</sup> Professor and Head, Department of Prosthodontics and Implantology, SRM Dental College and Hospital, Ramapuram

complaint of unsatisfactory retention and ill-fitting upper denture. Partially edentulous maxillary arch with the presence of 17 teeth alone in maxilla and presence of 33,34,43,44 and 45 teeth in the mandibular arch which were periodontally compromised (Figure 1). Treatment options explained to the patient but the patient was not willing for extraction and any other restoration and he wanted only a new removable denture. So, advised for removable denture in maxillary arch with reproduction and transfer of palatal rugae and removable partial denture in lower arch.



Figure.1: Pre-Operative view

#### TECHNIQUE

1. Maxillary and mandibular primary impressions were made using alginate impression material and master casts were prepared (figure 2 and 3).



Figure 2 & 3: Primary Impression and Primary Casts

2. Temporary denture bases were then made, followed by recording of jaw relations and teeth arrangement in a semi adjustable articulator.



Figure 4 & 5 Rugae duplication with inlay wax. Transfer of wax duplicated Rugae

3. After try-in stage, pattern of rugae was recorded from the patient by making maxillary impression using mucostatic impression material (alginate). The impression recorded the rugae pattern on either side of the midline.
4. In that impression Type II Inlay wax (BEGO) were softened and poured over the palatal rugae

area in layers to form a uniform adequate thickness of 2mm. (Figure 4)

5. Then the palatal portion of temporary denture base in trial denture was trimmed and removed.
6. The waxed portion of palatal rugae from the elastomeric impression was carefully removed and transferred to the trial denture by using incisive papilla and midline as guide. (figure 5)
7. Then the wax-up of trial denture was done with the transferred portion of rugae region
8. Flasking procedure was carried out by conventional method under long curing cycle.
9. After deflasking trimming and polishing were done and the details of palatal rugae were checked in the denture and was followed by insertion.



Figure 6&7 Processed Denture with rugae duplication and Post-Operative intra oral view

10. The patient was given a test paragraph to check the phonetics which contain the words with d, t, n, l, s and sh.
11. The patient was satisfied with the new denture and also showed improved phonetics.

#### DISCUSSION

Generally, while making complete dentures great importance is given to esthetics, comfort and function but phonetics is commonly neglected. Some patients cannot get adapted to the changes in palatal contours of maxillary denture and can have difficulty in pronouncing linguopalatal sounds<sup>8</sup>. So, while transferring the contour of palatal rugae to the final denture, the patients can easily adapt to it and can definitively improve the phonetics within a short duration. Different techniques are there to transfer the palatal rugae to the final denture like arbitrary carving the rugae, plastic palatal forms, electroplated metal dentures, customized acrylic pattern, tinfoil duplication, transferring the rugae contour by using putty impression material from patient etc<sup>9</sup>. But these techniques are technique sensitive, expensive and time consuming. So, in this article most accurate and a simple technique was used to transfer the rugae contour to the final denture using elastomeric impression material and inlay wax.

When the palatal contour of maxillary denture is accurately approximated with the tongue it can improve the phonetics and provides rigidity to the

maxillary denture. This in turn is associated with the position of artificial tooth, plane of occlusion and accurate vertical dimension<sup>10</sup>. It was also stated that they can improve the biological adaptation of the tongue to the denture enhance the taste perception<sup>11</sup>. The denture in the palatal rugae region provides an irregular surface in which the tongue can be locked and creates a negative pressure and the flavor from the food is sucked. It also enhances the perception by opening up the microvilli by stretching them each other by the elevations and depressions on the denture contacting the palatal rugae. This helps to form the hydrogen ion from the food in contact with the taste receptors which are oriented perpendicular to the surface in a parallel arrangement<sup>12,13</sup>.

### CONCLUSION

So, by obtaining proper vertical dimension, positioning of anterior and posterior teeth in correct position, proper occlusal plane and a good contouring of palatal region will provide an optimal phonetics to the patients. So, prosthodontists should customize the rugae and palatal contour in removable acrylic dentures which enhance the phonetics and also reduce the period of waiting and training of phonetics after insertion of denture. So, it can be concluded that palatal rugae when transferred to acrylic dentures will improve phonetics.

### REFERENCES

1. Vijayaraghavan V, Chandni P. A simple method for palatal rugae carving in complete dentures. J Indian Prosthodont Soc. 2013;13(2):137-138.
2. Manvi, Supriya, Ankola. Simple Technique for Duplicating the Palatal Rugae in the Maxillary Complete Denture. World Journal of Dentistry.2012; 3.95-96.
3. Kar S, Tripathi A, Madhok R. Replication of Palatal Rugae and Incorporation in Complete Denture. J Clin Diagn Res. 2016;10(8):ZJ01-ZJ2.
4. Adaki R, Meshram S, Adaki S. Acoustic analysis and speech intelligibility in patients wearing conventional dentures and rugae incorporated dentures. J Indian Prosthodont Soc. 2013 Dec; 13(4):413-20.
5. Thomas CJ, Kotze TJ. The palatal rugae pattern: A new classification. J Dent Assoc South Afr.1983;38:153-7
6. Jain A, Chowdhary R.. Palatal rugae and their role in forensic odontology. J Investig Clin Dent. 2014 Aug; 5(3):171-8.
7. Saraf A, Bedia S, Indurkar A, Degwekar S, Bhowate R. Rugae patterns as an adjunct to sex differentiation in forensic identification.J Forensic Odontostomatol. 2011 Jul 1; 29(1):14-9.
8. Krishna V, Reddy VV, Kumar NP, Raju KV Dentures with phonetically contoured palate: a simple technique of adding customized rugae and palatal contours to the maxillary denture.J Contemp Dent Pract. 2012 Mar 1; 13(2):216-8.
9. Rogers OW (1970) Electroformed metal plates for complete dentures. J Prosthet Dent 23:207-217
10. Zaki Mahross H, Baroudi K. Spectrogram analysis of complete dentures with different thickness and palatal rugae materials on speech production. Int J Dent. 2015;2015:606834.
11. Kong HJ, Hansen CA. Customizing palatal contours of a denture to improve speech intelligibility. J Prosthet Dent. 2008; 99(3): 243-8.
12. Mohan A, Harshakumar K, Prasanth V et al. A novel technique for palatal rugae transfer to a complete denture: a case report. Int J Health Sci Res. 2016;6(6):386-389.
13. Gitto CA, Esposito SJ, Draper JM.A simple method of adding palatal rugae to a complete denture. J Prosthet Dent. 1999; 81(2): 237-9.

#### Correspondence Author

Dr. J. Brintha Jei MDS  
L8D Bharathidasan colony  
Kk Nagar  
Chennai-78  
brinthajei@yahoo.co.in  
Mobile no. 9486452225

*Copyright by the Editorial Board of the Journal of Clinical Prosthodontics and Implantology*