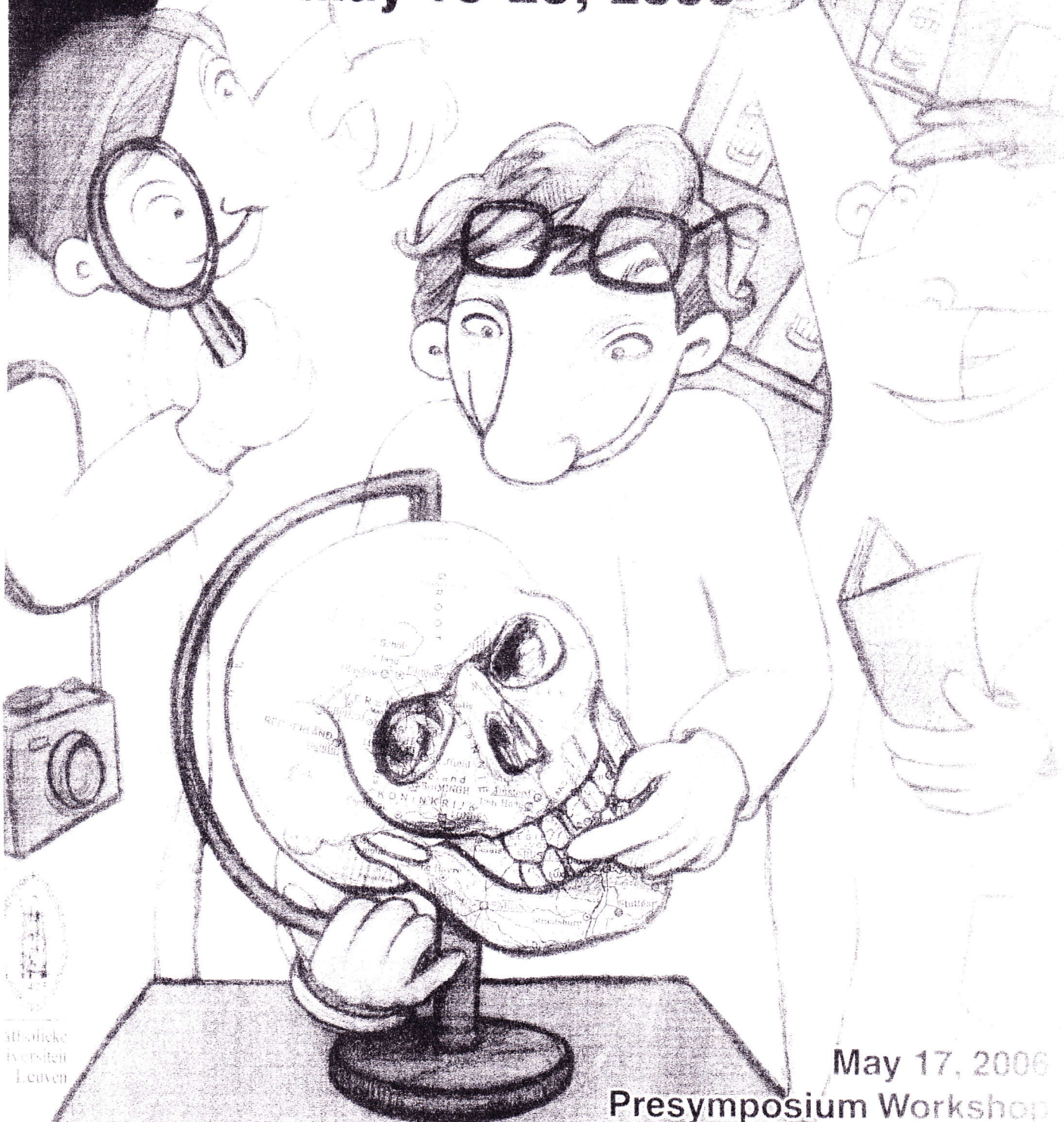


# International Symposium on Forensic Odontology

Leuven, Belgium  
May 18-20, 2006



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May 17, 2006  
Presymposium Workshop  
Dental Age Calculation  
(pre)registration: [www.mfo.be](http://www.mfo.be)

# **INTERNATIONAL ORGANIZATION**

For

## **FORENSIC ODONTO-STOMATOLOGY**

International Meeting

Leuven, May 17-19 2006

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12:15-12:30 Discussion

12:30-13:30 Lunch

**Session 12: Dental Age Estimation IV:**

**Oral presentations**

**Chairman: G. Maat**

**13:30-13:45 Evaluation of post-mortem estimated dental age versus real age: a retrospective 21 - year survey.**

**K. REPIEN\*, B. SEJRSEN AND N. LYNNERUP.**

Institute of Forensic Medicine, University of Copenhagen, Frederik d. 5's Vej 11, DK-2100 Copenhagen N, Denmark

Drs. Reppien DDS (2004) is a forensic odontologist. She has been a research assistant and is now enrolled in a PhD program at the Institute of Forensic Medicine, University of Copenhagen, Denmark.

The aim of the study was to evaluate the reliability of methods used for forensic dental age estimation. We analysed all cases over the last 21 years (1984 – 2004) of unidentified bodies that were examined for identification purposes (including age assessment), and of which secure identification was subsequently achieved. In total, the study included 51 cases and 7 different methods had been used for dental age estimation, with the Bang/Ramm and the Gustafson/Johanson methods being the most frequently applied. The age estimates had usually been recorded as 10-year intervals. Factual ages at death were in the range of 6 – 76 years, with the largest concentration of cases being in the age interval of 25 – 55 years (34 cases). There was good agreement between estimated age interval and factual age at death in 37/51 (72%) of the cases. In 8 cases the factual age at death deviated up to +/- 5 years from the estimated age, and in 6 cases by more than 6 years. The average difference between factual age at death and estimated age was 4,5 years. The 4 subadults in the material were all correctly estimated within an age range of +/- 3 years.

