Estimation of age using aspartic acid racemisation in human dentin in Indian population

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Abstract (English): AIM

The quest to identify an accurate method of age estimation, had lead to the evaluation of aspartic acid racemisation in hard tissues of the human remains using high performance liquid chromatography (HPLC). Our study is aimed at the applicability of the racemisation technique to use dentin as the sample to estimate the age in South Indian sub-population.

MATERIALS AND METHODS

Thirty-six non-carious teeth from living individuals distributed among 6 age groups (6 each), sexes (18 each) and jaws (18 each) were analysed for dextro (d) and levo (l) forms of aspartic acid using high performance liquid chromatography (HPLC) technique and their racemisation ratio were calculated for each tooth sample.

RESULTS

High correlation was obtained between the aspartic acid racemisation rates in dentin and age of the individual with an error limited to ±3 years. Racemisation rates in teeth did not significantly differ between the sexes or jaws.

CONCLUSION

The d-aspartic acid accumulation in dentin is synchronous with the aging of an individual and can be used as an accurate method of age estimation in our population.

MeSH: Adolescent; Adult; Age Determination by Teeth -- methods (major); Aged; Aspartic Acid -- analysis (major); Child; Chromatography, High Pressure Liquid; Dentin -- chemistry (major); Female; Forensic Dentistry -- methods; Humans; India; Linear Models; Male; Middle Aged; Young Adult

Journal classification: Index Medicus

Substance: Substance: Aspartic Acid; CAS: 30KYC7MIAI;

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Language: English
Language of abstract: English
Document type: Journal Article
Publication title: Forensic science international
Volume: 228
Effect of systematic dental shape modification in bitemarks

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Abstract (English): Studies on human cadaver models have reported significant levels of distortion of bitemarks in skin, indicating that tooth characteristics are not reliably transferred and recorded in the bitten subject. Moreover, matches among the anterior biting dentition in open population studies have been found. This prompts the question as to what degree of difference in shape will distinguish one dentition from another as reflected in a bitemark. In order to understand how these
variables appear on skin, 10 dental casts with systematic variations in tooth positions were produced. The height of the lateral incisors was systematically altered in 1mm increments up to 3mm and lateral incisor/canines were altered in facial/lingual displacement in 1mm increments up to 5mm. Each of the models was used to produce a series of 10 repeated bites, distributed over arms and legs of un-embalmed cadavers. Landmark-based geometric morphometrics were used for analysis of digital images of the bitemarks. Results indicate that alterations of height and displacement of particular teeth affected the position of impressions created by the adjacent teeth. Displacement of one lateral incisor/canine led to a relative shift in impressions of the central incisors and unaltered canines, while height alteration of the lateral incisors led to a shift in relative position of central incisors as recorded in the bitemark. The prominence of displacements was more pronounced in the bitemarks than in images of the dentition used to make the bites, thus the bitemarks tended to exaggerate the differences. It was found that a displacement of 5mm between teeth allowed for reliable distinction between bitemarks. No such threshold of distinction could be established for differences in height of teeth under these experimental conditions. The effect of distortion was more significant in the mandibular than maxillary arch, suggesting that the mandible exhibits higher variation than the maxilla, as impressed in skin. Numerous bitemarks also exhibited arch flattening, consistent with recent studies showing arch width as the principal variable in a bitemark.

MeSH: Bites, Human -- pathology (major); Cadaver; Dental Models; Dentition (major); Forensic Dentistry; Humans; Image Processing, Computer-Assisted; Photography, Dental; Principal Component Analysis

Journal classification: Index Medicus

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Language: English

Language of abstract: English

Document type: Journal Article

Publication title: Forensic science international

Volume: 228

Issue: 1-3

Pagination: 61-9

ISSN: 0379-0738 (ISSNLinking)

Electronic ISSN: 1872-6283

Publication type: Journal

Journal code: 7902034
Civil aircraft accident investigation

Author: Haines, Daniel


Abstract (English): This talk reviews some historic aircraft accidents and some more recent. It reflects on the division of accident causes, considering mechanical failures and aircrew failures, and on aircrew training. Investigation results may lead to improved aircraft design, and to appropriate crew training.

