CLASSIFICATIONS USED BY AUSTRALIAN FORENSIC ODONTOLOGISTS IN IDENTIFICATION REPORTS

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Forensic odontologists are repeatedly called upon to assist in the identification of deceased persons. A great deal of information is available in the literature as to how and why comparative dental investigation of identification is performed but there is little information on the descriptive terms used in reporting these identifications. A forensic odontology report sets out the findings of a comparison between antemortem and postmortem evidence and indicates the odontologist’s opinion on the identification. This opinion needs to be defendable in a court of law. This paper investigates the classifications utilised in the six states and two territories of Australia and reflects on the differences.

Three states of Australia use American Board of Forensic Odontology classifications, whilst the remaining regions use a modified format. Since there are no significant legal, cultural or religious differences, and similar practitioners and clients, variation between regions within Australia would seem hard to justify. National standard terminology should be encouraged.

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COMPONENT ANALYSIS OF DENTAL PORCELAIN FOR ASSISTING DENTAL IDENTIFICATION

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The fluorescence of porcelain crowns recovered from the mouth of an unknown murder victim, and several control porcelain samples, were examined by fluorescent examination lamps. The fluorescence from two of the control samples was quite similar to that from the porcelain crowns recovered from the victim. To increase the objectivity of the results by quantitative analysis, the composition of each porcelain crown and control sample was also evaluated by wave dispersion X-ray microanalyser. The elements detected from the porcelain crowns of the victim matched those of two of the porcelain samples. Later, the antemortem dental records and radiographs of the victim were obtained through a dentist, who had recognized the name of the porcelain manufacturer in a postmortem dental information request placed on the Japanese Dental Association web page. Although component analysis of dental porcelain may be an effective means of assisting dental identification, a more rapid and non-destructive analysis for detecting the elements is required. The energy dispersive X-ray fluorescence (EDXRF) spectrometer was used for a pilot study of identification of porcelain composition.

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**THE USE OF DENTAL RADIOGRAPHS FOR IDENTIFICATION OF CHILDREN WITH UNRESTORED DENTITIONS**

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The success of dental identification is often dependent on the extent of previous dental care and the location of detailed dental records. However, several factors limit available comparable data among children. There are often no clinical indications for dental radiography before the age of five and many children and adolescents have no restorative care. This reduces the amount of individualizing information suitable for comparative identification.

The aim of this study was to investigate matching of dental x-rays from children without fillings at different ages, and to see if radiographic expertise facilitated radiographic comparison. Five general dental practitioners (GDP) and five oral and maxillofacial radiologists (OMR) attempted to match bitewing examinations from 30 children.

The results showed that dentists are likely to match bitewing radiographs in these conditions. This likelihood is further enhanced when oral and maxillofacial radiologists compare images. This suggests that manual comparison of bitewings from children allow sufficient concordant visible points for identification to occur.

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CRANIOFACIAL IDENTIFICATION BY COMPUTER MEDIATED SUPERIMPOSITION

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Mass disasters are associated with a large number of fatalities, with victims being visually unidentifiable in most cases. Dental identification, although being an important and valuable identification method, is subject to the availability and quality of antemortem and postmortem dental records. This paper presents a simple-to-use method of human identification using an antemortem photograph showing anterior teeth with superimposition onto a postmortem image using specific features of Adobe® Photoshop®.* We present cases and discuss the benefits and difficulties of this method.

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CLINICAL AND HISTOPATHOLOGICAL EXAMINATION OF EXPERIMENTAL BITE MARKS *IN-VIVO*

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Under rigorously controlled laboratory conditions, mechanically induced simulated human bite marks were made on pig skin to enable the clinical and histopathological study of experimental bite marks *in-vivo*.

A series of bite marks were created on the abdomen and thorax of live anaesthetized juvenile pigs at specific times just prior to and after death. Following the release of the biting force clinical observations of antemortem wounds revealed slow diminishment of the bite indentations presumably due to dermal elastic recovery. Minutes after euthanasia of the animals, the indentations of the teeth from the postmortem bite marks faded rapidly. After the biting process the animals were placed on either the right or left side and this side was maintained until necropsy to examine for dependant and non-dependant side differences. All bite mark injuries located on the non-dependant side revealed specific pattern characteristics. However, on the dependent side whether the bite mark was antemortem or postmortem in areas of livor mortis, no clear pattern was visible. Histologically, the observations for each bite mark specimen were categorised by the presence or absence of extravasated red blood cells in the fatty or muscle layers.
The histopathological findings correlate with the clinical observations of antemortem and postmortem bite marks located on the non-dependent side in regard to muscular erythema and extravasated red blood cells. It is clinically difficult to comment on temporal relationship of a bite mark in relation to time of death in areas affected by blood-pooling seen on the dependent side. In these situations, histopathological studies could be a reliable alternative to provide information regarding antemortem or postmortem injuries.

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A PILOT STUDY TO DETERMINE THE EFFECTS OF SKIN CONTACT ON TWO COMMONLY USED DENTAL IMPRESSION MATERIALS

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Impression material used in the analysis of bite marks are required to maintain their stability and integrity for extended periods. It has been observed that certain impressions taken of skin lose their properties with time, becoming sticky and unusable as evidence. The objective of this study was to investigate the onset of “stickiness” in two commonly used dental impression materials when brought into contact with skin. The two materials tested were Impregum and President. They were syringed into glass rings positioned on the upper arms of 28 volunteers. Changes in stickiness were monitored over a four-month period using a tensile testing machine. A metal plunger was lowered onto the impression material and then retracted measuring the adhesive force of the material to the lower surface of the plunger. Over the research period 17 of the 28 rings of Impregum became sticky and changed colour from purple to turquoise. The remaining 11 Impregum samples, all the President samples and all control samples remained unchanged over the 120 day period. The results of this study show that certain factors present in or on skin are responsible for the loss of surface integrity of Impregum. The factors responsible for these changes have not been established.

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