OSTEOLOGICAL EVALUATION

Prepared by

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Product No. BC-092

Human Male Asian Skull, Calvarium Cut

Bone Clones, Inc.

OSTEOLOGICAL REPRODUCTIONS

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Human, Male, Asian, Calvarium cut

Product Number: BC-092

Specimen Evaluated: Bone Clones® replica

Skeletal Inventory: 1 intact cranium
1 intact mandible

General observations:

The general shape and configuration of the skull is within normal limits. The ectocranial morphology of the individual cranial bones is within normal limits. The sutural patterns are of expected configuration; there is a complete metopic suture. There are no sutural bones. The foramina are of expected configuration. The skull is atraumatic. There are small "button" osteomas of the right squamous portion of the temporal bone (external table), the right facial portion of the frontal bone (external table), and the mid-left parietal bone (medial to the superior temporal line; external table).

Dentition:

There are 16 teeth in the maxillary arcade and 16 teeth in the mandibular arcade. All teeth have an adult morphology and no deciduous dentition remains. The dentition is atraumatic. There are no dental restorations or prostheses. There is severe attrition.

There is generalized mild furcation involvement (periodontal disease).

Features of Race:

The interocular distance is broad. The nasal root is flat and the nasal angle is obtuse. The zygomatic bones are broad. The nasal aperture is broad superiorly and inferiorly. The anterior nasal spine is short, and the inferior margin of the nasal aperture is blunt; there is the vague impression of bilateral nasal gutters. The maxillary dental arcade has a somewhat rounded shape. There is no alveolar prognathism. The maxillary incisors are prominently shovel-shaped. There is nearly an edge-on-edge incisal bite. There is no post-bregmatic depression. The calvarial sutures are predominantly simple.

The totality of features is most in keeping with those of an Asian individual.

Features of Sex:

There is mild prominence of the cranial sites for musculofascial attachment including especially:

- the nuchal lines
- the external occipital protuberance
- the mastoid processes of the temporal bones
- the temporal lines (prominent)
- the supraorbital tori (prominent)
- the masseteric tuberosities of the mandible
- the occipital condyles
- the supramastoidal crest (prominent)

There is a broad ascending mandibular ramus. The nasion is somewhat rough (difficult assessment due to metopic suture), and the supraorbital margins are blunted. The inferior border of the mandible is square.

The totality of features is most in keeping with male sex.

Features of Age:

There are no identifiable fontanelles. The spheno-occipital synchondrosis is fused.

Ten ectocranial osteologic landmarks are evaluated for degree of suture closure according to the Meindl and Lovejoy method*.[1] Scores are assigned as follows:

1	1
2	1
3	1
4	1
5	1
6	1
7	2
8	2
9	2
10	3

* As is always the case with casting, there is a tendency towards overscoring.

The sum of scores for the cranial vault (landmarks 1 through 7) is 8. This corresponds to an estimated age of 39.4 +/- 9.1 years.

The sum of scores for the anterior cranium (landmarks 6 through 10) is 10. This corresponds to an estimated age of 51.9 +/- 12.5 years.

SUMMARY:

1. Asian.
2. Male.
3. 39.4 – 48.5 years; range 30.3 – 64.4 years.
4. No evidence of trauma.
5. Complete metopic suture.

EDUCATIONAL RESOURCES:

1. This is an excellent example of an Asian male.
    a. The concept of race assessment is controversial. It may be worthwhile to review the varying schools of thought on this issue. Short summaries from the perspective of the forensic anthropologist[2] and forensic pathologist[3] are readily available.
    b. In many circumstances, the skull alone will allow an investigator to correctly determine sex.[4] However, the findings in the skull should never been treated in isolation; rather, they should be incorporated into your 'whole case' database. This database should include information obtained from all other aspects of the case. From an osteologic perspective, this includes (importantly) the bones of the pelvis.
2. It may be appropriate to use this specimen as a discussion piece for the concept of metopism.
3. Button osteomas are small, benign proliferations of bone. Generally, they are of no clinical relevance; when very large, they may be of cosmetic concern to living patients. It may be appropriate to use this specimen as a discussion piece for osteologic differential diagnoses of bony lumps and bumps.
4. By removing the calvarium, junior osteologists are able to learn the complex anatomy of the endocranium, especially including the pathways of the various foramina of the skull base, and the orbit.

REFERENCES:

1. Meindl, R.S. and Lovejoy, C.O. (1985). Ectocranial suture closure: a revised method for the determination of skeletal age at death based on the lateral-anterior sutures. *American Journal of Physical Anthropology*, 68(1): 57-66.
2. Matshes, E. and Lew, E. (2006). Forensic osteology. In *Forensic Pathology: Principles and Practice*, D. Dolinak, E. Matshes, and E. Lew, Editors. San Diego, CA: Elsevier (Academic Press).
3. Gill, G. (1998). Craniofacial criteria in the skeletal attribution of race. In *Forensic Osteology: Advances in the Identification of Human Remains*, K. Reichs, Editor. Springfield, IL: Charles C. Thomas.
4. Krogman, W. and Iscan, M. (1986). *The Human Skeleton in Forensic Medicine*. 2 ed. Springfield, IL: Charles C. Thomas.

DISCLAIMERS:

This report is meant only as a teaching tool for introductory level students of the anatomical, anthropology or forensic sciences who might be using this specimen to learn human and forensic osteology. Evaluation of osteologic material is best done with original specimens. My evaluation was based solely upon studies of a Bone Clones® replica. My opinions are based solely upon the material presented to me. This is somewhat artificial as in real forensic investigations, additional studies would be undertaken prior to the formulation of diagnoses and the production of a report. These studies might include plain film radiography, computed tomography (CT) studies, histology, etc. My opinions regarding race and sex are based only upon non-metric analyses. Evaluation of cranial suture closure is most accurately assessed endocranially, as the sutures are known to close from the endocranial table towards the ectocranium. My opinions regarding this skull were made without access to the postcranial skeleton.

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