MeSH: Accidents, Aviation (major); Forensic Dentistry (major); Forensic Medicine (major); Humans

Journal classification: Index Medicus

Identifier (keyword): Air accident, aircrew training, airframe, dental identification, fatigue, investigation

Language: English

Language of abstract: English

Document type: Lectures
Expert witnesses in dentistry: a comparison between Italy and Croatia

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Abstract (English): A dentist is frequently required to translate dental trauma into monetary value, for example after car accidents and/or work-related injuries. When called to act in this capacity a dentist should combine his/her biological and technical knowledge with a quality medico-legal knowledge. Calculation of economic (pecuniary) damages and non-economic (non-pecuniary) damages requires specific training in medico-legal matters and awareness of the inherent pitfalls. Expert Witnesses registered in Court are usually asked to perform this duty. Nevertheless, European countries have differences regarding dental damage evaluations as well as significant differences in the conditions required for registration as an Expert Witness in Court. A dental Expert Witness has precise responsibilities and is subject to civil or criminal proceedings (depending on the judicial
system) if found wanting. In forensic/legal dentistry a medico-legal doctor should not work in isolation from a dentist in dental cases nor is it wise for a dentist to work in the courts without having had specific training regarding judicial disciplines relating to dental damages. In this preliminary work the authors investigate the principal differences in the judicial systems regarding the appointment of Expert Witnesses in both Italian and Croatian courts. The next step will expand this investigation through to European countries in order to marshal knowledge towards harmonization, best practice and a common ground for dental evaluation and claim compensations (in accordance with the Council of Europe Resolution 75 –7 Compensation for physical injury or death).

MeSH: Clinical Competence -- legislation & jurisprudence; Confidentiality -- legislation & jurisprudence; Coroners and Medical Examiners -- ethics; Coroners and Medical Examiners -- legislation & jurisprudence; Croatia; Dentists -- ethics; Dentists -- legislation & jurisprudence (major); Ethics, Dental; Expert Testimony -- legislation & jurisprudence (major); Forensic Dentistry -- education; Forensic Dentistry -- legislation & jurisprudence (major); Humans; Insurance, Liability -- legislation & jurisprudence; Italy; Liability, Legal; Maxillofacial Injuries -- economics; Professional Competence -- legislation & jurisprudence; Registries; Social Responsibility; Tooth Injuries -- economics; Value of Life

Journal classification: Dental Journals

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The dentist’s responsibilities with respect to a nofault motor accident compensation scheme

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Abstract (English): The State of Victoria, Australia operates a no-fault accident compensation scheme for the treatment and rehabilitation of those injured on the roads. The administration of the scheme by the Transport Accident Commission includes an in-house clinical panel of clinicians in many disciplines including dentistry who liaise with treating practitioners with the aim of optimizing the outcome for the injured claimants.

MeSH: Accidents, Traffic -- economics; Accidents, Traffic -- legislation & jurisprudence (major); Automobile Driving -- legislation & jurisprudence (major); Compensation and Redress -- ethics; Compensation and Redress -- legislation & jurisprudence (major); Dental Care -- economics; Dental Care -- ethics; Dental Care -- legislation & jurisprudence; Dentists -- ethics; Dentists -- legislation & jurisprudence (major); Ethics, Dental; Forensic Dentistry -- ethics; Forensic Dentistry -- legislation & jurisprudence; Humans; Insurance, Accident -- economics; Insurance, Accident -- legislation & jurisprudence (major); Insurance, Liability -- economics; Insurance, Liability -- legislation & jurisprudence (major); Maxillofacial Injuries -- economics; Patient Care Planning -- economics; Patient Care Planning -- legislation & jurisprudence; Reimbursement Mechanisms -- economics; Tooth Injuries -- economics; Victoria; Wounds and Injuries -- economics

Journal classification: Dental Journals

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Language: English

Language of abstract: English

Document type: Journal Article
Missing people, migrants, identification and human rights

