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Original Research

Assessment of effect of tooth loss on rugae pattern in complete and partially edentulous subjects

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ABSTRACT:
Background: Preservation of rugae plays an important role in prosthetic rehabilitation especially among completely edentulous individuals. The present study was conducted to assess effect of tooth loss on rugae pattern in complete and partially edentulous subjects. **Materials & Methods:** 108 patients of both genderswere divided into 2 groups. Group I had 54completely edentulous subjects and group II had partially edentulous subjects. Alginate impression was made and maxillary casts were made. The number, type of rugae patterns were recorded using graphite pencil and tracing paper based on Martins dos Santos classification system. **Results:** Group I had 34 males and 20 females and group II had 30 males and 24 females. The mean rugae type in group I and group II was Sinnous in 2.4 and 2.2, line in 1.5 and 2.1, curve in 1.5 and 1.3, point in 0.4 and 0.3, bifurcated in 0.7 and 0.4, trifurcated in 0.2 and 0, angle in 0.4 and 0.3, anomaly in 0.20 and 0, interrupt in 0.2 and 0 and circle in 0.2 and 0.7 respectively. The difference was significant (P< 0.05). **Conclusion:** There was significant differences in the rugae pattern between partially edentulous and completely edentulous subjects and greater changes with complex patterns were observed in partially edentulous subjects.
Key words: Forensic odontology, Rugae, completely edentulous

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INTRODUCTION

Forensic odontology is a branch of dental science that deals particularly with proper handling and examination of all available dental evidences to aid in establishment of the individuality of a person either alive or dead specifically in deceased conditions where the human remains are severely decomposed beyond recognition following mass disasters and accidents.[1,2]

Palatal rugae are anatomical folds or wrinkles (usually used in the plural sense); the irregular fibrous connective tissues located on the anterior third of the palate behind incisive papilla. They are also called plica palatinae transversae and rugae palatina.[3] Palatal rugae are asymmetric ridges of dense connective tissues extending laterally, on both sides, from the incisive papilla and the anterior part of the median palatine raphe and supplied by the greater palatine and nasopalatine branches.[4]

Preservation of rugae plays an important role in prosthetic rehabilitation especially among completely edentulous individuals as it acts as the stress bearing

area that prevents displacement of the denture anteriorly, guides in setting the maxillary teeth at the anterior region and provides indirect retention in denture extension cases.[5]Rugae pattern are least susceptible to external environment changes and are unique to every individual often considered as a consistent relevant marker of forensic importance.[6] The present study was conducted to assess effect of tooth loss on rugae pattern in complete andpartially edentulous subjects.

MATERIALS & METHODS

The present study comprised of 108 patients of both genders. All gave their written consent for the participation in the study.

Data such as name, age, gender etc. was recorded. Patients were divided into 2 groups. Group I had 54completely edentulous subjects and group II had partially edentulous subjects. Alginate impression was made and maxillary casts were made. The number, type of rugae patterns were recorded using graphite pencil and tracing paper based on Martins dos Santos classification system. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Groups	Group I	Group II
Status	completely edentulous	partially edentulous
M:F	34:20	30:24

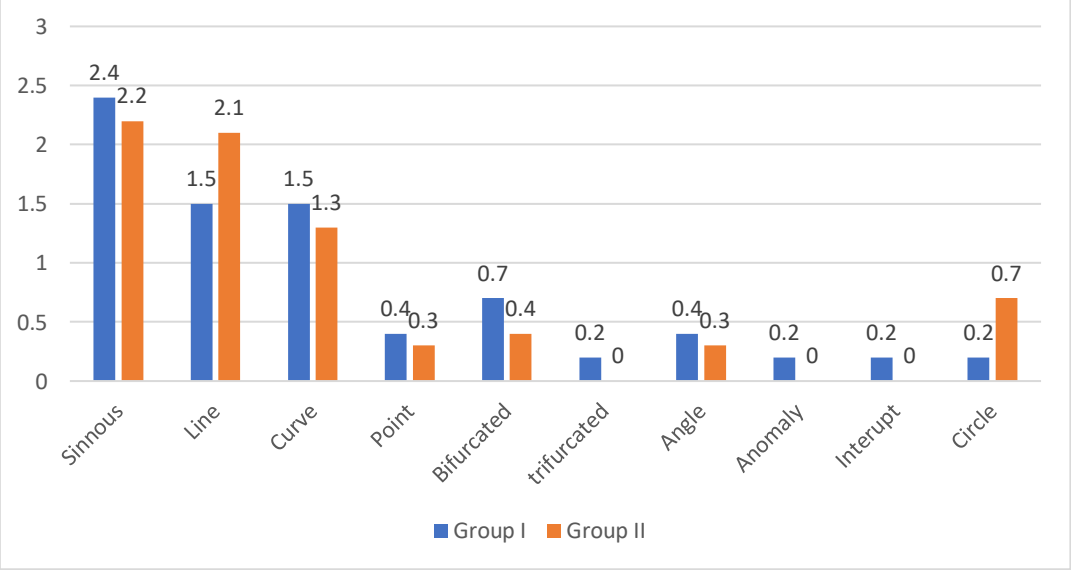
Table I shows that group I had 34 males and 20 females and group II had 30 males and 24 females.

