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Short fieldwork report

Human remains from Shahne Poshte, Iran, 2019

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The cemetery of Shahne Poshte (also known as Haft Tepe) is located south of the modern small town of Khoshroud Pey, not far away from the village of Kamikola in Mazandaran province (36°20′12″N, 52°30′54″E, 254masl). Occupying c. 2 hectares, the site is now covered by forest and has been substantially looted during the recent years. It was discovered during the survey around the currently excavated site of Ghal-e Ben (see another report in this volume) and investigated during a 10-days salvage operation in February 2019.

In total, 24 looted pit graves have been documented and five small test trenches were opened to produce a reliable picture of the site chronology and stratigraphy. Another 10 undisturbed graves were found there, with numerous associated artifacts: pottery, bronze daggers, arrowheads, swords and beads (**Figures 1** and **2**). The orientation of the bodies in these simple pit burials was variable, but males were always buried on the right side and females on the left side. There were also some differences in the artifacts associated with the dead, with only males buried with bronze daggers and only females equipped with grindstones and bronze pins.

Human remains at Shahne Poshte were retrieved from nine graves found in five trenches during regular excavations and from 13 graves that were damaged during looting activity. All associated pottery was dated to the Iron Age I and II (late 2nd and early 1st millennium BCE), and two radiocarbon dates corroborated this dating (Poz-120657, Trench 1 Grave 3, 1216–1008 cal. BC; Poz-120652, Trench 3 Grave 2, 1108–917 cal. BC). The skeletons were studied in the bioarchaeological laboratory at the University of Kashan in June, 2019.

All human remains were recorded according to the protocols presented in Buikstra and Ubelaker (1994). Taphonomic alterations were not scored in a systematic way,

Figure 1. A single burial in Trench 1, Grave 3. Photograph by Hassan Afshari.

though unusual weathering (Behrensmeyer 1978), staining, root etching or insect tunelling (Pittoni 2009), where present, were recorded together with general remarks on bone fragmentation pattern and possible specific pattern of postmortem damage (Sołtysiak 2010).

Degree of completeness was scored on a 4-point scale: 0 = absent element, 1 = less than 50% present, 2 = more than 50% present, 3 = complete or nearly complete element. The list included major skull bones, left and right side scored separately, (i.e. frontal, parietal, occipital, temporal, sphenoid, zygomatic, nasal, maxilla, palatine and mandible), six long bones scored separately for five areas (proximal end, proximal 1/3 of the shaft, midshaft, distal 1/3 of the shaft, distal end), six parts of the spine (atlas, axis, other cervical, thoracic, lumbar and sacral vertebrae), ribs (irrespective side), sternal manubrium and sternal body, hyoid, hand and foot bones (irrespective side) and the following elements with left and right side scored separately: clavicle, scapula, ilium, ischium, pubis, talus, calcaneus, patella. Additionally, presence of minor bones (carpals, metacarpals, tarsals, metatarsals and phalanges) was recorded.

Sex assessment was based primarily on morphology of the os coxae, including ventral arc, subpubic concavity, ischiopubic ramus ridge (Phenice 1969), greater sciatic notch and preauricular sulcus. For the skull, robustness of the following landmarks was recorded: nuchal crest, mastoid process, supraorbital margin, glabella, mental

