

Abstract

The diploma thesis deals with the differences in the development of the palate in girls and boys within five age groups in the age range of 7 to 19 years, using methods of geometric morphometry. Furthermore, the work deals with the monitoring of sexual dimorphism in the development of the palate. Understanding palate growth, knowledge of differences in its development and changes related to sexual dimorphism are very useful, as the results of this study will serve as a comparative standard for palate defects in the Czech population, but also for appropriate planning of orthodontic procedures.

The material consists of 228 gypsum castings of palate without any pathologies, 112 of which belonged to boys and 116 girls of the Czech population. Thus, transverse data are used in our study. The subjects were divided into five age groups 7, 10, 12, 15 and 19 with respect to gender. Age changes of the entire palate surface were modeled using geometric morphometry methods (Coherent point drift - Dense correspondence analysis, Per vertex T-test and Principal component analysis). To visualize the results, superprojection color maps, maps of significance and superprojection.

The results show the greatest variability in the form of palate in girls of groups 10 and 12 years and in boys of groups 10 years, and conversely the smallest variability in the group of girls 15 years and boys of 7 years. In shape, the greatest variability in both sexes is in the group of 19 years and then also 15 years and the smallest in the group of girls 7 years and boys in the group 10 years. Overall, it can be said that the palate lengthen with increasing age in the posterior area, and thus relatively narrow. At a younger age they are more arched in the front part, this arch is equal to the age in the front part and in the back part the height of the palate increases. These changes take place in girls mainly in the age intervals of 7-10 and 12-15 years, and after the age of 15 the morphology is almost unchanged. For boys, changes take place continuously throughout the development period, lasting until at least 19 years. Finally, sexual dimorphism was found in all the age categories we observed, which, however, is most pronounced at 15 years, where the paws of boys are lower in the medial area of the palate and wider in its lateral areas. Furthermore, dimorphism is still significant in 19 years, when the palate of boys are higher in the front and back and also longer in the back than the palate of girls.

Key words: sexual dimorphism, geometric morphometry, Czech population, palate, modeled growth, transverse data, palate variability