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Partially mummified remains of a 3rd century AD individual from the Eastern Desert in Egypt: a paleopathological case study

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ABSTRACT Our study deals with the partially mummified remains of an adult individual recovered in the Eastern Desert of Egypt in 2007, during the excavations of the Roman *praesidium* of Dios. The grave was discovered in the rubbish dump of the fortification. Several elements of the lower limb are mummified. However, the lack of mummification or more precisely the partial state of mummification of some parts enables the direct observation of the bones and the identification of several paleopathological conditions. Among others, dental pathologies and associated maxillary infection, severe osteoarthritis and a very advanced stage, OPLL-associated DISH (Resnick et al. 1978) have been identified.

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KEY WORDS

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In 2007, partially mummified remains of an adult individual were recovered in the Eastern Desert in Egypt, during the excavation of the Roman *praesidium* of Dios. The fort belonged to a series of small fortifications built by the Romans along the road from Koptos to Berenice (Fig. 1). The excavation of this fort (Fig. 2) is included in a large archeological program with duration of several years (Cuvigny 2003, 2008). To the surprise of all members of the archaeological excavation, a grave was discovered in the rubbish dump of the *praesidium* (Fig. 3). The human remains were not simply 'scrapped' to the dump: the body has been wrapped in a pitched shroud, presumably to prevent decomposition, and a trench had been dug in the garbage on purpose to lay the body into it (Fig. 4).

As no anthropologist was present at the excavation in 2007, the remains were reburied, and re-excavated for further investigations in 2009.

Material and Methods

The subject of the current case study is the re-excavated human skeleton. Several elements of the lower limb are mummified (Fig. 5). Remains of the hair and the beard had been in a better state during the first excavation, but the reburial and the second excavation damaged the mummified parts.

The anthropological study of the material was carried out in 'quasi *in situ*' conditions at the Dios archaeological site. To estimate sex, age at death and height, we used accepted anthropological methods (e.g. Workshop of EAA, 1980; Rösing

1988; Ubelaker 1989). The identification of paleopathological conditions was performed using macromorphological observations and the classical paleopathological and medical literature (e.g. Ortner and Putschar 1985; Resnick and Niwayama 1988; Rogers and Waldron 1995; Ortner 2003). Because of the special conditions of this 'field paleopathological' analysis, there was no possibility to support the diagnosis of the observed lesions with specific laboratory investigations (e.g. medical imaging or molecular techniques).

Results and Discussion

Our preliminary anthropological and paleopathological study deals with the partially mummified remains of this approx. 160 cm tall male, who died in his sixties. The skeletal material is well preserved and quite complete (Fig. 6). The lack or the partial state of mummification of some body parts enabled direct observation of the bones and the identification of several paleopathological conditions. Traces of periapical abscesses, periodontitis, sinusitis and periostitis were observed on the maxillae, indicating very poor dental hygiene (Fig. 7). The right shoulder and the right sterno-clavicular joint were affected by degenerative articular processes. Osteoarthritis affected several articulations of the hands and the feet. In spite of the better-state mummification of the left lower limb, direct macroscopic observation could reveal eburnation on the left femoro-patellar joint surface, due to severe osteoarthritis of the knee (Figs. 8 and 9).

The most spectacular pathological conditions is the ligamentous ossification of the anterolateral aspect of the

