

**MA Thesis – Human Skeletal Biology Track, Biological Anthropology - New York University**

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RELATING HISTOMORPHOMETRIC VARIABLES  
OF ADULT HUMAN FIBULAE TO AGE-AT-DEATH

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Abstract

The microstructure of the fibula remains poorly understood, with little research focusing on the age-related trends of the histomorphometric variables of the fibula. This study is an initial observation on the correlation between eight histomorphometric variables (number of intact osteons, number of fragmentary osteons, cortical area, relative cortical area, intact osteon population density, fragmentary osteon population density, and population density) and age-at-death of 30 adult individuals. Multivariate regression analysis was performed to determine relationships with age. No significant correlation was found between the histomorphometric variables and age. The strongest correlation with age was found to be the number of fragmentary osteons and intact osteon population density with a p-value of 0.142. Statistically significant differences did occur between male and female cortical area, relative cortical area, and the fragmentary osteon population density. These results suggest possible sexual dimorphism in the histology of the fibula, which has previously not been observed. An increased sample size in which more than one individual represents a particular age-at-death may improve the correlations to age. More research is needed to fully understand the microstructure of the fibula, particularly the possibility of nonlinear relationships between age and histomorphometric variables and the potential of a new method of sex estimation based on the cortical area and fragmentary osteon population density.