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ANTHROPOLOGY OF HUMAN REMAINS OF THE CLASSICAL/LATE ANTIQUITY PERIOD FROM FIRMI BAGHER AND VARTAQAR SITES, ARMENIA

ABSTRACT: This paper describes the most interesting diseases observed in skeletal samples from two necropolises found in Shirak and Lori provinces during archaeological excavations in the last decades and corresponded to Classical/Late Antiquity period (1st century BC – 3rd century AD). The diseases observed were grouped into the following categories: traumas, infections, nutritional diseases, tumors characteristic for group. A relatively low prevalence of fractures suggests a relatively low level of interpersonal violence in this community. Palaeopathology allowed highlighting the spread of some illnesses, many of which can be related to the life and health conditions of the Armenian population.

KEY WORDS: Armenia – Classical/Late Antiquity period – Trauma – Dental pathologies – Neoplastic conditions – Mastoiditis – Periostitis – Ankylosing spondylitis – Osteoarthritis – Chondromalacia patellae

INTRODUCTION

The Armenian highland was in early history a crossroad linking the worlds of East and West. The Armenian highland was an area of frequent military conflicts, and its history was largely determined by external forces (Eremyan 1968). The Classical/Late Antiquity period saw the interaction of various ethno-cultural groups – Iranic nomads (Scythians, Sarmatians, Sauro-matians, Saka) and locals are interacted. Their presence in this region perhaps goes back to the 8th century BC (Piotrovsky 1959, Eremyan

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1968). A statistical analysis of measurements of crania from the 1st century BC – 3rd century AD cemetery at Armenia indicates considerable morphological heterogeneity (Khudaverdyan 2000, 2012). Detailed analysis including the craniometric, cranioskopic, osteometric, demographic and the paleopatologics indeces allowed not only to reveal the complex anthropological structure of the population of Classical/Late Antiquity period, but also to uncover the reasons of anthropological and ethnic inhomogeneity of the population living in the Armenian highland. For the first time a multydimensional analysis provided a chance to allocate two groups of the population and to establish the resemblance of the Armenian antique groups (II) to the Scythians of Moldova, coastal steppes of the Black Sea and Ukraine, the Sarmatians of the Volga-Ural region and Central Asian Saqs (Khudaverdyan 2000, 2012). The skulls of the first group have been diagnosed as classical European sample. The analysis of the main odontological traits in sites indicates that their frequencies fit within the range characteristic for the European dental complex and the biologically admixed groups (Khudaverdyan 2014). A detailed study of discretely varying (fenetic) signs of the individuals from antique populaces of Shirakavan and Karchakhpyur was carried out by A. A. Movsesyan (Movsesyan, Kochar 2001, 112) who concluded that "Along with preseving a genetic link with the population of the previous eras the polulation of Karchakhpyur and Shirakavan had undergone certain influence of the alien groups". This scenario is consistent with other archaeological and historical studies of the area which show the long-standing presence of Scythians in the Caucasus (Piotrovsky 1959, Eremyan 1968).

Trauma

Traumatic conditions, especially fractures, can tell a lot about the life style of an individual and how they may have died. Studies on cranial and facial fractures show that the main causes behind these injuries are accidents and violence (e.g. Haug *et al.* 1994, Brasileiro, Passeri 2006, Fornazieri *et al.* 2008, Trinidade *et al.* 2013). Much of the evidence for trauma in archaeological populations focuses on fractures to the bones (Roberts, Manchester 2007). The bone elements to which muscles attach can also provide information on muscle trauma and excessive use of muscles.

Hematopoietic diseases

Cribra orbitalia, a descriptive term for porotic hyperostosis lesions of the orbit and of the skull vault, were identified as pitting of the compact bone varying in size from capillary like impressions to coalescing outgrowths (Stuart-Macadam 1997). The behavior of these indicators in the skeletal sample allows us to evaluate nutrition and health condition in these individuals, as it permits us to approach the disorders related to nutritional deficiencies, such as that of iron that leads to anemia (Aufderheide, Rodriguez-Martin 1998). The cause of the anemia is however not determined by the presence of porotic hyperostosis, it can for instance be caused by nutritional stress or parasites. Other explanations, for example inflamatory or haemorrhagic processes are also possible (Ortner 2003).

Neoplastic Conditions

Tumors are abnormal productions of tissue that may originate directly in the bone (primitive neoplasms) or in other organ systems of the body, and secondarily spread to the bone. The most common benign tumors in skeletal tissue are those originating in the cartilage (chondroma and osteochondroma) and in the bone tissue (osteoma). Osteoma is the most commonly observed bone tumor in archaeologically obtained bones. An osteoma is a benign, slow-growing tumor. It consists mostly of dense lamellar bone with vascular channels but with minimal marrow space (Aufderheide, Rodriguez-Martin 1998, Ortner 2003). It is most frequently located on the outer table and is presented as a smooth bump. Larger osteoma can be 4 cm in diameter and almost 4 mm above the plane of the normal bone at the center of the tumor (Ortner 2003). The origins of osteomas are uncertain, but commonly accepted theories propose embryologic, traumatic or infectious causes (Smith, Calcaterra 1989, Ortner 2003). Auditory exostoses is common in individuals who practice aquatic sports, and prevalence of auditory exostoses and degree of canal obstruction are positively corelated with intensity and number of years involved in aquatic sports (Kennedy 1986, Kroon *et al.* 2002). The skin in the ear canal is very thin, so the periosteum here is very near the surface. Irrigation of the ear canal with cold (below about 19°C) water has been shown to cause prolonged local redness, hyperaemia and inflammation which may traumatise the periosteum, stimulating it to lay down new bone.

Diseases of the Viscera

Mastoiditis is a severe middle ear infection that is the result of otitis media (McKenzie, Brothwell 1967, Flohr, Schultz 2009 a, b). Otitis media may be caused by a variety of bacteria, but infections caused by Streptococcus pneumoniae, and Haemophilus influenza are the most common (Aufderheide, 2003, Lewis 2007). Acute mastoiditis may develop into necrosis and demineralization of the normal mastoid air cells, osteitis of the mastoid bone, and general damage of the mastoid air cells (Anderson, Adam 2009). Chronic or subacute mastoiditis possibly evolves into a long lasting middle ear disease with chronic purulent drainage and hearing loss (Anderson, Adam 2009). Berman (1995) lists the complications of mastoiditis that can result in death, including sepsis, meningitis, brain abscess, subdural emphysema, lateral sinus vein thrombosis, and disabilities of the central nervous system, such as spasticity, paralysis, mental retardation, cortical blindness, seizures, labyrinthitis, and facial nerve paralysis.

Infectious Diseases

Periostitis is an inflammation of the periosteum and is caused by bacteria that enter the bone either due to a traumatic incident or due to infection (Larsen 1997, Ortner 2003). In periostitis, the formation of woven bone is usually activated which causes the incorporation of the latter into the underlying cortex and the remodeling into lamellar bone (Ortner 2003).

Joint Diseases

Ortner (2003) provides the three major components of skeletal involvement in osteoarthritis: 1) the collapse of articular cartilage that results in bone on bone contact and in abnormal abrasion of the subchondral bone, 2) reactive bone formation (sclerosis) in the subchondral compact bone (eburnation) and in the trabeculae underlying the affected subchondral compact bone and possibly associated with cyst formation, and 3) new growth of cartilage and bone at the joint margins (osteophytes). Generally, two types of osteoarthritis can be distinguished: primary osteoarthritis that tends to affect individuals in their later years as a result of multiple factors, such as biomechanical stress due to repetitive workload, traumatic conditions, or a high body mass index, and secondary osteoarthritis that develops earlier in life in joints that are affected by other pathological conditions, such as slipped femoral epiphysis and Legg-Perthes disease (osteonecrosis of the hip and the femoral head which is only found in children: Salter 1984) or metabolic disorders (Ortner 2003, Weiss 2006, Weiss, Jurmain 2007).

The ankylosing spondylitis (or Bechterew's disease, HLA-27 spondyloarthropathy, Marie-Strümpell disease) is a progressive inflammatory disease of unknown aetiology, genetic and environmental factors are thought to have key roles. The disease is the most important and most frequent member of the complex seronegative spondylarthropathies (SNSAs). The majority of the individuals have a tissue antigen referred to as HLA-B27 antigen in their blood; the overall estimated prevalence of AS is 1.9%, however there is a wide variation according to geographic areas (Braun *et al.* 1998). The peak onset of the disease is in the early 20s. (Sieper *et al.* 2002). It affects more males than females. One of the characteristics is the syndesmophyte – ossifications leading to fusion of the spine, the lumbar vertebrae are the most involved. Vertebrae become 'squared' radiographically, so-called 'bamboo-spine' without skip lesions is recognizable. Uni- or bilateral sacroiliitis, symmetrical fusion of the sacroiliac joint is possible, sometimes costovertebral fusions appear (Waldron 2009).The disease can also affect other joints of the extremities (e.g. knee, hip, shoulder and ankle), however the lack of spinal involvement in any of these skeletons, and presence of periosteal reaction (not associated with ankylosing spondiylitis) rules it out as a causative agent (Bilsel *et al.* 2003). Other members of the SNSAs may also result in ankyloses, both reactive and psoriatic arthropathies may be in association with skeletal fusions, special distinctive pattern according to vertebral and sacroiliac involvement is seen in these diseases (Waldron 2009, Mease, Helliwell 2008).

