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SERIOUS PATHOLOGICAL LESIONS IN A SMALL OSTEOARCHAEOLOGICAL SAMPLE FROM 8th–9th CENTURIES IN HUNGARY

ABSTRACT: A skeletal sample excavated in Nyíregyháza-Manda bush (East Hungary), housed in the collection of the Józsa András Museum (Nyíregyháza) and dated to the 8th–9th centuries served as source for the study of palaeopathological lesions. The demographic profile of this sample of 42 skeletons represents 22 adult males, 14 adult females, 2 juveniles and 4 infants. In spite of the small sample, many individuals suffered lesions of bones and teeth, mostly degenerative osteoarthritis, non-specific infections, fractures, porotic hyperostosis, congenital anomalies, and carious lesions or enamel hypoplasia. Three specimens were especially pathological and very special for diffuse idiopathic hyperostosis, spinal tuberculosis and metastatic carcinoma. The purpose of the present study is to add these special cases to the paleopathological literature emphasizing their differential diagnosis.

KEY WORDS: Osteoarchaeological sample – Diffuse idiopathic hyperostosis – Spinal tuberculosis – Metastatic carcinoma

INTRODUCTION

This study reports on the pathological remains found during the preliminary analysis of a small skeletal sample, dated to the later part of the 8th and most of the 9th centuries, excavated in Nyíregyháza-Manda bush in Eastern Hungary. Housed in the Jósa András Museum (Nyíregyháza), this collection was excavated in 1994 as a part of an archaeological highway salvage project directed by Eszter Istvánovits (Istvánovits 1997). Over 400 artifacts were recovered from the Scíthian age settlement, but a Celtic house was also uncovered. However, 46 excavated graves from the adjacent cemetery represent the late Avar period. Few artifacts were found with these interments and the economic level reflects the very poor. The present cemetery excavation represents approximately 20 percent of the total cemetery. Therefore, the total cemetery may contain as many as 200 individuals. We are hopeful that the remainder of the cemetery will be excavated in the future.

From 46 excavated graves the skeletal remains of 42 individuals were studied at the Jósa András Museum (Nyíregyháza) by the authors during July 1997 for age, sex (Ferembach *et al.* 1979), stature (Sjøvold 1975), race and metrics (Lipták 1983), pathology (Steinbock 1976, Ortner, Putschar 1981, Aufderheide, Rodriguez-Martin 1998) and non-metric traits (Finnegan, Marcsik 1979).

The demographic profile of these 42 skeletal remains shows 22 adult males, 14 adult females, 2 juveniles and 4 infants. It is important to note that in this small sample, a number of significant pathological conditions are represented: degenerative osteoarthritis, non-specific infections, fractures, porotic hyperostosis, congenital anomalies, carious lesions and dental hypoplasia. Three individuals were especially interesting for displaying pathological conditions of diffuse idiopathic skeletal hyperostosis, spinal tuberculosis and metastatic carcinoma.

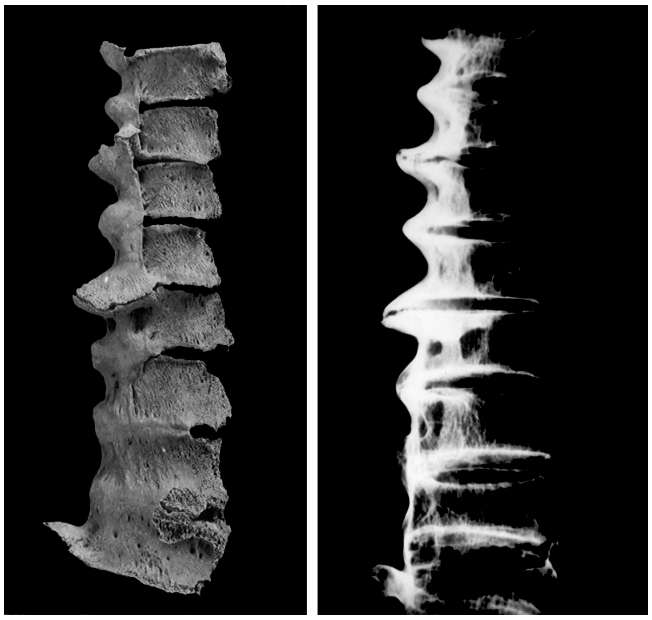

FIGURE 1. X-ray and gross morphology of antero-lateral view of fused vertebrae. DISH involves the superior 5 vertebrae, ankylosing spondylitis of the lower three vertebrae (grave 30).

