

## Personal Identification in Forensic Examinations

Tanuj Kanchan<sup>1\*</sup> and Kewal Krishan<sup>2</sup>

<sup>1</sup>Department of Forensic Medicine, Kasturba Medical College, Mangalore (A Constituent College of Manipal University), India

<sup>2</sup>Assistant Professor, Department of Anthropology, Panjab University, Chandigarh, India

Personal identification is defined as establishing the identity of an individual. The need for personal identification arises in natural mass disasters like earth quakes, tsunamis, landslides, floods etc., and in man-made disasters such as terrorist attacks, bomb blasts, mass murders, and in cases when the body is highly decomposed or dismembered to deliberately conceal the identity of the individual [1]. The need to identify the dead is obvious for social and medico-legal purposes. Various techniques of biological anthropology are employed in the process of identifying the individuals from the bones or the body parts [2]. The identification of the dead from the bones/ body parts in a legal setting forms an essential component of forensic anthropology [3]. The foremost task in achieving the personal identification is to establish whether the skeletal remains are human or not. If the remains belong to a human being, then various anthropological techniques can be used to identify the dead. The 'big fours' of personal identification are determination of age, sex, stature and ethnicity. These form the features of 'tentative identification' [4].

The age can be estimated by examination of the fontanelles/ fonticulis in infancy, eruption and sequence of eruption of teeth in childhood, appearance and fusion of ossification centers of bones in juveniles (skeletal age estimation), obliteration of cranial sutures and on the basis of general features of the skull in adulthood and old age. There are other methods which have been developed recently like public symphy seal morphology, phase changes in the sternal rib, number of whole osteons and osteon fragments, and degenerative changes in the skeletal features [3].

Sex can likewise be determined from various bones/ skeletal remains. When whole skeleton is available, the sex can be determined with almost 99-100% accuracy. Among individual bones, pelvis is known to provide the most accurate results in the determination of sex (95% accuracy), followed by skull (92% accuracy). Several other bones are also used in sex estimation such as femur, tibia, ulna, radius, vertebrae, sternum, metatarsals and metacarpals etc. Sex determination from bones are based on their morphological and morphometric features. A combination of both morphological and morphometric features can provide most accurate results. The growth process in the children and juveniles may hamper the manifestation of some sexually dimorphic features in the bones, and hence, methods for sex determination are practiced on the adult skeleton [5,6].

Stature estimation is also an important part of personal identification. It provides an idea about the size of the person. Due to the allometric relationship of the body parts with one another, the stature can be estimated from almost all the bones of the skeleton. Forensic anthropologists worldwide have attempted to estimate stature from various bones. Long bones of the lower extremity are known to give more accurate estimates of stature as these directly contribute to the stature of a person. Other long bones such as the bones of the upper extremity such as humerus, ulna and radius can also be used to estimate the stature of a person. There are two methods for estimation of stature from the skeletal remains; anatomical method and mathematical method. The anatomical method is the most accurate

method as it involves the complete skeleton for stature estimation. The mathematical method involves the use of certain statistical formulae in estimation of stature [7,8].

Determination of ethnicity/race is also considered as one of the mainstay in personal identification. Race determination is based on the morphological features of the human bones. Many characteristics of the skull such as nasal opening, zygomatic bones, maxillary bones and teeth have been used to determine the race from the skeletal remains. At times, proximal and distal end of femur has also been used to determine race in forensic examinations. With intermixing of different population groups in modern population the issue of race determination from skeletal remains has become more challenging [3].

In the present scenario, forensic anthropologists are involved in discovering new methods of identification from skeletal remains, cadavers as well as living beings. In the last decade, the stress has been laid upon achieving the accuracy on already developed methods of identification. Various new methods of age and sex determination have been developed from teeth and the methods have been tested for accuracy across the globe [9]. Another reason to work on new populations is that the earlier acquired standards of age and sex determination have lost their values due to secular changes in the modern populations [10,11]. Therefore, there is always a need to apply and test the methods to newer populations for making population standards for achieving precision and accuracy.

Once the forensic anthropologist can provide this vital information regarding the missing person/deceased, the identification takes the form of 'proper identification'. Other techniques such as facial reconstruction and DNA identification can then be applied accordingly to provide positive identification of an individual. Forensic anthropology, as a specialty has tremendous utility in investigations [12]. The need of this hour is to promote newer research in the field of Forensic anthropology involving the modern samples.

### References

1. Modi JP (2011) A Textbook of Medical Jurisprudence and Toxicology, 24<sup>th</sup> Edn, LexisNexis Butterworths, Nodia.
2. Burns KR (2007) Forensic Anthropology Training Manual. New Jersey: Prentice Hall Publishing.

\*Corresponding author: Tanuj Kanchan, Associate Professor, Department of Forensic Medicine, Kasturba Medical College, Mangalore (A Constituent College of Manipal University), India, Tel: +91-9448252394; E-mail: [tanujkanchan@yahoo.co.in](mailto:tanujkanchan@yahoo.co.in)

Received November 18, 2013; Accepted November 30, 2013; Published December 01, 2013

Citation: Kanchan T, Krishan K (2013) Personal Identification in Forensic Examinations. *Anthropol* 2: 114. doi:10.4172/2332-0915.1000114

Copyright: © 2013 Kanchan T, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

3. Krogman WM, Iscan YM (1986) *The human skeleton in forensic medicine*. 2nd ed. Springfield, Illinois, USA: Charles C. Thomas Pub Ltd.
4. Vij K (2008) *Text book of forensic medicine and toxicology-principles and practice* (4th ed). New Delhi: Reed Elsevier India Private Limited-A Division of Elsevier.
5. Krishan K (2007) Anthropometry in forensic medicine and forensic. *Science e forensic anthropometry*. *Internet J Forensic Sci* 2: 1.
6. Kanchan T, Krishan K (2011) Anthropometry of hand in sex determination of dismembered remains-A review of literature. *J Forensic Leg Med* 18: 14-17.
7. Krishan K, Kanchan T (2013) Stature and Build. In: Siegel JA, Saukko PJ, editors. *Encyclopedia of forensic sciences*. Waltham: Academic Press 1: 49e53.
8. Krishan K, Kanchan T, Ghosh A, Menezes RG (2012) Forensic anthropological casework-essential methodological considerations in stature estimation. *J Forensic Nurs* 8: 45e50.
9. Pickering RR, Bachman DC (2009) *The Use of Forensic Anthropology*. New York: CRC Press-Taylor and Francis Group.
10. Ulijaszek SJ, Masci-Taylor CJN (1994) *Anthropometry: The individual and the population—Cambridge studies in biological anthropology*. Cambridge, UK: Cambridge University Press.
11. Eveleth PB, Tanner JM (1976) *Worldwide variation in human growth*. Cambridge, U.K.: Cambridge University Press.
12. Larsen CS (2010) *A companion to biological anthropology* (Blackwell Companions to Anthropology). New Jersey: Wiley-Liss-A John Wiley & Sons, Inc. Publication.