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Identification in Skeletal Remains: A Case Report

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Abstract: ***Identification is the most important facet in any crime investigation especially in a putrified or in a skeletonized body. Here, we are presenting the identification aspect of a case of skeletonized dead body. Bones, covered in mud with no soft tissues, recovered from the crime scene (a cave in a forest covered hill) were received by our department to examine. The contents were skull with mandible, right & left scapula, right & left Humerus, right radius, right & left ulna, one metacarpal, 11 right side ribs & 12 left side ribs, 3 cervical, 4 thoracic vertebrae, Sacrum, Both sides pelvis, right & left Femur, right & left tibia and fibula and one patella. After establishing that they all belong to human being and of the same individual, all bones were examined separately with emphasis on Skull and Pelvis to establish the sex, age of the individual and any peculiarities. It was found that it belongs to a female and of age group 25 to 30 years and the information was forwarded to Police department to check for match of missing complaints. An ideal approach to narrow down the identification is Photographic superimposition of the Skull and DNA profiling with the missing women. This emphasizes that the determination of age, by external examination of bones based on their anatomical features, could only be opined in a specific age intervals but not the exact age and should not be completely relied upon rather be a supplement to Photographic superimposition and DNA profiling.***

Keywords: Iliopectineal line, chilotic line index, sacral index, Corporobasal index, Kimura's base wing index

1. Introduction

Forensic Osteology is the application of knowledge of bones for the purposes of law and administration of justice. Identification is the determination of the individuality of a person – living or dead. Partial identity is when only some aspects of the individual are determinedeg: age, sex, stature etc.

2. Case report

The department received a brown cardboard box with intact seal containing bones, covered in mud with no soft tissues with requisition from the Investigation Officer to examine the bones.

The contents were skull with mandible, right & left scapula, right & left clavicles, right & left Humerus, right radius, right & left ulna, one metacarpal, 11 right side ribs & 12 left side ribs, 3 cervical, 4 thoracic vertebrae, Sacrum, Both sides pelvis, right & left Femur, right & left tibia and fibula and one patella. They were dry with no smell but covered in mud and were washed with water and then examined. They were arranged in anatomical order. The general anatomical architecture of Skull, Pelvis, long bones and Scapula suggested that they all belong to a human being. The long bones, which are of relatively same length on either sides, and their articulations, and the relative proportionality of Skull, pelvis and Age and Sex based on Sutures closure and other anatomical factors suggested that all the bones belong to the same individual.

3. Findings & Discussion

The overall general size of the bones were smaller and less massive with processes, ridges, depressions and muscular markings less prominent. Shafts of long bones were smoother with medullary cavity relatively wider.

A. Skull: It was smaller, lighter and less massive. It had smooth architecture, Muscular ridges were less marked.
(i) Forehead was vertical and rounded.
(ii) Orbits were rounded and had sharp margins.
(iii) Supraorbital ridges were less prominent.
(iv) Smooth Glabella.
(v) Frontonasal junction was smoothly curved.
(vi) Maxilla were more compressed and lighter.
(vii) Bony ridges along upper border of external Auditory meatus were less prominent.
(viii) Frontal and parietal eminences were large.
(ix) Frontal sinuses were less developed.
(x) Maxillary sinuses were smaller.
(xi) Occipital protuberance less prominent.
(xii) Mastoid process was small in size with pointed tip.
(xiii) Digastric grooves were shallower. Occipital condyles were smaller.
(xiv) Palate was smaller and narrower with parabolic shape.
(xv) Foramina magnum was smaller with Anterio - Posterior diameter 29 mm.
(xvi) All other foramina were comparatively smaller.
(xvii) Teeth were comparatively smaller.

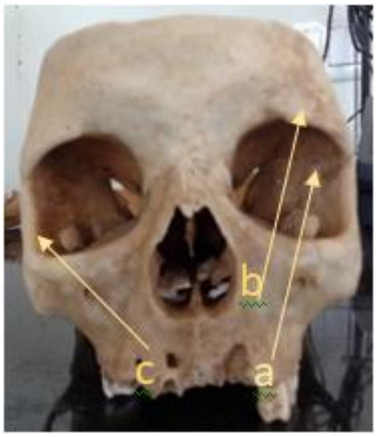

Figure 1A: a. Orbits rounded, margins sharp.
b. SupraOrbital ridges less prominent.
c. Zygoma lighter, less prominent.

