RECONSTRUCTION OF SKULL BY ENDOCRANIAL GROOVE - A CASE REPORT

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ABSTRACT

Identification of an individual is one of the requisites in establishing the corpus delicti. Here, we discuss a case of establishing corpus delicti based on the continuance of the vascular groove on the endocranial surface, by matching two pieces of skull bone that were recovered at the crime scene and preserved at autopsy.

Key words: Cranial groove, identification, fragmented skull.

INTRODUCTION

Identification is an essential requirement for any medicolegal investigation as the mistaken identity may pose a problem in delivering the justice. Identification of a living person or a dead body is very important, because identity is a part and parcel of corpus delicti, which helps in connecting the criminal to the crime.

Identification of human skeletal remains is a critical matter and is required when the body is decomposed, mutilated or skeletonised to the point where customary means of identification are rendered uncertain or impossible. The determination of race, sex, age, and stature of the bone gives valuable information in establishing the identity of a person.

Another skill that is receiving increasing attention is the reconstruction of skeletal remains to produce a physical likeness of the deceased individual. Reconstruction of skull is required for the reproduction of facial contour and superimposition, which may be helpful in the identification of a missing person[1,2,3]. Skull reconstruction is also required for doing craniometry and determination of race, sex and age. Reconstruction of fractured pieces of bone also helps in proving the corpus delicti in a case where the fractured pieces were missing from the main bone.

Reconstruction of the skull is done by approximating the fractured ends of bone and its proper alignment. Sometimes, the edges of the bony pieces recovered are destroyed due to the natural decaying process or due to activity of scavenging animals. This may lead to difficulty in matching the bony pieces based on the approximation of the edges. We report a case of reconstruction of skull pieces based on the continuance of the vascular grooves present on the endocranial surface, thereby establishing the corpus delicti.

CASE REPORT

Two persons while traveling in a motorcycle were assaulted by a group of persons with deadly weapons and one person was killed on the spot. The body was sent for medicolegal autopsy. During examination, the autopsy doctor observed comminuted fracture of skull vault with missing of some fragments. At the request of investigating officer, the autopsy surgeon preserved few pieces of fractured skull. Later, a piece of bone was recovered by the investigating officer near the crime scene. The piece of bone recovered from the crime scene and those preserved at autopsy were sent to the Office of State Medicolegal consultant, Department of Forensic Medicine and Toxicology, Kasturba Medical College, Mangalore for an expert
opinion regarding whether the pieces of bone recovered at autopsy and crime scene belonged to the same person.

On examination, the pieces of bone recovered at autopsy and crime scene were found to be of human origin. The piece of bone recovered at the crime scene was irregular in shape with few attached hair and was soiled with mud. The edges of the bone were irregular with a brownish black coloured stains. The bone pieces preserved at autopsy consisted of 3 pieces of bone, irregular in shape, more or less equal in size. One piece of bone preserved at autopsy closely approximated with the piece of bone recovered from the scene of crime. This was confirmed by the continuance of the vascular groove on the endocranium of both pieces.

**DISCUSSION**

The identification of skeletal, badly decomposed, or otherwise unidentified human remains is important for both legal and humanitarian reasons.

In general, the nature of the human remains and physical evidence that a forensic anthropologist must examine for relevant information ranges from a single bone to an entire skeleton. If all or most of the skeleton is recovered, even when badly broken up into small pieces, it can be reconstructed in the laboratory[4]. When fragmented skull bones are available, it can be reconstructed by approximating the fractured ends. If they belong to same skull, it will properly align. But when the edges of bone are destroyed due to natural decaying process or by animals, the approximation will be difficult.

The endocranial surface of the middle cranial fossa is grooved by the middle meningeal vessels. The groove starts at the foramen spinosum and runs forwards by dividing into frontal and parietal branches. The frontal branch runs upwards and forwards to the region of the inner surface of the pterion, where it is often converts into a canal. It then runs upwards and backwards on the inner surface of the parietal bone. The parietal branch runs backwards first on the squamous temporal and then on the parietal bone[5].

The endocranial grooves are supposed to be unique for each individual. These grooves become deeper and margins become sharper with advancing age[6]. Even if the edges of the skull pieces are destroyed, these endocranial grooves are protected from destruction. The fragmented pieces of skull can be matched by approximating the fractured ends and looking for the continuance of these grooves.

**CONCLUSION**

Identification by matching the missed fragments of bone is essential in the establishment of crime in any medicolegal investigation. Vascular grooves present on the endocranial surface are useful in matching the dismembered pieces of skull. It is therefore important that the field investigator must recover all the mutilated parts or skeletal remains that are present at the crime scene, no matter how small or seemingly insignificant they may appear to be.

**References**