Chondromalacia patellae is damage to the cartilage at the back of the patella. This smooth hard cartilage is known as articular cartilage and its purpose is to allow smooth movement of the patella over the femur or thigh bone in the knee. The cause can be either acute from a sudden impact or from a long standing overuse injury. Acute injuries normally occur when the front of the knee cap suffers an impact, such as falling directly onto it, or being hit from the front. This results in small tears or roughening of the cartilage. It is also more common in those who have experienced previous traumatic knee injuries such as fractures and dislocations.

Dental pathologies

Enamel hypoplasias represent a permanent chronological record of a stressful incident during the first 7 years of life (Goodman, Rose 1990). Physiological stress including particularly metabolic disorders and nutritional deficiency (but also infectious disease, and physical and emotional trauma) during the development of the teeth appears to be an important cause of (linear) enamel hypoplasia. Diets which are extremely specialized or monotonous may be linked to hypoplasia, as a non-varied diet can lead to malnutrition.

Dental caries causes the demineralization and dissolution of dental tissues, caused by an acid-producing bacterium called Streptococcus Mutans, which is produced in the dental plaque on the teeth surface (Aufderheide, Rodriguez-Martin 1998, Goodman, Martin 2002). The consumption of carbohydrate rich plants from non-agricultural sources could be the cause, since some non-agricultural diets are comprised of large amounts of (non-domesticated) plant foods. Exchange of food with agricultural groups, or low levels of fluoride in the local water sources, are others explanation for the inflated caries rates in some hunter-gatherer/forager groups (Larsen 1997, Lukacs 1989).

Dental abscesses might be caused by a fast wear that provokes a diminution of dentine to fill the pulp, or are also the result of progressive caries which generate a dental infection frequently originating these abscesses; they are macroscopically observed in the maxillary and in the jaw (Herrera *et al.* 2000 a, b).

Dental wear: a pattern of behavior in relation to the sort of alimentation or an occupational activity as for the use of dentition can be observed (Lagunas, Hernández 2000). Dental wear tends to be more common and severe in archaeological populations than in modern teeth. In a review of the field Dahlberg (1963) suggested "grasping, holding, crushing, cutting, tearing, gnawing, tool-making, leather-treating, and thong, reed and thread fashioning" as just some of the "special uses" the human teeth are put to. Later, Molnar's complete and comprehensive overview of the non-alimentary uses of teeth defined a set of criteria by which to distinguish non-alimentary wear patterns from masticatory wear, and emphasized the value of ethnographic comparisons in linking the clinical presentation of non-alimentary wear to particular (craft) activities (Molnar 1972).

Dental calculus is commonly observed in archaeological populations whose dental hygiene was not a rigorous as it is today. Dental calculus is a hard, yellowish to brownish-black deposit on teeth formed largely through the mineralization of dead bacteria in dental plaque by the calcium salts in salivary and sub-gingival secretions.

Dental chipping was first described at length by Turner and Cadien (1969). They strongly associated this type of dental wear with a diet consisting mainly of meat and with the action of crushing bones with the teeth. A number of researchers have suggested masticatory causes for dental chipping, such as the extreme toughness and abrasiveness of some food types which sometimes include parts of snail shells, fruit stones and bones (Bonfiglioli *et al.* 2004), the adherence of sand and grit to certain foods (Budinoff 1991, Molleson, Jones 1991), and the consumption of dried fish (Budinoff 1991). Numerous non-alimentary causes for dental chipping have also been suggested, including cracking nuts (Mickleburgh 2008), cracking crab shells (Budinoff 1991), chewing seal hides and preparing sinew (Merbs 1968), cracking bones (de Poncins 1941), retouching chert artefacts (Gould 1968), and holding objects between the teeth (Bonfiglioli *et al.* 2004, Merbs 1968, de Poncins 1941).

Ante-mortem tooth loss can occur as a result of a variety of factors, including dental caries, pulp-exposure from heavy tooth wear, or periodontal disease (occurring when inflammation of the gums, gingivitis, spreads to the underlying bone).

Torus mandibularis and torus palatinus or hyperostosis, was taken as evidence of masticatory stress. Although the etiology of these traits remains unclear, seem to share causative factors of stress and therefore tend to co-occur (Jainkittivong, Langlais 2000). The relationship of these bone formations to masticatory stress has been shown in clinical (Kerdpon, Sirirungrojying 1999) and bioarchaeological (Scott *et al.* 1991) studies. Torus mandibularis is a bony growth in the mandible along the surface nearest to the tongue. The prevalence of torus mandibularis ranges from 5% – 40%. It is less common than bony growths occurring on the palate, known as torus palatinus. Mandibular tori are more common in Asian and Inuit populations, and slightly more common in males (Neville *et al.* 2009).

MATERIALS

Firmi bagher

In 2010, archaeological excavations were conducted by Suren Hobosyan and Ruzan Palanjyan in Lori region of the Republic of Armenia (*Figure 1*). Archaeological excavations were done near the villages of Shnogh and Teghut. Data from excavations suggest that a small farming community occupied the site from at least 1st century BC – 2nd century AD. Individuals were placed in extended positions. Most of the skeletons were accompanied by large numbers of pottery vessels, bangles, and beads, semiprecious stones. A large portion of the skeletal sample had extensive postmortem damage and fragmentation. The excavations of Firmi bakher cemetery produced a minimum number (MNI) of 14 skeletons: 4 male and 4 females, one individual is not defined sexualidentity. Four children (6–12 years) and one adolescent the present in the sample (*Table 1*). The post-cranial skeletons in Firmi bagher site not were collected (post-cranial skeletons was very frail).

Vartaqar

An archaeological evaluation was undertaken by Shirak Archaeology in March 2016 at village Vartaqar of Shirak province. Excavations there were led by Hamazasp Khachatryan and Larisa Eganyan from Regional Museum of local lore of Shirak. Shirak lies on the middle and lower reaches of the river Akhurian and occupies about 3730 square kilometers. Set at 1530 meters above sea level, the Shirak plateau is mainly in black earth belt. A total of two trenches was excavated in village Vartaqar. During the excavation at Vartaqar site 4 burials were excavated, the remains of six adults and 3 infants were excavated (*Table 2*). Due to poor preservation no bones could be recovered in the burial 1. A large portion of the skeletal sample had extensive postmortem damage and fragmentation. Burials were identified in the western part of the site, probably corresponded to Classical/Late Antiquity period (1st century BC – 3rd century AD).

The sex and age composition of the two samples is reported in table 3: in the Vartaqar necropolis, the best represented age classes are 30–39 and 40–49 years, while the younger age classes are represented (mainly 20–29 and 30–39) in the Firmi bakher necropolis. Older subjects (50+ years) are present two times.

Archaeologists who have excavated burials suggested, based on the archaeological materials (Firmi bagher, Vartaqar), that the burials in stone tombs at this necropolis belong to local residents. The purpose of the present paper was to review

FIGURE 1: Map of Armenia with the locations of the Classical/Late Antiquity period necropolises excavated.

TABLE 1: List of individuals from Firmi bagher site.

Year	Burial	Sex	Age
	Firmi bagher		
2010	1	male	20–25
		undet.	35–40
2010	2	female	25–30
		male	45–50
		undet.	6–7
2010	3	undet.	6–10
2010	5	female	20–25
2010	6	male	50–60
2010	7	undet.	8–10
2010	8	male	25–30
2010	9	female	30–35
2010	10	female	20–25
2010	12	undet.	13–16
2010	13	undet.	11–12

TABLE 2: List of individuals from Vartaqar site.

Year	Burial	Sex	Age
	Vartaqar		
2016	2	male	50–55
2016	3	male	40–45
		male	40–49
2016	4	undet.	8–9
		undet.	4–6
		undet.	1–3
		female	40–49
		male	30–39
		female	30–39

anthropological characteristics, health status of people living in the Late Antiquity period on the Shirak and Lori regions in order to reconstruct their biological state and living conditions on the past.

METHODS

The age-at-death and sex of adults were assessed through the use of multiple indicators: morphological features of the pelvis and cranium were used for the determination of sex (Phenice 1969, Buikstra, Ubelaker 1994); a combination of pubic symphysis (Gilbert, McKern 1973, Katz, Suchey 1986, Meindl *et al.* 1985), auricular surface changes (Lovejoy *et al.* 1985), degree of epiphyseal union (Buikstra, Ubelaker 1994), and cranial suture closure (Meindl *et al.* 1985) were used for adult age estimation. For subadults, dental development and eruption, long bone length, and the appearance of ossification centres and epiphyseal fusion were used (Moorrees *et al.* 1963 a, b, Ubelaker 1989, Buikstra, Ubelaker 1994).