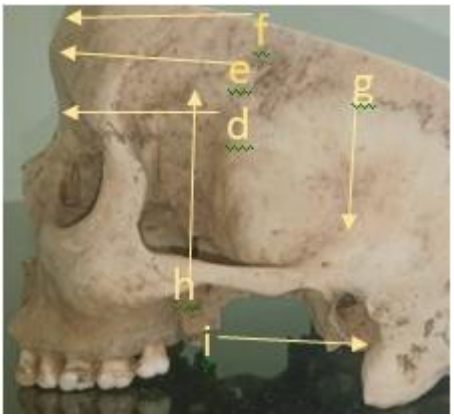

Figure 1B: d. FNjn. Smoothly curved
e. Glabella small.
f. Forehead vertical/less steep.
g. Bony Ridge - > upper EAM Less prominent
h. Muscular ridges less markedi. Mastoid small, pointed, F type.

Figure 1C: j. Parietal eminences large

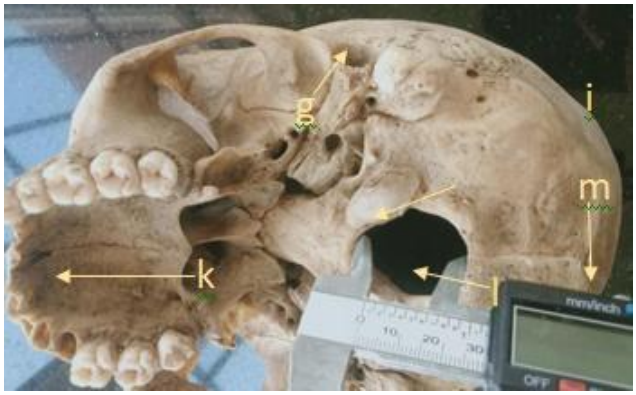

Figure 1D: k. Palate small, narrow & parabolic
l. F. Magnum small, dia: 33 mm
m. Occipital protuberance less prominent
n. Occipital condyles smaller

B. Mandible: It was smaller and thinner.
(i) Body height at Symphysismenti was larger.
(ii) Breadth of Ascending Ramii were lesser, 28 mm either sides.
(iii) Posterior border or ascending ramii doesn't show any indentation at the level of occlusal surface of the molars.
(iv) Angle of body and ramus was more obtuse.
(v) Angles inverted.
(vi) Condyles smaller.
(vii) Mental tubercle less significant.

Figure 2: o. Gonion more obtuse
p. Condyles smaller
q. Angles less everted/inverted

C. Pelvis:
(i) Bony framework was less massive.
(ii) Muscular markings less marked and smoother.
(iii) Bones were thin and light.
(iv) Iliac crest less prominent, Iliac fossa shallow.
(v) Distance between Iliac crests was 20.6 cm.
(vi) Preauricular sulcus were broad and deep.
(vii) Acetabulum diameter was 41mm, directed antero - laterally.
(viii) Obturator foramina were small and triangular.
(ix) Greater Sciatic notches were larger, wider and shallower.
(x) Average width of Greater Sciatic Notch: 45 mm.
(xi) Average depth of Greater Sciatic Notch: 26 mm.
(xii) Sciatic Notch Index: 173
(xiii) Iliopectineal lines were smooth and rounded.
(xiv) Chilotic lines: pelvic parts more prominent.
(xv) Chilotic line index: 50/56 = 91
(xvi) Body of pubis were broad, quadrangular, parturition pits absent.
(xvii) Ischiopubic index: 74/64 = 110
(xviii) Pelvic brim: circular.
(xix) Pelvic outlet: larger.
(xx) Sub pubic angle: U - shaped.

(xxi) Sacroiliac joint surface: Small, angulation L - shaped, extends to 2.5 vertebrae. .
(xxii) Sacrum: shorter and wider.
(xxiii) Curvature absent in upper half and lower half curved.
(xxiv) Sacral promontory less marked.
(xxv) Sacral index: 95/80 = 118.
(xxvi) Corporobasal index: 36/95 = 38.
(xxvii) Kimura's base wing index [Alar index]: 32/36 = 88.

