Age estimation by pulp/tooth ratio in lower premolars by orthopantomography.

Author: Cameriere, Roberto; De Luca, Stefano; Alemán, Inmaculada; Ferrante, Luigi; Cingolani, Mariano; et al.


Abstract: Accurate age estimation has always been a problem for forensic scientists, and apposition of secondary dentine is often used as an indicator of age. Since 2004, in order to examine patterns of secondary dentine apposition, Cameriere et al. have been extensively studying the pulp/tooth area ratio of the canines by panoramic and peri-apical X-ray images. The main aim of this paper is to examine the relationship between age and age-related changes in the pulp/tooth area ratio in monoradicular teeth, with the exception of canines, by orthopantomography. A total of 606 orthopantomograms of Spanish white Caucasian patients (289 women and 317 men), aged between 18 and 75 years and coming from Bilbao and Granada (Spain), was analysed. Regression analysis of age of monoradicular teeth indicated that the lower premolars were the most closely correlated with age. An ANCOVA did not show significant differences between men and women. Multiple regression analysis, with age as dependent variable and pulp/tooth area ratio as predictor, yielded several formulae. R(2) ranged from 0.69 to 0.75 for a single lower premolar tooth and from 0.79 to 0.86 for multiple lower premolar teeth. Depending on the available number of premolar teeth, the mean of the absolute values of residual standard error, at 95% confidence interval, ranged between 4.34 and 6.02 years, showing that the pulp/tooth area ratio is a useful variable for assessing age with reasonable accuracy.

MeSH: Adolescent; Adult; Age Determination by Teeth -- methods (major); Aged; Analysis of Variance; Bicuspid -- radiography (major); Dental Pulp -- radiography (major); Female; Forensic Dentistry -- methods; Humans; Male; Mandible; Middle Aged; Radiography, Panoramic (major); Regression Analysis; Young Adult

Journal classification: Index Medicus

Correspondence author: Cameriere, Roberto AgEstimation Project, Institute of Legal Medicine, University of Macerata, Macerata, Italy.

Language: English

Language of abstract: English

Document type: Journal Article, Research Support, Non-U.S. Gov't

Publication title: Forensic science international

Volume: 214

Pagination: 105-12

ISSN: 0379-0738 (ISSNLinking)

Electronic ISSN: 1872-6283

Publication type: Journal
Permanent teeth development in a Spanish sample. Application to dental age estimation.

Author: Feijóo, Gonzalo; Barbería, Elena; De Nova, Joaquín; Prieto, Jose Luis.


Abstract: The purpose of this study is to clarify the chronology of different stages of dental development, according to Demirjian, in a sample of Spanish children, which will enable us to build a database that will be used as a reference in regard to the dental development of individuals of our socio-geographic environment. In the same studied sample, a calculation of the dental age according to Demirjian was carried out. This study was conducted in a final sample consisting of 1010 orthopantograms, corresponding to Spanish children (485 boys and 525 girls) ages 2-16. Comparing the age of onset of the different stages among the children, evidence was found that girls had an earlier general development than boys. These differences were only statistically significant in teeth and concrete stages. The canine teeth revealed greater gender dimorphism, with significant differences in all stages compared with the upper canines. The method proposed by Demirjian for dental age calculation resulted in a significant overestimation of dental age in relation to the chronological age in boys (average of 0.87 years) and girls (average of 0.55 years). Data from this study may be used as reference for dental maturity, as well as a standard for estimating age in Spanish children.

MeSH: Adolescent; Age Determination by Teeth -- methods (major); Child; Child, Preschool; Dentition, Permanent (major); Female; Forensic Dentistry -- methods; Humans; Male; Radiography, Panoramic; Sex Characteristics; Spain; Tooth -- growth&development (major); Tooth -- radiography
Validation of X-ray fluorescence spectrometry for determining osseous or dental origin of unknown material.