The skeletons were recorded in a database by Institute of Archaeology and Ethnography, National Academy of Science based on the recommendations in Standards for Data Collection from Human Remains (Buikstra, Ubelaker 1994). The recording included: representation and preservation of skeletal elements, estimation of age and biological sex, dental development and dental health, pathologies,

TABLE 3: Age at death and sex in the skeletal samples of the Vartaqar and Firmi bagher necropolises.

Age classes	Males	Females	Sex?	Total
Vartaqar necropolis				
0–6 years			2	2
7–12 years			1	1
13–19 years				
20–29 years				
30–39 years	1	1		2
40–49 years	2	1		3
50+ years	1			1
Total	4	2	3	9
Firmi bagher necropolis				
0–6 years			1	1
7–12 years			3	3
13–19 years			1	1
20–29 years	2	3		5
30–39 years		1	1	2
40–49 years	1			1
50+ years	1			1
Total	4	4	6	14

cranial and postcranial measurements and non-metric traits.

For metrical evaluation of skeletal material the system of measures by Alekseev and Debets (1964), Alekseev (1966) was used. The bone is measured on an osteometric board, and stature is then calculated using a regression formula developed upon individuals of known stature (Trotter, Gleser 1958, Alekseev 1966). Non-metric traits have been recorded for these skulls (Movsesyan *et al.* 1975) and dentition (Zubov 1968).

All bones were examined macroscopically for evidence of pathological changes. All fractures were examined macroscopically, followings recommendations provided by Roberts (2000). Each orbital roof is recorded as a single unit with cribra orbitalia noted as present, absent or unobservable. Lesions are recorded following the grading system defined by Stuart-Macadam (1991) (types 1–5). Severity of the dental wear was assessed using a chart developed by Smith (1984). Each tooth was scored using a grading system ranging from 1 (no wear) to 8 (severe attrition of the whole tooth crown). Caries was recorded at individual tooth level noting the position and severity of the largest carious lesion visible. Carious lesions were recorded based on the system devised by Buikstra and Ubelaker (1994). Calculus was noted where mineralized plaque can be seen adhering to the tooth surface (Hillson 1996). Calculus was recorded on an individual tooth level stating the location and severity of the formation. The location was recorded as supra- or sub-gingival based on the location of the deposit (on the crown or the root) and on the characteristics of the calculus (Hillson 1996). The severity was recorded as slight, medium or considerable deposition following Brothwell (1981). Diagnosis of hypoplastic defects refers to Hillson (1996) for description of linear and pit-shaped interruption in the enamel formation. Enamel hypoplasia is recorded on individual tooth level. Periodontal disease is recorded on an individual tooth level. Lost teeth are recorded as lost ante mortem when there is no alveolus present, or when the alveolus is partly resorbed. When the alveolus shows no signs of resorbtion the tooth is recorded as lost post mortem. The size of the torus mandibularis is scored as 0) absent, 1) trace, 2) moderate (2–5 mm), 3) marked (>5 mm).

Degenerative joint changes are observed as macroscopic changes to the zygoapophyseal joints and recorded following Brothwell (1981). True osteoarthritis is defined by the presence of eburnation.

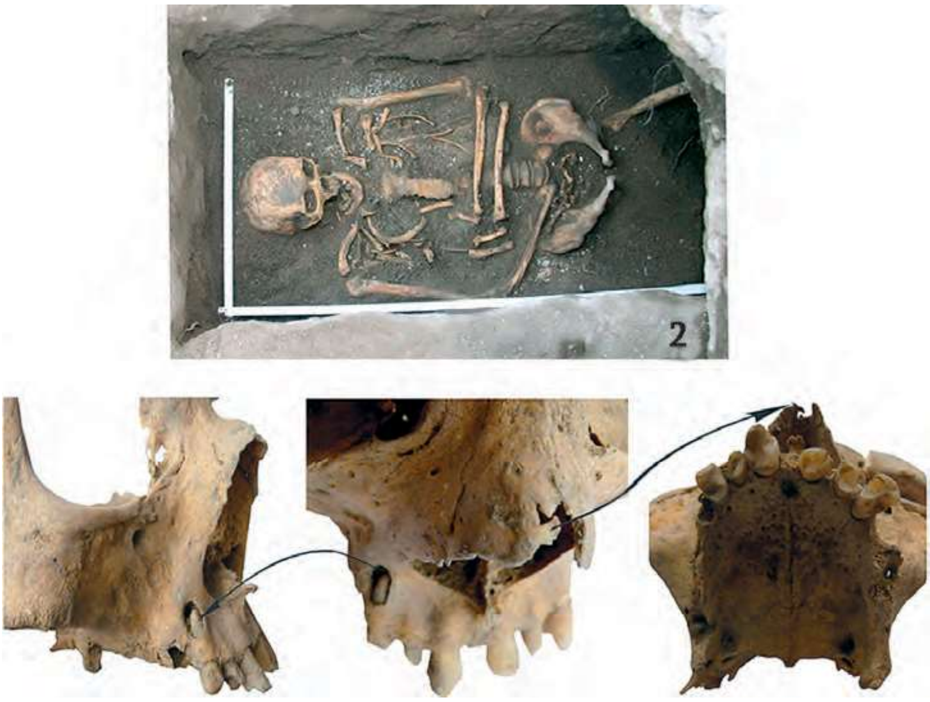

FIGURE 2: Burial 2: the facial region of subject shows the fracture of the free margin of the left nasal bone, with possible periapical lesion at the right canine, ante-mortem tooth loss and periodontitis (Vartaqar, burial 2).

Degenerative changes were not recorded for uncovertebral, costovertebral or costotransverse joints. The recording of a Schmorl's node was based on the maximum dimension of depressed circular or linear lesions in the articular surfaces of the centra: less than 15mm (small), 15–25 mm (medium) and greater than 25mm (large). Degenerative changes to the vertebral bodies were recorded when osteophytes (bony outgrowths) were present around the margins or on the body surfaces, or /and porosity of the body surfaces (Rogers 2000). Schmorl's nodes can be seen as impressions in the superior and inferior surfaces of the vertebral bodies. They are common, particularly in the lower thoracic and lumbar region. There are many possible causes, including stress to the lower spine (Waldron 2009).

Periostitis is an inflammation of the periosteum and is caused by bacteria that enter the bone either due to a traumatic incident or due to infection (Larsen 1997, Ortner 2003). In periostitis, the formation of woven bone is usually activated which causes the incorporation of the latter into the underlying cortex and the remodeling into lamellar bone (Ortner 2003). The surface of the bone may be irregular and appear elevated due to different degrees of thickness, nodulation, and pitting secondary to hypervascularity (Aufderheide, Rodriguez-Martin 1998).

RESULTS

Anthropology of the population from Vartaqar

Burial 2.
Sex: male
Age: 50–55 yrs
Individual: poorly preserved skeleton
Skull: robust, flat forehead, flat glabella, weakly developed arcus superciliares, mastoids are large, strong. Cranial occiput with linea nuchae suprema and linea nuchae superior forms a massive protuberantia occipitalis externa with coracoid eminence at the inion.

FIGURE 3: The post-cranial bones of subject also show other healed fracture: on the middle part of a rib (line of fracture indicated) (Vartaqar, burial 2).

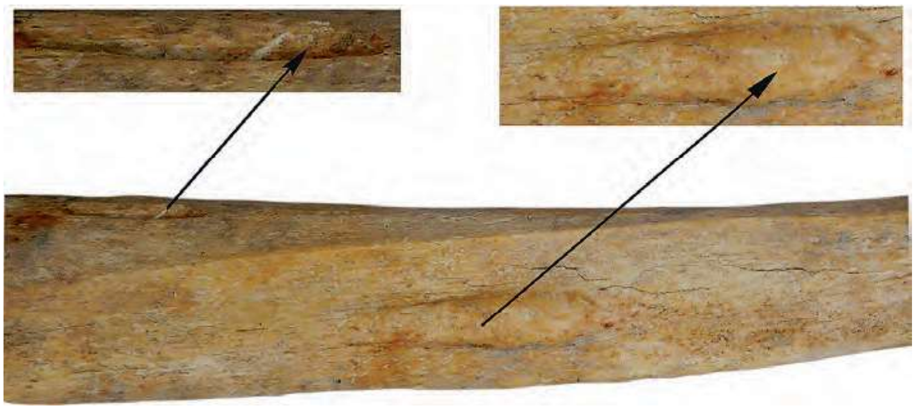

FIGURE 4: Benign neoplastic growth on the shaft of the right tibia (Vartaqar, burial 2).

