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Short fieldwork report

Human remains from Ali Kosh, Iran, 2017

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Ali Kosh on Deh Luren plain (32°33′28″N, 47°19′30″E) was excavated in 1961 and 1963 by an American expedition directed by Frank Hole and Kent Flannery as a part of a larger regional project (Hole et al. 1969). Dated to c. 9500-8500 cal. BP (Hole 2000), Ali Kosh is an important Neolithic site located at the eastern edge of the Fertile Crescent (**Figure 1**), providing ample evidence of plant (cf. Moore 1982) and animal domestication (cf. Zeder 1999). In May 2017 a small stratigraphical trench was opened by Hojjat Darabi with the intention of revising the chronology of the site and to gather samples for research on subsistence strategies (Darabi 2017) (**Figure 2**).

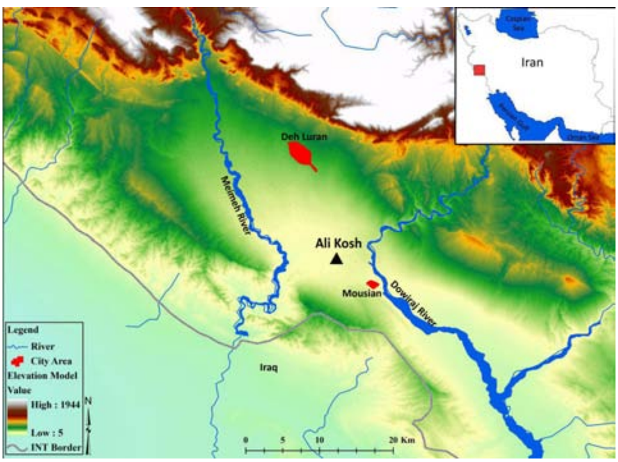

Figure 1. Map of Deh Luren plain showing the location of Ali Kosh.
Drawing by S. Bahramiyan.

During this recent small-scale excavation, a dense cluster of 13 human burials was found at a depth of roughly 4–5m below the surface. Due to time constraints they were not explored *in situ*. Several of the skeletons were cut with large blocks of

Figure 2. A general view of the 2017 excavations at Ali Kosh.

surrounding soil and transported to the archaeological workshop at Razi University in Kermanshah. There they were cleaned and documented with a set of photographs enabling 3D modelling of each block. Finally, all human elements and artifacts were retrieved, cleaned and the human remains analyzed following the protocols of Buikstra and Ubelaker (1994).

In total, three blocks contained the remains of at least 11 individuals (**Figure 3**), although many of them were represented only by crania and/or mandibles while postcranial elements were under-represented. More specifically, block A contained one partially preserved skeleton (H2) and one cranium (H1), block B contained a cranium (H3) on top of three incomplete and disarticulated skeletons (H10, H11 and H12), another disarticulated cranium (H4), incomplete skeleton (H5) and disarticulated mandible (H7). The last block C included a skull (H6) with small remains of postcranial skeleton. Additionally, two mandibles (H8 and H9) were retrieved from other contexts and several dozen fragmented human elements have been identified in assemblages of animal remains. Additionally, one more skull excavated by Hole and Flannery in 1963 has been studied in the National Museum of Iran, referred to here as H13. Another skull curated in this museum (Niknami et al. 2011) was not available for study due to its use in an ongoing exhibition.

Figure 3. Human remains from Ali Kosh, soil block B during cleaning.

All blocks were affected by insect tunneling with a few nests observed, although bones were only slightly damaged by what may be attributed to solitary wasps (Pittoni 2009). In general, human remains were relatively well preserved in hard clayish soil with the only exception of inner parts of the crania that in most cases were empty and therefore strongly weathered and incrusted by crystalline deposits of various size (cf. Sołtysiak & Fetner 2017). All crania were distorted postmortem by pressure from the burial matrix resulting in element dislocations.

Although the burials were not excavated in a systematic way, several artifacts were retrieved from the soil surrounding the human elements. In particular, two subadult individuals received several hundred beads: around the pelvis of H5 there were shell beads, a bigger green one close to the face and two fine big mollusc shells close to the elbow and right auditory meatus. Around the pelvis of individual H2 small shells were found (**Figure 4**). Finally, a fragment of a fine narrow blade and a few small shell beads were located close to the bones of H6. Single small shells and fragments of flint tools were also scattered elsewhere. Most skeletons were coated with red ochre.

Only limited insight into the funerary customs is possible due to the accidental character of the discovery. The bodies of all three individuals with preserved articulations (H2, H5, H6) were buried in squatting position, both limbs hyperflexed, hands and knee joints close to face, feet and elbows close to pelvis. Such position perhaps involved some bundling with textiles or ropes, as all long bones were set together in vertical position between the skull and the os coxae. There were also many disarticulated bones and teeth, which were most likely the result of long-term use

Figure 4. Small mollusc shells around pelvic bones of individual H2.

of the cemetery, with some burials opened after complete skeletonization and bones re-buried in secondary contexts. Primary burials in squatting position seem to be not uncommon during the Pre-Pottery and Early Pottery Neolithic in the Near East (cf. Ortiz et al. 2013; Akkermans et al. 2006) and were also previously reported at Ali Kosh (Hole et al. 1969).

