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Rugae Pattern Distribution in Different Archform, Between Genders and Distribution in Malwa Population

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ABSTRACT:BACKGROUND; Forensic Science plays a crucial role in identification of humans for certification of death. Forensic odontology, particularly palatal rugae pattern identification plays a small but a significant role because of its uniqueness and resistance from getting decayed and stability **AIMS AND OBJECTIVES**: the aim of our study was to investigate the potential of using palatal rugae pattern as an aid for sex identification in Malva population and predominant rugae pattern and difference in pattern of different arch forms. **MATERIALS AND METHODS:**A total of 240 cast were taken for the study, the rugae pattern of each cast is marked with a graphite pencil and studied **RESULT**: Straight rugae is more statistically significant in oval archform than tapered and square archform

KEYWORDS: Rugae pattern, Different arch form,Gender identification, Malwa population.

I. INTRODUCTION

Forensic Science plays a crucial role in identification of humans for certification of death and also for many other reasons like personal, social and legal reason, in case of massive disaster like natural disaster and voilence where we come across decomposed and fragmented bodies Forensic odontology, particularly palatal rugae pattern identification plays a small but a significant role because of its uniqueness and resistance from getting decayed and stability and also it is economical, reliable and simple method which makes its more advantageous.[1] Gender and race determination also play an role in forensic odontology.[2]

The reason behind its postmortem stability of palatal ruage is that they are not associated in postmortem changes with time, temperature and humidity. Apart from that they are in an anatomical position where it is protected from high temperature and trauma.

Palatal rugoscopy/palatoscopy gives better evidence than other methods may be very much useful for identification of human remains in mass diaster.[3] Palatal rugae are seen as anatomical folds or wrinkles which is present posterior to the incisive papillae on the anterior part of palatal mucosa as ridges on either side of median palatal raphe are called as “Pilca Palatine” or “Rugae Palatine”.

Application of palatal rugae patterns for personal identification was suggested by Allen in 1889.[4] The term "Palatal rugoscopy" was first proposed by the Spanish investigator Trobo Hermosa.

Thus, the aim of our study was to investigate the potential of using palatal rugae pattern as an aid for sex identification in Malva population and predominant rugae pattern and difference in pattern of different arch forms.

The objectives were:

1. To identify palatal rugae patterns (in terms of number and shape) in males and females
2. To compare the palatal rugae patterns in males and females
3. To analyze whether palatal rugae pattern can be used as a tool for sex identification.
4. To identify palatal rugae patterns (in terms of number and shape) in Malva population
5. To identify predominant rugae pattern and difference in pattern of rugae in different arch forms.

II. MATERIALS AND METHODS

A study was done in government college of dentistry, Indore in department of orthodontics. A total of 240 cast were taken for the study in which 90 male patients and 151 female patients and are taken within the age range of 14-30. And the rugae pattern of each cast is marked with a graphite pencil and studied. Though many classifications are there,Tomas and kotze classification is used for classifiying the ruage pattern in this study in order

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to avoid the complexity of the procedure.The master table used for the study is included (Tab 1)

TAB : 1 MASTER TABLE

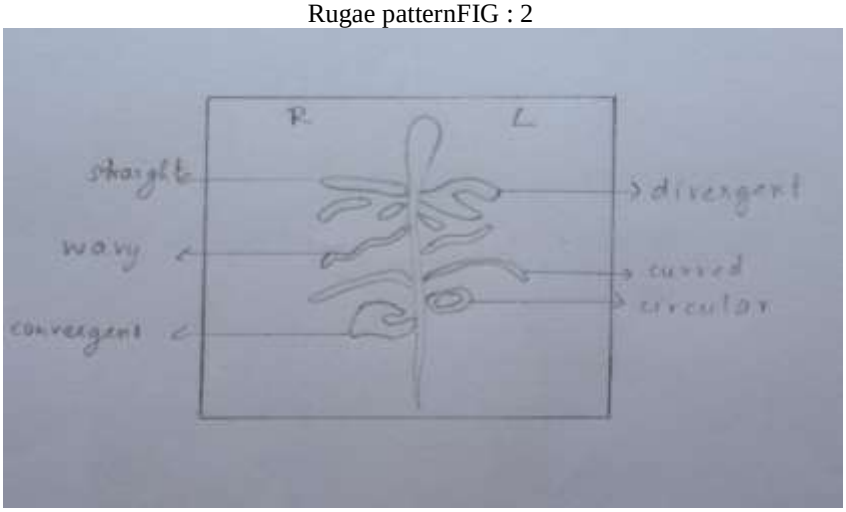
NAME	AGE	GENDER	ARCH FORM	STRAIGHT RUGAE	WAVY RUGAE	CURVED RUGAE	ROUND RUGAE	DIVERGENT/ CONVERGENT
1. --								
2. --								