Anthropometric characteristics: dolichocrany, minimal frontal breadth, 112; occipital breadth, 91; alveolar arch length, 54; alveolar arch breadth, 53.8; palatal length, 51.5; palatal breadth, 37; nasal height, 53; nasal breadth, 24; orbital breadth (mf), 40; orbital breadth (d), 37.5; nasal index, 45.29; palatal index, 71.85.
Nonmetric trait: stenocrotaphia, processus frontalis squamae temporalis, os wormii suturae squamosum, torus palatinus, sutura palatina transversa (Π-shaped), sulcus mylohyoideus, midline diastema (I^1–I^1), reduced, peg-formed tooth I^2, septal aperture, Poirier's facet.
Stature: 166.5 cm
Dental pathology: Mandible – left M1 caries. Maxilla - dental wear is uneven, suggesting that the teeth have been used for other activities. Incisors and canines, for example, are subject to different patterns (Figure 2). Non-alimentary modifications can often be identified by their "odd" appearance. Abscesses are evident on the alveolar bone of the right canine. Also, there is ante-mortem loss of the premolars and molars. Above the maxillary molars, premolars is an irregular area with pitting on the internal and external surfaces indicating the spread of infection from the dentition into the maxilla above the alveolus. The mandible shows complete resorption of the posterior alveolus and active resorption of the anterior alveolus. The mandibular canines also have dental calculus.
Paleopathology. The subject who had suffered a fracture of the left nasal bone, with introflection of the inferior free margin of the bone, the fracture is completely healed (*Figure 2*). Male also has a well-healed fracture of the right middle thoracic rib (*Figure 3*).
The individual also has a two elongated growths on the right tibia (*Figure 4*). This class of neoplasm is a benign lesion consisting of dense lamellar bone. Our diagnosis considered osteoid osteoma, its predilection site is mainly the long bones such as the femur and tibia, only very rarely in the skull (Ortner 2003, Greenspan 1993). There is hypertrophy of the proximal and middle phalanx of the hands, with hypertrophy of the lateral crests revealed *(Figure 5*). Tuberosities of *m. deltoideus* are also very strong. Femurs show strong tuberositas glutaea and linea aspera. In the proximal femora, bony spicules or exostosis were observed in the trochanteric fossa. This individual being a habitual horse rider.

FIGURE 5: Evidence of strenuous physical activity at Vartaqar (burial 2) flexor ridge development in the phalanges, bone lips on finger phalanges.

FIGURE 6: Osteoarthritis had developed in the left mandibular condyle with overall deformation (Vartaqar, burial 3: individual 1).

Pathology of the infracranium consists of minor expressions of osteoarthritis (humerus, femur). Our observation showed that the vertebral (second, third and fourth cervical, third, fourth, fifth, eighth and ninth thoracic) bodies were the affected with wide range of alterations. In most cases vertebral bodies are deformed by osteophytes (small bone spurs), diarthroidal joint eburnation and porosity and Schmorls nodes.

Burial 3.

Individual 1.

Sex: male

Age: 40–45 yrs

Individual: poorly preserved skeleton

Skull: robust, with strongly developed arcus superciliares, robust mastoids. Cranial occiput with rough topography, protuberantia occipitalis externa forms a protuberance of extreme shape at the inion.

Nonmetric trait: foramina infraorbitalia, os wormii suturae squamosum, os wormii suturae lambdoidea, foramina mastoidea, sutura palatina transversa (concave), sutura incisiva, foramina mandibularia, Poirier's facet.

Stature: 172.2 cm

Paleopathology. Cranium exhibits symmetrical hyperostosis in both auditory canals. Palatine torus and mandibular torus are bony exostoses found in the oral cavity. The right mandibular condyle was normal, but temporomandibular joint osteoarthritis had developed in the left mandibular condyle with overall deformation (*Figure 6*). The corresponding left condyle on the mandible is irregularly shaped and pitted and shorter than the right condyle. It was of minimum expression under the Rando and Waldron classification (Rando, Waldron 2012). The right mandibular fossa was

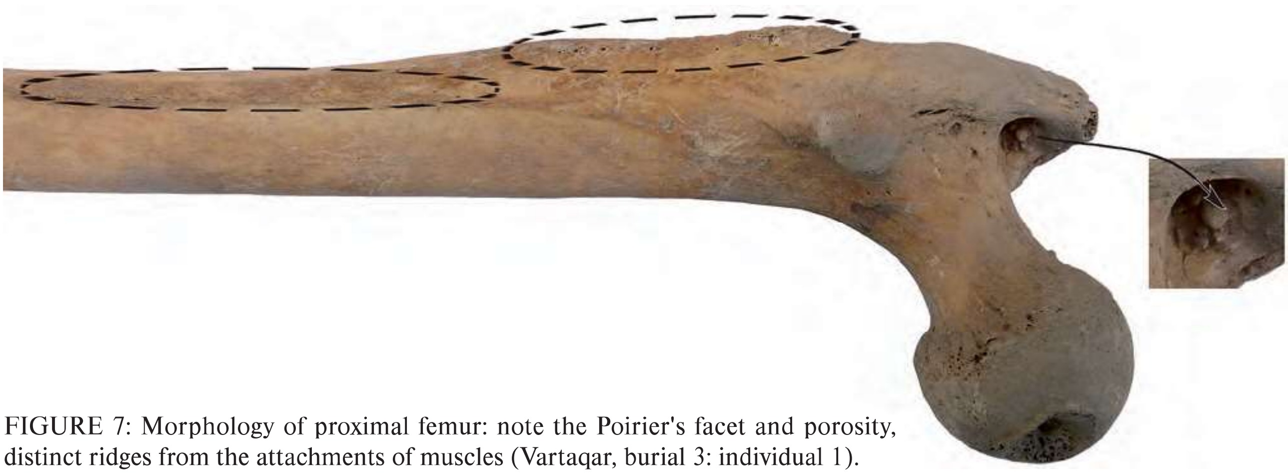

FIGURE 7: Morphology of proximal femur: note the Poirier's facet and porosity, distinct ridges from the attachments of muscles (Vartaqar, burial 3: individual 1).

normal. In the left mandibular fossa, a new articular facet had formed accompanying inflammation and deformation of the mandibular condyle. This damage may have been due to an injury causing dislocation of the temporo-mandibular joint or may simply be a result of dietary factors or use of the dentition as tools (Larsen 1997).
Dental pathology: dental enamel hypoplasia was observed on the canines. Individual was more than one line of enamel hypoplasia in their teeth, indicative of several episodes of stress. It is likely that the enamel hypoplasia lesions formed between the ages of eighteen months and four and a half years (Roberts, Cox 2003: 264). Dental caries was observed on the left M1 (mandible). There is ante-mortem loss of the premolars and molars (maxilla – right P1, P2, mandible – left M3). Also had thick deposits of plaque concretions on his incisors and canines, which coated all the tooth surfaces. Small fracture was observed on the left M1 (maxilla).
Postcranial finding: humerus with rough tuberosity of *m. deltoideus*, radius – on the dorsal surface osteophytes. Joints in long bones are massive, with distinctive muscle attachment sites. In the proximal femora, bony spicules or exostosis were observed in the trochanteric fossa (*Figure 7*). Some cone-shaped osseous exostoses were also present on the calcaneal tuberosity (*Figure 8*). Exostosis of the trochanteric fossa has been linked to prolonged sitting posture with the lower limbs extended (Capasso *et al.* 1999). This individual being a habitual horse rider. Individual also exhibits signs of mild osteoarthritis in the form of slight porosity and/or lipping on articular surfaces, such as on the edge of the right humeral head, the trochlear notches of the left and right ulnae, the distal heads of both ulnae, the edge of the left femur head, and the superior articular facets of the atlas, all of which may be due to degeneration with age or physical activities. Evidence of osteoarthritis in the vertebrae bodies was also observed.

FIGURE 8: Exostosis on the calcaneal tuberosity (Vartaqar, burial 3: individual 1).

Individual 2.
Sex: male
Age: 40–49 yrs
Individual: poorly preserved skeleton
Skull: robust, with strongly developed arcus superciliares, robust mastoids, cranial occiput with rough topography.
Nonmetric trait: sutura frontalis, os wormii suturae lambdoidea, torus mandibularis
Paleopathology: symmetrical hyperostosis in both auditory canals and button osteoma on the right parietal bone (4×4mm). Dental enamel hypoplasia was observed on the canines and premolars, dental calculus occur on the molars (mandible).

Burial 4.
Individual 1.
Age: 8–9 yrs
Individual: incomplete skeleton
Paleopathology: *Cribra orbitalia* were present on the orbital roofs, symmetrical hyperostosis in both auditory canals. Periosteal new bone was also observed diffusely on the mandible, on the external surface of the maxilla and hard palate.

Individual 2.
Age: 4–6 yrs
Individual: incomplete skeleton
The only notable **paleopathology** is cribra orbitalia in both orbits.

Individual 3.
Age: 1–3 yrs
Individual: incomplete skeleton.
No paleopathologies were noted.

Individual 4.
Sex: female
Age: 40–49 yrs
Individual: poorly preserved skeleton
Skull: robust, flat forehead, flat glabella, weakly developed arcus superciliares, mastoids are medium.
Anthropometric characteristics: occipital breadth, 93; alveolar arch length, 54.5; alveolar arch breadth, 58; palatal length, 43; palatal breadth, 33.5; nasal height, 55,5; nasal breadth, 27; orbital breadth (mf), 41; orbital height, 38.5; nasal index, 48.65; orbital index (mf), 93.91; palatal index, 77.91.