Table II Mean comparison based on rugae pattern

Rugae	Group I	Group II	P value
Sinnous	2.4	2.2	0.01
Line	1.5	2.1	
Curve	1.5	1.3	
Point	0.4	0.3	
Bifurcated	0.7	0.4	
trifurcated	0.2	0	
Angle	0.4	0.3	
Anomaly	0.2	0	
Interupt	0.2	0	
Circle	0.2	0.7	

Table II, graph I shows that mean rugae type in group I and group II was Sinnous in 2.4 and 2.2, line in 1.5 and 2.1, curve in 1.5 and 1.3, point in 0.4 and 0.3, bifurcated in 0.7 and 0.4, trifurcated in 0.2 and 0, angle in 0.4 and 0.3, anomaly in 0.20 and 0, interrupt in 0.2 and 0 and circle in 0.2 and 0.7 respectively. The difference was significant (P< 0.05).

Graph I Mean comparison based on rugae pattern



DISCUSSION

The purpose of palatal rugae is to facilitate food transportation through the oral cavity, prevent loss of food from the mouth and participate in chewing process.[7] Due to the presence of gustatory and tactile receptors, they contribute to the perception of taste, texture of food qualities and tongue position during speech. These important rugae functions encouraged many researchers to reproduce the individual palatal rugae on the dentures' palatal surfaces.[8,9]Palatal rugae area plays an effective role; it is a secondary bearing area that resists anterior displacement of the denture, it is considered as a part of the primary denture supporting area because it does not affect by resorption, sometimes, rugae area is covered to provide indirect retention for free extended denture base.[10,11]The present study was conducted to assess effect of tooth loss on rugae pattern in complete andpartially edentulous subjects.

We found that group I had 34 males and 20 females and group II had 30 males and 24 females.Cruz JM[12]compared and evaluated the effect of tooth loss on rugae pattern among completely and partially edentulous maxillary arch individuals as a reliable personal identification tool. A total of 50 participants were divided into two groups comprising of 25 completely edentulous (Group A) and 25 partially edentulous (Group B) individuals. Impressions, maxillary casts were made and the number, type of rugae patterns were recorded using graphite pencil and tracing paper every 3 month over a period of 1year based on Martins dos Santos classification system. More complex patterns (line, curve, circle, bifurcated, sinnous) are observed in Group B with significant differences between the mean values of line, bifurcated and circle pattern when compared to Group A. Simultaneously mean differences in sinnous pattern (Group A) and Sinnous, Line pattern (Group B) within the group were also seen over a period of 1 year.

We found that mean rugae type in group I and group II was Sinnous in 2.4 and 2.2, line in 1.5and 2.1, curve in 1.5 and 1.3, point in 0.4 and 0.3, bifurcated in 0.7 and 0.4, trifurcated in 0.2 and 0, angle in 0.4 and 0.3, anomaly in 0.20 and 0, interrupt in 0.2 and 0 and circle in 0.2 and 0.7 respectively. Jawad IA et al[13] explored the volatile topographic changes occurring in the palatal rugae after aging and loss of all teeth. Materials and methods: The total sample consists of 40 Iraqi participants in 2, dentate and edentulous, groups. Their maxillary casts were minutely observed. Number, lengths, qualitative characteristics, and medial position of the rugae ends were recorded. Many differences were observed between the 2 groups. Palatal rugae were topographically changed greatly after aging and loss of teeth regardless of time of edentulism and wearing dentures. Short, simple, scattered and anteriorly flared is the overall picture of rugae in edentulous palates.

Jacob et al[14]performed a study on moulds of the internal surface of complete maxillary prostheses of twenty- eight edentulous individuals evaluated the rugae present and the topographic aspects of the ridges, comparing the plaster models originated from the wearers of the dentures with their original dentures. The research showed an unequivocal individualization of 100% accuracy when the plaster models were analyzed entirely, including the palatal rugae and the topography of bone contour, demonstrating the reliability of the method.

The limitation the study is small sample size.

CONCLUSION

Authors found that there wassignificant differences in the rugae pattern between partially edentulous and completely edentulous subjects and greater changes with complex patterns were observed in partially edentulous subjects.

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