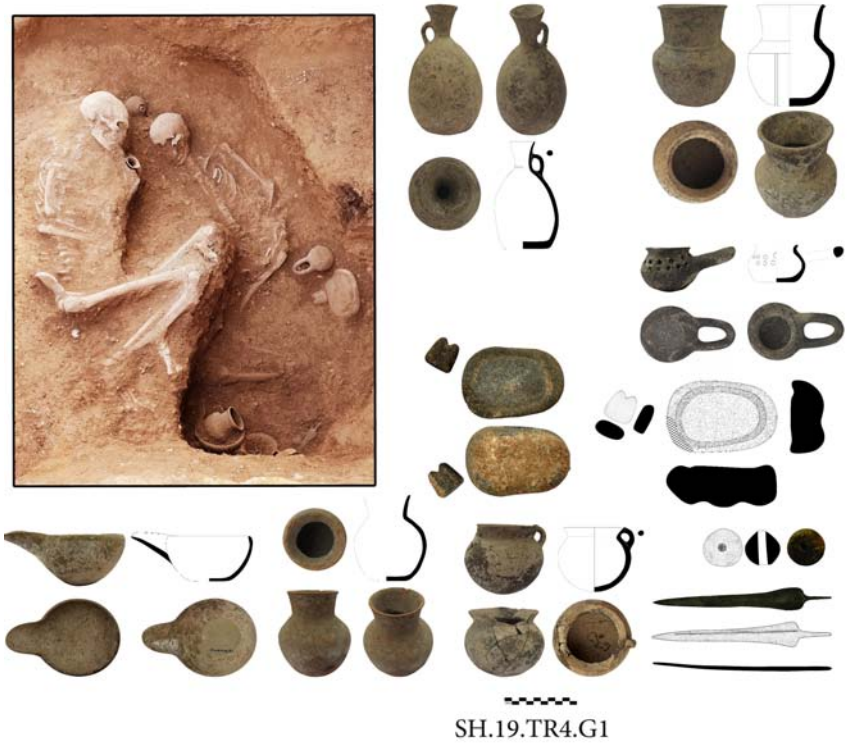

Figure 2. A double burial in Trench 4, Grave 1. Photograph by Hassan Afshari.

eminence. Age-at-death assessment was based on the morphology of the pubic symphysis, scored according to the system of Todd (1920) as well as Brooks and Suchey (1990), and the auricular surface (Meindl & Lovejoy 1989). For bilateral morphological landmarks, both sides were scored separately. Additionally, suture closure along the external cranial vault (midlamboid, lambda, obelion, anterior sagittal, bregma, midcoronal, pterion, sphenofrontal, inferior and superior sphenotemporal), palate (incisive, anterior and posterior median palate, transverse palate) and internal cranial vault (sagittal, left lambdoid, left coronal) were scored in the according to the 4-point scale (Meindl & Lovejoy 1985).

The set of 24 standard cranial measurements includes maximum cranial length, maximum cranial breadth, bizygomatic diameter, basion-bregma height, cranial base length, basion-prosthion length, maxillo-alveolar breadth, maxillo-alveolar length, biauricular breadth, upper facial height and breadth, minimum frontal breadth, nasal height and breadth, orbital breadth and height, biorbital breadth, interorbital breadth, frontal, parietal and occipital chords, foramen magnum length and breadth, mas-

toid length (Buikstra & Ubelaker 1994). Orbital breadth was measured in two ways: dakryon to ectoconchion and maxillofrontale to ectoconchion (cf. Nikita 2017). The ten standard measurements recorded for the mandible included: chin height, height of the mandibular body, breadth of the mandibular body, bigonial width, bicondylar breadth, minimum ramus breadth, maximum ramus breadth, maximum ramus height, mandibular length, mandibular angle (Buikstra & Ubelaker 1994). Additionally, gonion-gnathion length, condylo-symphyseal length and maximum length of the condyle were measured.

The list of postcranial measurements included all 44 standard measurements defined in Buikstra & Ubelaker (1994), with the following additions: glenoid height (scapula), maximum and minimum measurements at the maximum development of deltoid tuberosity (humerus), maximum proximal and distal epiphyseal breadths, antero-posterior and medio-lateral diameter at the maximum development of the interosseous crest (radius), maximum breadth at the coronoid process (ulna), maximum length of the sacrum, maximum diameter of the acetabulum, maximum length of tibia, maximum proximal and distal epiphyseal breadths (fibula), breadth and length of atlas, maximum height, height without the odontoid process, breadth and length of axis, height and breadth of patella, total length and maximum length of upper articular facet (talus), breadth of the navicular, maximum height and maximum breadth of the sternal body (without xyphoid process), maximum height and maximum breadth of the sternal manubrium, maximum length, proximal and distal epiphyseal breadths, antero-posterior and medio-lateral diameters at midshaft of the first metacarpal. All measurements were taken on the left side or on the right side if measurement of the left was not possible. Only measurements of the first metacarpal were taken on both sides.

The standard list of 36 primary nonmetric traits (Buikstra & Ubelaker 1994) was supplemented by division of talar articular surface on calcaneus, third trochanter and lateral fossa on proximal femur, supracondylar ridge on distal humerus, vastus notch on patella, squatting facet on distal tibia and *spina bifida* on sacrum. Pathological conditions were documented with photographs and some specific conditions, such as *cribra orbitalia* and porotic hyperostosis (if more than 75% of cranial vault was present) were scored in a simplified way (Steckel et al. 2006). Degenerative joint disease in all joints more than 75% preserved was assessed according to a 3-point scale (Steckel et al. 2006).

