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Case Study

Biological and social implications of a medieval burial from Cyprus for understanding leprosy in the past☆

Brenda J. Baker*, Katelyn L. Bolhofner

School of Human Evolution and Social Change, Arizona State University, Tempe, AZ 85287-2402, USA

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ABSTRACT

An early 15th-century burial from a basilica at Polis Chrysochous provides the first archaeological evidence of leprosy in Cyprus, extending the temporal depth and illuminating the biological and social history of this disease on the island. The skeletal remains of a young adult female (age 20–34 years) display pathognomonic features of lepromatous leprosy including maxillary alveolar resorption with antemortem loss of all but one incisor, remodeling of the margin of the nasal sill and resorption of the anterior nasal spine, with diaphyseal remodeling of hand and foot phalanges and the distal third through fifth metatarsals of both feet. Periosteal reaction on distal tibiae and the majority of both fibulae demonstrates tracking of inflammation from the feet to lower legs. Use wear on the remaining maxillary incisor signals participation in common occupational activities in life. Although disfigured and debilitated, burial inside the narthex of the basilica indicates that the community did not ostracize this woman in death. This contextualized analysis provides insight into the biological and social consequences of living with leprosy and illustrates the changing attitudes toward those afflicted with this disease in Cyprus.

1. Introduction

Skeletal evidence for leprosy is found throughout the Mediterranean region by the beginning of the first millennium AD (e.g., Dzierżykray-Rogalski, 1978, 1980; Molto, 2002; Rubini et al., 2012; Zias, 2002), yet it has not been reported previously in Cyprus, an island that has long been a crossroads in the eastern Mediterranean. Until recently, little bioarchaeological research has been conducted in Cyprus, and it tends to be hampered by poor preservation, commingling, and lack of information on archaeological context (Harper and Fox, 2008). Analysis of human remains from Polis, on the northwest coast (Fig. 1), is producing considerable insight into life in medieval Cyprus (Baker and Papalexandrou, 2012; Baker et al., 2012). Here, severe pathology in the skeleton of an individual buried within a medieval basilica at Polis and a differential diagnosis are presented. Osseous manifestations are linked with clinical information to reconstruct the biological consequences of the disease progression. Contextualization of this individual's disease experience and treatment in death illuminates social perceptions of illness and debility, especially relating to leprosy, within this community.

2. Burial context

Polis Chrysochous, or "City of Gold," has been the focus of Princeton University's Archaeological Expedition since 1983 (Childs, 2008; Childs et al., 2012). More than 300 burials excavated between 1983 and 2007 are associated with basilicas in the E.F2 and E.G0 project areas (Fig. 1; an interactive map can be found in the online version at doi:10.1016/j.ijpp.2013.08.006), which date from the late 5th or early 6th century AD. After a hiatus, the E.G0 basilica was reused from the 13th through 16th centuries. Unit E.G0:c13, excavated in 2000, included part of the narthex (entry vestibule) and an area outside the basilica's west end. Burial 11 was located just inside the narthex (Fig. 1). The sole, overexposed excavation photo shows a typical Christian burial. The body was in a supine and extended position with head to the west and feet to the east. Forearms were placed across the abdomen with legs crossed left over right at the ankles. Field notes indicate a "pot handle" was on the chest and a coin was recovered from screening. This coin, identified by Christopher Moss (Princeton University), was minted in Cyprus during the reign of Janus, King of Cyprus, Jerusalem, and Armenia (1398–1432), providing a secure *terminus post quem* for the interment and placing it within the Lusignan period (1191–1489) of Frankish rule.

3. Methods

All skeletal remains are housed in the Princeton University storage facility in Polis. Field records were consulted to ensure all

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* Corresponding author. Tel.: +1 480 965 2087; fax: +1 480 965 7671.
E-mail addresses: BrendaJ.Baker@asu.edu (B.J. Baker), Katelyn.Bolhofner@asu.edu (K.L. Bolhofner).

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Fig. 1. GoogleEarth images of Cyprus (inset) and excavation areas in Polis: 1. Polis Chrysochous, Cyprus, 2. E.F2 Basilica, 3. E.G0 Basilica, 4. Burial 11 location in E.G0 basilica narthex.

bones associated with this individual were included in analysis. Because burial/tomb numbers typically were designated after a skeleton was encountered, elements initially uncovered often had a different level and pass (stratigraphic designations assigned by the excavator) than the rest of the grave. Accordingly, a portion of the Burial 11 cranium and some hand bones were found in a separate bag in the miscellaneous material for the unit. Fragments of occipital and maxilla were cross-matched to ensure that these pieces were from the same individual. Skeletal remains were cleaned by brushing dry or with limited amounts of water. Several bones were reconstructed to the extent possible using Paraloid B-72.

4. Results

The skeleton is friable but fairly well preserved compared to many others from the E.G0 basilica (Fig. 2).

4.1. Sex and age

Presence of a subpubic concavity (Phenice, 1969) and gracile cranial features (Buikstra and Ubelaker, 1994) indicate a female. Billowing with commencement of the ventral rampart on pubic symphyses correspond to Suchey-Brooks Phase 2, age 19–40 (mean = 25; Brooks and Suchey, 1990) and Hartnett (2007, 2010) Group 2, age 20–25 (mean = 23.2). Marked transverse organization with slight lipping at the posteroinferior aspect of the auricular surfaces places age at death between 20 and 34 years (Lovejoy et al., 1985).

4.2. Skeletal pathology

4.2.1. Rhinomaxillary region

Nasal bones and intranasal elements are absent. The alveolar process and nasal sill of the left maxilla are preserved from the midline to second molar, while the right side extends from midline to premolar region (Fig. 3). The area of the anterior nasal spine is slightly damaged postmortem, but the extensive exposure of cancellous bone indicates it was mostly resorbed. Resorption and rounding of the left nasal margin are evident, but postmortem damage to the right side precludes definitive observation. Extensive alveolar resorption is apparent in the maxillary incisor area with small areas of porosity on the remnants of the rugose oral surface of the palatine process (Fig. 4). The nasal surface shows vascular impressions and a lytic lesion with rounded edges on the posterior aspect of the right side (Fig. 5).

The maxillary left central incisor and both lateral incisors were lost antemortem. The extant right central incisor (Fig. 6) displays a narrow groove on the distal incisal edge. Two linear enamel hypoplasias are present on this tooth, with another observed on the mandibular right canine. The maxillary first molars and left canine display caries. Severe calculus on the mandibular incisors suggests loss of occlusion well before death (Fig. 6).

4.2.2. Hands

All extant carpals (all but the scaphoid on the right, and the left scaphoid and triquetral) and metacarpals are damaged postmortem (Fig. 2). The left scaphoid and right lunate and triquetral show small round to oval lesions (Fig. 7), with the largest on the distal side of the scaphoid tubercle measuring 3.90 mm. Smaller vascular openings occur on the palmar surfaces of the right lunate and triquetral (adjacent to the pisiform facet). Metacarpals are unaffected (Fig. 7). The sole proximal phalanx present is tapered distally and a break at the distal end reveals a constricted medullary canal.

4.2.3. Feet

All tarsals, excluding the right second and third cuneiforms, and all metatarsals are present, along with one distal and five proximal phalanges (Fig. 8). The left second cuneiform shows irregular bone apposition on the dorsal aspect. Diaphyseal remodeling of metatarsals includes concentric and “knife-edge” processes (Andersen et al., 1992) that is most severe on the narrowed shafts of the right third through fifth metatarsals, with “penciling” of the fourth and fifth. The right third metatarsal head is constricted at the neck with the head partially resorbed in a “knife-edge” fashion