F21 The Use of Dental Age Estimation Technique According to Kvaal on Panoramic Radiographs

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After attending this presentation, attendees will learn dental age estimation according to Kvaal may not be performed on panoramic radiographs.

Introduction: Age determination has become increasingly important in forensic sciences. This is certainly true for unidentified corpses but also for living individuals. Especially in a multicultural society where legal and illegal immigration is rising, an increasing demand exists for age calculation in living persons.

Several authors have reported different techniques for dental age calculation of adults in forensic literature. Among those are morphological and radiological techniques. Most commonly used morphological techniques are based on: the length of the apical translucent zone (Bang and Ramm, 1970); and on the evaluation of age related criteria such as attrition, secondary dentin, periodontal attachment, translucent apical zone, cementum apposition and root resorption (Johanson, 1971). Finally T. Solheim (1993) reported on a morphological technique which until today seems to be the most elaborated and statistically sound technique for dental age calculation. All these methods require extraction, and most of the time preparation of microscopic sections of at least one tooth and therefore are not suitable for use in living individuals. Kvaal et al. (1995) reported a method which is based only on radiological measurements. They investigated periapical radiographs by examining the relationship between chronological age and the twodimensional dental pulpal size. The present study will apply Kvaal et al.'s methodology on digital orthopantomographs. The purpose is to evaluate whether this approach could be feasible and could lead to statistically sound results with adequate repeatability.

Materials and Methods: 180 panoramic radiographs were collected at random from patients of which the age ranged from 19 to 75 years.

According to the reported technique, six teeth were selected on the panoramic radiograph: upper central and lateral incisor and second bicuspid, and lower lateral incisor, cuspid and first bicuspid. The same exclusion criteria as in the original paper were respected: impacted teeth, teeth with vestibular radio-opaque fillings, crowns, pathological processes in the apical bone visible on the radiograph or teeth with rootcanal treatment and teeth which had the mesio-distal plane of the tooth not parallel to the film.

Statistical analysis (t-Tests and analysis of variances) were carried out in order to spot significant differences and the standard error of the estimate was calculated.

Results: Results revealed significant differences between the actual age and the estimated age and the standard error of the estimate appeared to be larger compared to the original technique.

Discussion: The original technique based on standard long-cone periapical radiographs appeared to be more accurate in estimating the dental age of living individuals.

Dental Age Estimation, Forensic Odontology, Living Individuals

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