Abstract

The validity of the age assessment method based on the "Radiographic Atlas of Skeletal Development of the Hand and Wrist" by Greulich and Pyle (1st edition 1950) has been frequently questioned. The purpose of this study was to examine the reliability of this widely used method and to compare it to various dental and other skeletal age assessment methods. Forty-seven Finnish children of known ages below 16 years, who perished in Thailand in the Southeast Asian Tsunami on 26 December 2004 were examined. Every victim repatriated to Finland underwent a complete forensic autopsy including CT-scan, toxicological screening, and diatom analysis in order to establish the cause of death, as well as DNA testing and dental examination for the verification of the identification established in Thailand. Age assessment was performed by dental and skeletal methods. The average difference between the age assessment values obtained by the Greulich and Pyle method, and the chronological age was 9.7 months. In addition to the Greulich and Pyle method, an alternate skeletal method, Tanner and Whitehouse 2, resulted in an average age difference of 10.3 months. Dental age assessment methods were based either on the eruption (Nyström method, 8 cases, average age difference 5.6 months), or the development of the crown and roots (Demirjian method, 33 cases, average age difference 5.2 months and ABFO method, 7 cases, average differences 12.6 months). Dental methods proved to be most accurate in childhood until the teeth-with the exception of wisdom teeth-have erupted and root development is completed. In adolescence, however, the validity of skeletal methods improves considerably.
Age assessment by the Greulich and Pyle method compared to other skeletal X-ray and dental methods in data from Finnish child victims of the Southeast Asian Tsunami.

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English

English

Comparative Study, Journal Article
Similarity and match rates of the human dentition in three dimensions: relevance to bitemark analysis.

Bush, Mary A; Bush, Peter J; Sheets, H David. International journal of legal medicine 125. 6: 779-84. (Nov 2011)

Found in: MEDLINE®

Abstract

Uniqueness of the human dentition is a fundamental premise in bitemark analysis. Despite the importance of this key aspect of bitemark methodology, systematic studies of large populations have
been limited. Furthermore, there have been no investigations of the significance of the third dimension with regard to dental uniqueness. One hundred digitally scanned mandibular models were analyzed in both 2D and three dimension (3D) using Landmark software. Additionally, 500 3D maxillary and mandibular sets were investigated for determining dental match rate. Statistical analysis was performed with geometric morphometric methods. Results show that measurements in 3D preserve more information about the dentition, reducing but not eliminating random matches in a sample population of 100 mandibular dentitions. Examination of pairs of maxillary and mandibular dentitions showed a substantial number of random matches (197 maxillary, 51 mandibular, one of both maxillary and mandibular). Conclusions indicate that a zero match rate cannot be claimed for the population studied.

Indexing (details)

MeSH
Bites, Human -- pathology (major);
Dentition (major);
Forensic Dentistry -- methods (major);
Humans;
Imaging, Three-Dimensional;
Lasers -- diagnostic use;
Mandible -- anatomy&histology;
Maxilla -- anatomy&histology

Journal classification Index Medicus
Title: Similarity and match rates of the human dentition in three dimensions: relevance to bitemark analysis.
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Language English
Language of abstract English
Document type Journal Article, Research Support, Non-U.S. Gov't
Publication title International journal of legal medicine
Publication date Nov 2011
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Age estimation from pulp/tooth area ratio (PTR) in an Indian sample: A preliminary comparison of three mandibular teeth used alone and in combination.

Babshet, Medha; Acharya, Ashith B; Naikmasur, Venkatesh G. Journal of forensic and legal medicine 18. 8: 350-4. (Nov 2011)