The available assemblage includes 7 crania, 7 mandibles and postcranial elements from at least 7 individuals (**Table 1**). The most striking feature of all crania was their more or less pronounced artificial deformation that was evident in spite of post-mortem alteration and fragmentation of all crania. In all cases circumferential modification was evident (Frieß & Baylac 2003), resulting from application of a band wrapped around the cranium along the anterior parietal and occipital, forming a conical protuberance around lambda (**Figure 5**). In most cases crania were very elongated and only in H3 the shape had been only slightly modified, still with clear impressions of the band. Change of cranium geometry affected the skull base, especially the occipital condyles, which were very convex, with the anterior part at a high angle to the horizontal plane. Additional crests between inferior nuchal line and foramen magnum were present in at least two individuals.

Artificial cranial deformation was common in the Near East and especially in Iran during the Neolithic and Chalcolithic (Meiklejohn et al. 1992; Daems & Croucher 2007), although its pattern changed over time. Among crania excavated by Hole and Flannery at least three female ones were artificially deformed (Hole et al. 1969), although in the female skull curated in the National Museum of Iran no clear evidence of deformation may be seen (Niknami et al. 2011). Artificial cranial deformation was

Figure 5. Cranial deformation in individual H6.

Table 1. Basic characteristics of skeletons from Ali Kosh. Cran. – cranium, Mand. – mandible, PCr – postcranial skeleton, URI1 Avul – avulsion of the right upper incisor, Calc – dental calculus. Scale for completeness: 0 – absent, 1 – less than 50% preserved, 2 – more than 50% preserved, 3 – complete or nearly complete.

ID	Sex	Age-at-death	Completeness			Caries	URI1 Avul	Enamel hypoplasia			Calc
			Cran.	Mand.	PCr			C	M1	Other	
H1	F??	old	3	0	0	0/1	?				+
H2		9	3	1	2	0/5	–	+	+	+	–
H3	F??	15	3	0	0	0/3	–		–		–
H4	M??	young	3	0	0	0/7	+	–	–	–	+
H5		6	3	3	2	0/11	–	–	–	–	–
H6	M	young	3	3	1	0/28	+	+	–	–	+
H7	M??	young	0	2	0	0/5			–		–
H8	M??	young	0	2	0	0/9			–	–	–
H9		7	0	2	1	0/4		+	+	+	–
H10	M??	adult	0	0	1						
H11	F??	14-21	0	0	1						
H12		7-14	0	0	1						
H13	M?	adult	2	0	0	0/6	+		–	+	–

also observed at the nearby site of Chogha Sefid (Hole 1977). The presence of this custom in the recently excavated assemblage at Ali Kosh is, as such, not surprising.

Another cultural modification of the head observed at Ali Kosh was avulsion of the upper right first incisor in all adult males, but not in children nor adolescent individuals. Small sample size makes it impossible to say whether females were also affected, as the only adult female cranium in the sample belonged to an old individual with many teeth (incisors included) lost antemortem. However, in three male individuals even if several teeth were lost postmortem, evidence of antemortem avulsion of this one specific tooth was evident. As two children and one adolescent were not afflicted, it is possible that this custom of tooth avulsion served as an age related rite of passage. Tooth avulsion was common during the Early Holocene in North Africa (Stojanowski et al. 2014; De Groote & Humphrey 2016), and it was also occasionally observed in the Natufian culture, with no relation to sex or age-at-death (Boyd 2002). Such a custom has not been previously reported in the eastern part of the Fertile Crescent.

The age-at-death profile for the Ali Kosh sample seems to be highly biased; there are no infants and only one old adult and therefore age categories with the highest mortality rate are underrepresented, even when small sample size is taken into account. No cases of dental caries have been observed, suggesting a possible diet with low intake of fermentable sugars (cf. Sołtysiak 2014). Frequency of cranial porosities was also rather low, with only one case (H6) of highly obliterated microporosity at several locations on the cranium. On the other hand, in two individuals (H1 and H3, both probable females) the temporal line was very pronounced, with clear vascularization above, suggesting some mechanical stress on the temporal muscle.

Linear enamel hypoplasia (LEH) follows an unusual pattern in this assemblage. Many individuals were free or almost free from this condition, but in two subadult dentitions (H2 and H9) multiple LEH were present in the canines, also along the upper part of the crown. The regular pattern of LEH lines suggests a seasonal character of the stress episodes. Along with the canines, a single hypoplastic line was observed also on the first molars, close to their cusps. Such a condition is very unusual and suggests an episode of stress in infancy around the first year of life. Also in one adult individual (H6) seasonally patterned LEH was observed on the canines. Although interpretation of LEH is difficult because of the osteological paradox (Wood et al. 1992), the pattern of LEH at Ali Kosh is very specific and different from what is seen at later sites where this condition is present in higher frequency, but hypoplastic lines are usually observed mainly close to the cemento-enamel junction on the anterior teeth (cf. Sołtysiak 2010).

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