

Editorial

Forensic Facial Reconstruction

Forensic facial reconstruction is a technique to reconstruct human face from unidentified skull remains. This is considered as the last resort in forensic identification when traditional methods such as examination of dental records, radiographs, and DNA analysis are ineffective or not feasible. Forensic facial reconstruction is considered to be a combination of scientific method and artistic skill. The conventional method of forensic reconstruction has received various criticism as it is considered highly subjective and reliant on individual skill. Hence, attempts are made to automate the process of reconstruction.

The human skull is made up of 22 bones of which, 14 are facial and 8 cranial bones. These bones together form a complex structure with gradual changes during development and growth along with soft-tissue changes creates a huge variation in different facial forms.

The level of accuracy of forensic reconstruction is of utmost importance, especially in investigation proceedings. Van den Eerenbeemt, 2001; Policing Cardiff, 2005, Algemeen, 2009, Caldwell, 1981; Haglund and Raey, 1991; and Wilkinson, 2006 have reported success rates in identifying a person with facial reconstruction. However, the extent of usage of facial reconstruction in identification was not very clear. A number of methods such as face pool assessment, resemblance ratings, and morphometric comparison have been used to assess the accuracy and reliability of forensic facial reconstruction.

The techniques of facial reconstruction can be divided into two types, two dimensional (2D) reconstruction, and 3D reconstruction. The techniques can either be done manually or using specialized software.

TWO-DIMENSIONAL RECONSTRUCTION

Antemortem photographs and skull are used for facial reconstruction with the use of soft tissue estimates manually. This method was first introduced in 1980s by Karen Taylor, Texas. Computerized software's such as Computer-Assisted Recovery Enhancement System and Forensic Anthropology Computer Enhancement System have sped up the process of reconstruction using digitalized photographs, radiographs, and pictures of the skull.

THREE-DIMENSIONAL RECONSTRUCTION

Manual 3D reconstruction also requires an artist and forensic anthropologist. It also uses tissue depth markers similar to 2D

reconstruction along with clay, plastic, or wax. Computerized reconstruction uses scanned and stock photographs.

The following are the types of 3D reconstruction:

- Anthropometrical American method/Tissue depth method
- Anatomical Russian method
- Combination Manchester method/British method
- Computerized 3D-forensic facial reconstruction.

The computerized system used either 3D-animation software (Freeform modeling plus) or virtual sculpture system using haptic feedback (Phantom desktop haptic device). These systems create multiple images of the face quickly and efficiently.

Forensic facial reconstruction is an efficient, noninvasive, and rapid and reproducible method. This technique is used in forensics as well as in archeology. With advancements in computerized technologies, the disadvantage of intensive labor oriented manual methods can be avoided, and the reconstruction can be done in an easy and effective approach.

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