
Digitisation and reconstruction of the burial of newborn twins from the Gravettian site Krems-Wachtberg

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Abstract

In 2005, an exceptionally well preserved burial of neonate monozygotic twins was uncovered at the Gravettian site Krems-Wachtberg in east Austria in the course of systematic excavations conducted by the Austrian Academy of Sciences. The infants were embedded in red ochre and carefully deposited in a burial pit covered by a mammoth scapula. Individual 1 was adorned with ivory beads while individual 2 was attributed with pierced mollusk shells and fox tooth. While individual 2 died at birth, individual 1 survived for about 50 days. While the general grave construction and layout, as well as personalised adornments reflect treatment not uncommon for contemporaneous burials, re-opening of a grave and secondary burial demonstrate a new facet of Gravettian mortuary behaviour.

Upon discovery, the finding was only superficially exposed and then recovered as a block and stored in a climate-controlled storage facility of the Natural History Museum Vienna. Excavation of the block was conducted but in 2015. Hereby, careful exposure and recovery of the skeletal elements were accompanied by continuously produced structured-light 3D surface scans. This documented the exact position of all elements.

An interdisciplinary pilot project aiming at digitisation of the elements, reconstruction of the skeleton, as well as archiving and sharing the produced data was launched in 2018. High resolution imaging of the individual bones is performed at the Division of Biomechanics of

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the Core Facility Campus Krems using a SkyScan microCT-scanner. The surface scans generated during excavation of the burial are then used to reconstruct the elements' original positions. At present, we focus on the left hand and the cranium of individual 2. The former is represented by sixteen preserved carpals, metacarpals, and phalanges for which the find positions were restored. The cranium is fragmented and partly collapsed, so that reconstruction of its anatomical shape requires using geometric morphometrics. We intend to make the resulting data accessible in an open-source database that will be structured for addressing different target groups ranging from interested non-specialists to experts in the fields of archaeology and palaeoanthropology.

The Krems-Wachtberg twin burial provides the rare opportunity for studying both neonate anatomy and cultural behaviour of early modern humans. Moreover, digitisation and reconstruction of the skeletons will allow for ontogenetic and phylogenetic comparisons with other subadult early modern humans and Neandertal infants, and will therefore set a basis for future research.

Keywords: burial of newborn twins, early modern humans, high resolution imaging, digital reconstruction, open source database