Our study showed that forensic odontological age estimates are reliable. However, the implementation of the specific methods may need to be adjusted concerning age ranges.

In the future we recommend to register anamnestic information and the different steps in the methods used. Clinical evaluation should contain more details about attrition, colour, number and presumed age of the restorations, periodontal status).

13:45-13:50 Discussion

**13:50-14:05 Age calculation methods used in the investigation of the archaeological sample from Croatia (18th – 19th century)**

**M. VODANOVIĆ<sup>A</sup>\*, H. BRKIĆ<sup>A</sup>, R. CAMERIERE<sup>B</sup>, V. NJEMIROVSKIJ<sup>A</sup>, J. KEROS<sup>A</sup>,  
M. PETROVEČKI<sup>C</sup>**

<sup>a</sup> School of Dental Medicine University of Zagreb, Department of Dental Anthropology, Zagreb, Croatia

<sup>b</sup> Istituto di Medicina Legale, Università di Macerata, Macerata, Italy

<sup>c</sup> Medical School, University of Zagreb, Zagreb, Croatia

Dr. Vodanović graduated and obtained a Master Degree from the School of Dental Medicine University of Zagreb, 2005. He took additional education in Forensic Odontology at the School of Dental Medicine Oslo, Norway. He worked as a young researcher at School of Dental Medicine University of Zagreb, Department of Dental Anthropology (2001). He was a partner in the scientific project on Analysis of Teeth in Identification of Exhumed War Victims in Croatia, supported by the Ministry of Science and Technology of the Republic of Croatia. He is the Secretary of the Croatian Association of Forensic Stomatologists and has specific scientific interests in the fields of forensic odontology, paleodontology, dental anthropology.

Estimation of age at death is an essential part of reconstructing information from skeletal material. Given that skeletal remains coming from archaeological series are very often poorly preserved, fragmentary, and demand careful handling to prevent further damage, age determination can be particularly complex.

The research was carried out on 192 skulls from excavations from the crypt at St. Theresa's Cathedral, Požega, Croatia. The exhumation of the burials was done in 2004. The skeletal remains were dated from the 18<sup>th</sup> and 19<sup>th</sup> century.

The aim of the investigation was to reconstruct the chronological age of the archaeological samples from Croatia using cranial skeletal remains and subsequently to make an evaluation of the methods used for age estimation. For this purpose, four age calculation methods were used: palatal suture closure, occlusal tooth wear, tooth root translucency and pulp/tooth area ratio. Cramer's V test was used to test the association between the age calculation methods.

According to the time of palatal suture obliteration, 51.4% of the population was younger than 35 years at time of death. Results of the analysis of occlusal tooth wear showed an average age at death of 31.4 years. Age estimation using root dentine translucency was performed on 77 intact upper permanent canines and showed an average age at death of 51.0 years. Age estimation using pulp/tooth area ratio was performed on radiographs of 88 intact upper permanent canines and showed an average age at death of 48.2 years. Cramer's V test showed high association (0.677) between age determination results using palatal suture closure and occlusal tooth wear, and low association (0.177) between age determination results using palatal suture closure and pulp/tooth area ratio.

Simple methods like palatal suture closure can provide data about age at death for large number of individuals, but with less accuracy. More complex methods which require qualified and educated personnel can provide data about age for a smaller number of individuals, but with more accuracy. Using different, both simple and complex, age calculation methods in archaeological samples can raise the level of confidence and percentage of success in determining age.

**14:05-14:10 Discussion**

**14:10-14:25 Age estimation in children using three mathematical models**

**I. ČUKOVIĆ-BAGIĆ<sup>A\*</sup>, H. BRKIĆ<sup>B</sup>, Ž. VERZAK<sup>A</sup>**

<sup>a</sup> School of Dental Medicine University of Zagreb, Department of Pedodontics, Zagreb, Croatia

<sup>b</sup> School of Dental Medicine University of Zagreb, Department of Dental Anthropology, Zagreb, Croatia

Dr. Čuković- Bagić is an Associate professor at School of Dental Medicine, University of Zagreb, Department of pedodontics. She took part in the scientific project on Dental traumatology, supported by the Ministry of Science and Technology of the Republic of Croatia. She is a member of IAPD (International Association of Pediatric Dentistry) and has particular scientific interests in pedodontics, dental traumatology, craniofacial anthropometry.

The purpose of this paper is to evaluate the relevance of three mathematical models used in determining age on the basis of number of erupted teeth on the orthopantomograms (OPG) of children of known chronological age. The research was conducted on 200 OPGs of children aged from 6 to 16 years. The known chronological age of children is compared with the results of the OPG analyses of all three models, and in that way the most accurate model for determining age is produced. The results showed that the best assessment of the chronological age on the whole sample is given by the model A (maxillary and mandibular teeth, except the germ), where the average deviation of the estimated age from the chronological age was 0.480 years. Positive and strong relevance between chronological and estimated age is noted in the models A and B (maxillary teeth, except the germ), and the least relevance in the model C (mandibular teeth, except the germ). Model A can be used as a simple way of determining age in forensics, where it is not possible to count the tooth germs.

**14:25-14:30 Discussion**

**14:30-14:45**