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ABSTRACTS

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THREE-DIMENSIONAL GROWTH OF HUMAN SKELETAL PALATE

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INTRODUCTION. A 3D mathematical description of the human skeletal palate has recently been introduced (1). This method uses an electromagnetic 3D computerized digitizer to measure several standardized landmarks, a mathematical model for the quantitative description of size and shape, and allows a fast evaluations of dental casts. In the present study, the same method has been used to analyze the effects of sex and age on palatal dimensions and shape in healthy individuals with a complete permanent dentition.

MATERIALS AND METHODS. The dental casts of 18 girls and 19 boys (mean age 14 years) and of 24 women and 14 men (mean age 20 years), all with a complete permanent dentition including the second molars, and free from respiratory problems, were obtained. They all had bilateral Angle Class I molar and canine relationships, overjet and overbite between 2-5 mm, no cross-bite. The 3D coordinates of palatal landmarks were obtained with a computerized 3D digitizer, and used to derive a mathematical model of palatal shape in the frontal and sagittal planes (1). Palatal dimensions were computed, and compared between ages and sexes by ANOVA.

RESULTS AND DISCUSSION. The errors of the method applied in the present study seemed to very small: for landmark identification, the error was always less than 10% of the total biological variance. For landmark digitization, the error ranged between 2-8%. Palatal shape as assessed by the frontal and sagittal curves was not influenced by sex or age. Palatal length in the sagittal plane was larger ($p<0.05$) in males (boys and men 30.1 mm) than in females (girls 28.8, women 28.6 mm), while palatal width in the frontal plane was influenced by both sex ($p<0.01$) and age ($p<0.01$) being larger in men than in boys, and in girls than in women (boys 36.2, men 36.7, girls 34.8, women 32.8 mm). A similar sex x age interaction ($p<0.05$) was found for the maximum palatal height (sagittal: boys 13.8, men 15, girls 14, women 13.5 mm; frontal: boys 14.1, men 15.5, girls 14.4, women 13.7 mm). The sexual dimorphism in facial size but not in facial shape was thus confirmed: while girls with a complete permanent dentition had reached adult dimensions, in boys some increase was still to occur. The size of female palates slightly decreased between the beginning of a complete permanent dentition and young adulthood.

REFERENCES. 1. Ferrario V.F., Sforza C., Schmitz J.H., Colombo A. Quantitative description of the morphology of the human palate by a mathematical equation. *Cleft Palate-Craniofac. J.*, 35: 396-401, 1998.