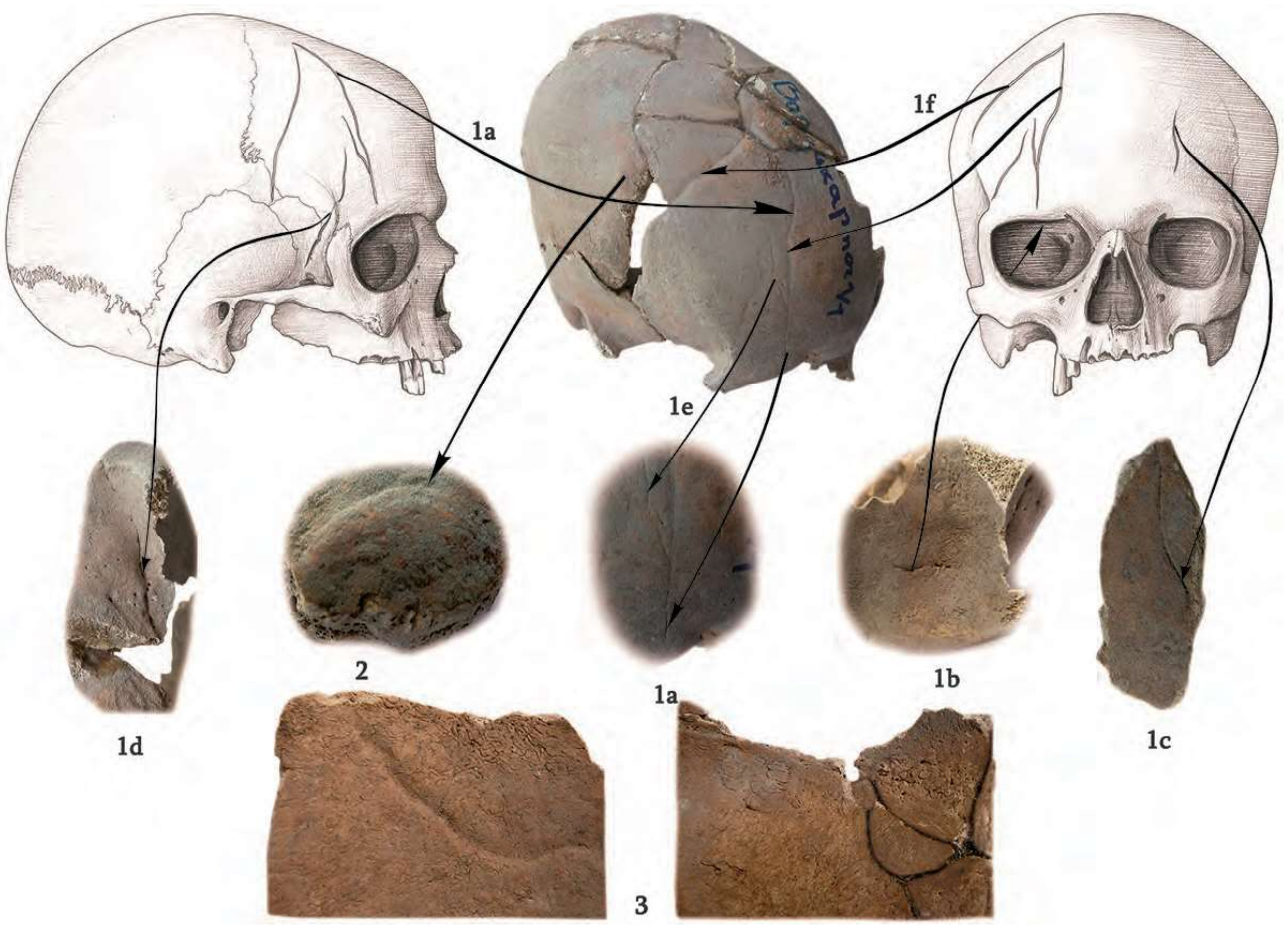

FIGURE 9: Trauma on the frontal, parietal bones, in pterion region, with curved marks, button osteoma (Vartaqar, burial 4: individual 4).

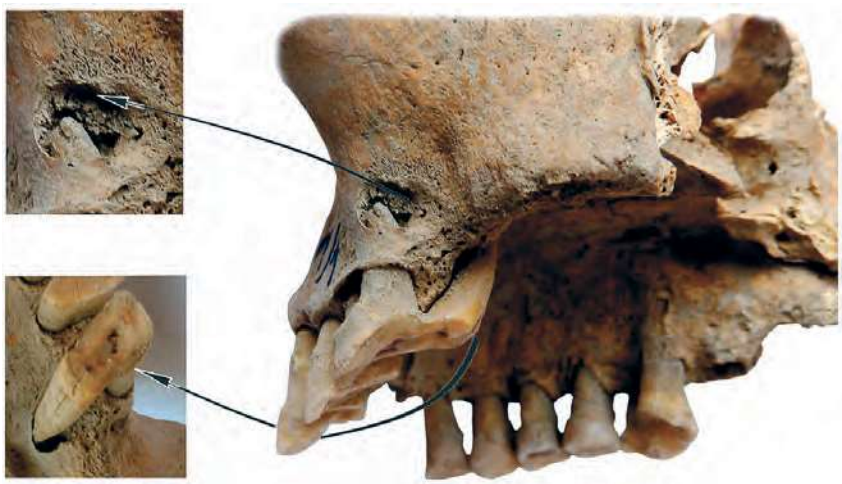

FIGURE 10: Dental wear, slight periostitis is admitted in the widespread area of the alveolar bone with periapical lesions at the roots of the first molar and exposed pulp chamber due to occlusal wear (Vartaqar, burial 4: individual 4).

Nonmetric trait: foramina zygomaticofacialia, os zygomaticum bipartitum (divided into two parts), stenocrotaphia (X-shaped), processus temporalis ossis frontalis, os wormii suturae squamosum, os wormii suturae lambdoidea, foramina mastoidea, sutura palatina transversa (meandering), sutura incisiva, foramina mentalia, dental crowding (Crow I^2), reduced, peg-formed tooth I^2 (1).

Paleopathology. The extensive fracture seen on the right side of the frontal bone (approximately length 70 mm (*Figure 9: 1a*), 41.5 mm (*Figure 9: 1e*), 26 mm (*Figure 9: 1f*), on the left side of the frontal bone 17 mm (*Figure 9: 1c*), inside the right orbit (*Figure 9: 1b*), and the right pterion region (approximately length 33 mm) (*Figure 9: 1d*). This fracture is usually the result of an indirect force, such as a fall, where the force of impact is transmitted up the bone to produce an oblique fracture line. The lesion was well healed indicating long survival after the injury i.e. the trauma was not lethal. Only a fractured bone near the pterion region do not united. In macroscopic analysis on the skull, we found circular bone mass located on the right parietal bone (*Figure 9: 2*). A number of nutrient foramina were also observed around the mass, indicating the fast-growing bone patterns. The bone mass could be identified in the outer table of skull. It was elevated above the normal part of the skull by about 3.5 mm. The external depression appears as either relatively flat or a distinct depression. The endocranial surface of the right parietal and frontal bones showed marked engravings called serpens endocrania symmetrica (*Figure 9: 3*). These endocranial alterations have often been attributed to tuberculous meningitis (Schultz 2001), intrathoracic infections (and not specifically to tuberculosis) (Hershkovitz *et al.* 2002). Other diseases related to these endocranial changes may be trauma, neoplasm, chronic meningitis and bacterial infections (Lewis 2004). Individual had suffered of porosity within the superior orbit areas.

Dental pathology. The individual (*Figure 10*) had an overbite, which meant that the upper teeth protruded slightly over the lower teeth, causing wear on the inner (lingual) surface of the maxillary teeth and the outer part (labial) of the crowns of the mandibular anterior teeth. Individual suffered from a dental abscess, which was located around the root of the left upper first molar and ante-mortem tooth loss (M2, M3). There was bilateral periostitis of the alveolar bone supporting the primary teeth. Periostitis was severe in the areas with over-retained primary second molars, and there was mild periostitis in all other areas (maxilla: left C, P1, P2, right P1, P2, M1) (*Figure 10*). Periostitis also was mild in the mandible (left M1, M2, right C). In addition, particu larlym maxillary teeth, are slightly more affected by calculus (*Figure 10*). The female did have periodontal disease and caries is noted in M2. In the right mandibular fossa, a new articular facet had formed accompanying inflammation and deformation of the mandibular condyle (osteoarthritis of the temporomandibular joint).

Postcranial finding: fusion of the vertebrae from L3rd – L5th, with the ossification of the anterior and posterior ligaments (*Figure 11*). Lumbar vertebrae have fused together through bone deposition between vertebrae bodies. Note the periosteal reactive bone in the ventral surface of the L3–L5 bodies and the osteophytic rim. Differential diagnosis suggested an advanced case of ankylosing spondylitis: the ossification of ligaments (syndesmophytes) was evident Also osteophytes in thoracic and lumbar vertebrae with Schmorl's nodes. The left fibula exhibits periostitis at midshaft on the posterior surface. Other pathology includes osteoarthritis (humeral, femur, fibula).

