ORIGINAL ARTICLE

Palatoscopy among Pondicherry Population

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ABSTRACT: Human identification is one of the most challenging subjects that man has been confronted with. Human identification is based on the scientific principles mainly involving dental records, finger prints, and DNA comparisons. Finger print, lip print were commonly used in identification of victims in forensic dentistry. Palatoscopy is the name given to the study of palatal rugae in order to establish a person's identity. Palatoscopy can be of special interest in those areas where there are no fingers prints available like decomposed bodies, burned bodies. This present study aims to determine the predominant rugae of Pondicherry population and also to evaluate the uniqueness of palatoscopy in identification of subjects.

Key words: Palatoscopy, Forensic dentistry, Palatal rugoscopy

Human identification is one of the most challenging subjects that man has been confronted with. Human identification is based on the scientific principles mainly involving dental records, finger prints, and DNA comparisons.[1] However, since they can't be always used, lesser common and unusual technique can be used successfully in human identification, such as 'Palatoscopy'. 'Palatoscopy' or 'palatal rugoscopy' is the name given to the study of palatal rugae in order to establish a person's identity.

Palatal rugae also called 'plicaepalatinae transverse' or 'rugaepalatina' refers to asymmetrical and irregular elevations of mucosa located in the anterior third of palate and made from the lateral membrane of incisive papilla, arranged in transverse direction from palatine raphae located in the mid sagital plane. The palatine rugae are formed in the third month of intra uterine life. Histologically they are stratified squamous (layered scales), mainly parakeratinized epithelium on a connective tissue base.

The palatine rugae like finger prints do not change during the life of the individual. They are protected from trauma and high temperatures because of their internal position in the oral cavity, protected by lips, cheek, tongue and buccal pad of fat. Palatal rugae are reasonably stable during a person's growth, staying in same position throughout the life of a person.

Palatoscopy can be of special interest in those areas where there are no fingers prints available like decomposed bodies, burned bodies. This present study aims to determine the predominant rugae of Pondicherry population and also to evaluate the uniqueness of palatoscopy in identification of subjects.

METHODOLOGY

The stratified random sampling consisting of 40 subjects between 15-25 years were selected as study group. The study was conducted from the month of January 2010 to March 2011 in Sri BalajiVidyapeeth after obtaining institutional ethical committee clearance and informed consent from subjects. Healthy subjects without braces, removable partial denture and severe malocclusions were selected for the study. Subjects with congenital abnormalities, inflammation of palate were excluded.

Alginate impressions of maxillary arch was made and poured with dental stone for interpretation. The rugae patterns were delineated using a pencil. The rugae pattern were analysed using Thomas, Kortz et al classification (1983).

The rugae were divided into 5 types based on their shape as:

1) *Curved:* They have a crescent shape and curve gently.

2) *Wavy:* Slight curve at the origin or termination of a curved rugae.

Fig 1: palatal rugae pattern in cast model.

3) *Straight:* They run directly from their origin to termination.

4) *Circular:* Rugae that form a definite continuous ring were classified as circular.

5) *Branched:* Rugae with branching.

All the details from each dental cast were observed as mentioned and documented.

RESULTS

In the present study we have used Kortz classification of palatoscopy. Throughout the whole work, no identically similar palatal-rugae pattern appeared in two subjects. Every individual has a unique palatal rugae pattern, thereby confirming the uniqueness of the palatoscopy. Wavy pattern appears to be the most predominant pattern followed by straight, curved, branched and circular pattern. There is no significant differences among males and females in different palatal pattern (Fig-1).

DISCUSSION

Palatal rugoscopy was first proposed in 1932, by a Spanish investigator TrobanHermaso. Since then various classifications had been given. Most studies are based on systems devised by Lysell and Thomas and Kotze, although they may differ in detail.

In the literature, the consensus of opinion is that the rugae remain fairly stable in number and morphology except when there is trauma, such as loss of tooth, persistent pressure, extreme finger sucking, orthodontic tooth movement, which may modify the alignment.[2,3] Thomas and Kotze (1983) studied the rugae patterns of 6 South African populations to analyse the interracial difference. They found that rugae were unique to each ethnic group and that it can be used successfully as a

medium for genetic research.

Limsons and Julian who compared rugae patterns using computer software reported that the percentage of correct matches ranged from 92% to 97%.[4] Ohtani who examined the accuracy rate of identification in edentulous cases achieved 94% correct matches.[5]

In the present study, on comparing the different rugae pattern of the individuals, no identically similar palatal-rugae pattern appeared in two subjects.

The present study confirms that palatoscopy is unique and which can be a useful toll in identification of victims in forensic dentistry. On comparing the two sides of the palate, right side showed a significantly more number of palatal rugae. Furthermore, in the present study we found thatWavy pattern appears to be the most predominant pattern followed by straight, curved, branched and circular pattern. Whereas in the study done by Preethi et al. (2007) on Western and South Indian population, straight pattern is predominant and circular group was found to be absent.

CONCLUSION

The uniqueness of rugae pattern in an individual is promising. In the present study, on comparing the different palate rugae pattern, Wavy pattern appears to be the most predominant pattern among Pondicherry population followed by straight, curved, branched and circular pattern. There are no significant differences among males and females in different palatal pattern. This requires further extensive study for establishing its significance in personal and racial identification.

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