CAST EVALUTION AND ANALYSIS

The outline of the rugae is drawn with graphite pencil and the shape of the rugae is analyzed and included in study according to the Kotze and Thomas classification of rugae pattern. (fig 1, 2)

Rugae pattern marked on Study models with graphite pencilFIG : 1

Rugae patternFIG : 2



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III. RESULT:

Rugae pattern is unique for each individual which enables it in identification purpose of each and by which its imparts the role in forensic odontology

The result that we obtained in the study is given in the table, Descriptive statistics for rugae pattern (Tab 2), rugae distribution in the sample according to the gender group (Tab 3), rugae distribution in the sample according to arch forms (Tab 4) .

Rugae distribution in the overall sampleTab 2

Presence of Round/circular rugae	**N**	**%**
Straight	183	76.3
Wavy	120	50.0
Curved	137	57.1
Round/Circular	0	0.0

Rugae distribution in sample according to gender groupsTab :3

	GENDER			
RUGAE PATTERN		MALE(90)	FEMALE(150)	P VALUE
	STRAIGHT	64 (71.1%)	119 (79.3%)	0.19
	WAVY	46 (51.1%)	74 (49.3%)	0.89
	CURVED	53 (58.9%)	84 (56%)	0.76
	ROUND	NIL	NIL	_

Inference: The test shows that there is no significant difference in the distribution of any of the individual rugae pattern among the genders.

Rugae distribution according to arch formTab 4

	ARCH FORM				
RUGAE PATTERN		SQUARE (44)	TAPERED (37)	OVAL (159)	P VALUE
	STRAIGHT	28 (63%)	26 (70%)	129 (81%)	0.035
	WAVY	25 (56%)	15 (40%)	80 (50%)	0.34
	CURVED	27 (61%)	24 (64%)	86 (54%)	0.40
	ROUND	NIL	NIL	NIL	_
	P value	0.7	0.06	0.041	nil

Inference: Straight rugae is more statistically significant in oval archform than tapered and square archform.

Different Rugae pattern more common in oval arch form

Rugae distribution in overall sample is 76% straight (183), 50% wavy (120) , 57% curved (137), 0% round.

By applying chi-square test for finding the rugae pattern distribution amonggenders, there is no significant difference between gender is found. The testshows that there is no significant difference in the distribution of any of the individual rugae pattern among the genders. (there is no significant predilection of one type of rugae in any of the gender groups).

The rugae distribution according to arch form shows statistically significant result,

The straight rugae pattern in oval arch form (81%) is significant than square (63%) or tapered arch form (70%).

IV. CONCLUSION:

Palatal rugae are anatomical structures with many clinical, forensic, and anthropological significances.[5]By analysis, there is no statistical

significance among genders. By using identification of rugae patterns alone, population identification also becomes difficult as similar patterns are seen in different population groups. Further studies on larger sample size are needed to judge the role of palatal rugae in forensic identification and gender discrimination. However in our study, we showed a statistical significant difference in the presence of straight rugae pattern in oval arch form than other arch form. There are many studies on rugae pattern and arch form as individual parameters, but studies combining them are scanty.

REFERENCE

[1]. Gadicherla P, Saini D, Bhaskar M. Palatal rugae pattern: An aid for sex identification. Journal of forensic dental sciences. 2017 Jan;9(1):48.

[2]. Sandhya jain, Merin Kuriakose. Gender and race determination in forensic odontology: An overview. International journal of current research. 2020 sep

[3]. Mittal S, Vyas P, Bhullar M, Singla D, Aggarwal I, Hassan R. Arch Length and Palatal Rugae: An Adjunct in Gender Discrimination. Dental Journal of Advance Studies. 2019 Dec;7(03):110-3.

[4]. Teena maria Wilson, Sandhya jain. Orthodontics as related to forensic odontology: A review. Indian journal of forensic odontology. 2020jun

[5]. Pillai J, Banker A, Bhattacharya A, Gandhi R, Patel N, Parikh S. Quantitative and qualitative analysis of palatal rugae patterns in Gujarati population: A retrospective, cross-sectional study. Journal of forensic dental sciences. 2016 Sep;8(3):126.