Individual 5.

Sex: male

Age: 30–39 yrs

Individual: poorly preserved skeleton

Skull: robust, flat forehead, flat glabella, weakly developed arcus superciliares, mastoids are medium.

Anthropometric characteristics: occipital breadth, 114.5; alveolar arch length, 53; alveolar arch breadth, 67; palatal length, 44; palatal breadth, 37; nasal height, 54; nasal breadth, 24; orbital breadth (mf), 41; orbital breadth (d), 38; orbital height, 34; nasal index, 44.45; orbital index (mf), 82.93; orbital index (d), 92.69; palatal index, 84.1.

Nonmetric trait: foramina supraorbitalia, os zygomaticum bipartitum tripartitum, foramina parietalia, os apicis lambda, os wormii suturae lambdoidea, foramina mastoidea, sutura palatina transversa (concave), foramina mentalia, sulcus mylohyoideus, shovel UI2, hypocone UM2, bukkostyle UM2, UM3.

Stature: 168.5 cm

Postcranial finding: vertebrae column and ribs are fragmentary. Humeri without articular heads, deltoid tuberosities are missing. In phalanges proximales bone lips in the middle parts. Femurs – robust, massive articular heads with distinct trochanter minor, trochanter tertius with rough topography, angular linea aspera. Chondromalacia patellae has been revealed (*Figure 12*). The cartilage under the kneecap is a natural shock absorber, and overuse, injury, and many other factors can cause increased deterioration and breakdown of the cartilage. The cartilage is no longer smooth (*Figure 12*). It is thought that the patella may rub against the lower part of the thigh bone (femur) instead of gliding smoothly over it. It often affects individuals engaged in active physical work (Grelsamer 2005). Usually the patella moves sideways towards the outside of the knee due to muscle imbalances. Patella lies within the quadriceps tendon. The quadriceps muscles and other tissues such as the retinaculum are too tight on the outside of the knee and the vastus medialis oblique muscle is weak on the inside of the knee. This large tendon from the powerful thigh muscles (quadriceps) wraps round the patella and inserts into the top of the lower leg bone (tibia).

Dental pathology. Caries occur on the right maxillary second premolar and the left maxillary first molar. Periodontal disease is also evident on maxillary and mandibular teeth. The high sugar diet of the Shirak plateau may have contributed to the high incidence of periodontal disease in individual. Dental enamel hypoplasia was observed on the central incisors and canines. The calculus deposits were very large (*Figure 13*).

Paleopathology. Cribra orbitalia were present on the orbital roofs. The right tibia exhibits the multiple occurrences of periostitis, with the largest area covering nearly the entire distal third of the shaft.

FIGURE 11: Spine (from 3rd lumbar vertebrae to the 5th), with candle melted resemblance, shape deformations in lumbar vertebrae with osteophytes (Vartaqar, burial 4: individual 4).

Individual 6.
Sex: female
Age: 30–39 yrs
Individual: partial postcranial skeleton
Skull: fragments of the frontal bone, temporal bones with small mastoids, fragments of the mandibular and maxillary.
Nonmetric trait: foramina zygomaticofacialia, os wormii suturae squamosum, os wormii suturae lambdoidea.
Dental pathology: The maxillary canines, premolars have linear enamel hypoplasias. Buccal abscesses are present on the right maxilla at the lateral incisor and first premolar (left). The maxillary teeth show evidence of periodontal disease with slight exposure of the roots. Individual has lost left second molar antemortem. Caries occur on the right maxillary first premolar and the left maxillary first molar. The mandibular molars, canines also have dental calculus. Chipping was observed in individual with the majority of the affected teeth being molars.
Paleopathology: slightly unusual changes to the superior surfaces of two of her cervical (C 4, C 5) (*Figure 14*) and two of the lumbar vertebra (L3, L5). The anterior margin of the superior body surface of her fifth lumbar had an eroded epiphyseal ring, with lacy osteophytic lipping around the lateral margins of the body. The superior anterior margin of the third lumbar vertebrae appeared porotic, with a remodelled trabecular appearance (Figure 14). While examination of the lesion was complicated by taphonomic alteration, it was evident that the epiphyseal ring had been preserved. These changes may be related to degenerative joint disease in the spine; alternatively they may have been the result of a circulatory disorder. A presence of Schmorl's nodes on the superior surface of the thoracic vertebra (T10–T11) and on the inferior surface of the lumbar vertebra (L2–L3) was observed.

FIGURE 12: Chondromalacia patellae (Vartaqar, burial 4: individual 5).

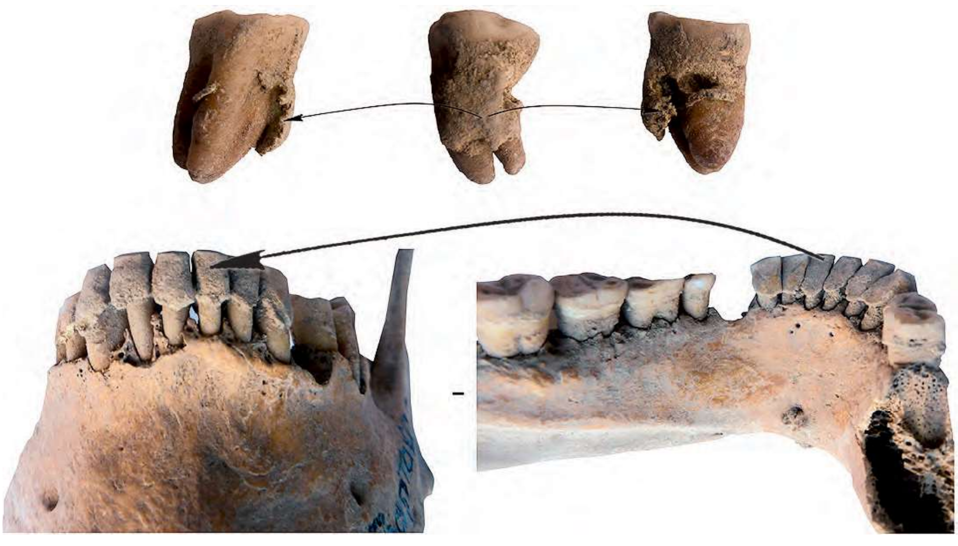

FIGURE 13: Calculus deposits, periodontal disease, torus mandibularis development on mandible: mild intermittent ridges (Vartaqar, burial 4: individual 5).

The anthropological analysis of the skeletal assemblage from Vartaqar has provided a glimpse into the lives of the people buried there. Traumatic injuries are frequently encountered in skeletal populations from Armenia (see Khudaverdyan 2005, 2010 a, b, 2015). In total, in Vartaqar site, 2/9 individuals (burials 2, 4: individual 4) displayed evidence of antemortem trauma of the cranium. Benign neoplastic growth affected a total of 3 individuals (burial 2, burial 3: individual 2, burial 4: individual 4), auricular exostoses were discovered in two individuals (burial 3: individuals 1, 2). In 3 individuals torus formation is bilateral (birial 3: individuals 1, 2, burial 4: individual 1), while one have a torus only on the left side (burial 2). Observations regarding cribra orbitalia relate to abnormal bony deposits and/or porosity within the superior orbit areas of the frontal. Within adults, cribra orbitalia was noted in 2/5 (burial 4: individuals 4, 5) and in 2/3 children (burial 4: individuals 1, 2). All recorded cribra orbitalia exhibited only fine porosity. Dental enamel hypoplasia in the sample is 4 (burial 3: individuals 1, 2, burial 4: individuals 5, 6). Enamel hypoplasia is most often recorded on the mandibular canines, followed by maxillary canines and maxillary central incisors. Caries was uncommon in the populations. In the individuals in the burials 2, 3 (individual 1) and 4 (individuals 5, 6) erosion of the cervical area is present, and cervical caries is probably the reason. Chipping and small fractures in the teeth are not uncommon, but only two individuals (burial 3: individual 1, burial 4: individual 6) have fractured teeth. In 4 individuals periodontitis can be observed (burials 2, 4: individuals 4, 5, 6). Periodontitis is not observed in any children, but it is common in the adult population. Dental wear was observed in two individuals and was heavy (burials 2, 4: individual 4). In 3 adult individuals (burials 2, 4: individuals 4, 6) showed evidence of dental abscesses (I2, C, M1). Dental calculus was observed in 6 individuals (burial 2, burial 3: individuals 1, 2, burial 4: individual 4, 5, 6). The calculus deposits were slight to heavy. In some individuals the deposits are very large, cover the occlusal surface. Usually all or most of the teeth are affected. In 4 individuals at least one tooth has been lost ante-mortem (burials 2, 3: individual 1; burial 4: individuals 4, 6).

