Identification of Bone Skeleton in Old Well

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ABSTRACT

The purpose of forensic identification of cadavers is to identify each bone's usefulness in the identification process in addition to establishing the time and cause of death. Identification of skeletonized corpses will be difficult to assess, and pathological conditions such as broken bones and bruising of the bones are also an assessment of signs of violence in the individual. The results of the examination of the human skeleton show that one individual was identified. Meanwhile, bone is a mongoloid male, estimated to be between 20-25 years old with a bone height of 159 - 166 cm, in which bruises were found on top of the head. Post-mortem fractures were found at the tip of the distal femur and proximal tibia, and the estimated time of death is more than three months. The assessment of diatoms in the upper arm bones, which yielded a negative result, was done as a supporting investigation. Further, a sample of DNA was extracted from one of the second right ribs for analysis.

Keywords: anthropology; forensic identification; skeleton

INTRODUCTION

Identification is the determination or confirmation of the identity of an individual, living or dead, based on the characteristics possessed by such an individual. Forensic identification is an attempt to establish the identity of an individual for forensic purposes, namely for judicial process[1].

The identification of the human skeleton is very important for two reasons, legal and humanitarian. This identification aims to prove that the skeleton is that of a human, race, gender, estimated age, height, special characteristics, deformity, and, if possible, a facial reconstruction.

To determine if the individual was a victim of abuse or murder in accordance with the Criminal Code, an examination of the bones for evidence of violence will be carried out. To determine the age of the bones and estimate the time of death, dryness and bone color were used [2].

The purpose of this case is to assist police investigators in uncovering an incident of suspected murder where the victim's body was dumped into an old well that has dried up. Furthermore, the identification of the bone is necessary to the police because it will later become the subject of the next investigation process. In addition to identity, police investigators also need data on the cause of death of the victim from the individual in this case with scars on the bones due to signs of violence, which will be evidence in law.

One of the bone identifications is the determination of body length, which is measured based on the calculation of an existing formula from previous research, the physical anthropology scale. In this case, the length of the body is determined by a combination of the identification of race and

sex, in contrast to the results that are only from bone measurements without prior identification of race and sex. In addition, bone measurements are also carried out from several long bones, namely the *humeral bone, radius, ulna, femur, tibia, and Fibula*, the results of which are averaged, in contrast to results measured on only one of the bones. In this way, even when it has decomposed and even turned into a bone, it can still be used to identify an individual more precisely.

CASE PRESENTATION

The human skeleton found in an old well was examined in a dry state, and an examination was carried out that included the identification of race, age, sex, and height, then also the identification of injuries and anomalies on the skeleton. To support the identification examination, several supporting assessments were carried out.

The results of the examination of the human skeleton show that one individual was identified. Furthermore, the identification of the skeleton is a male individual evident from an examination of the surface of the skull bones, especially rough temporal, thick glabella, prominent superciliary arc, rough zygomaticus arc, wide mandibular fossa, hilly planum occipital, prominent linea temporalis. However, there is an examination that shows the characteristics of the female skeleton where the orbit is rounded, the edges are blunt, and the mastoid process appears low (female).

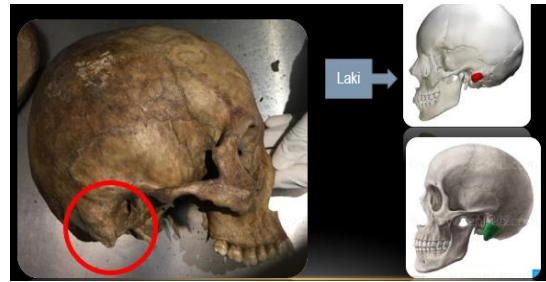Figure 1. Shows prominent superciliary arcs and thick glabella indicating male sex

Figure 2. Processus mastoids look low, characteristic of the female sex

For racial examination, the results obtained include a round brachycephalic skull, relatively high & narrow nose, dental occlusion overbite, prominent alveolar prognathism, shovel shape teeth, straight transverse palatine suture, the parabolic arch, which indicates the characteristics of the Mongoloid race but also found a carrabelle scope on 16th tooth which indicates a caucasian race

Figure 3. Parabolic arcus dental and shovel shape teeth that characterize the mongoloid race

Figure 4. *Carabelli scope* on the 6th tooth characterizes the Caucasoid race

Examination to identify age, among others, sagittal suture line is still clearly visible, rough, obliteration has not coalesced, which indicates age between 17-23, growth of 3rd molar is estimated at 17-18 years, 1st molar surface has not experienced erosion,

the degree of tooth wear (attrition) was not significant, suggesting an age group of fewer than 17 years. Furthermore, parallel occlusal surfaces indicate the age of 23, there is plication on the dorsal scapula and partial fusion of the epiphysis & diaphysis on the humeral head. According to the results of the identification examination, the age range is between 17-23 years.

