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**Dental age estimation on Bosnian-Herzegovinian children aged 6-14 years: evaluation of Chaillet’s international maturity standards**

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Abstract:

**BACKGROUND** Dental age estimation in children plays an important role in forensic dentistry. The most commonly used method for age estimation was developed by Demirjian in 1973 on a French-Canadian sample. It generally overestimates dental age in many populations. International maturity standards were formed to obtain a predicted age with more confidence when ethnic origin was not available.

**OBJECTIVES** The aim of this study was to evaluate the applicability of Chaillet's international scores in the dental age assessment on Bosnian Herzegovinian (BH) children.

**METHODS** Orthopantomograms of 1772 children, 980 girls and 792 boys aged 6.04-14.90 years, were assessed using Chaillet's international maturity tables and curves. The dental ages for both genders were compared to the chronological ages through a paired t-test.

**RESULTS** Mean overestimation using Chaillet's international maturity standards were 0.09 ± 0.83 for girls and 0.28 ± 0.90 for boys. The absolute accuracy of residuals between the dental and chronological age were 0.65 ± 0.52 years for girls (Median: 0.52 years) and 0.73 ± 0.60 years for boys (Median: 0.57 years).

**CONCLUSION** The Polynomial compound formula was recommended to predict dental age with more accuracy for results of international maturity standards on BH children.

MeSH: Adolescent; Age Determination by Teeth -- methods (major); Bosnia-Herzegovina; Child; Female; Forensic Dentistry; Humans; Male; Mathematical Concepts; Radiography, Panoramic; Reproducibility of Results; Tooth Calcification (major)

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Procedures to recover DNA from pre-molar and molar teeth of decomposed cadavers with different post-mortem intervals

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Abstract: A task-force to resolve 26 pending forensic caseworks was carried out. We tested four different protocols to extract DNA from molar and pre-molar teeth from 26 cadavers with post-mortem intervals from 2 months to 12 years. We compared the amount of DNA and DNA profiles with the time elapsed between death and laboratory procedures. Molar or pre-molar teeth were removed from the corpses, cleaned, and DNA was extracted using 2 or 12h of incubation on lysis buffer and filtered using concentration column or precipitated with isopropanol. DNA profiles were obtained using PowerPlex16TM System PCR Amplification Kit, AmpFlSTR(®) YfilerTM and/or mtDNA sequencing. Complete DNA profiles comparison and statistical evaluation allowed unambiguous identification of the 26 victims. No significant differences were observed in the amount of DNA
obtained with the distinct incubation times. The use of concentration column resulted in an increased amount of DNA when compared to isopropanol. However, the lower concentration of DNA obtained with isopropanol seemed to have been compensated by the higher purity. No significant differences in the number of amplified loci were found. A non-significant tendency was found between the amount of total DNA recovered and the time elapsed between death and laboratory procedures. The increase of post-mortem time did not interfere in the analysed autosomal loci. In conclusion, molar and pre-molar teeth were shown to be good candidates to obtain satisfactory DNA profiles, suggesting the high potential of tooth samples as source for DNA typing independently of the decomposed corpse's time or laboratory procedures.

MeSH: Analysis of Variance; Cadaver (major); DNA -- isolation & purification (major); DNA Fingerprinting -- methods (major); Female; Forensic Dentistry -- methods (major); Genetic Loci; Humans; Male; Molar -- chemistry (major); Postmortem Changes

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Identification and long term stability of DNA captured on a dental impression wafer

Author: Kim, Maile; Siegler, Kate; Tamariz, Jeannie; Caragine, Theresa; Fernandez, Jill; Daronch, Marcia; Moursi, Amr


Abstract:

PURPOSEThe purpose of this study was to determine the quantity and quality of DNA extracted from a dental bite impression wafer immediately after impression and after 12 months of home storage. The authors’ hypothesis was that the wafer would retain sufficient DNA with appropriate genetic markers to make an identification match.

METHODSTwo impression wafers (Toothprints(®) brand) were administered to 100 3- to 26-year-olds. A cotton swab was used as a control. DNA from wafers stored for 12 months at home were compared to DNA collected at time 0 and compared to swabs at specific sites to determine quality and accuracy. The amount of DNA captured and recovered was analyzed using MagAttract technology and a quantitative real-time polymerase chain reaction. Capillary gel electrophoresis was performed to determine the quality of the DNA profiles obtained from the wafers vs those generated from the swabs of each subject.

RESULTSAverage DNA concentration was: 480 pg/µL (wafer at time 0); 392 pg/µL (wafer after 12 months kept by subjects); and 1,041 pg/µL (buccal swab). Sufficient DNA for human identification was recovered from all sets of wafers, producing clear DNA profiles and accurate matches to buccal swabs. No inhibitors were found that could interfere with DNA profiling.

CONCLUSIONS Toothprints® impression wafers can be useful for DNA collection and child identification. After 12 months, the wafer was still usable for DNA capture and identification match.

MeSH: Adolescent; Adult; Child; Child, Preschool; DNA -- analysis (major); DNA Damage; DNA Fingerprinting (major); Dental Impression Materials (major); Electrophoresis, Capillary; Female; Forensic Anthropology -- methods (major); Forensic Dentistry -- methods; Humans; Jaw Relation Record -- instrumentation (major); Male; Real-Time Polymerase Chain Reaction; Saliva -- chemistry; Specimen Handling; Young Adult

Journal classification: Dental Journals; Index Medicus