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Dental age estimation standards for a Western Australian population

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Abstract

Age estimation in the juvenile skeleton primarily relies on the assessment of the degree of dental and skeletal development relative to full maturity. The timing of the mineralization and eruption of the teeth is a sequential process that, compared to skeletal growth and development, is less affected by extrinsic influences such as nutrition and/or chronic illness. Accordingly, radiographic visualization and analysis of different tooth formation stages are the foundation for a number of widely applied age estimation standards. Presently, however, there is a relative paucity of contemporary dental age estimation standards for a Western Australian population. To that end, the aim of the present study is to develop statistically quantified radiographic age estimation standards for a Western Australian juvenile population.

A total of 392 digital orthopantomograms (202 male & 190 female) of Western Australian individuals are analyzed. Following Moorrees et al. (1963a,b), dental development and root resorption was assessed. Alveolar eruption was analyzed following Bengston (1935). Stages of dental development were used to formulate a series of age estimation polynomial regression models; prediction accuracy (±0.998 to 2.183 years) is further validated using a cross-validation (holdout) sample of 30 film