For every tooth the following data were gathered: mediodistal and buccolingual maximum diameter, dental wear score in a 10-point scale for molars (Smith 1984), or 8-point scale for other teeth (Scott 1979), enamel hypoplasia and dental caries. Enamel hypoplasia was scored according to a 4-point scale: 0 = no hypoplasia, 1 = visible lines that are not perceptible with a fingernail, 2 = one line perceptible with a

Figure 3. Femoral fragment covered by a clayish hard deposit, Trench 1, Grave 3. Note harder mineral deposit around the original bone surface. Scale bar 1mm.

fingernail, and 3 = two or more perceptible lines (modified from Steckel et al. 2006); dental caries were scored according to a 4-point scale: 0 = no lesions, 1 = a lesion

Table 1. Basic characteristics of human remains from Shahne Poshte, regular excavations.

Trench	Grave	Sex	Age-at-death	Caries	Comments
1	1	M**	mature	2/11	
1	1	F*	adult		
1	2	F*	mature	0/7	
1	3	M	adolescent		
2	1/B1	M*	adult	0/2	
2	1/B2	M	adult	0/9	
2	1/B3	–	0.5–0.75		
3	1	M**	adult	2/25	
3	2	M**	adult	2/26	
3	3	?	adult	0/8	a fragment of right mandibular body
4	1/B1	M	50–60	0/4	
4	1/B2	F	45–50	1/20	
5	1	M	40–45		
5	1	F	adult		

less than 2mm in breadth, 2 = a lesion 2–6mm in breadth, and 3 = a larger lesion (see Sołtysiak 2014). Apart from this, location of the lesion was noted (i.e. medial, distal, labial, lingual, occlusal, root, cemento-enamel junction, and crown). Antemortem and postmortem tooth loss were noted, as well as absorption of the alveolar process >2mm. The presence of considerable amounts of dental calculus was also documented, but no specific quantitative scale was utilized.

As many elements were covered by a hard clayish surface (**Figure 3**), observation of paleopathological conditions and metric measurements was not possible in many cases. However, sex assessment, even in many cases of fragmented remains, was possible for most adult skeletons. In total, the remains of 38 individuals were identified: 14 in graves excavated during the salvage operation (**Table 1**) and 24 retrieved from the looted pits (**Table 2**). This number includes only two subadults (one infant and one older child), which is much less than expected in a regular attritional cemetery.

Table 2. Basic characteristics of human remains from Shahne Poshte, rescue operation at looted burials.

Grave	Sex	Age-at-death	Caries	Comments
1	M	35–40		
1	M	40–45		
2	M**	adult	0/10	only cranial fragments
4	M*	adult		
8	M*	adult		very few fragments
9	M**	adult		
10	M*	adult		
10	F*	old		
11	M*	40–45		MNI based on femoral diaphyses
11	F**	35–40		
11	?	adult		
11	?	adult		
12	M*	adult		
12	M**	adult		
12	?	adult		
13	M**	old	0/2	MNI based on humeri
13	F**	adult		
13	?	adult		
14	M**	adult	2/6	
14	F*	adult	0/17	
15	M*	adult		
15	F**	adult		
16	–	12–15	0/6	a fragment of left mandibular body
17	?	mature		a fragment of left mandibular body

Figure 4. Uneven wear pattern and abscess in individual 2 from Trench 4, Grave 1. Scale bar 1mm.

Figure 5. Healed fracture of ulna, Trench 3, Grave 2. Scale bar 1mm.

Although infant remains may be more easily damaged by taphonomic agents, such a striking bias is more likely the effect of specific funerary customs that assumed separate burial places for adults and subadults.

Another specific pattern has been revealed in the distribution of sexes. In 11 graves, single burials were found, and in another 11 graves there were at least two skeletons. However, in three cases the additional bones of a third or fourth individual were represented by single elements; all such contexts were disturbed and looted pits, suggesting that it is likely these extra bones were moved from another grave. Therefore, the only strong confirmation of a triple burial comes from Grave 1 from Trench 2 (T2G1), where the third individual was an infant. When this subadult individual and all possibly intrusive elements are neglected, in 3/11 double burials, two males or likely males were buried and in 8/11 instances there was a couple of a male and a female. On the other hand, in single graves the prevalence of males is evident (one female versus seven males). Although this pattern is neither perfect nor statistically significant, it