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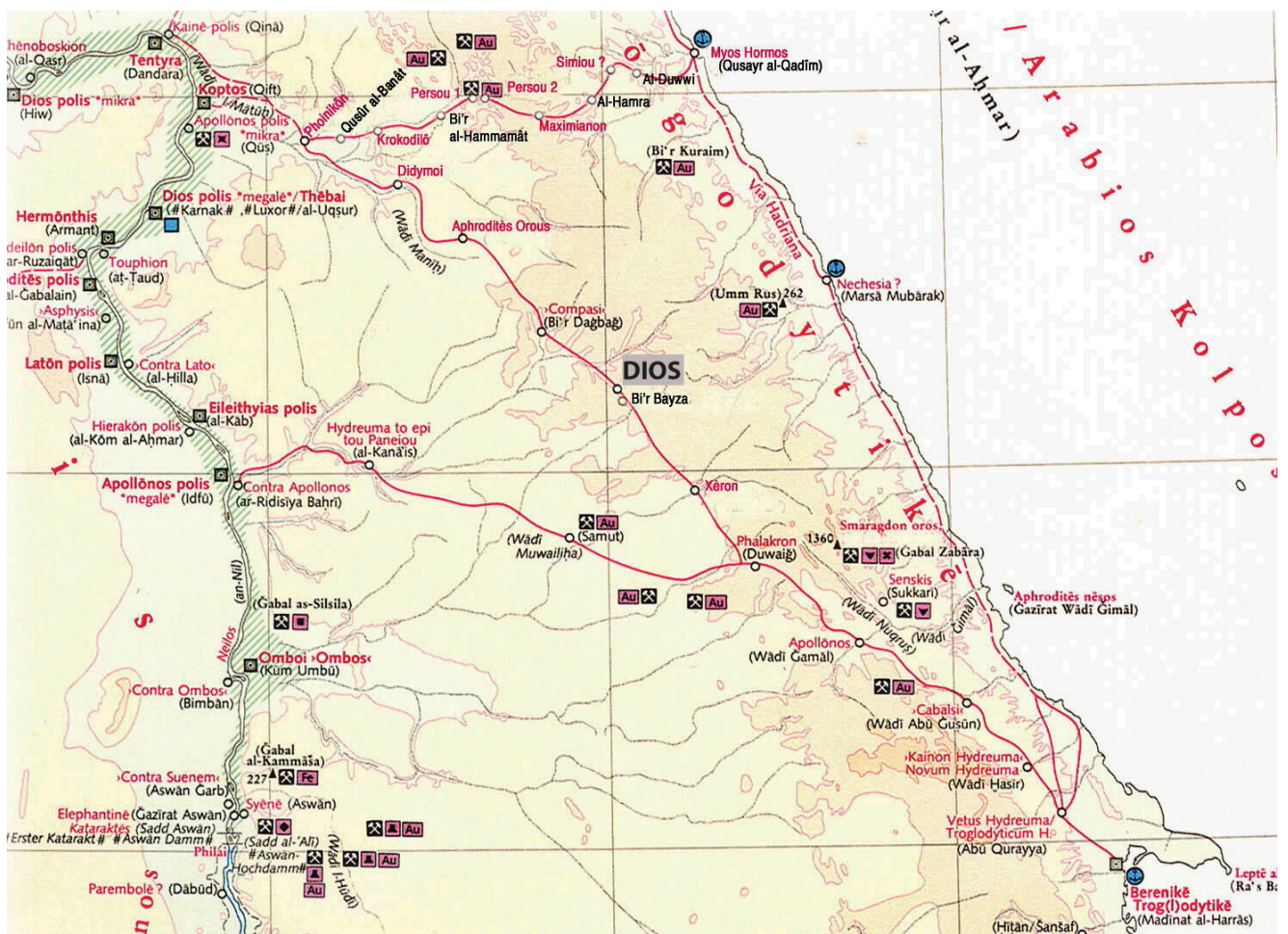


Figure 1. Geographical localisation of Dios along the road from Koptos to Berenice, in the Eastern Desert in Egypt.



Figure 2. The excavation of the Roman praesidium of Dios and its environment.



Figure 3. The grave was discovered in the rubbish dump of the praesidium.



Figure 4. Remnants of the pitched shroud used to prevent the decomposition of the body.



Figure 5. Mummified part of one of the lower limbs.



Figure 6. The relatively well preserved skull of the approximately 60-70 years old man.

spinal column (Fig. 10). Two third of the vertebral column is completely fused (Fig. 11). The thoracic region is the most



Figure 7. Traces of periapical abscess periodontitis in the left maxilla.



Figure 8. Lower extremity of the left femur presenting traces of knee arthrosis.

seriously affected. The phenomenon of ligamentous ossification is not limited to the spine; exuberant ossification at sites of tendon, ligament, or joint capsule insertions is also observed (Fig. 12). Morphology of the vertebral and extraver-tebral lesions suggests the etiology of a very advanced stage diffuse idiopathic skeletal hyperostosis (DISH) (Resnick et al. 1975; Resnick and Niwayama 1988; Pálfi et al. 1992; Ortner 2003).

The paleopathological analysis also revealed extensive ossification of the posterior longitudinal ligament (OPLL) in the cervical spine (Figs. 13 and 14). This phenomenon being an additional skeletal manifestation of DISH (Resnick et al.



Figure 9. Severe arthrosis of the left knee: the partial mummification of the left lower limb reveals the advanced stage eburnation and remodelling on the proximal epiphysis of left the tibia.



Figure 10. Thoracic spine with ossified spinal ligaments (DISH).

1978) is relatively rarely described in non-oriental populations. In OPLL, ossification of the ligament running behind the



Figure 11. Two third of the vertebral column is completely fused due to DISH.

vertebral bodies in front of the spinal cord can compress the spinal cord and may cause severe myelopathy, occasionally complete quadriplegia (Pouchot et al. 1987; Epstein 2002; Cruzeiro et al. 2007). In our case, relative robusticity of the limb bones and the observed degenerative joint changes contradict a long standing paraplegic condition, but we cannot



Figure 12. Calcified/ossified entheses on the posterior surface of the right tibia.

totally disclose the possibility of a sudden quadriplegia close to the death of the individual.

In this short case history only a brief overview of the main pathologies of this male skeleton was given. Seeing the presented alterations we can conclude that our subject individual had suffered for a long time before his death from several serious conditions, especially because of the dental diseases and the severe osteoarthroses of the right shoulder and the left knee. Probably the most serious conditions could



Figure 13. Ossification of the posterior longitudinal ligament (OPLL) in the cervical spine.



Figure 14. Traces of extensive OPLL and degenerative articular changes on the second cervical vertebra.

have been the associated DISH and OPLL. But neither the degenerative joint changes, nor the ossifying metabolic disorders could explain the observed special burial conditions. We cannot explain why this man was buried in the dump, few meters from the gate of the fort. It is difficult to avoid the idea that this special burial was aimed to humiliate the

body of this individual. Even though our anthropological and paleopathological investigations furnished a large amount of information, the latter question will remain an enigma for archaeology.

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