Review Article

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Palatoscopy/Rugoscopy: An adjunct to Forensic Odontology

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Abstract:
Palatoscopy is the study of palatal rugae pattern and it can be used to establish the identity of a person. The rugae are unique internal structures protected by the lips, buccal pad of fat and teeth that resist decomposition, thus serving an important role in forensic identification. The appearance of palatal rugae is constant, as they do not demonstrate changes after the completion of growth of the individual, thus increasing its utility as a personal identification tool. The aim and objectives of this reviews is to analyse the prevalence of different palatal rugae patterns in different , populations. In most studies it was found that mean rugae number in females was slightly more than males. The most prevalent forms in both genders were curved type followed by wavy, straight and diverging types. Straight and curved forms were significantly more in numbers in females than males. It has been concluded in this review that rugae pattern may be used to determine gender as well as personal identification. This comprehensive review also supported that rugae can be used as a reliable guide in forensic identification.

Keywords: Palatoscopy, Palatal Rugae, Forensic Odontology

Introduction:

Palatal rugae (PR) or transverse palatine folds are irregular and asymmetrical ridges of the mucosa located in the anterior third of the palate behind the incisive papillae originating from the lateral membrane of the incisive papilla and arranged transversely on either side of the median palatine raphe [Figure 1]. Palatoscopy has gained importance in the recent past. [1],[2],[3],[4] Postmortem identification using teeth can be used for individuals who possess teeth, but in certain situation where the teeth are lost or a person is edentulous, the identification becomes difficult. In such cases palatal rugae can be used as an alternative adjunct in forensic identification. [5] The rugae are unique internal structures, protected by the lips, buccal pad of fat and teeth that resist decomposition. They can resist decomposition changes for up to 7 days after death. [1],[6] The palatal rugae pattern remains stable throughout an entire person's life following the completion of growth. [7] Additionally, it has been reported that they retain their stability even during orthodontic treatment and extraction of teeth thus serving an important role in forensic identification. They also serve as stable superimposition landmarks to assess tooth movement in orthodontics[8] The palatal rugae pattern are highly individualistic, uniquely structured and specie specific.[9] In this study we used the classification of rugae patterns suggested by Kapali *et al*.[6] (straight, curved, wavy and circular) and Thomas and Kotze[10] (unification and nonspecific).

Figure 1- Palate showing the rugae patterns

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The rugae pattern was recorded according to Kapali *et al*. classification (1997) as straight, curved, wavy and circular, and according to Thomas and Kotze classification (1983) as unification/branching and nonspecific [Figure 2]a and b. Unification was further classified as diverging or converging, depending on the type of origin

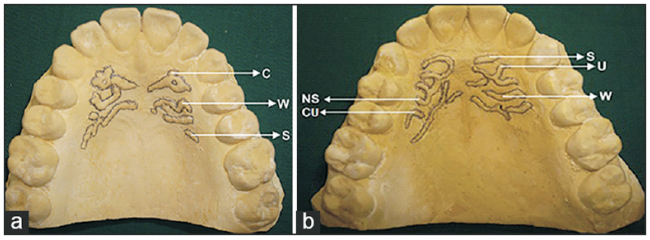

Figure 2-Different types of palatal rugae delineated in maxillary cast.

Ashoka A *et al* in 2020 carried out a study on 200 individuals (100 males and 100 females) among Kerala population . Thus on winding up study has proved chieloscopy and palatoscopy identified the sex and identity of the individual.

Ramdas S *et al* in 2019 conducted a study for comparing and correlating Dactyloscopy and Palatoscopy with blood group from western Maharashtra population .Thus to sum up the comparison made with palatal rugae and finger print yielded no result.

Mathew SA *et al* in 2016 conducted a study to compare the uniqueness of rugae marking and cheiloscopy and on conclusion it was found that the sex and identity of the individual, as they remain stable over time and unique to individual.

Byatnal A *et al* in 2014 conducted a comparative study for analyzing variations among five different populations of India and upon concluding it could not identify any special variations in diffusion of various palatal rugae markings.

Asdullah M *et al* in 2014 studied the widespread prsence of different palatal rugae markings in a instance of Lucknow. On concluding it was found that there is a scope that exists to determine sex of an individual as well as personal identification.

Satish K *et al* in 2012 conducted a study among regarding palatal rugoscopy among Puducherry population and found that wavy pattern was most prominent followed by curved, straight, branched and circular pattern in both the genders.

The diversity in rugae patterns and their potential for sex discrimination among different populations showed differing results due to individual variations and the complex influence of genetic, growth, and environmental factors on their morphology.

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