Abstract

Pulp/tooth area ratio (PTR) method of adult dental age estimation has been examined on few tooth types. We assessed the lateral incisor (LI) and first premolar (PM1) in addition to canine (C) - alone and in combination. Periapical radiographs from 61 Indians aged 21-71 years were examined. PTR of LI produced the best age correlation ($r = -0.395$) followed closely by PM1 ($r = -0.362$). The canine revealed the lowest correlation ($r = -0.206$); among tooth combinations, the three teeth taken together had the best R value (-0.438) followed by LI + PM1 (-0.435), LI + C (-0.406) and C + PM1 (-0.37). The standard errors of estimates (S.E.E.) of the regression analyses for the individual teeth and
tooth combinations ranged from ±12.13 to 13.08 years, indicating minimal difference in age estimates using solitary or multiple teeth. Errors were higher than in European groups (±2.5-5 years) which may partly owe to moderate age correlation of secondary dentine deposition in Indians. Moreover, facial soft-tissue superimposition in living subjects evaluated herein possibly precluded optimal tooth and pulp canal visualization. These indicate that the PTR method should be used judiciously in age estimation of living Indian adults, although further studies on larger samples with evenly distributed age-groups is necessary for deriving definitive conclusions.

Indexing (details)
MeSH
Adult;
Age Determination by Teeth -- methods (major);
Aged;
Bicuspid -- radiography (major);
Cuspid -- radiography (major);
Dental Pulp -- radiography (major);
Female;
Forensic Dentistry -- methods;
Humans;
Image Processing, Computer-Assisted;
Incisor -- radiography (major);
India;
Male;
Mandible;
Middle Aged;
Regression Analysis;
Young Adult

Title: Age estimation from pulp/tooth area ratio (PTR) in an Indian sample: A preliminary comparison of three mandibular teeth used alone and in combination.
Abstract

Palatal rugae patterns are relatively unique to an individual and are well protected by the lips, buccal pad of fat and teeth. They are considered to be stable throughout life following completion of growth, although there is considerable debate on the matter, they can be used successfully in post mortem identification provided an antemortem record exists. Thus the aim of this study was to examine palatal rugae shape among two Indian populations and determine the accuracy in defining the Indian population using logistic regression analysis. The study comprises two groups from geographically different regions of India with basic origin from Maharashtra and Karnataka state. The sample includes 100 plaster cast equally distributed between two populations and genders with age ranging between 18 and 40 years. Impression of maxillary arch was obtained using alginate impression material and plaster cast was made. The rugae was delineated on the cast using a sharp graphite pencil under adequate light and magnification and recorded according to classification given by Kapali et al. and Thomas and Kotze (1983). Chi-Square analysis showed significant difference in wavy, circular and divergent pattern between the two populations. The straight and wavy forms were significant in logistic regression analysis. A predictive value of 71% was obtained in determining the original cases correctly when straight, wavy, curved and circular patterns were assessed. 70% of predictive value was achieved when all rugae patterns were assessed. Mean number of rugae was greater in females compared to males with straight pattern showing statistically significant difference between males and females. Significant difference was recorded among straight, wavy, circular and divergent pattern between two populations. Consequently this study demonstrates moderate accuracy of palatal rugae pattern using logistic regression analysis in identification of Indians.
Determination of palatal rugae patterns among two ethnic populations of India by logistic regression analysis.

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Language English

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Pagination 360-5
To evaluate the utility of smaller sample sizes when assessing dental maturity curves for forensic age estimation.


Abstract

Dental maturation and chronological age estimation were determined from 144 healthy Western Australian individuals aged 3.6-14.5 years. The results were compared with Farah et al.’s previous study which comprised a larger heterogeneous sample of Western Australian individuals (n = 1450). Orthopantomograms were analyzed with the application of Demirjian and Goldstein’s 4-tooth method based on eight stages of dental mineralization. Analysis of variance revealed no significant differences in dental maturity scores in each age group among the males in both studies; similar results were seen in the females. Paired t-tests showed no statistical significance overall between
chronological and estimated ages for the males in our sample (p = 0.181), whereas the females showed significant differences (p < 0.001). Our results show that smaller samples may be used when assessing dental maturity curves for forensic age estimation.