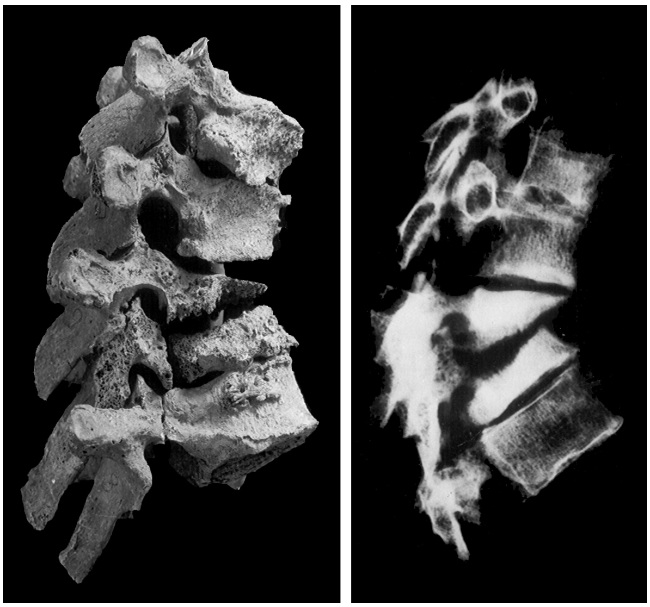

FIGURE 2. Morphological picture and X-ray of spinal tuberculosis involving thoracic vertebrae 6 and 7 (possible early stage) (grave 22).

DESCRIPTION OF SPECIAL CASES AND THE DIFFERENTIAL DIAGNOSIS

Grave 30, an adult male of an estimated age of 63–75 years, 8 lower thoracic vertebrae are shown. The pathological lesions on the lower three vertebrae represent more of an ankylosing spondylitis, but the superior 5 vertebrae display the smooth surface "dripping candle wax" effect on the right anterior-lateral body suggesting diffuse idiopathic skeletal hyperostosis (DISH) as mentioned by Aufderheide and Rodriguez-Martin (1998) (*Figure 1).* The 5th lumbar vertebra also displays arthritic or DISH evolution, but this had not fused with adjacent vertebrae during life.

There is a difference between DISH and ankylosing spondylitis. In ankylosing spondylitis the bony bridges are usually thinner and vertically oriented, and there is no extraspinal bone foramination (Roberts, Manchester 1995).

Grave 22, an adult male, of an estimated age of 53–58 years, displays a classic example of spinal tuberculosis, centered between thoracic vertebrae 6 and 7. *Figure 2* shows thoracic vertebrae 4 to 8. There is some increased bone deposition on vertebrae 4, 5 and 8, but there is no bone regeneration on vertebrae 6 and 7. (The fracture on T-7 is post mortem.) This lesion may be in the early stages of development of tuberculosis, as there is no extensive angular kyphosis often seen in more developed cases.

The differential diagnosis is mostly against osteomyelitis and healed fracture. In TBC sequestra are either small or absent, gibbus and paravertebral abscess formations are uncommonly found in vertebral osteomyelitis. In vertebral fractures mostly only one vertebra is involved (Aufderheide, Rodriguez-Martin 1998).

Grave 40, a male of 65–75 years of age at death, displays multiple loci of metastatic carcinoma. On the cranium, lesions are seen at the centre of the frontal, superior part of the coronal suture, centre of the left parietal, one centered at the left pterion affecting the left parietal, frontal and sphenoid bones at their common articulation (*Figure 3a*). The largest (5 × 5 cm) is located on the occipital bone a few mm below the lambda with a smaller lesion on the right parietal, a few mm to the right of the lambda (*Figure 3b*). A large erosive lesion is located on the left ascending ramus of the mandible (*Figure 3c*). The margins of these lythic formations present increased vascularization. One lower thoracic and a lower lumbar vertebrae display lesions affecting the centre of each vertebra. A lesion has devolved the right half of the manubrium. Only one rib fragment survived the excavation process and it displays a small leion. The sacrum has two lesions: one on the left anterior surface affecting the lamina and ala, and the other on the right posterior surface. Left and right innominate bones are affected: the left innominate bone displays a large lesion above the acetabulum, a large lesion on the anterior ilium and a small lesion above the iliac tuberosity (*Figures 4a–b*), while one large lesion is on the right ilium (*Figures 4b–c*). The distal quarter of each femur has a large destruction: the lesion on the right femur has destroyed most of the anterior, lateral and posterior cortical bone leaving only some medial cortical bone holding the distal portion to the diaphysis of the femur (*Figures 5a–c*), the left lesion penetrates both medial and lateral cortical walls in the corpus and a larger dip is in the condyle destroying entirely the cortical walls and slightly the cancellous bone (*Figures 5b–c*) while

