

A luno-triquetral non-osseous coalition found in an individual from the Chalcolithic Pit 40 of Perdigões (Portugal)

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INTRODUCTION

Carpal coalitions - may result from a failure in the separation of the cartilaginous precursors of the carpal bones during gestation (Gottschalk et al., 2016).
- can be osseous or non-osseous and affect the luno-triquetral joint most frequently (DeFazio et al., 2013).

To the best of our knowledge, the only palaeopathological reports of carpal coalitions are from the:

La Ferrassie II female Neanderthal - complete osseous luno-triquetral coalition (Oberlin and Sakka, 1989)

Bronze Age male individual (Italy) - incomplete osseous capitate-trapezoid coalition (Saccheri et al., 2017).

Aims - to present a non-osseous luno-triquetral coalition found amongst the cremated commingled human remains in the Chalcolithic Pit 40 of the Perdigões ditched enclosures.

MATERIALS AND METHODS

This study is based on human skeletal remains from Pit 40 of Perdigões (Alto Alentejo, Portugal), a set of ditched enclosures (Figure 1A and 1B) dating from the late Middle Neolithic (5500 BP) to the transition to the Bronze Age (4000 BP), where, during the Chalcolithic, cremation coexisted with other funerary practices (Valera, 2014).

Pit 40 represents one of the few confirmed examples of intentional cremation of human remains in the Chalcolithic of Portugal.

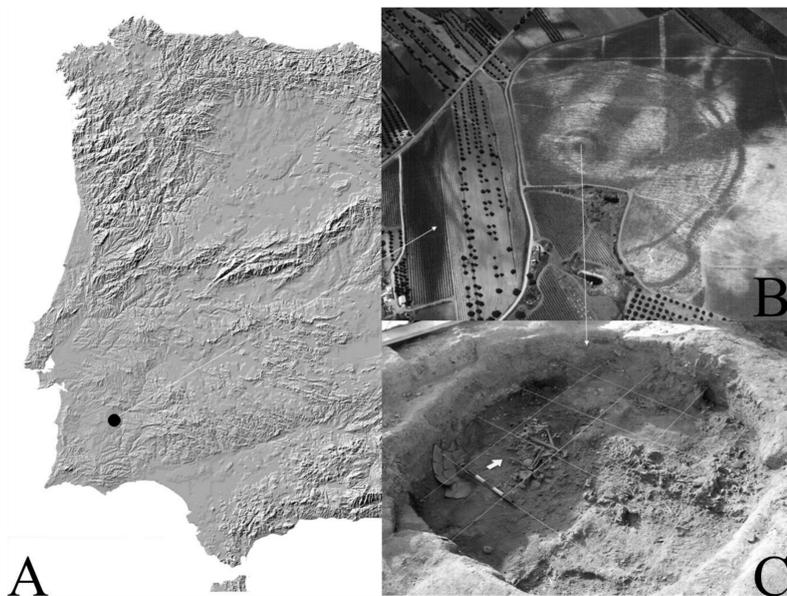


Figure 1. Perdigões ditched enclosures and Pit 40. A: Location of Perdigões in the Iberian Peninsula; B: Aerial image in which several ditches are visible; C: Overview of Pit 40 showing human remains and pottery.

Pit 40 (Figure 1C) - minimum number of 240 individuals (mostly cremated).

Stratigraphic unit (SU) 193, holding approximately 152 kg of human skeletal remains and a minimum of 147 individuals, has been fully examined.

Extreme fragmentation and the size of the sample preclude systematic analysis of all remains. Thus, bone fragments were sorted by bone whenever possible or by anatomical region when bone-specific identification was inconclusive. All bones showing relevant funerary or paleobiological information were separated, allocated an inventory number and examined systematically macroscopically.

FINAL COMMENTS

While luno-triquetral coalitions are the most common of all carpal coalitions they are very rare in the paleopathological record. To the best of our knowledge, this is the oldest case of such congenital condition.

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RESULTS AND DISCUSSION

A right lunate and triquetral evidencing compatible morphological features and articulating perfectly were found amongst the 4538 individualized bone fragments of SU 193.

Such features include macroscopically visible pinpoint pitting in the luno-triquetral articulation (Figure 2A) and an atypical morphology of that joint in which no intra-articular space exists (Figure 2A-2C). No other atypical or pathological processes were observed.



Figure 2. Right lunate and triquetral. A: Luno-triquetral joint showing pinpoint pitting; B: Proximal surface of the lunate and triquetral in articulation showing no articular space; C: Distal joints of the bones.

These bones appear fully grown, suggesting to have belonged to a mature individual. However, reliable osteometric sex estimation of this individual was impossible due to the atypical morphology of the bones and possible heat-induced size changes.

The following pathologies were excluded during **differential diagnosis**:

Osteoarthritis (OA) - because such localised pinpoint porosity with no involvement of other joints is rare;

Erosive arthropathies - no erosive lesions were found and no fusion occurred;

Bipartite lunate - the lunate is a single bone and there is no evidence of fusion of a possible secondary ossification centre with the triquetral;

Trauma - the lunate is seldom affected in falls and no trauma related changes were found in any joints.

According to Istanbul Protocol (Appleby et al., 2015:20), these bones present alterations 'typical' of non-osseous carpal coalitions.

This condition may result in pain and impairment of wrist mobility (Burnett, 2011). Coalitions may occur isolated or as part of syndromes or metabolic disorders that involve other anatomical regions (DeFazio et al., 2013). Regrettably we are unable to assess which is the case because of extreme fragmentation and commingling.

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