
Root for cementochronology – An efficient method for age at death estimation

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Résumé

Age at death estimation is a fundamental component of creating a biological profile in bioarchaeological context. Even if physiological and structural biological background of the dental cementum deposit are still not perfectly elucidated, acellular cementum is considered to be formed continually throughout life and - unlike bone - to not undergo remodelling processes. Originally developed for nonhuman mammalian species, cementochronology based on the counting of incremental lines is considered to be a method with the potential for directly assessing chronological age. Even if most of the studies have assumed the method's superior performance for age at death in adults, we address the paradoxical disregard for cementochronology by debating the aspects that may contribute to the limited use of this method and by illustrating its potential. Cementochronology clearly suffers from a lack of standardization that slows down the adoption of this method and hinders the assessment of its precision that remains unclear as well as the impact of taphonomical processes. In order to define the boundaries of the cementum ageing technique, we applied a certified protocol on a sample of 200 healthy canines from individuals of known age, sex and postmortem interval from anthropological and anatomical collections. We scored readability and preservation of cementum tissue and measured the agreement between cementum estimates, i.e. the precision, and assessed the quality of the accordance between chronological age and estimates, i.e. the accuracy. To investigate the applicability of this method on ancient material, 200 additional canines extracted from archaeological assemblages were included. Accuracy and precision were analysed for each age group in considering postmortem intervals and taphonomical conditions. A strong global correlation was found between chronological age and estimated age [$r=0.927$; $p=0.000$]. Even if results revealed a notable difference in both precision and accuracy between individuals under and over 50 years, cementochronology's performance compared to classical osseous and dental methods justifies a more regular implementation in anthropology. This presentation aims, on a large standardized sample, to argue cementochronology's potential and limitations, and to propose a prediction model to reduce differences between estimated age and chronological age.

Mots-Clés: Age at death, Cementochronology, Taphonomy, Acellular cementum, Precision, Accuracy

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