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A CASE OF SEGMENTATION ERROR ON THE RIB CAGE OF AN INFANT FROM SARILHOS GRANDES, PORTUGAL

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During the 2008 renovation of the water sanitation network administrated by the public entity SIMARSUL, the archaeological survey detected the presence of a burial ground from modern to contemporary periods. This finding occurred next to the religious complex composed by the Church of São Jorge and the chapel of Nossa Senhora da Piedade at Sarilhos Grandes (Municipality of Montijo, Portugal). The impact minimization for this site was accomplished by promoting its archaeological excavation which resulted on the exhumation of 21 individuals, most of them buried following Christian conventions.

The skeleton pathological description of a peri-natal individual composed by a possible active infectious process in the splanchnocranium and a segmentation error of a right rib is here presented. A congenital pathology affecting a right rib from a peri-natal individual resulted on a segmentation error which produced two contiguous sternal extremities. In addition, periosteal new bone is also present in the splanchnocranium of the same infant and may be an indicator for an active infectious disease.

Congenital pathologies are defects produced during embryological life (Ortner, 2003) and may be detected at birth or only years later (Aufderheide e Rodríguez-Martín, 1998). These result from disturbances on a developmental threshold (Roberts e Manchester, 2005) with consequences varying according to the developmental stage of each individual. There are several types of congenital abnormalities: malformations, disruptions, deformations, syndromes and associations. Each have different etiologies (Sadler, 2003) and the consequences may vary from small anomalies to severe malformations incompatible with life (Ortner and Putschar, 1981; Ortner, 2003). During the formation of the ribs, an irregular segmentation of the sclerotomic tissue from which those are developed may result in multiple expressions such as bifurcation, flaring, abnormal wideness, merging, bridging and partial bridging involving articulation between ribs.

Rib with two sternal articulations.

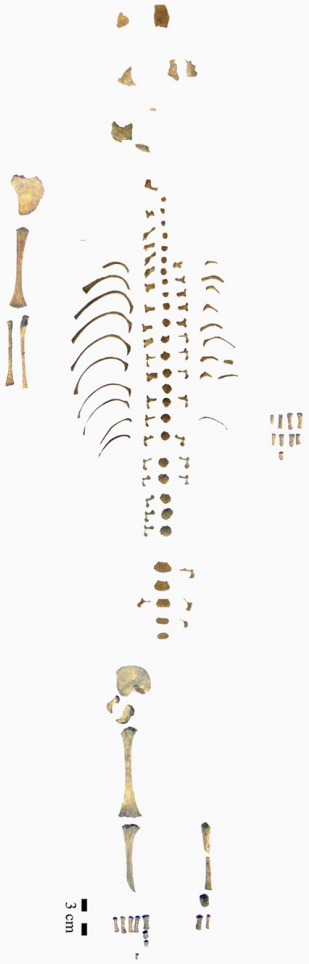
The individual of Sarilhos Grandes displays an apparent case of bifurcation which is characterized by the presence of two not completely separated sternal articulations on the same rib. Rib segmentation errors are seldom described in the paleopathological record. Cases of bifid ribs were detected on the following archaeological sites:

- Alkali Ridge, Utah (Pueblo I-III) (Brues, 1946 in Barnes, 1994);
- Wetherill Mesa (Pueblo II-III) (Miles, 1975 in Barnes, 1994);
- Hohokam, Broadway and McClintock site, Arizona (Merbs, 1985 in Barnes, 1994).

Woven bone on cranial bone.

Woven bone is also present in the splanchnocranium of the infant. Rising over the bone surface, this 1cm^2 region is delimitated by well defined margins. Due to severe fragmentation, it is not possible to determine if its distribution is unilateral or bilateral.
Both periostitis (Roberts and Manchester, 2005) and normal physiological bone formation/remodelling may result in the formation of woven bone (Ortner, 2008; Waldron, 2009). Therefore, it is advisable to use terms with no aetiological implications when referring to periosteal abnormal bone formation, such as periostosis (Ortner, 2008) or periosteal new bone (Waldron, 2009). In subadult individuals the distinction between new bone formation of pathological origin and normal bone formation/remodelling is particularly difficult (Lewis, 2007; Waldron, 2009). As a result, it is not possible to point out with certainty the causes leading to the formation of woven bone present in the splanchnocranium of the infant of Sarilhos Grandes.

The case of the infant from Sarilhos Grandes provided for the opportunity to add a rare example of congenital pathology to the paleopathological record. No similar cases were found for the remaining individuals inhumated at that cemetery. It is uncertain if the woven bone is of pathological origin and if it could at all be related to the cause of death.



REFERENCES
Aufderheide AC, and Rodríguez-Martín C (1998) The Cambridge Encyclopedia of Human Paleopathology. Cambridge: Cambridge University Press.
Barnes E (1994) Developmental Defects of the Axial Skeleton in Paleopathology. Colorado: University Press of Colorado.
Lewis M (2007) The Bioarchaeology of Children: Perspectives From Biological and Forensic Anthropology. New York: Cambridge University Press.
Ortner D (2003) Identification of Pathological Conditions in Human Skeletal Remains. Amsterdam: Academic Press.
Ortner D (2008) Differential diagnosis of skeletal lesions in infectious disease. In R Pinhasi and S Mays (eds.): Advances In Paleopathology. Chichester: John Wiley & Sons, Ltd.
Ortner, D.; Putschar, W. G. 1981. Identification of Pathological Conditions In Human Skeletal Remains, Washington D.C., Smithonian Institution Press.
Roberts C, and Manchester K (2005) The Archaeology of Disease. Gloucestershire: Sutton Publishing Ltd.
Sadler TW (2003) Medical Embriology: Lippincott Williams and Wilkins.
Waldron T (2009) Paleopathology. New York: Cambridge University Press.

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