

Osteological analysis of human skeletal remains from Happyland 241 KT

Report prepared for:

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October 2008

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1: INTRODUCTION

Fragmented skeletal human remains were excavated at the site Happyland 241 KT. The remains comprise two juveniles and an adult. Information regarding the burial contexts and events leading to discovery of the site is with the contracted archaeologist (Archaetnos CC). The purpose of the analysis was to determine two basic demographic elements of age and sex of each individual. In addition, there was determination of stature, assessment of dental and bone pathology and trauma.

The remains were cleaned with water and skeletal parts were reconstructed with hot melt non-permanent glue prior to analysis. Skeletal inventories were recorded to indicate the degree of preservation and/or damage to the remains. Age and sex were determined from morphological characteristics of the skeletons. All skeletal elements are fragmented and could not be measured. Calculation of stature could not be made on any of the individuals because bones needed were fragmented and incomplete. Teeth and bones present were evaluated for lesions resulting from pathology and trauma.

The burials comprise two juveniles and an adult. Burial 2 has small cribra orbitalis lesions associated with iron deficiency anemia or infection. There was no evidence for bone pathology on Burial 1. Burial 3 is represented by an incomplete mandible only and hence its pathological condition remains unknown. Teeth of the juveniles and the adult were in fairly good health as indicated by minor carious lesion and dental wear.

2: METHODS

1. Skeletal Inventory

For each individual, an inventory indicating all skeletal elements present and their state of preservation were recorded using standard already published in the literature (Brothwell 1981; Buikstra & Ubelaker 1994; Moore-Jansen *et al.* 1994; Brickley & McKinley 2004). The inventory was divided in to skull, long bones, flat bones, small bones, irregular bones ribs and vertebrae. Scoring system used in this report was adopted and modified from Moore-Jansen *et al.* (1994) Buikstra and Ubelaker (1994) and Brickley and McKinley (2004). Specific bones from each category were scored between 1 (present complete) and 6 (congenitally missing).

Dental inventories were also recorded using standards modified from Buikstra & Ubelaker (1994), Moore-Jansen *et al.* (1994) and Connell (2004). Teeth preservation was described as 0 (not developed at the time of death) and 5 (lost postmortem). Overall state of preservation of the entire skeleton was based on the general information obtained from the inventory.

2. Age Estimation

The literature provided endless volumes on techniques established to estimate age from human skeletal materials. Applicability of each technique depends on age and the presence of skeletal elements to be examined. In this section, brief descriptions of age determining methods only applied to the Happyland 241 KT human remains are made.

A combination of deciduous and permanent teeth was used to estimate the age of the individuals. In brief, the method is based on the development and eruption of teeth at known intervals (Ubelaker 1989; Scheuer & Black 2000). Eruption of deciduous teeth start with mandibular central incisors at the age of six months and by the age of three years, all deciduous teeth are in occlusion. At around six year, permanent first molars erupt and are shortly followed by the eruption on maxillary central incisors. The sequence of permanent teeth eruption ends with third molars around 15-18years old (Ubelaker 1989).

The degree of dental wear of permanent teeth may also shed light into the approximate age of the individual (Loth and İşcan 2000a). Dental wear is not an accurate technique but it is nevertheless, helpful in cases where preservation discriminates against the use of other skeletal parts.

In addition to dental eruption, fusions of major joints were examined where possible. The predicted sequence of epiphyseal closure starts with the elbow at 12 years and proceeds with the hip, ankle, knee, wrist and shoulder at one- year intervals (Scheuer & Black 2000; Loth & İşcan 2000a; Sauer & Lackey 2000).

3. Sex determination

In order to determine sex from human skeletal remains, it is required that sexually dimorphic features be present and well preserved (Krogman & İşcan 1989; Loth & İşcan 2000b). Unfortunately, preservation of two of the Happyland 241 KT skeletons did not favour known sexually dimorphic elements. Sex was determined for Burial 1 only using morphological characteristics of the mandibular corpus (Loth & İşcan 2000b).

4. Stature estimation

Lengths of long bones provide best and most accurate estimates of stature on human skeletal (Lundy & Feldesman 1987; Sjøvold 2000). Bones have to be completed and not fragmented prior to being measured. Unfortunately, no complete and not fragmented long bones were recovered among the three individuals. Therefore, in all cases stature could not be estimated.

5. Dental and bone pathology and trauma

Teeth and bones were observed to identify any lesions associated with pathology and trauma as described in numerous texts (e.g. Ortner & Putschar 1981; Buikstra & Ubelaker 1994; Aufderheide & Rodriguez-Martin 1998; Steyn & İşcan 2000; Roberts & Connell 2004). Dental and bone lesion were identified as definite abnormalities on affected areas. Where possible, differential diagnosis was made.

3. MATERIALS

Burial 1

Preservation

The skeleton is poorly preserved. Reconstruction of the skullcap was made from numerous fragments (Figure 1a) and an incomplete mandible represents the facial skeleton only. The postcranial skeleton is fragmented and incomplete. Fragments of humerii, a radius, femur and tibia are present. There are no flat bones and vertebrae. Very small fragments of ribs, incomplete hands and feet bones were identified.