..
Abstract: Forensic anthropological examinations typically involve the analysis of human skeletal remains, but in cases where samples are very small and/or physically compromised, it may first be necessary to determine whether the material is even osseous or dental in origin. X-ray fluorescence spectrometry (XRF) is a technique that reveals the elemental composition of materials and is hypothesized to have utility in such cases. XRF analysis was conducted on a variety of tissues and materials in unaltered and altered (damaged) states. With few exceptions, osseous and dental tissues in unaltered and altered conditions contained characteristic levels of calcium and phosphorus, while other materials did not. Materials could be accurately identified as osseous or dental in origin based on the calcium and phosphorus levels identified by XRF, and we therefore conclude that XRF analysis is a valid and effective means of determining osseous or dental origin of unknown material.

MeSH: Animal Shells -- chemistry; Animals; Anthozoa -- chemistry; Bone and Bones -- chemistry (major); Calcium -- analysis (major); Calcium Compounds -- chemistry; Fires; Forensic Anthropology; Forensic Dentistry; Humans; Manufactured Materials; Oxides -- chemistry; Phosphorus -- analysis (major); Spectrometry, X-Ray Emission; Strontium -- analysis; Tooth -- chemistry (major)

Journal classification: Index Medicus

Substance: Substance:Calcium Compounds; CAS:0; Substance:Oxides; CAS:0; Substance:lime; CAS:1305-78-8; Substance:Strontium; CAS:7440-24-6; Substance:Calcium; CAS:7440-70-2; Substance:Phosphorus; CAS:7723-14-0;

Correspondence author: Christensen, Angi M Federal Bureau of Investigation, Laboratory Division, Forensic Anthropology Program, Quantico, VA 22135, USA. angi.christensen@ic.fbi.gov.

Language: English

Language of abstract: English

Document type: Journal Article, Validation Studies

Publication title: Journal of forensic sciences

Volume: 57

Issue: 1

Pagination: 47-51

ISSN: 0022-1198 (ISSNLinking)

Electronic ISSN: 1556-4029

Publication type: Journal

Journal code: 0375370

Publisher location: UNITED STATES

Notes: Publication model:Print-Electronic; Cited medium:Internet
Context effects and observer bias--implications for forensic odontology.

Author: Page, Mark; Taylor, Jane; Blenkin, Matt.

Abstract: Psychologists have long recognized the effects of contextual and extraneous information on decision making. Such information renders the subject susceptible to both motivational and cognitive bias; yet, it is difficult to assess the extent to which these influence forensic odontologists opinions as there have been no studies to date on this subject. This article explores the various types of contextual effects and biasing influences that potentially impact on the analysis of bitemarks in forensic odontology. It appears that the current practice of bitemark analysis is rich in sources of potentially biasing influences. In addition to the fundamental recognition that some form of bias is likely to exist, ways in which these should be minimized include: separation of the collection and analysis phases; limiting the amount of contextual information available to the odontologist responsible for the analysis; and ensuring that evidence that is ambiguous or of poor quality is identified as such prior to analysis.

..

MeSH: Bites, Human (major); Cognition; Decision Making; Emotions; Forensic Dentistry (major); Humans; Interprofessional Relations; Law Enforcement; Observer Variation (major) ..

Journal classification: Index Medicus

Correspondence author: Page, Mark University of Newcastle, School of Health Sciences, Ourimbah, NSW 2258, Australia.

Language: English

Language of abstract: English
Bite marks: physical properties of ring adhesion to skin--phase 2.

Author: Desranleau, Sylvain; Dorion, Robert B J.