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Abstract (English): The increasing volume and complexities of migratory flow has led to a range of problems such as human rights issues, public health, disease and border control, and also the regulatory processes. As result of war or internal conflicts missing person cases and management have to be regarded as a worldwide issue. On the other hand, even in peace, the issue of a missing person is still relevant. In 2007 the Italian Ministry of Interior nominated an extraordinary commissar in order to analyse and assess the total number of unidentified recovered bodies and verify the extent of the phenomena of missing persons, reported as 24,912 people in Italy (updated 31 December 2011). Of these 15,632 persons are of foreigner nationalities and are still missing. The census of the unidentified bodies revealed a total of 832 cases recovered in Italy since the year 1974.
These bodies/human remains received a regular autopsy and were buried as 'corpse without name'. In Italy judicial autopsy is performed to establish cause of death and identity, but odontology and dental radiology is rarely employed in identification cases. Nevertheless, odontologists can substantiate the identification through the 'biological profile' providing further information that can narrow the search to a smaller number of missing individuals even when no ante mortem dental data are available. The forensic dental community should put greater emphasis on the role of the forensic odontology as a tool for humanitarian action of unidentified individuals and best practise in human identification.

MeSH: Autopsy; Cause of Death; DNA -- analysis; Databases, Factual; Dental Records; Dermatoglyphics; Disasters; Forensic Anthropology -- methods (major); Forensic Dentistry -- methods (major); Government Agencies; Human Rights (major); Humans; Italy; Mass Casualty Incidents; Ships; Transients and Migrants (major)

Journal classification: Dental Journals

Substance: Substance: DNA; CAS: 9007-49-2;

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Language: English

Language of abstract: English

Document type: Journal Article

Publication title: The Journal of forensic odonto-stomatology

Volume: 30 Suppl 1

Pagination: 47-59

ISSN: 0258-414X (ISSNLinking)

Electronic ISSN: 2219-6749

Publication type: Journal

Journal code: 8501421

Publisher location: AUSTRALIA

Notes: Publication model: Electronic;; Cited medium:Internet

Publication date: Nov 30, 2012

Date created: 2012-12-11

Date completed: 2013-12-12

Medline document status: MEDLINE

Electronic publication date: 2012-11-30
Role of dentists in Indonesian disaster victim identification operations: religious and cultural aspects

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Abstract (English): Indonesia is the largest archipelago in the world, consisting of five main islands and 17,500 smaller islands, spread across three seismic belts that run throughout the country. Indonesia is extremely prone to disasters, both natural and manmade. With a total population of nearly 250 million people, Indonesia’s Muslim community exceeds 180 million - the largest Muslim population in the world. On December 26, 2004 an earthquake and tsunami hit Aceh resulting in an estimated 165,00 deaths (mostly Muslims) and half a million people displaced. The members of the Disaster Victim Identification (DVI) operations faced unique obstacles. Speed was required because families wished to bury their relatives within 24 hours (before the next prayer time) and the hot tropical climate caused rapid decomposition of bodies. At the same time, survivors needed medical help; there was total destruction of facilities; minimal equipment; ante mortem data destroyed by the flood; and no electricity, transportation, water or food. DVI was of necessity basic so that the team of 33 could process tens of thousands of victims. Lessons were learnt including the need to involve religions leaders immediately; revise the DVI protocols that were designed for manmade (and smaller) mass disasters; provision of individual cameras, laptops and portable x-ray devices; and attention to more efficient use of mass graves.

MeSH: Culture (major); DNA -- analysis; Dental Records; Dentists (major); Dermatoglyphics; Disaster Planning; Disasters (major); Earthquakes; Forensic Anthropology -- methods (major); Forensic Dentistry -- methods (major); Humans; Indonesia; Islam (major); Mass Casualty Incidents; Photography; Religion and Medicine (major); Rescue Work; Survivors; Time Factors; Tropical Climate; Tsunamis

Journal classification: Dental Journals

Substance: Substance: DNA; CAS: 9007-49-2;

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