

Evaluation of the Morphology of Palatal Rugae in Portuguese Subjects [†]

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Abstract: Palatal Rugae (PR) are disproportionate bilateral protuberances of connective tissue found on each side of the medpalatine raphe posterior to the incisive papilla. The aim of this study was to investigate the pattern and sexual dimorphism of PR. The prevalence and pattern of PR of 120 Portuguese individuals attending the Orthodontic Clinic of Egas Moniz were categorized. The sample comprised 44.2% males and 55.8% females with similar PR frequencies among sex and age. The total number PR was 624. Straight and wavy PR morphologies were the most frequently observed. There was no sexual dimorphism related to the PR pattern.

Keywords: orthodontic population; palatal rugae; Portuguese individuals; straight palatal rugae



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1. Introduction

Palatal Rugae are disproportionate bilateral protuberances of connective tissue found on both sides of the median palatine raphe posterior to the incisive papilla [1]. Comparable to fingerprints, PRs appear from birth, are distinctive to each subject, and are noticed in various configurations and forms. The number of PR ranges from three to five on each side of the midpalatine raphe [1,2].

PR has a number of physiological functions, such as assisting in suckling in babies and enhancing deglutition, food mastication, and speech [1,2].

This cross-sectional observational study aimed to investigate the anatomical morphological pattern and sexual dimorphism of palatal rugae (PR) in Portuguese subjects attending the orthodontic clinic at the Egas Moniz School of Health and Science.

2. Materials and Methods

This sample investigated orthodontic dental casts of 120 Portuguese individuals (mean age 19.9, SD = 6.7 years) attending the Orthodontic Clinic of Egas Moniz School of Health and Science. Each maxillary dental cast was assessed for the prevalence and pattern of PR morphology corresponding to the classification of Thomas and Kotze [3]: straight, wavy, curved, circular, divergent unification, convergent unification and cross-link. Each PR was determined by one operator using a graphite pencil (0.5 mm) under suitable light and magnification by one operator (Figure 1). Any PR less than 3 mm were excluded from the study.



Figure 1. Maxillary study model showing delineated palatal.

An intra-observer reliability test was performed on 15 casts in two-week intervals. The intra-class correlation coefficient revealed an excellent level of reliability (≥ 0.97).

The data were analysed using Mann–Whitney U and Pearson’s Chi-square test at $p < 0.05$.

3. Results

The sample comprised 44.2% males and 55.8% females (Figure 2). Chi-square tests determined a similar correlation between gender and the frequency of PRs ($p \geq 0.372$). The total number of PR included in the analysis was 624 rugae. The most frequent PR shape was straight (44.6%), followed by wavy 257 (40.7%) PR (Figure 3). Likewise, the prevalence of converging (11%), diverging (2.7%) and circular PR (1%) were the least frequent, while cross-linked PR did not exist in our group.

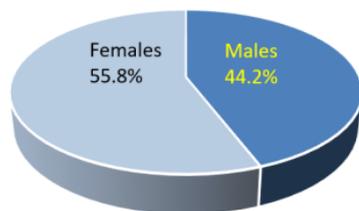


Figure 2. Percentage of males and females in the group.

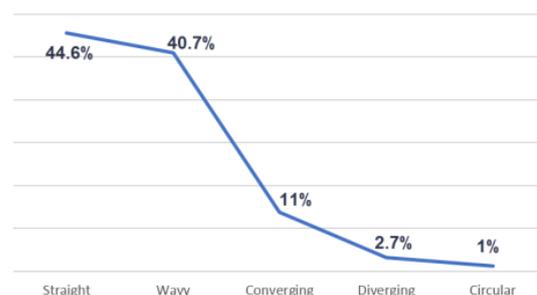


Figure 3. Percentage of different shapes of palatal rugae.

4. Discussion

This retrospective study evaluated the appearance, prevalence and sexual dimorphism of PR in a limited group of Portuguese individuals. Therefore, for the moment, we regard this investigation as a pilot study.

In agreement with our study, several other investigations on Portuguese individuals living in Porto [4] and other populations reported similar prevalence and distribution of PR in both sexes [1,2,5]. In comparison, sexual dimorphism was observed in other populations [6,7].

Straight (44.6%) and wavy (40.7%) PR were the most frequently observed shapes in the Portuguese subjects. Similarly, Santos and Caldas [4] reported a higher prevalence of

straight first PR in their Portuguese sample living in Porto. However, their study analysed only each individual's 1st and 3rd PRs. The occurrence of straight PRs in our sample was more than in Caucasians (15.2%) [1] and Libyans (14.28%) [2]. These variations might be attributed to the different ethnicities of the investigated groups.

The occurrence of diverging and converging PR combined (13.7%) was slightly less than in Caucasians [1] and relatively more than in Libyans [2].

This preliminary study explored the morphological discrepancy and sexual dimorphism of PR morphology in Portuguese individuals. A national research initiative involving larger groups is proposed to acquire a clearer picture of the morphological differences of PR in Portuguese individuals.

5. Conclusions

Straight and wavy PRs were the most common in Portuguese individuals. Furthermore, both sexes had a similar PR frequency and morphology; therefore, using PR to determine sex in the Portuguese subjects attending our clinic is not proposed.

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