The use of intraoral radiographs for identification of edentulous patients rehabilitated with implants.

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The aims of this study were; i) to determine the accuracy by which two intra-oral radiographic examinations performed on patients with edentulous mandibles treated with dental implants can be matched. ii) to determine whether prosthodontic supra-construction is important for matching. iii) to investigate whether there is a difference between oral and maxilla-facial radiologists (OMR) and dental practitioners, not specialized in oral and maxillofacial radiology (NOMR), regarding their ability to match.

The specific features of the radiographs used by the operators to acquire a match were also investigated.

Intra-oral radiographic examinations from 59 patients were utilized. Radiographic examinations from 47 patients carried out at placement of the supra-construction and at subsequent follow-up examinations were used as “ante-mortem” and “post-mortem” records respectively. Examinations from 12 patients were added to the “post-mortem” records without “ante-mortem” records being available.

The study was divided into two parts. In Part One all “ante”- and “post-mortem” records had the supra-construction masked and in Part Two it was visible. Seven dentists (4 OMR, 3 NOMR) were instructed to specify on what basis each matching was made on the confidence of a three-graded scale.

OMR had 93.2 % and 98.5 % accuracy in Parts One and Two respectively. NOMR had 63.8 % and 87.9 %. Bone anatomy was the most commonly used feature by OMR to obtain a match. For NOMR it was the appearance of the fixtures. OMR reported higher confidence in their ability to match the examinations. This study indicates that OMR could be a valuable resource in cases of identification where dental implants are a feature of the post-mortem dental records.

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Behavior in vitro of the dentin-enamel junction in human premolars submitted to high temperatures: prediction of the maximum temperature based on logistic regression analysis

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Objective: The aim of the study was to provide scientific evidence that would permit DEJ separation to be used as a parameter to estimate the temperature to which burnt, carbonized or incinerated cadavers or human remains had been subjected. Materials and methods: A descriptive pseudo-experimental study was carried out in vitro using cone beam tomography to determine the physical behavior of the dentine-enamel junction in 60 human premolars submitted to high temperatures (200°C, 400°C, 600°C, 800°C and 1000°C). Results: Spearman’s concordance and correlation index was used to determine the relationship between longitudinal separation of the dentine-enamel junction (mm) and temperature (°C) and a simple linear regression model developed to show that once micro- and macrostructural changes are initiated in the enamel and dentine. Conclusions: The dentine-enamel junction begins to separate from the cervical towards the occlusal as temperature increases.
Discrimination potential of root canal treated tooth in forensic dentistry

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Forensic Odontology is a vital component of forensic science and one branch involves the application of dental science to the identification of unknown human remains. The aim of this study is to investigate the discriminatory potential for identification of the radiographic morphology of obturated single root canals. Thirty periapical radiographs of patients having endodontic treatment of single rooted canals were selected randomly from the data bank of the digital X-ray system present in the restorative department, University of Science and Technology, Sudan. The post-operative radiographs were considered as an ante-mortem data “Set 1”. Ten radiographs from the thirty were reprinted, labelled from (A-J) and considered as a post-mortem data “Set 2”. This post-mortem group of 10 radiographs “Set 2” would be compared with the ante-mortem group of 30 radiographs comprising “Set 1”. These two sets of radiographs would be examined by 40 dentally trained personnel. The thirty radiographs comprising “Set 1” and the 10 radiographs comprising “Set 2” were provided to each of the examiners who were asked to match the individual post-mortem radiographs (“Set 2”) with the ante-mortem radiographs (“Set1”). The result demonstrated that 34 examiners achieved a success rate of 100%, 4 examiners achieved a success rate of 97.5% (1 mismatch) and 2 examiners achieved a success rate of 95% (2 mismatches). The radiographic images of obturated single-rooted teeth in this study were shown to have highly specific morphological features. It is proposed that, in cases where the ante and post-mortem radiographs of a single-rooted obturated canal show similar morphology, this commonality of morphology can be used as a tool in the identification process.

Three-dimensional validation of the impact of the quantity of teeth or tooth parts on the morphological difference between twin dentitions

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BACKGROUND: The number of teeth involved in cases of bite-mark analysis is generally fewer in comparison to the number of teeth available for cases of dental identification. This decreases the amount of information available and can hamper the distinction between bite suspects. The opposite is true in cases of dental identification and the assumption is that more teeth contribute to a higher degree of specificity and the possibility of identification in these cases. Despite being broadly accepted in forensic dentistry, this hypothesis has never been scientifically tested. OBJECTIVE: The present study aims to assess the impact of the quantity of teeth or tooth parts on morphological differences in twin dentitions. MATERIAL AND METHODS: A sample of 344 dental casts collected from 86 pairs of twins was used. The dental casts were digitized using an automated motion device (XCAD 3D® (XCADCAM Technology®, São Paulo, SP, Brazil) and were imported as three-dimensional dental model images (3D-DMI) in Geomagic Studio® (3D Systems®, Rock Hill, SC, USA) software package. Sub samples were established based on the quantity of teeth and tooth parts studied. Pair wise morphological comparisons between the corresponding twin siblings were established and quantified. RESULTS: Increasing the quantity of teeth and tooth parts resulted in an increase of morphological difference between twin dentitions. More evident differences were observed comparing anterior vs. entire dentitions (p<0.05) and complete vs. partial anterior dentitions (p<0.05). CONCLUSION: Dental identifications and bite-mark analysis must include all the possibly related dental information to reach optimal comparison outcomes.