



Vertebral infection in a male individual buried in the monastic cemetery (Cemetery 2) at Ghazali (ca. 670–1270 CE), northern Sudan

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ABSTRACT

Purpose/research question: This article examines pronounced osteoblastic-osteolytic vertebral lesions in a middle adult male (Ghz-2-033), from the Christian Nubian monastic settlement of Ghazali (ca. 670–1270 CE), Sudan, to explore their potential etiology.

Methods: Morphological assessments of sex and age were undertaken in conjunction with macroscopic and radiological methods of assessment for the skeletal lesions documented.

Results: Macroscopic assessment of Ghz-2-033 identified mixed osteoblastic-osteolytic lesions in L2–L3 with minor foci in T12–L1, while radiological assessment identified no further lesions. This paleopathological analysis considers tuberculosis, brucellosis, pyogenic intervertebral disc infection, neoplastic conditions, and mycotic infections as potential etiologies.

Conclusions: Tuberculosis is the most probable etiology for the lesions observed. This assessment is based on the morphology of the lesions in conjunction with the known confined living quarters at Ghazali and the presence of tuberculosis vectors (i.e. cattle) in the region.

Contributions to knowledge/originality/value: This brief communication contributes original data documenting the presence of tubercular lesions in a monk buried at the Christian Nubian monastery of Ghazali. On a broader level this study contributes to regional and temporal paleopathological dialogues regarding interactions with pathogens in Christian Nubian monastic contexts.

Limitations for this study: The potentiality of co-infection with other pathogens (e.g. brucellosis, *Staphylococcus*) with similar macromorphological traits in skeletal remains cannot be entirely discounted.

Suggestions for further research: The use of biomolecular analyses may help to clarify the potential presence of tuberculosis in individual Ghz-2-033.

1. Introduction

The monastic settlement of Ghazali (ca. 670–1270 CE) is located at the entrance to Wadi Abu Dom (18° 26' N, 31° 56' E) in Sudan (Fig. 1) (Jeuté, 1994). Ghazali was initially excavated in the 1950s (Shinnie and Chittick, 1961) and subsequently, beginning in 2012, by the Polish Centre of Mediterranean Archaeology (Obłuski, 2014; Obłuski et al., 2015). Part of the medieval Kingdom of Makuria (ca. 6th–14th c. CE), an unknown number of lay individuals and 18–36 monks resided at Ghazali at any one time, many of whom were buried there (Scanlon, 1972; Anderson, 1996, 1999; Godlewski, 2014; Obłuski and Korzeniowska, 2018). In 2015 an individual (Ghz-2-033) exhibiting mixed osteolytic-osteoblastic vertebral lesions was identified within the monastic cemetery (Cemetery 2). This brief communication contributes

original paleopathological data that may be useful towards developing broader characterizations of encounters with pathogens in Nubian monastic communities.

2. Materials and methods

2.1. Burial of Ghz-2-033

Ghz-2-033 was interred south of the Ghazali monastery in Cemetery 2 (Fig. 2). Of the 66 individuals excavated from Cemetery 2, 64 are male and two indeterminate, providing strong evidence that Cemetery 2 was the monastic burial ground (Ciesielska et al., 2018). A low-lying mudbrick pavement (type FF02c1 of Borcowski and Welsby, 2012) marked the grave and a peaked mudbrick vault covered the supine body

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Fig. 1. Location of Ghazali in the Wadi Abu Dom of Sudan. Inset image shows the area depicted (in rectangle) in relation to the surrounding region (Map generated from ESRI Imagery by Robert Stark on 10/11/2017 using Scholars GeoPortal, <http://geo1.scholarsportal.info>).

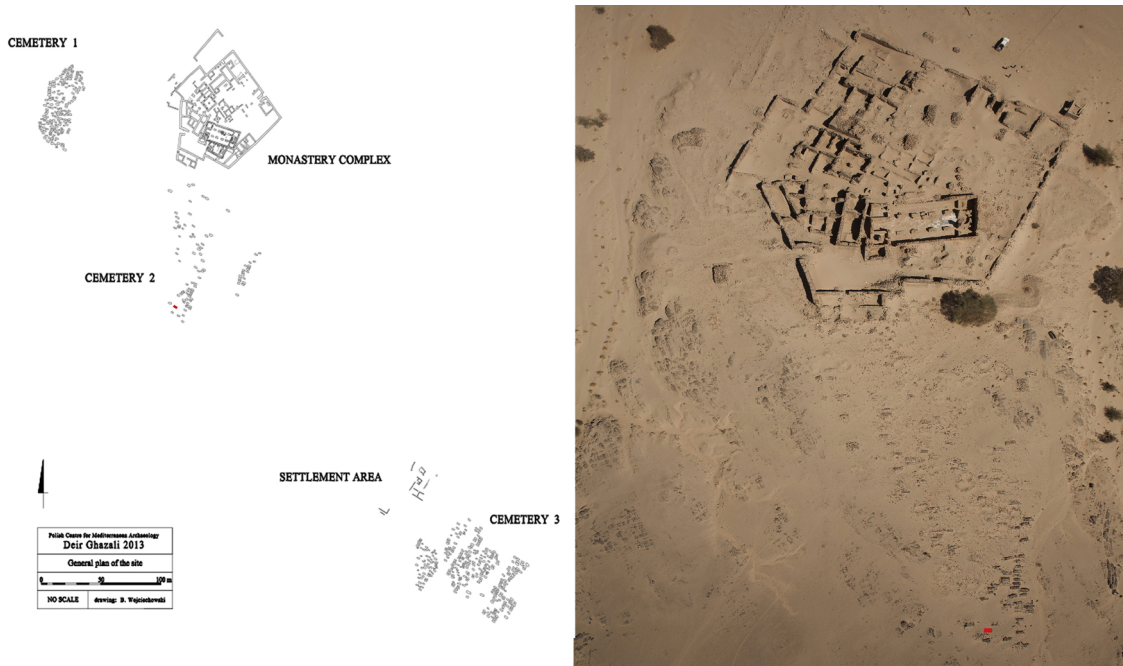


Fig. 2. Line drawing (left) and kite photograph (right) of the monastic complex, lay settlement area, and associated cemeteries at Ghazali. The location of the burial of individual Ghz-2-033 in Cemetery 2 is shown in red. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

(Fig. 3). With the head to the north-west and having no grave goods, the burial of Ghz-2-033 is typical of Christian Nubia (Adams, 1998; Baker, 2014).

2.2. Methods of observation

Skeletal lesions were primarily assessed using macromorphological

examination. Ancillary plain film radiography to examine for lesions within the vertebrae was undertaken using a Toshiba Rotanode Model E7329 at Karima-Hospital, Sudan.

2.3. Preservation, sexing, ageing, and curation of Ghz-2-033

Aside from skeletal remains (Fig. 4), Ghz-2-033 had fragments of

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