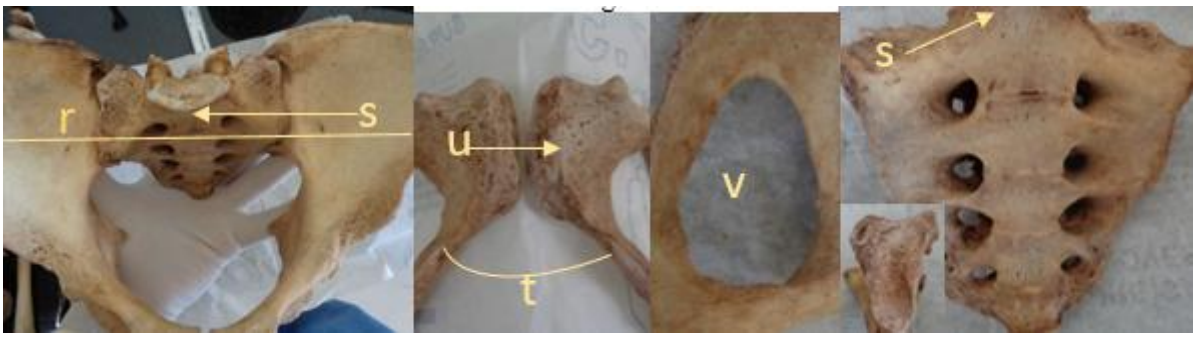

Figure 3: r. Iliac crests distance: 20.6 cm
s. Sacral promontory L. marked
t. Subpubic angle U shape, Obtuse
u. Pubis broad & quadrangular
v. Obturator F. small, triangular

D. Scapula:
(i) Height: 132 mm.
(ii) Glenoid cavity height: 31 mm.

Figure 4: Glenoid cavity height: 31 mm

E. Clavicles: Small, narrower, lighter and more curved.

F. Ribs: Thinner, shorter, of greater curvature and more oblique.

G. Humerus:
(i) Vertical head diameter: 35 mm.
(ii) Epicondylar breadth: 46 mm.

Figure 5: Head Humerus diameter: 35 mm

H. Radius: Diameter of head: 18 mm, Circumference: 52 mm.

Figure 6: Radius Head diameter: 18 mm

I. Femur:
(i) Head: Smaller, forms <2/3 of a sphere, Vertical diameter: 33 mm.
(ii) Popliteal length: 114 mm.
(iii) Bicondylar width: 63 mm.
(iv) Trochanteric oblique length: 380 mm.

Figure 7: Acetabulum small, diameter: 41 mm

Figure 8: Femur head circumference: 34 mm
Head< 2/3rd sphere
Based on all these findings, it was determined that the skeleton was of **a female**.

J. Features suggesting age:
(i) Basi - sphenoid and Basiocciput had fused.
(ii) Mental foramen: Present midway between upper and lower margins.
(iii) Condylar process elongated and projected above coronoid process.
(iv) III Molars on all 4 sides had erupted and are at the level of adjacent II molars.
(v) Endocranial sutures and Exocranial sutures had not started to obliterate yet.
(vi) Sternal ends of 4th Rib: Component I - Pit depth: 3.5 mm – Score: 2
Component II - Pit shape: V shaped with thick walls - Score: 2
Component III - Rim & Wall configurations: Definitely visible walls that
are thick and smooth with a wavy rim. – Score: 2
Total score: 6
(vii) Pubic symphysis: Face had granular surface with horizontal ridges and intervening grooves.

Based on all these findings, it was determined that it belongs to **25 to 30 years** old person.

Figure 9: Basi sphenoid &Basiocciput fused, Endocranial sutures &Exocranial sutures had not obliterated yet.
w: Sternal end of 4th rib, with pit depth: 3.5 mm, V shaped with thick walls & rim thick, slightly wavy (6)
x Symphysis Pubis end having granular surface, With horizontal ridges & intervening grooves surrounded.

4. Conclusion

It was identified partially to be of a female in the age group of 25 - 30 years. Photographic superimposition and DNA profiling were recommended to establish complete identity.

References

[1] Dr. Anil Aggrawal. Textbook of Forensic Medicine and Toxicology (2021); Avichal publishing company, 2nd edition: Part 1, Section 1, Chapter 3.
[2] KrishanVij. Textbook of Forensic Medicine and Toxicology, Principles and Practice; Elsevier, 6th edition: Pages 48 - 51.