Publication info: Journal of forensic sciences 57. 1: 201-5. (Jan 2012)

Abstract: Bite Marks: This study demonstrated that surface wetness was the most influential factor affecting ring adhesion to skin. Also, chemical depilatories and shaving creams were to be avoided when cleaning the skin. The second phase of this research examines the tensile stress needed to rupture the bond between TAK(*) hydroplastic, three new cyanoacrylates, and pigskin with particular consideration for temperature variations. This study also considers solubility issues of different cyanoacrylates in 10% formalin. Finally, the Dorion Type V bitemark excision technique
could significantly reduce the risks of tissue distortion when used in conjunction with the following methods and materials. The skin should be devoid of moisture, razor shaved, and cleaned with dishwashing detergent and 98.9% ethanol while avoiding the use of shaving creams and/or chemical depilatories where ring placement is anticipated. The use of unopened cyanoacrylate is encouraged with Permabond® as the cyanoacrylate of choice.

MeSH: Adhesives; Animals; Bites, Human (major); Cyanoacrylates; Detergents; Forensic Dentistry -- methods; Hair Removal -- instrumentation; Humans; Humidity; Models, Animal; Skin Physiological Phenomena (major); Skin Temperature; Solubility; Stress, Mechanical; Surface Properties; Tensile Strength

Correspondence author: Desranleau, Sylvain Clinique Dentaire Desranleau Inc., Mont St. Hilaire, QC, Canada. desranleaus@hotmail.com.

Language: English

Language of abstract: English

Document type: Journal Article

Publication title: Journal of forensic sciences

Volume: 57

Issue: 1

Pagination: 201-5

ISSN: 0022-1198 (ISSNLinking)

Electronic ISSN: 1556-4029

Publication type: Journal

Journal code: 0375370

Publisher location: UNITED STATES

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

DOI: 10.1111/j.1556-4029.2011.01918.x

Publication date: Jan 2012

Date created: 2012-01-06

Date completed: 2012-04-27

Medline document status: MEDLINE

Electronic publication date: 2011-09-16
Usefulness of Forensic Dental Symbols® and Dental Encoder® database in forensic odontology.

Author: Martínez-Chicón, Jesús; Valenzuela, Aurora.


Abstract: A new universal graphic dental system, Forensic Dental Symbols(©), has been created to provide precision in the construction of dental records, improve standardization, and increase efficiency in dental identification procedures. Two hundred and thirty-four different graphic symbols representing the most frequent clinical status for each tooth were designed. Symbols can be then converted to a typographic font and then are ready to use in any computer. For the appropriate use, manipulation, and storage of dental information generated by the Forensic Dental Symbols(©), Dental Encoder(©) database has been created. The database contains all the information required by INTERPOL Disaster Victim Identification (DVI)-dental-forms. To explore the possibilities that Dental Encoder(©) offers, an antemortem dental database from a Spanish population of 3920 military personnel had been constructed. Data generated by Dental Encoder(©) were classified into sex and age groups. The program can perform an automatic search of the database for cases that match a selected clinical status presented in a single tooth or a combination of situations for several teeth. Moreover, Dental Encoder(©) allows information to be printed on INTERPOL DVI-dental-forms, or the inclusion of any completed form into any document, technical report, or identification of dental report.

MeSH: Adolescent; Adult; Computer Graphics (major); Databases as Topic (major); Female; Forensic Dentistry -- instrumentation (major); Humans; Male; Middle Aged; User-Computer Interface; Young Adult

Journal classification: Index Medicus

Correspondence author: Martínez-Chicón, Jesús Department of Forensic Medicine and Forensic Odontology, Faculty of Medicine, University of Granada, Granada, Spain. ;

Language: English

Language of abstract: English

Document type: Journal Article

Publication title: Journal of forensic sciences

Volume: 57

Issue: 1

Pagination: 206-11
Bitemark analysis.

Author: Bowers, C Michael; NLM.

Publication info: Journal of the American Dental Association (1939) 142. 12: 1334-5. (Dec 2011)

Abstract: None available.