Figure 6. Plication on the dorsalis scapula

When determining body length, measurement of the long bones includes the humerus, radius, ulna, femur, tibia, and fibula which are listed in the following table:

Figure 5. The occlusal surface is not parallel indicating the age of 17-23 years and the growth of the 3rd molar indicates the age of 17-18 years

Table 1. Measurement of the length of the long bones

	Right	Left
Humerus	847 + 2,6 y	805 + 2,74 y
	Y= 29,6 = 161,60 cm	Y= 30,4 = 163,79 cm
Radius	842 + 3,45 y	862 + 3,40 y
	Y= 23,7 = 165,96 cm	Y= 23,5 = 166,10 cm
Ulna	819 + 3,15 y	847 + 3,06 y
	Y= 24,7 = 159,70 cm	Y= 25,1 = 161,50 cm
Femur	897 + 1,74 y	822 + 1,90 y
	Y= 41,0 = 161 cm	Y= 40,9 = 159,91 cm
Tibia	879 + 2,12 y	847 + 2,22 y
	Y= 35,1 = 162,31 cm	Y= 34,8,0 = 161,95 cm
Fibula	867 + 2,19 y	883 + 2,14 y
	Y = 34,1 =161,37 cm	Y = 33,5 = 159,99 cm
Estimated height	159-166 cm	

In the bone abnormality, a reddish color was found which was suspected to be a bruise on the top of the head, then anatomical pathology supporting examinations was carried out, where the results concluded that it was an intragravital wound.

Further supporting examinations were performed by examining the diatomaceous bone of the upper arm, and the results were negative, then one of the right second ribs was taken for a sample of Deoxyribonucleic Acid (DNA) examination.
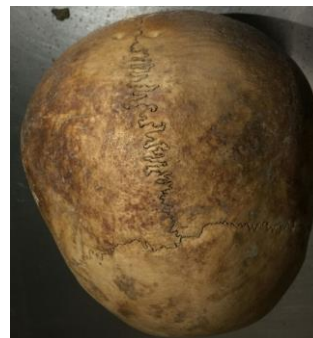

Figure 7. Redness on the top of the head

DISCUSSION

In addition to ascertaining the precise cause of death, identification is carried during the autopsy[4]. In this case, the skeletonized body was discovered in an old, 12-meter-deep well, and it is believed to have been there for at least three months. There have not been any reports of missing individuals in the neighborhood for three months.

Finding an individual requires very little effort when identifying the skeleton. Meanwhile, because the organs are no longer available, processing the cause of death is also quite challenging. A very durable and non-decaying component of the human body is the skeleton.

Four weeks after the death, the soft tissue that covered the bone starts to deteriorate and eventually disappears. The bone still exhibits connected ligaments at this point, along with a bad odor. After three months, the bones will appear yellow and after six months, they will be yellow-white, free of odor, and no longer resemble ligaments. Therefore, the bone/skeleton is one of the organs that are quite good for human identification because apart from being decayed for a long time, bones also have very prominent characteristics for identification[6].

In the bone examination, the important identification obtained is Sara, Age, Race, and Stature (SARS). There is much that can be revealed from a bone/skeletal examination and the height plays an important role in the identification process[3]. Furthermore, identification knowledge of bones plays a very important role not only when the organs of the body are only bones, but many features can be revealed from the bones/skeletons when they are still covered by muscle tissue, tendons, and skin. Among the features that can be revealed when the bones are covered with soft tissue is the measurement of the length of the long bones to measure height, the estimated age of the victim can also be carried out by looking at the epiphyseal line. This of course can be performed by measuring the bone directly in the organ or by measuring the length of the organ and seeing the epiphyseal line through radiological examination[20].

The identification of bones, as well as parts of bones that are still partially or completely covered with skin tissue as a result of mutilation, wild animal bites, or other consequences, should not be carried out with a single examination method. But with several existing identification methods as far as possible in order to obtain the greatest possible conclusion. It is advised to employ one existing method and multiple methods/measurement formulas that are present throughout the remaining tissue in order to maximize the results when determining height[14].

CONCLUSION

An examination of the body of a male with a height between 159 - 166 cm, estimated to be between the ages of 20 and 25, of the mongoloid race, revealed bruising on the victim's top of the head, however, the cause of death could not be ascertained because the body had decomposed into a skeleton. Furthermore, three months before the examination, the time of death was estimated.

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