



Odontology Section - 2016

G6 A Comparison of Dental Age Estimation Using Cameriere et al. to Other Osteological Methods in a Deceased, Undocumented Border Crosser (UBC) Population

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After attending this presentation, attendees will understand the potential role of forensic odontologists in reducing age estimation ranges reported by anthropological methods using a dental age estimation technique.

This presentation will impact the forensic science community by helping to construct a biological profile for unidentified, deceased UBCs by comparing the dental age estimation results of a non-destructive dental technique to the results of an array of anthropological age estimation techniques that have been completed for these individuals. Validating the technique against other anthropological techniques will serve to increase the tools available to the forensic investigation team.

Hundreds of migrants die every year in borderlands along the approximately 2,000 mile United States-Mexico border. Some of these UBCs in Texas have been exhumed and brought to the Forensic Anthropology Center at Texas State University (FACTS) for processing, examination, and storage until the deceased individual can be identified. Age estimation is an important step in building a biological profile to help identify unknown deceased individuals. Anthropological techniques for age estimation can be performed using complete or partial skeletal remains; however, if only skulls or mandibles are recovered, dental age estimation may be the primary identification technique utilized. This study estimated dental age for 20 UBCs at FACTS using the non-destructive dental technique described by Cameriere et al.¹

Twenty sets of remains were chosen for study. The remains were subjected to two exclusion criteria: (1) skeletons must have at least one maxillary or mandibular canine that had naturally separated from the jaw during tissue decomposition or was easily separable; and, (2) the selected canines could not exhibit any sign of abnormal occlusion or other pathological changes. Sixteen sets of remains had both maxillary and mandibular canines meeting or exceeding the criteria, and four had only one canine available for evaluation. When possible, ipsilateral canines were chosen. Periapical dental radiographs were obtained for each canine using labiolingual and mesiodistal projections. The radiographs were then analyzed using a photo editing software. The outlines of the areas of the tooth and pulp were identified in both projection images and used to calculate tooth and pulp areas. The software facilitated the calculations by measuring pixel counts for tooth and pulp areas. The ratio between these values was used to estimate dental age according to the equations outlined by Cameriere et al.¹ These results were then compared to the results of an array of standard anthropological age estimation techniques that had been completed for these individuals. All dental age estimations performed to date have been consistent with the anthropological estimates. The method of Cameriere et al. has a standard error of ± 3.62 years.¹ This method allows investigators to estimate the ages of the unknown individuals with greater precision and report narrower age-range values that could improve the likelihood of subsequent positive identification. The study is ongoing. The current results are consistent with results obtained from osteological studies but have improved precision.

Reference(s):

1. Cameriere et al., 2007, Age Estimation by Pulp/Tooth Ratio in Canines by Mesial and Vestibular Peri-Apical X-Rays. *J Forensic Sci* 2007; 52:5 1151-1155.

Dental Age Estimation, Undocumented Border Crossers, Forensic Odontology