

Abstract

This thesis compared age and sex differences in lunate surface morphology using a 3D geometric-morphometric approach. The acetabulum of 240 individuals was compared using landmarks and semilandmarks placed along the edge of the lunate surface. The individuals ranged in age from 20 to 90 and came from three geographic areas. This thesis was based on the study of San-Millán et al. (2017a) that used a 2D geometric-morphometric approach to investigate the shape of the acetabulum. Analyses in this thesis showed that size, sex, and age significantly affect the acetabular shape. The differences between both sexes can be observed in the size and depth of the acetabulum, the width of the acetabular notch, and the amount of bone growth at the acetabular horns and along the edges of the lunate surface. Both sexes exhibit age-related changes, which are linked to gradual deposits of bone along the edge of the lunate surface, the acetabular horns, and the acetabular fossa, which tends to lose the 3-lobed cloverleaf shape. According to the geometric-morphometric analysis conducted in this thesis, the acetabulum provides more accurate age estimates for individuals younger than 65 years of age.

Keywords:

Bioarchaeology, forensic anthropology, age estimation, sex estimation, acetabulum, lunate surface of hip bone, population specificity, principal component analysis, canonical variational analysis