



A skeletal case of hypertrophic osteoarthropathy from the Canary Islands dating from 1000 BP



Emilio González-Reimers^{a,*}, Aioze Trujillo-Mederos^b, Manuel Machado-Calvo^c,
María Castañeyra-Ruiz^d, Alejandra C. Ordóñez^b, Matilde Arnay-de-la-Rosa^b

^a Departamento de Medicina Interna, Hospital Universitario de Canarias, 38320, Universidad de La Laguna, La Laguna, Tenerife, Canary Islands, Spain

^b Departamento de Geografía e Historia, Universidad de La Laguna, Tenerife, Canary Islands, Spain

^c Departamento de Radiología, Hospital Universitario de Canarias, 38320, Universidad de La Laguna, La Laguna, Tenerife, Canary Islands, Spain

^d Departamento de Anatomía y Anatomía Patológica, Universidad de La Laguna, Tenerife, Canary Islands, Spain

ARTICLE INFO

Article history:

Received 18 January 2015

Received in revised form 10 July 2015

Accepted 15 July 2015

Keywords:

Hypertrophic osteoarthropathy

Periostitis

Paleopathology

Canary Islands-Prehispanic population

ABSTRACT

A left tibia, the distal right tibia, and the proximal four fifths of the right ulna and radius, probably belonging to an adult prehispanic man (antiquity of ≈ 1000 years BP) were found among commingled bone remains in a collective burial cave of the island of El Hierro, in the Canary Archipelago. All four bones show an intense periosteal bone formation, encrusting the preserved cortical bone of the diaphyses. Differential diagnosis include melorheostosis, syphilis, and leprosy, although the most likely diagnosis is hypertrophic osteoarthropathy, which is usually associated with lung neoplasm or non-malignant diseases leading to chronic hypoxemia. The marked bone proliferation, possibly due to a chronic condition, suggests that possibly the underlying illness was a non-malignant one.

© 2015 Elsevier Inc. All rights reserved.

1. Introduction

El Hierro (Fig. 1) is the most southwesternly located, smallest (273 km²), and youngest of the seven “big” islands of the Canary Archipelago. The economy of the Prehispanic inhabitants, who arrived from North Africa about 2500 years ago, was based on shellfishing, coastal fishing, and sheep- and goat-herding (Arnay-de-la-Rosa et al., 2010). These people buried their dead in volcanic caves that were used for collective burials. Most of these caves were looted in former times; therefore, it is usual to find large ossuaries containing commingled remains of many individuals.

Punta Azul is a collective burial. Among the remains we observed several bones (two tibiae, one of them fragmented, and one ulna and radius) with a diffuse marked periosteal alteration, conferring the bone a rough surface (Fig. 2). Proliferative periosteal reactions include a large number of diseases, classically classified into four major groups according to pathogenesis: inflammatory, hemorrhagic, tumoros and circulatory (Schulz, 2001). Paleopathological features range from subtle periosteal reactions affecting small areas of the tibia, as seen in sportlers who suffer repetitive trauma (Bates, 1985), to marked, diffuse, periosteal thickening caused by infec-

tious and/or other inflammatory processes. In these cases it is important to discern if the underlying cortical and cancellous bone is also affected, something that can be achieved either by inspection of a bone section along the longitudinal axis, or by tridimensional computed tomography (CT) and multiplanar reconstruction. This is important because in some cases the periosteal reaction is due to a distant process that induces secretion of humoral mediators that activate periosteal bone synthesis. In these cases several bones of the same individual may become affected. An example of this kind of lesions is hypertrophic osteoarthropathy (HOA), an entity that is not as frequent as periostitis secondary to bone infection (Ortner and Putschar, 1981; Aufderheide and Rodríguez-Martín, 1998), and should be strongly considered in the differential diagnosis of this case. The aim of the present study is to describe this case and to discuss the possible different etiologies that may have led to such an alteration.

2. Materials and methods

The burial cave Punta Azul harbored remains of at least 100 adults (based on right scapulae) and 27 subadults, including 140 tibiae, 64 right and 76 left. C-14 dating of 2 individuals yielded an antiquity of 970 ± 30 BP and 910 ± 30 BP (González-Reimers et al., 2015). Skeletal remains were already commingled at the time the burial site was first described (Álvarez Delgado, 1947). Later,

* Corresponding author.

E-mail address: egonrey@ull.es (E. González-Reimers).

