

Human remains from Estark 1, Iran, 2018

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The third season of excavations at Estark 1 (34°01'24''N 51°13'51''E) was conducted in August and September 2018 and focused on the extension of trench C opened in the previous season (**Figure 1**) (cf. Sołtysiak et al. 2016; Sołtysiak et al. 2017; Hosseinzadeh et al. 2017). All burials were dated based on pottery to the Iron Age II (c. 1000-800 BCE in regional chronology, according to Ghirshman 1938, 1939).



Figure 1. Graves excavated in 2018 at Estark 1, trench C.

During the 2018 season seven new burials were found. Grave construction was similar to the one recorded in the same part of cemetery in the previous season: it was composed of a rectangular shaft with the main axis of the grave at NW-SE, and a niche chamber for burial which had been dug in the northern wall of the shaft floor. After burial, the chamber was closed with the use of large stones.

The majority of the graves from Estark 1 were looted in the past and human remains were displaced and commingled. The minimum number of individuals from seven graves was 18 (Table 1). Moreover, one recently looted pit over grave 12 was excavated and dislocated remains of an adult individual were found. The state of preservation of all the remains was poor due to looting and animal activity. Skeletal remains from 4 out of 7 graves had insect tunnels (cf. Backwell et al. 2012) with a maximum diameter between 2-10mm.

Table 1. General register of human remains from Estark 1, trench C, season 2018.

Grave	Sex	Age-at-death	Completeness	Articulation
G-4a	F	45-49 years	fairly complete	disarticulated
G-4b	–	15±3 years	fairly complete	disarticulated
G-4c	–	9±3 months	complete	articulated
G-4d	?	adult	a few fragments	disarticulated
G-5a	F	adult	incomplete	disarticulated
G-5b	F	adult	incomplete	
G-5c	M?	adult	a few fragments	
G-6a	M?	adult	incomplete	disarticulated
G-6b	?	adult	a few fragments	disarticulated
G-7a	–	5±1.5 years	incomplete	disarticulated
G-7b	–	infant	a few fragments	disarticulated
G-7c	?	adult	1 bone	only hand phalanx
G-9a	F??	adult	incomplete	disarticulated
G-9b	–	feetus?	a few fragments	disarticulated
G-10a	F??	adult	fairly complete	articulated
G-10b	–	infant	tooth germs	disarticulated
G-11a	M?	adult	incomplete	disarticulated
G-11b	F?	adult	incomplete	disarticulated
G-12	?	adult	a few fragments	disarticulated

At Estark 1 articulated human remains were found only in two graves: G-4 and G-10. In grave 4, in the eastern part of the burial pit, there was an infant skeleton (age at death: 9 months), placed in a flexed position on the left side, facing southeast (Figure 2). The burial included two almost complete vessels and multiple beads in the region of the cervical vertebrae and head. Dense porosity was present on the surface of three parts of the cranial vault (Figure 3), which is most probably an indicator of environmental stress (cf. Walker et al. 2009).

In the filling of grave 4, skeletal remains of at least three more individuals were found. They were commingled between stones and present both in the shaft and main chamber. Such displacement was most probably an indicator of looting activity in the past or re-use of the grave. There were two almost complete skeletons: the first belonged to a female (age at death: 45-49 years) and the second to a juvenile (age



Figure 2. Burial G-4 from trench C.

at death: 15 years). Additionally, several bones from another adult individual were found. Only bones of the female and juvenile skulls were in anatomical order, however separated during excavation. There was one pathological condition observed in this assemblage: a part of an adult rib body (35mm in length) exhibited multiple oval lytic lesions (c. 4×3mm) at the anterior surface with bone spicules between them (c. 3mm in length) (Figure 4). Several artifacts were found among the human bones, including complete vessels in the western part of the grave, bronze ornaments (one ring was found on an adult phalanx), multiple beads, and a cylinder seal with a depiction of a goat.

