



Physical Anthropology Section – 2008

H71 Dental Aging Methods and Population Variation as Demonstrated in a Peruvian Sample

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After attending this presentation, attendees will understand the application of three dental aging methods to a contemporary Peruvian sample.

This presentation will impact the forensic community by demonstrating that dental aging techniques involving metrics of intact single rooted teeth – previously tested on French and American modern samples – yielded similarly accurate results in a sample from Peru. The results indicate that the accuracy of this approach appears to be minimally influenced by regional and population variation. It also demonstrates the need for further studies of this type to be conducted on new, untested populations.

Measurements of intact single rooted teeth have proven to be useful in methods of estimating skeletal adult age-at-death, especially in older adults. Lamendin et al. published such a technique in 1992 using three measurements of intact single rooted teeth: height of root transparency, height of peri-odontosis and total root height. This method was later tested on a contemporary French sample, which for one participant in the project provided more accurate estimates of age than other individual adult aging techniques. The study produced a mean error of approximately 10 years. Bang & Ramm (1970) conducted a similar study involving changes in root transparency with age by assessing dental sections as well as intact teeth.

In 2002, Prince & Ubelaker applied the Lamendin technique to a modern American sample, collecting data from the Terry collection at the Smithsonian Institution. The results of its application to the Terry sample proved to be as accurate, and in some cases more accurate, than its application to the original French sample. The mean error for this study was 8.23 years, which was reduced to 7.70 years when the regression equations were adjusted for the American sample. Nevertheless, the accuracy of these methods when taking into account regional and population variation beyond the French and American samples remained unclear.

The purpose of this study was to apply the above-mentioned dental aging methods to a population different from the previously tested French and American samples in order to gain insight into their accuracy in consideration of human variation. The chosen sample for this study consisted of 100 contemporary cadavers of known age and sex from various regions of Peru. These individuals consisted of 28 females ranging in age from 23 to 80 years, and 72 males ranging in age from 21 to 87 years.

Methodological approaches proposed by Lamendin et al., Bang & Ramm and Prince & Ubelaker were applied to a sample of 100 single rooted teeth (24 maxillary and 76 mandibular). A regression equation specific to the Peruvian population was developed as part of this study.

Analysis of these measurements in the Peruvian sample shows that the application of the Lamendin et al., Bang & Ramm and Prince & Ubelaker techniques to this previously untested population sample resulted in mean errors of estimation similar to those originally reported. When applied to the sample in Peru, the methods produced mean errors of 8.3 years for Lamendin et al., 8.8 years for Bang & Ramm and 7.6 years for Prince & Ubelaker. The results of the study suggest minimal impact of population variation of the features measured in the Peruvian sample, thereby increasing the reliability of utilizing these measurements in the estimation of age-at-death across various populations.

Age-at-Death, Teeth, Peru