Indexing (details)

MeSH

Adolescent;
Age Determination by Teeth -- methods (major);
Analysis of Variance;
Australia;
Child;
Child, Preschool;
Female;
Forensic Dentistry;
Humans;
Linear Models;
Male;
Radiography, Panoramic;
Sample Size (major);
Tooth Calcification

Journal classification

Index Medicus

Title

To evaluate the utility of smaller sample sizes when assessing dental maturity curves for forensic age estimation.
Publication type

Journal

Journal code

0375370

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Abstract

The aim of this study was to determine the comparative accuracy of Demirjian's four dental development methods for forensic age estimation in the Western Australian population. A sample comprising 143 individuals aged 4.6 to 14.5 years were assessed using Demirjian's four methods for dental development (original 7-tooth: M(2), M(1), PM(2), PM(1), C, I(2), and I(1); revised 7-tooth: M(2), M(1), PM(2), PM(1), C, I(2), and I(1); 4-tooth: M(2), M(1), PM(2), and PM(1); and an alternate
4-tooth: M(2), PM(2), PM(1), and I(1)). When comparing all four methods, the 4-tooth method overestimated age in both males and females by 0.04 and 0.25 years, respectively. The original 7-tooth was least accurate for males, while the original 7-tooth, the revised 7-tooth, and the alternate 4-tooth were unsuitable for females. Therefore, we recommend the 4-tooth method to be used for forensic age estimation in Western Australian males and females, as it has the lowest overall mean deviation and the highest accuracy.

Indexing (details)

MeSH

Adolescent;
Age Determination by Teeth -- methods (major);
Analysis of Variance;
Australia;
Child;
Child, Preschool;
Female;
Forensic Dentistry;
Humans;
Male;
Radiography, Panoramic;
Tooth Calcification

Journal classification

Index Medicus

Title


Author
Developing teeth are commonly the criteria used for age estimation in children and young adults. The method developed by Cameriere et al. (Int J Legal Med 2006;120:49-52) is based on measures of teeth with open apex, and application of a formula, to estimate chronological age of children. The present study evaluated a sample of panoramic radiographs from Brazilian children from 5 to 15
years of age, to evaluate the accuracy of the method proposed by Cameriere et al. The results has proven the system reliable for age estimation, with a median residual error of -0.014 years between chronological and estimated ages (p = 0.603). There was a slight tendency to overestimate the ages of 5-10 years and underestimate the ages of 11-15 years.

Indexing (details)

MeSH

Adolescent;
Age Determination by Teeth -- methods (major);
Brazil;
Child;
Child, Preschool;
Dentition, Permanent;
Female;
Forensic Dentistry;
Humans;
Male;
Mandible;
Radiography, Panoramic;
Reproducibility of Results;
Tooth Apex -- anatomy&histology (major)

Journal classification

Index Medicus

Title

Age estimation by measurements of developing teeth: accuracy of Cameriere's method on a Brazilian sample.
Titanic disaster: identity of the "unknown child".

Titley, Keith C. Journal (Canadian Dental Association) 77: b130. (2011)

Found in: MEDLINE®
Forensic Dentistry (major);
Humans

Journal classification

Dental Journals; Index Medicus

Title

Titanic disaster: identity of the "unknown child".

Author

Titley, Keith C

Language

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Document type

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Publication title

Journal (Canadian Dental Association)

Publication date

2011
New device for collecting intra-oral findings of unknown body.

Hanaoka, Yoichi; Tsuzuki, Tamiyuki; Yoshida, Masaki; Iwahara, Kaori; Suyama, Yuji; et al. The Bulletin of Tokyo Dental College 52. 3: 149-53. (2011)

Cadaver;
Dental Records;
Forensic Anthropology -- instrumentation;
Forensic Dentistry -- instrumentation (major);
Humans;
Mass Casualty Incidents;
Photography, Dental -- instrumentation (major);
Tape Recording -- instrumentation;
Video Recording -- instrumentation (major)

Journal classification

Dental Journals

Title

New device for collecting intra-oral findings of unknown body.

Author

Hanaoka, Yoichi; Tsuzuki, Tamiyuki; Yoshida, Masaki; Iwahara, Kaori; Suyama, Yuji; Matsukubo, Takashi; Sato, Yoshinobu; Minaguchi, Kiyoshi

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