Osteoarthritis of the temporomandibular joint was diagnosed in two individuals (burial 3: individual 1, burial 4: individual 4). Periostitis, the infection of the periosteum, occurs twice on tibial shafts (burial 4: individuals 4, 5), and thrice on skulls (burial 2, 4: individuals 1, 4). Degeneratively productive diseases are causes of deformative spondyloses in form of osteophytes and enthesophytes on the vertebral column, lowered vertebrae bodies, and vanished intervertebral discs. In four individuals were osteoarthritis changes in vertebrae joints (burials 2, 3: individual 1, burial 4: individuals 4, 6). Fusion of osteophytes was seen in only one case (burial 4: individual 4). In the changes in the sacroiliac joints and spine were asymmetrical. Three of those that suffered from osteoarthritis were middle adults (burials 2, 3: individual 1, burial 4: individual 4), and one was young adult (burial 4: individual 6). This report describes the occurrence of Schmorl's nodes (intravertebral herniations of intervertebral disc tissue) in three individuals from Vartaqar (burials 2, 4: individuals 4, 6).

In the present study, analysis of upper and lower extremity musculoskeletal stress markers has been used to clarify habitual activity patterns. The articular modifications related to horse riding were observed in 2 individuals (burials 2, 3: individual 1).

Anthropology of the population from Firmi bagher

Burial 1.
Individual 1.
Sex: male
Age: 20–25 yrs
Individual: incomplete skeleton
Skull: very robust, distinctive arcus superciliares, massive mastoids. Cranial occiput with linea nuchae suprema and linea nuchae superior forms a massive protuberantia occipitalis externa with coracoid eminence at the inion.
Nonmetric trait: foramina supraorbitalia, os wormii suturae lambdoidea, sutura incisiva, double shoveling, type 3 of the first eocone groove on the upper first molar (1 eo (3) on M1).
Paleopathology. The young male exhibited lesions in their orbital roofs indicative of cribra orbitalia. Skeleton had the greatest number of teeth affected of dental enamel hypoplasia (mandible: I1, I2, C, P1, P2, maxilla: I1, I2, C, P1). The individual had mastoiditis.

Individual 2.
Sex: undet.
Age: 35–40 yrs
Individual: incomplete skeleton
Skull: fragments of cranial bones
Paleopathology. Incisors were lost antemortem, linear enamel hypoplasias were observed on the right

mandibular first premolar. Sclerosis of the condyle was found and osteophyte formation. Buccal abscesse are present on the left maxilla at the first molar. Periodontal disease is also evident on mandibular teeth (P2, M1).

Burial 2.
Individual 1.
Sex: female
Age: 25–30 yrs
Individual: incomplete skeleton
Skull: fragments of cranial bones, isolated teeth
Nonmetric trait: os wormii suturae squamosum, os postsquamosum, foramina parietalia, os wormii suturae lambdoidea, os asterion, sutura mendosa, double shoveling.
Paleopathology. Enamel hypoplasia appears linearly on the enamel surface (maxilla: I1, I2, P1, P2). Calculus was recorded on the upper molars on the buccal surface.

Individual 2.
Sex: male
Age: 45–50 yrs
Individual: incomplete skeleton
Skull: fragments of cranial bones, isolated abraded teeth from the maxilla and mandible.
Dental pathology: right M2 caries (maxilla), wear on the inner (lingual) surface of the maxillary left canine. Also, there is ante-mortem loss of the right first molar (mandible).

Individual 3.
Age: 6–7 yrs
Individual: incomplete skeleton
Skull: Maxilla holds eight deciduous teeth, and on both sides erupted M1.
Nonmetric trait: double shoveling.
No paleopathologies were noted.

Burial 3.
Age: 6–10 yrs
Skull: isolated ten deciduous teeth and M1 from the mandible.
Nonmetric trait: deflecting wrinkle of metaconid.
No paleopathologies were noted.

Burial 5.
Sex: female
Age: 20–25 yrs
Individual: incomplete skeleton
Skull: forehead with flat glabella, small mastoids. Arched cranial occiput, weakly developed indistinct topography in the occipital region.
Anthropometric characteristics: dolichocrany, hipsyconchy, mesorrhiny.
Nonmetric trait: os wormii suturae squamosum, foramina mastoidea, sutura mendosa, double shoveling.
Paleopathology. The manifestations of auditory exostoses a bilateral expression, was identified in individual. Enamel hypoplasia appears linearly on the

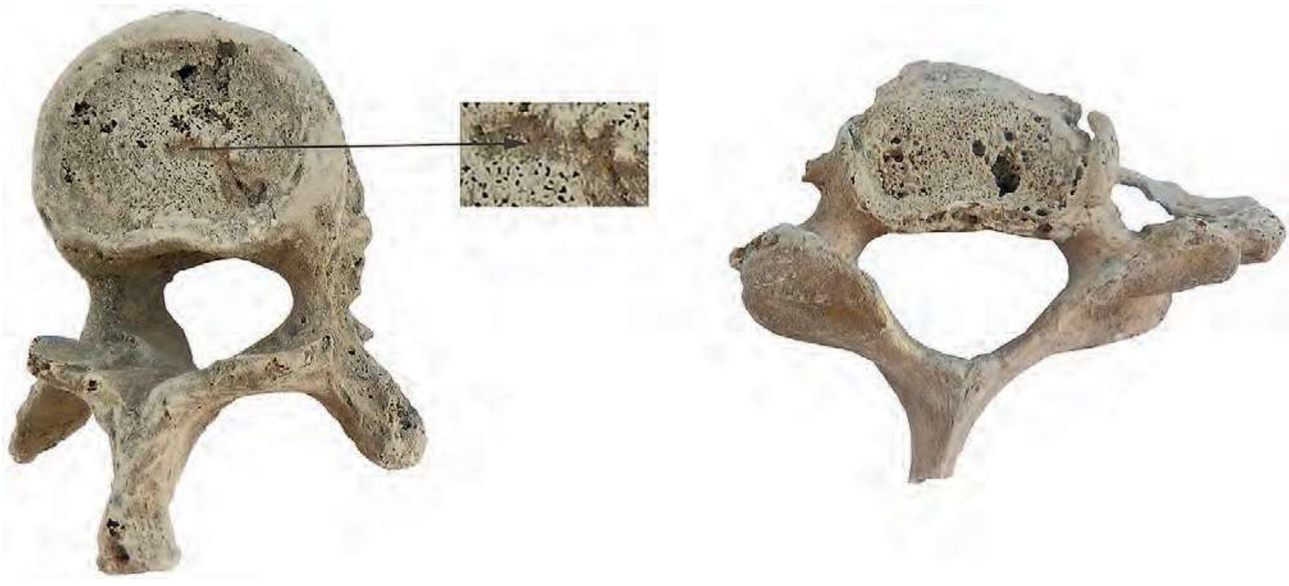

FIGURE 14: Osteoarthritis of fourth cervical and third lumbar vertebra. Diarthroidal joint eburnation and porosity, Schmorls nodes (Vartaqar, burial 4: individual 6)

enamel surface (maxilla: I1, I2, C, P1, P2, mandible: C, P1, P2). Calculus was recorded on the upper molars on the buccal surface and lower incisors on the lingual surface.

Burial 6.
Sex: male
Age: 50–60 yrs
Individual: incomplete skeleton
Skull. Arched forehead, medium-sized mastoids. Cranial occiput is arched, with distinct topography at linea nuchae suprema and superior. Mandible – prominent chin.
Anthropometric characteristics: dolichocrany, leptorrhiny, mesognathy.
Nonmetric trait: stenocrotaphia, processus temporalis ossis frontalis, os wormii suturae squamosum, os postsquamosum, foramina parietalia, propcessus interparietalis, foramina mastoidea, canalis craniopharyngeus, torus mandibularis.
Dental pathology. The dental paleopathology includes heavy dental wear (most teeth are worn down to the dentin and the root). Enamel hypoplasia appears linearly on the enamel surface (mandible: P1, C). Calculus was recorded on the upper incisors on the buccal surface. Buccal abscesses are present on the right maxilla at the second premolar and lateral incisor. Periodontal disease is also evident on five maxillary teeth (left M1, M2, M3, righ M2, M3) with the alveolus pulling away from the cemento-enamel junction to reveal a large portion of the roots. Dental pathology also includes the antemortem loss of the left mandibular M2 and M3 and dental caries (M1).

Burial 7.
Age: 8–10 yrs
Skull: isolated teeth from the maxilla and mandible.
Nonmetric trait: double shoveling, deflecting wrinkle of metaconid.
Dental pathology. Enamel hypoplasia appears linearly on the enamel surface (mandible: I1, I2).