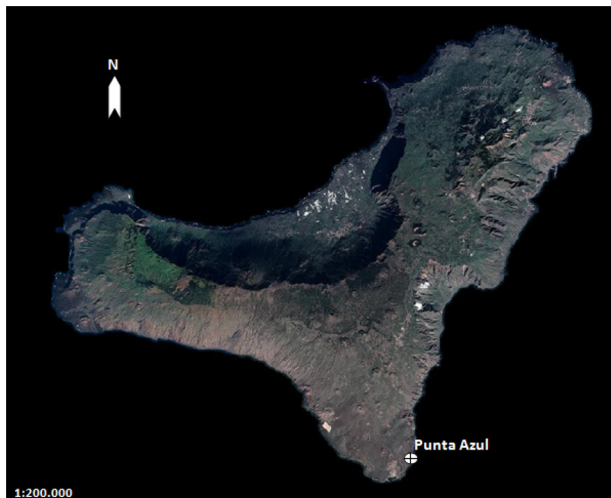


Fig. 1. The island of El Hierro, with the burial of Punta Azul located in a cliff at the southeastern coast.

members of the Department of Archaeology of the University of La Laguna (Jiménez Gómez, 1993) deposited the bones in the Cabildo of El Hierro (Heritage section), where they are currently curated. Genetic sexing was assessed successfully on 52 adult tibiae, and, on this basis, discriminant functions for sexing tibiae were performed (Ordóñez et al., 2013).

Two tibiae with diffuse, marked periosteal alteration were observed. The left tibia was measured following standard methods (Martin, 1914), and sex was estimated after applying the discriminant function: $y = 0.234 * \text{transverse diameter at nutrition foramen} + 0.123 * \text{minimum shaft perimeter}$ (Ordóñez et al., 2013). We also identified the proximal four fifths of one right ulna (out of 66 right ones, 1.51%) and one right radius (out of 76 right ones, 1.33%) with a similar periosteal alteration (Fig. 2).

We performed CT and multiplanar reconstruction of the left tibia, using a TOSHIBA Astelion 16 multislice CT system, working at 100 kV, 120 mA, 0.6 s/slice, and a field of view (FOV) of 310 mm (Toshiba, Kawasaki, Japan). We also performed histological analysis of an undecalcified periosteal sample. Briefly, the sample was embedded in methyl methacrylate (Sigma Chemicals, St. Louis, MO), polymerized at 32–34° for 6 days, cut with a carbon-tungsten microtome in 7 μm , and sections and stained with eosin-toluidin blue.

3. Results

3.1. Case description

It is impossible to assure that all the bones belong to a single individual, since the only complete bone is the left tibia; anthropometric measurements are given in Table 1. Considering the mean tibial length (352.94 mm) and the minimum shaft perimeter (MSP, 84.24 mm) of the prehispanic men from El Hierro, we conclude that this tibia probably belongs to a man, a conclusion confirmed after applying the discriminant function mentioned above. The only reliable measurement of the fragment of the right tibia was MSP, with 86 mm, being similar to that of the left one. Therefore, probably, both bones belong to the same individual. The left tibia is well preserved aside from some taphonomic erosion at both epiphyses, allowing the inspection of an underlying well preserved cancellous bone (Fig. 3). The tibial shaft is rough, with uneven proliferative changes affecting the entire diaphysis. Pathological bone addition is irregular in shape and in thickness, being 5 mm in the most intensely affected areas (lateral aspect of the proximal third



Fig. 2. Marked periostitis affecting the both tibiae of an adult man. Ulnar and radial affectation is also evident.

of the bone, Fig. 4). The proliferative lesion predominates in the midshaft; distal and proximal ends are relatively spared. The bone excrescence is a bony crust, separated from the diaphyseal cortex. There are areas of post-mortem detachment of the bony shell (Fig. 5). The distal part of the right tibia is also available. As with the left one, a bony crust covers an apparently normal diaphysis; the bony shell displays a geographical contour, suggesting that parts of it were detached post-mortem.

Both forearm bones show similar lesions, especially the ulna. As with the tibiae, affectation is more intense at the midshaft. The rough bone surface that covers the shaft is independent of the cortical bone.

CT procedure of the left tibia allowed identification of a fully preserved cancellous bone and a permeable medullary cavity (Fig. 6), without any sequestra or gross cortical involvement. Histological analysis showed apparently normal osteons (Fig. 7).

Download English Version:

<https://daneshyari.com/en/article/6554842>

Download Persian Version:

<https://daneshyari.com/article/6554842>

[Daneshyari.com](https://daneshyari.com)