H88 Classification of Frontal Sinus Patterns in Koreans by Three-Dimensional Reconstruction Using Computed Tomography

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Attendes of ths presentation will understand that the frontal sinus from computed tomography data might be helpful as an identification of unknown individuals of Korean in forensic studies.

The impact of this presentation on the forensic community will demon- strate the usefulness of frontal sinus as the identification and a distinction among populations and the simply classified method by three-dimensional reconstruction.

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This presentation has presented the usefulness of frontal sinus as the identification and a distinction among populations and the simply classified method by three-dimensional reconstruction.

The use of frontal sinus in identifying human skeletal remains is now an increasingly applied and accepted technique in forensic anthropology. The frontal sinus begins to develop at the age of five and six and does not change after the age 20 years except fracture or diseases. Computed tomog- raphy is becoming increasingly available and replacing gradually the radi- ographs rapidly. The aim of this study is described to define a simple and useful system for identification of an unknown person by three-dimensional reconstruction of frontal sinus in Korean and compared with other populations.

The material was the Digital Korean as human model database (http://digitalman.kisti.re.kr) at Department of Anatomy·Catholic Instituted for Applied Anatomy, College of Medicine, The Catholic University of Korea. The frontal sinus was classified based on four basic features: present sinuses, outline of upper border, partial septum, posterior extension, and measured twelve items included volume, width, and depth. The bilateral asymmetry index modified by Yoshino et al. (1987) and bilateral dimension are used as a classification in this study.

The most common type of frontal sinus due to four features was present sinuses at both, absent partial septum, smooth shape of outline of upper border, and absent posterior extension at both sexes. In bilateral dimension by volume, middle size (10 cm^3 < volume < 100 cm^3) was the most common in both sexes and sides but large size (100 cm^3 < volume <200 cm^3) was the most common in males' left side. The bilateral asymmetry index was used in two methods, one was used in volume (3D image) and the other was in width (2D image). In males, extreme asymmetry type (20%) was the most common under volume, and moderate asymmetry type (30%) was the most common under width. In females, the most common type was symmetry; 17% in volume and 35% in width. Analysis of variance showed that total volume, maximum height of both sinuses, and depth of right and left sinuses were significantly associated ($P<0.05$) with sex. In generally, the frontal sinus of male is larger than female and the left sinus is larger than right. The frequency of bilateral absence of frontal sinus is used to compare with other populations. The bilateral absence ratio of Koreans (this study), 5.8% in males and 3.9% in females, was lower than other populations; Eskimo was over 25%, Japanese was over 10%.

In three-dimensional reconstruction, the frontal sinus is showed with complete shape and in detail at a look so it doesn't need many slices for iden- tification unlike two-dimensional images. To make use of Reichs's (1993) method, the digit code was listed 14-, 21-, or 28-digit code number for each case. In this study, the digit code is listed just 7-digit code number for each case and 7-digit code is different in each case. This study suggests that three- dimensional images of the frontal sinus can be helpful in identifying and distinguishing individual skeletal remains from other populations.

References:

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