



Physical Anthropology Section – 2010

H49 Forensic Anthropological Consideration of Quantification Techniques of Individuals From Excavated Human Remains in Case of Burial Place at Daehak-Ro, Korea

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After attending this presentation, attendees will learn about the procedures and forensic anthropologic considerations used to estimate the number of buried individuals in a commingled burial site.

This presentation will impact the forensic science community by showing how anthropologic findings and methods helpful for estimation of the number of buried individuals can be enhanced by using with molecular (DNA) analysis.

The minimum number of individuals (MNI) and the grand minimum total (GMT) have been the traditional parameters of quantifying individuals. However, these methods have limitations in quantifying the commingled osteological assemblages for two reasons:

(1) Both traditional methods just estimate the number of individuals represented by the assemblage recovered; and, (2) the accuracy of estimation is determined by the number of skeletal elements to be completely recovered. The Lincoln Index (LI) and the most likely number of individuals (MLNI) were recently introduced as the methods of estimating the number of individuals throughout the excavated human remains. These recent methods can estimate the number of individuals by considering the bones unobserved, because the equation of estimation accounts for the number of skeletal elements on each side and the number of bones in each pair. Therefore, the LI and the MLNI have benefits to estimate the number of individuals in any types of commingled field.

On November 27, 2008, 170 scattered human remains were recovered in a cave after the removal of buildings located at Daehak-Ro in Seoul. The femur was most commonly found and the number of left and right femora was 13 and 17, retrospectively. Nine pairs of femurora were matched through forensic anthropological analyses and the molecular works targeting DNA. The MNI was calculated as 17 (the maximum number in both sides) and the GMT was calculated as 21 (accounts for the number of paired bones). Finally, the MNI and the GMT were calculated as 18 and 22, respectively, after adding some skeletal remains that might be from one infant.

The scattered remains at the site indicated a secondary interment by the presence of commingled skeletons and absence of bones. For this reason, the LI or the MLNI was regarded as suitable methods to quantify the individuals in the current study. The LI was 25 and the MLNI was

24. The DNA analysis detected 26 types of mtDNA from the skeletal sample that was available for the molecular experiment. In two cases, several bones with same mtDNA types were identified to be from the different individuals. As a result, 28 individuals were finally confirmed to be present at the site.

The LI or the MLNI are conclusively the more valuable methods for quantification of commingled field than the MNI or the GMT, as indicated by verification using molecular analysis. However, significant error in determining the number of individuals present may result when only DNA analysis is used.

Number of Individuals, Commingled Field, Daehak-Ro