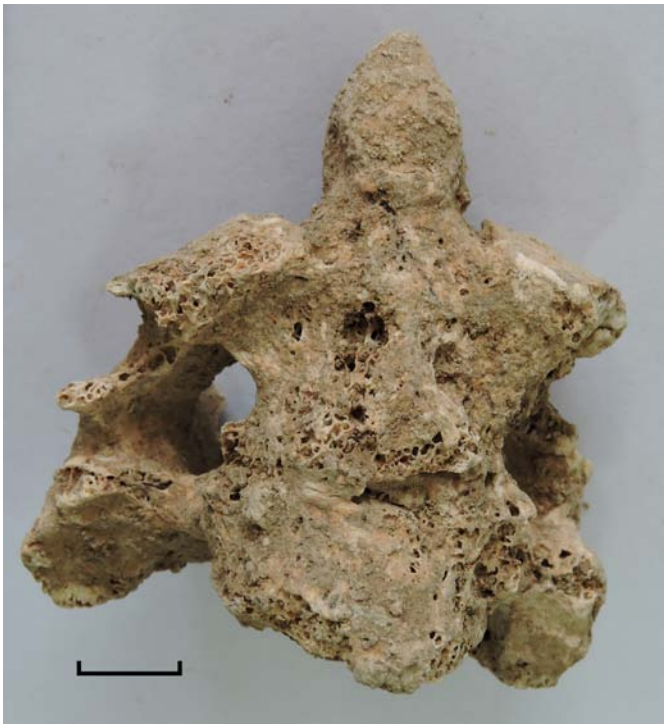

Figure 6. Fusion of the second and third cervical vertebrae, Trench 3, Grave 2. Scale bar 1mm.

seems likely that the burial custom in the group using the cemetery at Shahne Poshte assumed burying males in single or double graves and females predominantly together with males in double burials. In effect, the number of females among 30 individuals where sex assessment was possible was lower than expected (χ^2=4.8, p=0.03). It is therefore likely that females were also buried elsewhere.

As many individuals were mature or old adults, there were several cases of antemortem tooth loss (T1G1, G10, G11, G13) and dental abscesses (RM^1 in T1G2, many teeth in T4G1B1, RM_2 in T4G1B2, RC_x in G11) as well as significant amounts of calculus in many teeth. Dental caries were observed in five individuals, but the overall prevalence of this condition was relatively low (9 per 147 permanent teeth of adult individuals = c. 6%). Dental wear was occasionally very advanced, with no or little enamel present. In female individual T4G1B2, a very uneven wear pattern suggests exclusively vertical mastication, perhaps associated with malocclusion (**Figure 4**).

In male individual T3G2, the left ulna was broken at midshaft, most likely at an obtuse angle, and healed with some dislocation (**Figure 5**). The radius was not broken,

Figure 7. Degenerative joint disease in the axis, Trench 4, Grave 1, Body 1. Scale bar 1mm.

Figure 8. Enthesophyte at the popliteal line of tibia, Trench 4, Grave 1, Body 1. Scale bar 1mm.

but the shape of its proximal epiphysis appears to have adopted to a shortened ulna through development of the articular surface at the head (to 17.2mm on the medial side), with slight degenerative joint disease. The same individual suffered from fusion of the second and third cervical vertebrae (**Figure 6**).

The skeleton T4G1B1 exhibited degenerative joint disease in several articular surfaces, including right distal end of femur, both patellae, several cervical vertebrae (axis, left upper C4, right lower C5, right upper C6) (**Figure 7**), right lower lumbar vertebra (that was sacralized) and sacrum. There were also very developed enthesophytes at the

Figure 9. Additional articular surface in the left retroauricular area, Trench 4, Grave 1, Body 2. Scale bar 1mm.

Figure 10. Plant root traces inside the cranium, Trench 4, Grave 1, Body 2.

anterior side of both patellae, on the popliteal line of the left tibia (**Figure 8**) and on all femoral trochanters. Obliterated *cribra orbitalia* was observed in both orbital vaults. The development of degenerative joint disease, enthesophytes and several instances of

dental abscesses are consistent with the advanced age-at-death of this individual. A massive enthesophyte near the nutrient foramen of a very robust tibia was also present in the skeleton from the Grave 12.

Individual T4G1B2 exhibits some degenerative joint disease, especially in the lower thoracic vertebrae, with osteophytes around the bodies being up to 8mm, and in the seventh cervical vertebra. In the left retroauricular area an additional articular surface was present (**Figure 9**). The male skeleton from Grave 13A presents a similar picture.

Apart from the hard clayish cover on many skeletal elements, several other taphonomic agents were observed, including black root traces clearly evident inside the cranium of individual T4G1B2 (**Figure 10**) and on the tibia of the individual from Grave 12. The lumbar vertebrae of individual T3G2 had greenish staining, perhaps the consequence of the presence of some bronze objects in this area. The cranium of individual T1G3 had several small snail shells present, likely representing scavenging species.

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