Identification process in mass graves from the Spanish Civil War I.


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The identification process of human skeletal remains exhumed from a mass grave from the Spanish Civil War (1936-1939) is presented. Information regarding the presumptive location of the grave and the presumptive number and identities of the persons buried in the grave was collected from interviews and written records from relatives and witnesses, as well as from research at the penitentiary archive. Antemortem individual data were collected from testimonies, and from research from penitentiary, army and civil archives. The consistency between data obtained from testimonies, archives, archaeology and osteology allowed a targeted approach to DNA typing based on the assumption of the finding of a closed synchronic group. Two were the first genetic studies requested: the first study focused in the identification of a family group presumptively buried in the grave, compatible with a group of four skeletons that were associated on the basis of dental non-metric traits; the second study focused on the identification of the youngest person presumptively buried at the grave, compatible with the biologically youngest skeleton exhumed. A complete match between 16 Y-STR loci was observed for the four
skeletons, as well as a match between mtDNA profiles of the biologically youngest skeleton and the sister of the youngest person presumptively known to be buried in the grave. These results, together with the accumulated evidence, led to propose the identification of these five persons. To date, identifications have been proposed for 17 out of 46 skeletons exhumed from the grave.

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Sexual dimorphism in deciduous crown traits of a European derived Australian sample.


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Sex determination of juvenile skeletal remains is a problematic area affecting physical anthropology, forensic science and archaeology. Sexual dimorphism in the morphometric crown traits of the deciduous dentition may be used to help resolve this issue. Dental stone casts from a European derived Australian sample (n=151) were used to investigate variation within crown traits of the deciduous canine and molars. The metric traits investigated were crown size, trigonid size and talonid size. The morphological features included Carabelli’s trait and molar cusp number. Metric crown traits were significantly larger in males (p<0.05). The morphological crown traits were not significantly different between the sexes. The largest degree of sexual dimorphism was 11.11% in the trigonid mesiodistal diameter of the first deciduous molar. This is the first recording of the
measurement in a European derived sample. Two multivariate statistics, linear functional discriminant analysis and binary logistic regression, were used to determine the success rate of sex classification from the crown traits. The most suitable was linear functional discriminant analysis, however similar results were found when using binary logistic regression. When using all variables investigated in this study, sex could be classified with accuracy of 70.2% from linear functional discriminant analysis (cross validated).

The mandibular teeth had greater sexual dimorphism, classifying sex correctly 74.8% of the time compared to maxillary variables that had a success rate of 55.6%. Our results have shown that morphometric crown traits in the deciduous dentition can be used to classify sex of juvenile skeletons (11 months to 12 years) of European descent from linear functional discriminant analysis with accuracy between 70.2% and 74.8%.

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English.

2010.

**A new digital approach for measuring dentin translucency in forensic age estimation.**


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Assessment of age from the dentition constitutes an important step in constructing an identity profile of the decedent. Dentinal
translucency is one of the morpho-histologic parameters considered best for dental age estimation, not only in terms of accuracy but also simplicity. By convention, translucency has been measured using calipers. Computer-based methods have been proposed for the same, although these required the use of custom-built software programs.

The present study describes a method to measure translucency on sectioned teeth using commercially available computer hardware and software. Translucency measurements on 81 tooth sections were obtained using the digital method and compared with those obtained using a caliper. Correlation coefficients of translucency measurements to age were statistically significant for both methods (P < 0.001) and marginally higher for the digital approach (r = 0.49).

Application of linear regression equations derived from both methods on an independent sample (n = 15) revealed better ability of the digital method to assess age-60% of age estimates were within +/-5 years of the actual age as against 40% for caliper-based method.

The superior results using the digital method are attributed to refined measurements obtained under magnification and the "touch-free" approach of measuring translucency on digital images of thin tooth sections. Moreover, the computer hardware and software used in the present study are ubiquitous and easy to use. Considering these advantages, the report recommends the use of the digital method to assess translucency for age estimation.

English.

2010.

Fingering a murderer: a successful anthropological and radiological collaboration.

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We illustrate an interdisciplinary approach to identify a victim in a case with complex taphonomic and procedural issues. Burning, fragmentation, species commingling, and examination by multiple experts required anthropological preparation and analysis combined with radiographic adaptations to image and match trabecular patterns in unusually small, burned specimens. A missing person was last seen in the company of a reclusive female on a remote rural property. A warranted search found several burn sites containing human and animal bones. Fragment preparation, analysis, and development of a biological profile by anthropologists enabled examination by the odontologist, molecular biologist, and radiologist, and justified use of antemortem radiographs from one potential victim. Visual and radiological comparison resulted in a positive (later confirmed) identification of the victim by radiological matches of three carpal phalanges. Although some dimensional changes are expected with burning, morphological details were preserved, aided by selection of relatively intact, small bones for comparison.

English.
2010.

The response of skin to applied stress: investigation of bitemark distortion in a cadaver model.
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Knowledge of distortional properties of skin is important in bitemark analysis. Thus, the response of skin to stress from bites was investigated. Four sets of models were created from the dentition of one individual. Anterior teeth were systematically removed to vary contact surface area. A biting apparatus was constructed with an integrated load cell. Forty-six bites were created perpendicular to Langer lines on six cadavers. Rate of force application and bite pressure were controlled. Metric/angular measurement and hollow volume overlays were employed. Distortion produced by each dentition was calculated and assessed. Results showed that as teeth impressed loose tissue, mesial/distal distance increased, angles of rotation flattened, and inter-canine distance lengthened. An opposite effect was seen in tight tissue. When the surface area of the dentition was reduced, a mixture of these effects was observed. Conclusions indicated that stiffness of the tissue was the most important variable in bitemark distortion.

English.

2010.

The reliability of chronological age determination by means of mandibular third molar development in subjects in Croatia.


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The aim of this study was to determine the development of the
mandibular third molar and its relation to chronological age. The evaluated material consisted of 979 orthopantomograms of patients of Croatian Caucasian origin aged between 5.7 and 14.6 years. Third molar developmental stages were evaluated according to the stages proposed by Nolla. The frequencies of different stages of mineralization and the mean value of the mineralization of the mandibular third molars with regard to age, gender, and size of the mandible were determined and the coefficient of correlation determined between the age of the subject and the stage of development of the mandibular molars. Statistically significant correlation was determined between mineralization of the mandibular third molar and chronological age of the subjects (boys, mandibular left third molar $r = 0.779$, right third molar $r = 0.793$; girls, mandibular left third molar $r = 0.746$, right third molar $r = 0.725$). It can be concluded that the accuracy of age estimation based on Nolla's method is applicable for Croatian children.

English.

2010.

Radiographic recognition of dental implants as an aid to identifying the deceased.


This study was undertaken to determine if dental implants can be radiographically differentiated by company type to aid forensic identification of the deceased. Recognition of dental implants on intraoral radiographic images was assessed in a blind study using a
radiographic examination guide to highlight differences between
dental implants. Inter- and intra-examiner comparisons were conducted
and a computer program (Implant Recognition System) was evaluated to
see whether it improved the accuracy of implant recognition. The
study found that dental implants could be radiographically
differentiated by company type. The Implant Recognition System in its
current form was of little benefit for radiographic assessment of
dental implants for forensic odontologists. Prior knowledge of
implant types, with a McNemar's statistical value of 92.9, proved to
be most significant in identification.

English.
2010.