Age

Age of this individual was estimated from teeth and long bone fusion. On the mandible, all teeth between the canines and the second molars were in occlusion but third molars had not erupted. The dental development is consistent with an age of 12 - 14 years. The distal ends of the humerii (elbow) and the proximal end of the femur (hip) were not fused.

Sex

The mandibular corpus of the individual is angular in shape (Figure 1c). The angular shape is associated with males (Loth & İşcan 2000b).

Dental and bone pathology and trauma

The individual identified as Burial 1 had undergone removal of all mandibular incisors prior to death. By the time of death, the dental sockets had healed and closed (see Figure 1c). Removal of anterior teeth is fairly common as a form of beauty among Iron Age communities of southern Africa.



Figure 1a: Superior view of the skull of Burial 1



Figure 1b: Mandibular morphology of Burial 1



Figure 1c: Burial 1 mandible showing ante mortem removal of incisors

Burial 2

Preservation

The skull of this individual was fragmented and incomplete. The skullcap is partially complete and there are no facial bones besides an incomplete mandible (Figure 2a). The postcranial skeleton is also incomplete. Long bones are fragmented and partially complete. There are no vertebrae and ribs. Hands and feet phalanges are few.

Age

The age of Burial 2 was estimated from a combination of deciduous and permanent teeth. At the time of death, deciduous canines and molars were in occlusion. Permanent incisors and first molars were also in occlusion. Dental development in this case shows an age estimate of 6 to 8 years old.

Sex

The sex of this individual could not be determined from the fragmented mandible present (Loth & İşcan 2000b).

Dental and bone pathology and trauma

There are small lesions on orbital roofs commonly known as cribra orbitalia (Figure 2b). The lesions are non-specific makers of stress. They can be caused by dietary iron deficiency or by bacterial infection (Ortner & Putschar 1981; Buikstra & Ubelaker 1994; Aufderheide & Rodriguez-Martin 1998; Steyn & İşcan 2000; Roberts & Connell 2004).



Figure 2a: Mandible of Burial 2

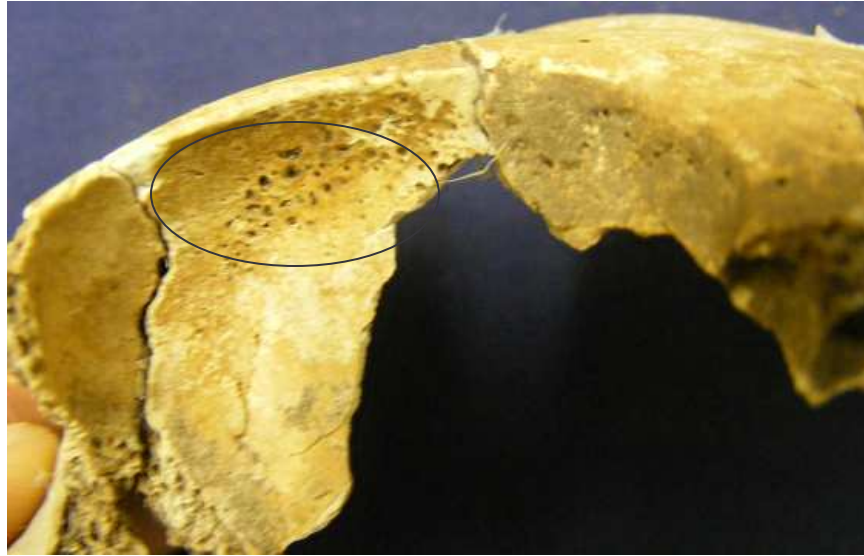


Figure 2b: Cribra orbitalia on Burial 2

Burial 3

A small fragment of what appears to be an adult mandible was found in the package of Burial 1 (Figure 3). Another fragment, possibly from the same individual was in the package containing remains of Burial 2. In both cases, there fragments of teeth were at advanced stages of dental wear. Since only a mandibular fragment was identified, it was not possible to determine age, sex, stature and pathology.



Figure 3. Mandibular fragment of Burial 3

4. CONCLUSION

Three human skeletal remains from Happyland 241 KT analysed. The analysis included estimation of age and sex as well as pathology. Bones appear to have been under good preservation within the burial context (Brothwell 1981) but were fragmented and possibly lost during recovery. Some of the fractures were clean, an indication of breakage around the time of recovery. Attempts were made to reconstruct various bones as much as possible to have better judgment of the remains in general.

The burials comprise two juveniles aged 13 ± 1 and 6 ± 1 years old as well as an adult whose age could not be estimated. Sex was determined for one individual only. No measurements of the cranial and postcranial skeletons were possible since the remains were fragmented.

Small cribra orbitalia lesions were identified on Burial 2. Other individuals (including Burial 2) are fragmented and incomplete and it is possible that some skeletal parts with evidence for pathology and/or trauma were lost postmortem.

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