The second human skeleton in anatomical order was found in grave 10 and belonged to an adult individual. It was placed in a flexed position on its right side,



Figure 3. Porosity on the infant cranial vault from G-4. Scale bar 1cm.



Figure 4. Rib pathology of an adult individual from G-4. Scale bar 1cm.

facing north-east (**Figure 5**). This individual was buried in the same position as the individuals found during the previous season in G-2 in trench B and G-3 the trench C (Hosseinzadeh et al. 2017), but facing the opposite direction. The bones were extremely eroded and affected by many taphonomic factors such as insect tunnels in the cranial vault, black staining on three ribs, and green and brown staining on the coracoid process of mandible and proximal and distal phalanges due to the contact with bronze objects. Furthermore, in G-10 poorly preserved tooth germs of a subadult individual were found (age at death below 15 years) but no bones that could have be-

longed to this individual were identified. The burial contained complete vessels and several bronze ornaments, such as spiral wire found on the mandible and a pin placed next to the spine. Additionally, multiple beads and a cylinder seal with a geometrical pattern were found in the region of spine and head.



Figure 5. Burial G-10 from trench C. Scale bar 1cm.

Skeletal remains were found in a disturbed position in five other graves. All burials contained bones of more than one individual. In G-5 the remains of at least three individuals were found: two females and one probable male (represented only by a few fragments). Several pathological changes were recognized in the aforementioned including advanced spondylosis of the cervical vertebrae with flattening of their bodies, almost completely healed fractures of a phalanx and rib, a dislocated articular surface on a mandibular condyle and a healed trauma of the first cuneiform with the development of pseudoarthrosis. Furthermore, some nonmetric traits were also scored, such as Allen's fossa (Figure 6). Because the remains were commingled it was impossible to connect any bone change with a specific individual.

In grave 6 the remains of two adult individuals were found, one of which was very robust. Advanced osteoarthritis and slight spondylosis were observed on one cervical vertebra. G-7 contained the remains of two infants: the incomplete skeleton of a 5-year-old individual and several bone fragments of a much smaller infant. Moreover, there was one adult phalanx. No pathological conditions were found among these remains. In grave 9 the remains of an adult individual were found along with an admixture of bones of a neonate. The parts of the skull of the latter were partially



Figure 6. Allen's fossa of an adult individual from G-10. Scale bar 1cm.



Figure 7. Insect tunnel in the head of femur of an adult individual from G-11.
Scale bar 1cm

preserved in the anatomical order. The surfaces of the adult bones exhibited green stains caused the contact with bronze objects. G-11 contained the remains of female and male adults. Insect activity in this burial was extreme: their tunnels were visible in the distal epiphysis of the right femur and proximal and distal epiphyses of left femur (Figure 7), the proximal epiphysis of the left humerus and beneath the articular surface of the sacrum. In this grave another cylinder seal was found with the depiction of a

lion. Finally, a recent looting pit was found in the location of grave 12 that included the bones of an adult individual, mostly fragments of long bones and cranial vault.

Due to looting activity in the past and the severe destruction of the graves any comparative analysis of burials is difficult. The only observed pattern, apart from the construction of graves, is the flexed position of skeletons in three graves: G-2 from trench B, as well as G-3 and G-10 from trench C. Moreover, all burials from the 2018 season contained bones of more than one individual and in most graves (4 out of 7) there were bones of subadult individuals, which were found so far only in the looting pits. Furthermore, several graves contained artifacts that may be a symbol of prestige, such as cylinder seals and bronze ornaments.

Acknowledgments: We are grateful to students from Iran, Italy and United States who took part in the bioarchaeology summer field school at Estark, students and staff of the University of Kashan, as well as Faeze Dadafar, Ali Moloodi and Simin Asgari for their help during the excavations. Research on human remains from Estark 1 was financially supported by the Polish National Science Centre (grant No. 2017/27/N/HS3/01373).

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