MeSH: Bites, Human -- classification (major); Forensic Dentistry -- standards (major); Humans

Journal classification: Dental Journals; Index Medicus

Language: English

Document type: Comment, Letter

Publication title: Journal of the American Dental Association (1939)

Volume: 142

Issue: 12

Pagination: 1334-5
The crash of Colgan Air flight 3407: Advanced techniques in victim identification.

Author: Bush, Mary; Miller, Raymond.

Publication info: Journal of the American Dental Association (1939) 142. 12: 1352-6. (Dec 2011)

Abstract:

BACKGROUNDIdentifying disaster victims by means of dental records is a well-established technique. In cases in which high temperatures are involved, destruction of the structural relationship of the dentition necessitates that adjunctive aids be used in the identification process. Analysis of tooth fragments by means of scanning electron microscopy with energy dispersive x-ray spectroscopy can reveal evidence of restorative procedures, as well as trace amounts of dental materials remaining on tooth surfaces. In addition, dental materials can be analyzed and identified according to brand, even if the materials have been cremated.

CASE DESCRIPTIONThe authors describe the identification of three victims from the crash of Colgan Air flight 3407, a commuter airplane flying between Newark, N.J., and Buffalo, N.Y. The crash involved a fire, and a portion of the airplane burned for nearly 11 hours. Dental fragments that had restorative material adhering to them were recovered and analyzed. These fragments contained corroborative information that helped confirm the identity of the victims.

CLINICAL IMPLICATIONSDetailed record keeping is part of clinical practice. The level of detail present in dental records can affect the ability of forensic odontologists to determine the identity of a
victim’s remains. Documenting the brand names of dental materials used in restorative procedures can make the difference between identifying and not identifying a victim’s remains.

MeSH: Accidents, Aviation (major); Acrylic Resins -- analysis; Bismuth -- analysis; Composite Resins -- analysis; Dental Amalgam -- analysis; Dental Materials -- analysis; Dental Materials -- classification; Dental Records -- standards; Dental Restoration, Permanent; Disasters (major); Epoxy Resins -- analysis; Fires; Forensic Anthropology -- methods (major); Forensic Dentistry -- methods (major); Humans; Microscopy, Electron, Scanning; Polyurethanes -- analysis; Radiography, Bitewing; Root Canal Filling Materials -- analysis; Root Canal Therapy; Silver -- analysis; Spectrometry, X-Ray Emission; Titanium -- analysis; Tooth -- chemistry

Journal classification: Dental Journals; Index Medicus

Substance: Substance: Acrylic Resins; CAS: 0; Substance: Composite Resins; CAS: 0; Substance: Dental Materials; CAS: 0; Substance: Epoxy Resins; CAS: 0; Substance: Heliomolar; CAS: 0; Substance: Polyurethanes; CAS: 0; Substance: Root Canal Filling Materials; CAS: 0; Substance: Venus flow composite resin; CAS: 0; Substance: epoxy resin AH-26; CAS: 55599-25-2; Substance: Silver; CAS: 7440-22-4; Substance: Titanium; CAS: 7440-32-6; Substance: Bismuth; CAS: 7440-69-9; Substance: Dental Amalgam; CAS: 8049-85-2;

Correspondence author: Bush, Mary School of Dental Medicine, University at Buffalo, The State University of New York, Buffalo, NY 14214, USA. bushma@buffalo.edu.

Language: English

Language of abstract: English

Document type: Case Reports, Journal Article

Publication title: Journal of the American Dental Association (1939)

Volume: 142

Issue: 12

Pagination: 1352-6

ISSN: 0002-8177 (ISSNLinking)

Electronic ISSN: 1943-4723

Publication type: Journal

Journal code: 7503060

Publisher location: UNITED STATES

Notes: Publication model: Print; Cited medium: Internet

Publication date: Dec 2011

Date created: 2011-12-01

Date completed: 2012-04-27

Medline document status: MEDLINE
Source attribution: Medline, ©Publisher specific

Accession number: 22130435

Last updated: 2012-04-28

Database: MEDLINE®; 1950 to date.