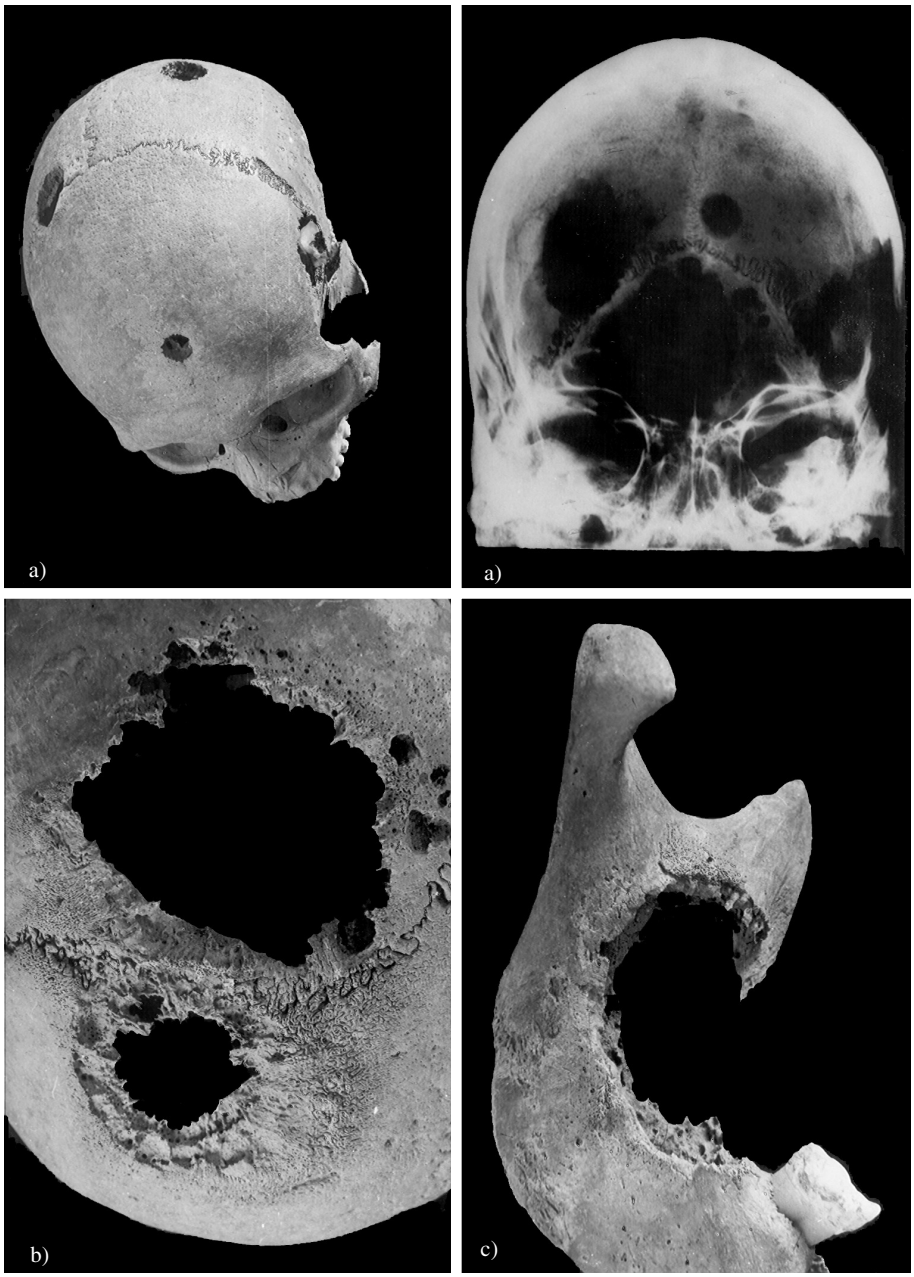

FIGURE 3. a) Gross morphology and X-ray of osteolytic metastatic carcinoma in the skull (grave 40); b) Magnified picture of osteolytic metastatic carcinoma in the skull; c) Osteolytic metastatic carcinoma in the mandible.

the lesion displays margins of the periosteal bony reaction.

