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C2–C3 block vertebrae in a late Neolithic/Chalcolithic child exhumed from a Portuguese collective grave

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Abstract

Among the commingled and very fragmentary human remains exhumed from the prehistoric tumulus of Praia da Samarra (Sintra, Portugal) a fusion of the second and third cervical vertebrae in a subadult individual was detected. The more likely diagnosis for this abnormality is a congenital osseous malformation of the spine. A possible case of dens axis hypoplasia was also suggested. Besides the description of the case, potential pathological implications and differential diagnosis were investigated.

Resumo

Entre o material ósseo humano desarticulado recuperado do monumento funerário pré-histórico da Praia da Samarra foi detectado uma fusão óssea, provavelmente congénita, envolvendo o segundo e terceiro segmento da região cervical, de um indivíduo não adulto. Para além desta anomalia, foi também sugerido um caso de hipoplasia do processo odontóide. A pesquisa foi complementada com dados médicos com o intuito de averiguar possíveis implicações que esta patologia congénita poderia ter tido na vida deste indivíduo Neolítico.

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Introduction

In 1948, a prehistoric grave of uncertain typology was discovered near the beach of Samarra (Sintra, Portugal). The excavation of this collective burial place revealed a great number of commingled fragmentary human remains. At present, some of these remains are curated and stored in the Museum Arqueológico de São Miguel de Odrinhas (Sintra). Until now it has not been possible to locate the rest of the exhumed human bones.

Osteological analysis of the sample housed in the abovementioned Museum was carried out during the year of 2005 (Silva et al., 2006). The estimated minimum number of individuals was 79. There were 55 adults (both sexes) and 24 subadults (<20 years). Among the subadults, all age groups were represented, ranging between 7 months and 17 years of age at death. A detailed osteological study of the sample is published elsewhere (Silva et al., 2006).

Radiocarbon dating of one human bone confirmed the Late Neolithic/Chalcolithic chronology: 3820 ± 60 BP; calibrated age 2399–2144 BC (1σ); calibrated age 2465–2042 BC (2σ) (analysis performed in Instituto Tecnológico e Núclear, Lisbon; sample no. Sac-1827).

This note is to draw attention to the fusion of two cervical vertebrae belonging to a subadult.

Case report

Among the fragmentary and commingled human bones preserved from the prehistoric grave of Praia da Samarra, a fragment of a C2–C3 block vertebrae from a subadult was recovered (Fig. 1). From the posterior elements, only one quarter from the left and half of the right neural arches were recovered. The absence of a forked apex of the axis suggests an age older than 12 years (Scheuer and Black, 2000). The inferior annular ring is not fused, suggesting an individual younger than 17–19 years (Scheuer and Black, 2000). Radiographic examinations seem to confirm the absence of intervertebral disc spaces (Fig. 2). Due to the incompleteness of the posterior elements it is not possible to confirm if the fusions in this part were also complete. Also, the dens axis is small, suggesting a case of hypoplasia.

Discussion

A probable diagnosis for the described fusion is a congenital osseous malformation. In the present case the congenital segmentation error affected the second and third cervical segments resulting in block vertebrae. This abnormality could be considered a case of Klippel–Feil syndrome, which is characterised by the congenital fusion of two or more cervical vertebrae. This fusion was first described in 1912 by Klippel and Feil from autopsy findings in a patient with a short neck, low posterior