



Physical Anthropology Section – 2005

H61 Testing Determination of Adult Age at Death Using Four Criteria of the Acetabulum

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The goal of this presentation is to evaluate the usefulness of a new aging technique based on degenerative changes to the acetabulum.

This presentation will impact the forensic community and/or humanity by demonstrating how accurate aging techniques are integral to identification of human remains. A method of age assessment from the posterior os coxa, such as the acetabulum, is desirable since this region is commonly preserved in forensic and archaeological contexts.

This poster will present the results of a study testing a recently published aging technique. This method, developed by Rouge-Maillart and colleagues (2004), sought to quantify degenerative changes to the acetabulum and equate these to age ranges. Because the acetabular region of the os coxa tends to be preserved in both forensic and archaeological contexts, an accurate aging method utilizing this area could increase the amount of useful information gained from the analysis of human skeletal remains.

Four features were scored based on degenerative changes: the rim of the acetabulum, porosity of the acetabular fossa, porosity of the lunate surface, and “apical” activity (degenerative changes of the posterior cornu of the lunate surface). The original study examined 30 white males, ranging in age from 24 to 81. Results showed a “significant” correlation between age and the acetabular rim and fossa. The purpose of the current research was to test the method for the ability to replicate the results as well as to expand the sample to include white females. In this study, all observations were made on adult Caucasians between the ages of 19 and 100 in the documented skeletal collection housed at the University of New Mexico’s Maxwell Museum. The sample size was 103, with 53 females and 50 males. During the data collection phase of this research, the observer was unaware of the age of the individuals observed. Scores for each of the four criteria were recorded and documented ages were matched to the individual scores for the final statistical analysis.

The results of this study show statistically significant correlations between age and acetabular rim, and age and acetabular fossa for males. For the female sample, age correlates with the acetabular rim, acetabular fossa and also with apical activity. The results of the porosity of the lunate surface are not significant for either sample population ($\alpha < 0.05$). Despite the significance of the results, the correlations are not strong, with apical activity in females having the highest correlation (0.63). Also, the results of the current study are not discrepant; there are large age ranges and significant overlap of ages between the stages. In addition, a high rate of intra-observer error was noted for both sexes.

A useful refinement to this method would be to create more descriptive definitions of each stage. Clearer descriptions of “extensive” osteophytes vs. “substantial” osteophytes in stages three and five of the acetabular rim, for example, will help other observers to apply this method. Further clarification of what is meant by “localized” destruction of the rim and when it becomes “generalized” destruction and thus progresses to the next stage of degeneration may also make this technique replicable by other observers as well as improving intra-observer error.

Rouge-Maillart’s *et al.* method may be most effective for categorizing specimens into broad age ranges because of the large overlap in scoring for all age groups. Perhaps this technique may be best applied in conjunction with other methodologies, such as the auricular surface. Although the present study found that the technique did not produce highly accurate results when tested on specimens drawn from the Maxwell Museum’s documented collection, the method may still contribute useful data for the assessment of age from skeletal remains, particularly when other diagnostic features are not observable. It may be possible in the future to narrow the ranges and increase accuracy if more detailed descriptions of the stages are produced.

Acetabulum, Degenerative Changes, Aging Technique