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Dental Radiography in Age Determination: Contemporary Methods and Trends

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Abstract

The determination of an individual's age assumes paramount significance in forensic and legal contexts, necessitating the utilization of diverse techniques. Dental radiography emerges as a non-invasive approach for determining age-related dental changes. This method grants a comprehensive analysis of various dental features to identify an individual's precise age, place them within designated age ranges, or define whether they exceed or subordinate to specific age thresholds. This review summarizes age estimation methodologies using dental radiography and conducts the investigations into contemporary trends by reviewing relevant studies published in Pubmed between 2020 and 2023. Age categorization delineates into three distinct phases: pre-natal, neo-natal, and post-natal; childhood and adolescence; and adulthood. Panoramic radiography becomes the predominant radiographic modality, with the Demirjian method is more commonly known for age estimation in the initial two phases. In contrast, adulthood age estimation relies on anatomical changes. Significantly, artificial intelligence (AI) technology has recently attracted attention for age estimation, yielding promising results. AI demonstrates the potential to enhance the accuracy of conventional methodologies, diminishing human errors and mitigating associated workload burdens, offering inventive ground for future advancements.

Keywords: age estimation, dental imaging, dental radiography, forensic dentistry, forensic odontology