OSTEOLOGICAL EVALUATION

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Product No. FO-102

Human Male, Surgically Altered Radius, Ulna and Innominate

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Human, Male, surgically altered radius, ulna and innominate

PRODUCT NUMBER: FO-102

SPECIMEN EVALUATED: Bone Clones® replica

SKELETAL INVENTORY: Left radius
Left ulna
Right innominate

GENERAL OBSERVATIONS:

In general, the molding process has preserved significant details necessary for evaluation. The remains are totally skeletonized.

OSTEOLOGIC OBSERVATIONS:

All three skeletal elements are markedly dysmorphic.

The proximal shafts of both the left radius and left ulna have an expanded segment with similar irregularities. The irregularity consists of an elliptical protuberance that runs longitudinally along the shaft in a region where the shaft has more subtle irregularities on the side opposite the elliptical protuberance.

The right innominate bone has a defect along the antero-superior border of the iliac crest. The defect has a flat surface with associated bony outgrowths laterally and a separate outgrowth in the region of the anterior superior iliac spine.

The elliptical protuberances on the proximal shafts of the left radius and left ulna, where the shafts have additional, more subtle, irregularities, are consistent with surgically placed bone grafts used to buttress fractures through the bones. These fractures are at adjacent levels on the radius and ulna, and likely resulted from the same physical injury.

The flat defect on the right iliac crest represents the healing site from where a bone graft had been surgically resected for implantation on the radius and ulna.

TRAUMA:

There is no evidence of acute/recent trauma.

SEX DETERMINATION:

Pelvic morphology:

The innominate bones are somewhat rugged and have prominent sites for musculofascial attachment. The ilium is not prominent in the superoinferior plane. There is no preauricular sulcus. The greater sciatic notch is broad. The subpubic angle is acute. The pubis is not significantly widened. There is no ventral arc. There is no subpubic concavity. The ischiopubic ramus is somewhat thick and its medial aspect is broad and flat. The obturator foramen is large and somewhat ovoid.

The sacrum is tall, narrow, and not prominently curved (in the anteroposterior plane).

The totality of pelvic features is most in keeping with male sex.[1-4]

AGE DETERMINATION:

Todd Pubic Symphysis Scoring System:

Degenerative features on the pubic symphyseal surface are in keeping with Todd phase 10. This suggests that the individual was older than 50 years at the time of death.[5, 6]

Suchey-Brooks Pubic Symphyseal Phase:

Degenerative features on the pubic symphyseal surface are in keeping with a Suchey-Brooks phase VI. This suggests that the individual was 61.2 years +/- 12.2 years (95% confidence interval 34 – 86 years) at the time of death.[7]

The totality of features is most in keeping with an adult older than 50 years.

DETERMINATION OF STATURE:

Measurements were taken from RIGHT-sided elements.

Radius 21.1 cm
Estimated height = 158 cm +/- 4.32

Ulna 23.3 cm
Estimated height = 160 cm +/- 4.32

The totality of data produced by regression equation calculations suggests that the individual stood between 154 cm and 164 cm tall.[5]

SUMMARY:

1. Male.

2. Older than 50 years.

3. 154 to 164 cm .

4. Unique identifying features:
   Remote (healed) fractures of the radius and ulna, and linear derangement of the anterosuperior right innominate. These features are compatible with remote surgical repair of radioulnar fractures with bone grafting from the ilium.

EDUCATIONAL RESOURCES:

1. This is an excellent example of prior orthopedic surgical intervention in an older white male.
2. Age assessment of skeletal remains is best done in the context of the entire skeleton. Integration of data from a broad set of studies is optimal. Investigators should offer the age range most safely suggested by the totality of studies. Students must be cautioned that statistical data is based on **populations**, and may not necessarily be reflective of reality in an **individual**.
3. Assessment of sex is best done through an evaluation of all available skeletal elements. That said, the pelvis is the most reliably sexually dimorphic element. Although not covered in this short report, many other bones (including, especially, some of the long bones) can be used with some degree of reliability to determine sex. Many resources exist to assist students with such endeavors.[8]
4. Stature determination is best done with evaluation of as many long bones as possible. A stature determination based on only one bone (for example, the radius) should be considered as a loose guide only. If an investigator must (for some obscure academic purpose) limit their evaluation of stature to only one bone, this investigator should always choose an intact femur.

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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.

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