H94 Sex Determination From the Greater Sciatic Notch of Koreans Using 3D Models

Dong-Ho Kim, BSc, 222 Banpo-daero, Seocho-gu, Seoul 137-701, SOUTH KOREA; Go-Un Jung, Yang-choun Gu, Mok-5-Dong, 911-1 bun-ji, Ewha Womans Hospital, Uwi-hak-GuanA dong, 511 ho, Seoul 158-710, SOUTH KOREA; Deog-Im Kim, PhD, Catholic University of Korea, Dept of Anatomy, 222, Banpo-daero, Seocho-gu, Seoul 137701, SOUTH KOREA; Yi-Suk Kim, MD, PhD, Ewha Womans University, Dept of Anatomy, School of Medicine, 911-1, Mok5-dong, Yangcheon-gu, Seoul 158710, SOUTH KOREA; and U-Young Lee, MD, The Catholic Univ of Korea, Dept of Anatomy, Coll of Med, 505, Banpo-dong, Seocho-gu, Seoul 137701, SOUTH KOREA*

The goal of this presentation is to report sex determination of the Korean population using 3D models. Applying the metric method to 3D bone models reconstructed from computer tomography scans, this presentation will illustrate the high accuracy of sex determination of this method.

This presentation will impact the forensic science community by explaining that sex determination from 3D models is a relatively new method of forensic anthropology. Using 3D bone models for the metric method proved higher accuracy accompanying objectivity when compared to former studies.

Using the pelvis is the most preferred method for determining sex in forensic anthropology. It is known that the accuracy of sex estimation is the highest when utilizing the pelvic bones because there are differences of function and structure of the pelvis according to the sex. Among numerous indicators, the greater sciatic notch is usually selected for the time of visual observation. This method has a few merits of taking less time and easy application on the dry bone in the field, but has the shortcoming of dependence on the accuracy on the observer's experience or subjectivity. As the importance of repeatability of a method is considerate, the visual analysis method is suspected of being inaccurate and inapplicable for the court issues. Therefore, this study developed a method to objectively measure three-dimensional models for sex estimation of the greater sciatic notch.

Studied were 103 sides (52 female sides, 51 male sides) of the Digital Korean Database stored in the Catholic Institute for Applied Anatomy. After defining the position of the Posterior Inferior Iliac Spine (PIIS) and the Ischial Spine (IS), the most medial point from the plane which passes the two points (PISS and IS) was defined as the Anterior Point (AP). The point where a line connects the PIIS and the IS and a line drawn from the AP meets vertically was defined as Posterior Point (PP). Mimics® version 15 was used to create 3D models and measure them with a measurement template designed for this study. There were 11 measurements related to distances between points and angles. For the sex determination process, SPSS version 20.0 was used to enable discriminant analysis.

The discriminant analysis on univariate data showed the range of accuracy from 53.8% to 96.2%. The angles of IS-PIIS-AP, PIIS-AP-IS, and especially, PIIS-AP-PP showed the highest accuracy. Compared to the visual examination of a former study, sex estimation with 3D model measurement possessed objectivity and accuracy.

Sex Determination, Sciatic Notch, 3D Model

 ** Presenting Author*