This metastatic carcinoma is differentiated from multiple myeloma by reason of lack of uniformity of size, relatively few lesions, the lesions are quite large and variable in size and the margins of most lesions appear sclerotic and display evidence of increased vascularization. These attributes depict the slower chronic development seen in metastatic carcinoma, rather than the rapid development of multiple myeloma (Ortner, Putschar 1981). Differentiating osteolytic and osteoplastic forms is more easily accomplished although this metastatic carcinoma may well display some properties of each. Significant bone destruction and other lytic processes appear to be more frequent in the present case suggesting osteolytic lesions. Therefore these lesions may be secondary to carcinomas of the kidneys, thyroid, lungs or gastrointestinal tract (Steinbock 1976).

This sample is of special interest for the extent of significant pathological lesions for any archaeological period and of particular interest during the late Avar period in Hungary. We hope that the remainder of this cemetery can be excavated so we may assess the pathological condition of this larger 8th–9th centuries Avar population.

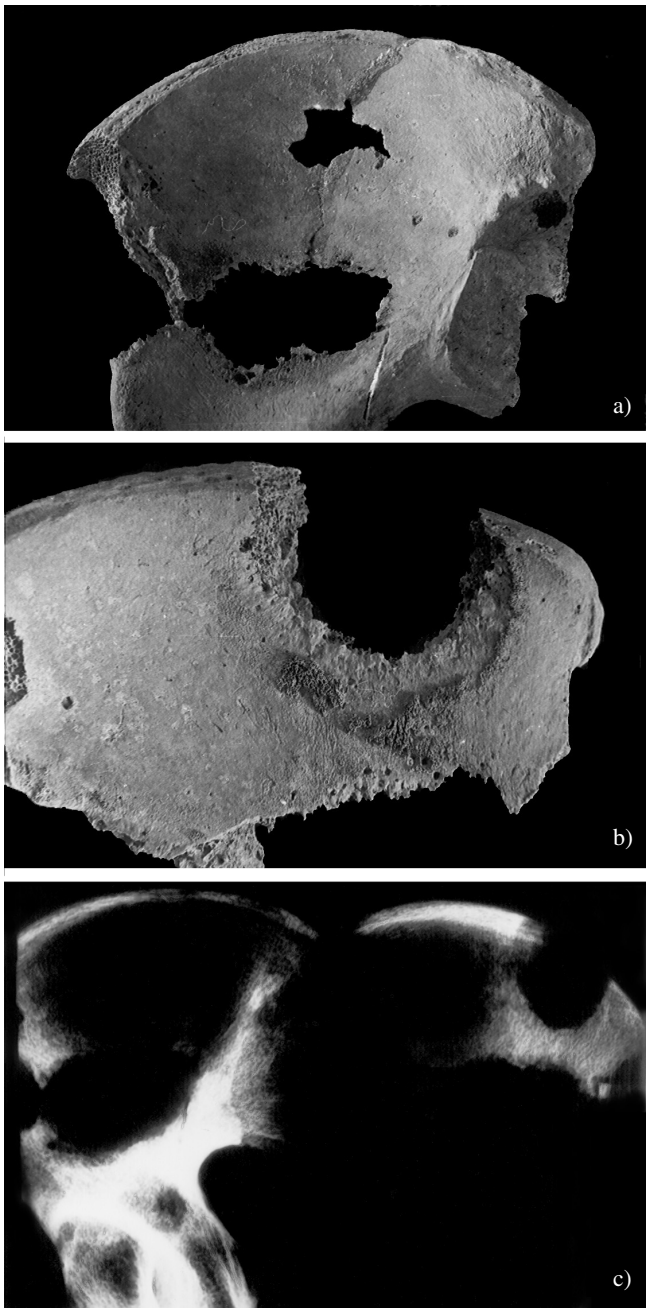

FIGURE 4. a) Osteolytic metastatic carcinoma in the right ilium; b) Osteolytic metastatic carcinoma in the left ilium; c) X-ray of osteolytic metastatic carcinoma of the hip bones.

FIGURE 5. a) Osteolytic metastatic carcinoma in the right femur; b) Osteolytic metastatic carcinoma in the left femur; c) X-ray of osteolytic metastatic carcinoma of both the femora.

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