

Abstract

Postnatal nutrition in humans is associated with advancement in the mode of feeding from the neonatal and infancy period of growth to adulthood. During the neonatal and infancy periods, the palate functions in suckling, tongue manipulation and swallowing, while in adulthood and with dental eruption, the palate participates in both mastication and in the production of sound. It is anticipated that the transition in the role of the palate due to alterations in its function over time will cause morphological changes. Thus, the aim of this study was to analyse alterations in the shape and dimensions of the human palate from birth through the stages of dental eruption to the complete emergence of the permanent dentition in the sub-adult stages of life. Crania from 72 South African individuals were sourced from the Raymond A. Dart Collection of Human Skeletons, School of Anatomical Sciences, Faculty of Health Sciences, University of the Witwatersrand. The sample was divided into three age groups to correspond with the age ranges of the eruption of the deciduous dentition (birth to 5 years of age), mixed dentition (6 to 12 years of age) and the permanent dentition (13 to 20 years of age) respectively. A series of 14 osteological landmarks were digitized across the oral surface of the palate using an Immersion MicroScribe G2 unit. Landmark data were converted to linear distances and the length, width and elevation of the palate were assessed in relation to the state of the dentition. Analysis included both quantitative (linear measurements) and qualitative (wireframes) methods. The length and width of the palate in the permanent dentition group was significantly larger when compared to the mixed and deciduous dentition groups. While elevation of the palatal dome in the permanent dentition group was significantly greater than that of the palate in the mixed dentition group, no further significant differences were observed. Thus, changes in the morphology of the palate appear to be progressive with dental eruption and development across the different states of the dentition. By establishing the nature of the changes in the functional environment of the palate during development and growth, abnormalities in the postnatal development of the palate could be diagnosed.