H47   The Sacral Auricular Surface: A New Approach to Aging the Human Skeleton

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After attending this presentation, attendees will appreciate the potential of the sacral auricular surface as an additional means of age estimation. A different, customized approach to aging the human skeleton will be presented along with its potential.

This presentation will impact the forensic community by presenting a new means of estimating age from the human skeleton and a new methodology that has the potential, with further research, to lead to a more individualized approach for estimating age at death.

This study proposes to identify and define morphological characteristics of the sacral auricular surface that correlate with age. Character selection began with a survey of those described by Lovejoy et al. (1985) and culminated with the refinement of modified characters. These were then tested for correlation with age using the Robert J. Terry Anatomical Skeletal Collection (n=410), housed at the National Museum of Natural History. Corresponding sacral and iliac surfaces were evaluated for reciprocal age changes; however, none were identified.

The characteristics defined for the sacral auricular surface are modifications of those described by Lovejoy et al., but also include new characters specific to the sacral auricular surface. Billowing, striations and transverse organization as described by Lovejoy et al. were omitted as they did not appear on the sacrum. Surface characters adapted from Lovejoy et al. include granularity (three grain types are observed on the sacral auricular surface) and retroauricular activity (surface characteristics differ significantly from Lovejoy et al.). Microporosity, macroporosity, and density were adapted without change from Lovejoy et al.; however, a new scoring system was devised for the expression of these characters. Newly devised characteristics involving the border of the auricular surface include thickened, arthritic sharp and arthritic lipped margins.

The sacral auricular surface was divided into four regions or quadrants. Each surface characteristic was then defined individually for each region and assigned a score based on presence, absence and degree of expression in keeping with Buckberry and Chamberlain (2002). The division of the sacral auricular surface into quadrants allowed an evaluation of the progression of degenerative changes over the entire sacral auricular surface.

The aging method developed in this study involves bracketing whereby the minimum and maximum ages of occurrence of particular characters define the upper and lower limits of the estimated age interval. This approach is more individualized, allowing the examiner to delimit an age interval based upon surface characters specific to the sacrum being examined, as opposed to identifying a phase with a set age interval. For example, traits that do not occur before a certain age can be used to set the lower limit to the age interval (e.g., a score of 1 for microporosity in region 1 does not occur before age 22) and traits that do not occur after a certain age can be used to set the upper limit (e.g., a score of 3 for primary grain in region 2 does not occur after age 38) resulting in an individualized age interval, of 22-38 years. This is particularly useful in instances where a surface may be in between two classically defined phases.

This aging method was tested using the William M. Bass Donated Collection (n=100), housed at the University of Tennessee, Knoxville. Results indicate accurate placement of individuals in 70% of the cases. Although not particularly high, accuracy may be improved with further research and incorporating other established aging methods to this individualized method of age estimation. The age ranges formulated from this customized method are from five to fifty years and are particularly useful in aging older individuals, even beyond the fifth decade. Additionally, the sacral auricular surface method, when used in conjunction with other established aging methods, may be of value in narrowing large age ranges.

Sacral Auricular Surface Aging Method, Age at Death Estimation, Forensic Anthropology