

HUMAN SKELETON REMAINS, ST CROSS COLLEGE, OXFORD (OXSC14)

by Alice Rose (20.04.15)

Introduction

The following report details the specialist osteological analysis of a single adult human skeleton (1139), recovered during archaeological excavations at St Cross College, Oxford. The skeleton was recovered from an isolated grave cut. An associated coin found by the left shoulder dates from the 16th-17th century. Another coin was found during processing of the environmental samples from the grave. The skeleton was orientated East-West (head at the West end of the grave cut) and was lying with their legs flexed, their knees to the South, their arms flexed and their hands over their chest. Copper pins, found around the skeleton, suggest the individual had been wrapped in some kind of cloth shroud.

Methodology

Analysis of the skeleton was undertaken in accordance with published guidelines (Brickley and McKinley 2004). The preservation of the skeleton was recorded with reference to completeness (scored as: <25%, 26-50%, 51-75% or 76-100%), degree of fragmentation (scored as: low - <25% fragmented; medium – 25-75% fragmented; or high: >75% fragmented) and degree of surface erosion (after McKinley 2004, 16).

The sex of the skeleton was estimated based on observations of the sexually dimorphic traits of the skull and pelvis (Bass 1987; Buikstra and Ubelaker 1994) and was recorded as either possible female (??F), possible male (??M), probable female (?F), probable male (?M), female (F) or male (M), depending on the level of confidence with which sex could be estimated.

The age of the skeleton was estimated based on observations of late-fusing epiphyses (Scheuer and Black 2000), on the level of dental attrition (Brothwell 1981, Miles 1962) and on the morphological changes of the auricular surface (Lovejoy *et al.* 1985; Buckberry and Chamberlain 2002) of the pubic symphysis (Brooks and Suchey 1990) and of the sternal rib ends (İşcan and Roth 1993).

Intact, complete bones were measured using an osteometric board and calipers. Stature was estimated using a complete long bone length and applying it to the appropriate regression formula (Trotter and Gleser 1952; 1958; Trotter 1970).

Bones were macroscopically assessed for non-metric traits and evidence of pathology. Non-metric traits were scored as present or absent (Berry and Berry 1967; Finnegan 1978). Skeletal pathology was identified, described and diagnosed with reference to standard texts (for example, Aufderheide and Rodríguez-Martín 1998; Ortner 2003).

Results

A summary of the osteological findings is presented in Table 1.

Skeleton 1139 was 75-100% complete. Almost all elements were present, with the exception of a few distal hand and foot phalanges, giving an overall completeness estimation of almost 100%. Fragmentation was low, meaning less than 25% of the bones present were fragmented. There was only slight, patchy surface erosion on the bones, consistent with McKinley's (2004: 16) grade 1.

All features of the skull, mandible and pelvis were observable for sex estimation and all exhibited morphology consistent with a female. All features of the skull, ribs and pelvis were observable for age estimation and indicated a young adult aged 18-23yrs. Unfused and fusing epiphyses were observed (e.g. medial and lateral clavicles, iliac crest and sternal rib heads), which provided a narrow age estimation.

The skeleton appeared to be very gracile. Based on the maximum length of the complete left femur, stature was estimated to be 1.61m (+/- 3.27cms), approximately 5ft 3ins.

Several cranial and post cranial non metric traits were observed in the skeleton. These may be genetically or environmentally induced (Mays 1998, 110; Tyrrell 2000) and are not of pathological significance.

30 tooth sockets and 29 adult teeth were present for analysis. Three mandibular molars had been lost ante-mortem and the alveolus was largely remodelled, indicating that the teeth were probably lost more than approximately 12 months before death. 17 teeth had dental calculus, which was most severe on

the right posterior maxillary and mandibular teeth. This was probably due to ante-mortem tooth loss and a severe carious lesion seen in the right mandibular 2nd molar, causing the individual to change the way they chewed their food. Other, smaller, carious lesions were also seen in the left mandibular 3rd molar and the left maxillary 1st molar. The ante-mortem tooth loss was probably also caused by caries. Two tooth sockets exhibited mild periodontitis (grade 2) (after Ogden 2008, 293).

The rest of skeleton 1139 displayed very little pathology. There was no evidence of metabolic disease, specific infection or trauma, but congenital conditions, non-specific inflammation and Schmorl's nodes were present. Congenital conditions included evidence for border shifting in the spine, in the form of a cranial shift at the thoracolumbar border (where the transitional facets move to the eleventh thoracic vertebrae) and a cranial shift at the lumbosacral border (assimilation of the fifth lumbar vertebrae into the sacrum) (Barnes 1994: 104-108). This had resulted in 11 thoracic vertebrae (instead of the usual 12), the usual 5 lumbar vertebrae and 6 sacral vertebrae (instead of the usual 5). Border shifting is not rare and is probably due to a delay in vertebral development in utero (Barnes 1994: 79). It is likely that the border shifting in skeleton 1139 was asymptomatic.

Another congenital condition was observed on a first sacral vertebra, which had a cleft neural arch, meaning that the arch had failed to fuse completely. One or two cleft neural arches involving the lowest vertebrae of the spine can be indicative of a very minor form of spina bifida occulta (Barnes 1994, 49). Minor spina bifida occulta does not have associated abnormalities of the spinal cord or nerve roots (as is seen in more severe cases) and is usually asymptomatic. For these reasons it is considered to be clinically insignificant in living populations (ibid.). However, the cleft seen in skeleton 1139 is very minor and technically affects the sacralised LV5 rather than SV1, therefore this defect is likely to simply be a small, asymptomatic developmental defect that is not attributable to spina bifida occulta.

Very slight, inactive porosity was observed on the endocranial surface of the frontal bone in the skull, focussed around the frontal crest. This appeared to be the result of a period of minor non-specific bone inflammation (of unknown cause), which had subsequently healed (Lewis 2004: 13). In addition, inflammation (spicules of dense new bone) was observed in the left and right maxillary sinuses, consistent with maxillary sinusitis (Aufderheide and Rodríguez-Martín 1998:257). Maxillary sinusitis can result from dental disease, poor ventilation, air pollution or allergies (Lewis *et al.* 1995). Two small pieces of ossified material were recovered from a sample taken around the upper body. They lacked a distinct morphology, but they may be ossified soft tissue from the pleura.

Very shallow Schmorl's nodes were observed in the thoracic and lumbar spine. These are defects in the vertebral end plates caused by intervertebral disc herniation (Rogers and Waldron 1995:27). In adults, Schmorl's nodes are usually an age-related occurrence due to gradual deterioration of the intervertebral discs, but they may also occur as a result of an injury, such as a jump or fall from height (Lovell 1997, 159). Schmorl's nodes in adolescence are more likely to relate to activity or trauma (Jurmain 1999, 165).

Discussion and conclusions

The isolated burial from St Cross College appears to be somewhat of an anomaly in an otherwise fairly uneventful excavation of college grounds. There was no evidence of any other burials in the excavation area. The skeleton displayed very little evidence for pathology and the lesions that were observed do not suggest any reasons as to why this female had died in young adulthood and had been buried in the college. The coins buried with the skeleton suggest that the individual may have come from a wealthy background. The position of the skeleton was quite unusual (flexed arms and legs, laid to the side of the grave cut), at first this appears to contradict the evidence for a shroud, as these were usually tightly wrapped around the body, binding the arms and legs in an extended position. The position may be explained by presence of *rigor mortis* when attempting to bury the individual, although this usually dissipates 24-48hrs after death (Klepinger 2006: 117).

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Table 1: Skeleton 1139 osteological summary (Key: L=left; R=right; PO=porosity)

Completeness	75 - 100%
Surface condition	Grade 1
Fragmentation	Low
Sex estimation	Female
Age estimation	Young adult, 18–23 yrs
Stature	161.30cm (+/- 3.27cm)
Non-metric traits	<i>Cranial:</i> Lambdoid ossicles, coronal ossicles, L parietal foramen, absent zygomatical facial foramen, supraorbital foramina, L accessory supraorbital foramen <i>Post-cranial:</i> Allen's fossa on L+R femur, calcaneus double anterior facet, calcaneus peroneal tubercles, R talus os trigonum
Dental pathology	Calculus, caries, periodontitis, ante-mortem tooth loss
Other pathology	<i>Congenital/developmental:</i> vertebral border shift with lumbarisation and sacralisation, cleft neural arch 1 st sacral vertebra <i>Inflammation/infection:</i> L+R maxillary sinusitis, PO on endocranial frontal bone <i>Spinal joint disease:</i> Schmorl's nodes