Burial 8.
Sex: male
Age: 25–30 yrs
Individual: incomplete skeleton

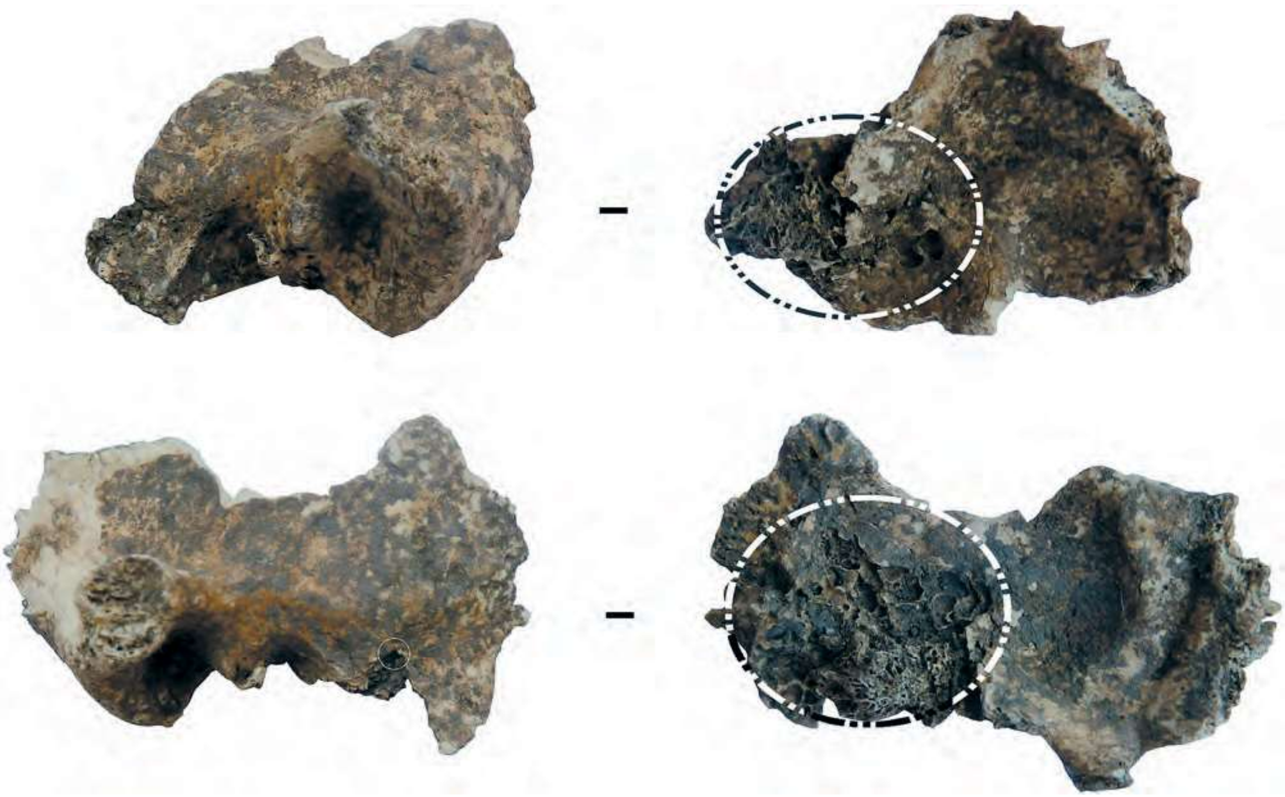

FIGURE 15: Mastoiditis (Firmi bagher, burial 8).

Skull: arched forehead, medium-sized mastoids, cranial occiput is arched, with distinct topography at linea nuchae suprema and superior.
Nonmetric trait: spina trochlearis, os wormii suturae squamosum, os wormii suturae lambdoidea, foramina mastoidea, sutura incisive, double shoveling.

Paleopathology. The young male exhibited lesions in their orbital roofs indicative of cribra orbitalia, porotic hyperostosis in the region of the pteryon and auditory exostosis of the right external auditory meatus. In that skull, there is little doubt that the antemortem destruction of the right mastoid region was caused by acute mastoiditis with widespread erosion (*Figure 15*). The left temporal bone also shows destruction (by otitis media) of the tympanic plate and mastoid antrum (*Figure 15*). There is no sign of healing, and this individual probably died from the extensive inflammation.

Dental pathology. Enamel hypoplasia appears linearly on the enamel surface (maxilla: I1, I2, C, P1, P2). Chipping was observed in individual with of the affected teeth (I1, I2) on the left side (Figure 16). Buccal abscesse are present on the left maxilla at the first incisor.

Burial 9.
Sex: female
Age: 30–35 yrs
Individual: cranial fragments.
Skull: incomplete frontal and parietal bones, medium-sized mastoids, mandible.
Nonmetric trait: foramina parietalia, os wormii suturae lambdoidea, foramina mastoidea.
Paleopathology. The female exhibited lesions in their orbital roofs indicative of cribra orbitalia and porotic hyperostosis of the parietal bones. The manifestations of auditory exostoses a bilateral expression, was

FIGURE 16: Chipping (Firmi bagher, burial 8).

FIGURE 17: Firmi bagher, burial 10.

identified in individual. Furthermore, apical abscesses are present on mandibular right M2, as well as lost teeth antemortem: from the mandible the right PM2, left I1.

Insert Figure 17
Burial 10 (*Figure 17*).
Sex: female
Age: 20–25 yrs
Individual: cranial fragments and isolated teeth.
Nonmetric trait: deflecting wrinkle of metaconid.
Dental pathology. Calculus was recorded on the upper incisors and canines on the buccal surface (mandible).

Burial 12.
Age: 13–16 yrs
Individual: cranial fragments and isolated teeth.
Skull. Cranial occiput shows on *planum nuchale* a distinct arched *linea nuchae suprema*, occipital topography is tubercular.
Nonmetric trait: deflecting wrinkle of metaconid, type 3 of the first eocone groove on the upper first molar (1 eo (3) on M1).
Paleopathology. Individual has a small (7×4.5 mm) "button" osteoma present on the skull, located on the occipital bone. Chipping was observed in individual with of the affected teeth (maxilla: P1, M2).

Burial 13.
Age: 11–12 yrs
Individual: cranial fragments and isolated teeth.
Nonmetric trait: deflecting wrinkle of metaconid.
Dental pathology. Enamel hypoplasia appears linearly on the enamel surface (maxilla: I1, C, P1, P2, M2).

Considering that only 14 partial skeletons were recovered from the Classical/Late Antiquity period at Lori region (Firmi bagher), a large number of pathological lesions were observed. In Firmi bagher group traumatic injuries not were seen. Within adults, cribra orbitalia was noted in 3/7 (burial 1: individual 1, burials 8, 9). All recorded cribra orbitalia exhibited only fine porosity. Observations regarding porotic hyperostosis refer to the presence of porosity on the cranial vault. Only two examples of porotic hyperostosis were found (burials 8, 9). In the Firmi bagher population, osteoma was observed in one individual (burial 12), auricular exostoses were discovered in 3 out of the nine individuals (burials 5, 8, 9). The two individuals (burial 1: individual 1, burial 8) had mastoiditis. The severity of the mastoiditis in these cases was obvious. Dental enamel hypoplasia in the analysed sample is 7/12 (burial 1: individuals 1, 2, burials 5, 6, 7, 8, 13). Enamel hypoplasia is most often recorded on the mandibular canines, followed by maxillary canines, maxillary central incisors and premolars. Caries cavity is observed in two individuals from Firmi bagher, burial 2 (individual 2), at the second molar of the right mandible and burial 6, at the left first molar of the maxilla. Only 2 individuals have fractured teeth (burials 8, 12). In 2 individuals (burial 1: individual 2, burial 6) periodontitis can be observed. Periodontitis is not observed in any children or adolescents, but it is common in the adult population. In 3 adult individuals showed evidence of abscesses (burial 1: individual 2, burials 8, 9). Te molars were more commonly affected by abscesses, followed by the incisor. There were more dental abscesses in the maxillary dentition compared to the mandible. The central incisors of the maxilla, premolars, are lost often, as well as some of the molars (burial 1: individual 2, burial 2: individual 2, burials 6, 9). Dental wear was observed in two individuals (burial 2: individual 2, burial 6). Dental calculus was observed in 4 individuals (burial 2: individual 1, burials 5, 6, 10). The calculus deposits were slight.

DISCUSSION AND CONCLUSIONS

The palaeopathological examination of skeletal remains from the Classical/Late Antiquity period has increased the knowledge on diseases occurring its suburbs in Armenia. Due to the smalls samples sizes, no statistical testing of inter-sex or inter-site differences was applied. It is not easy to understand the trauma data because bioarchaeological analyses are impacted by incomplete, unexcavated, and poorly preserved skeletal material. Only in Vartaqare group, 2 adults suffered of antemortem trauma of the cranium. Studies on cranial and facial fractures show that the main causes behind these injuries are accidents and violence (e.g. Haug *et al.* 1994, Brasileiro, Passeri 2006, Fornazieri *et al.* 2008; Trinidade *et al.* 2013). Traumatic injury of the nasal, perhaps, be the result of direct blows to the face resulting (Lovell 1997). We identified our present four cases as osteoma (Vartaqar, burials 2, 3: individual 2; Firmi bagher, burial 12) and osteoid osteoma (Vartaqar, burial 4: individual 4). Osteomas are very rarely described in the archaeological literature. Aufderheide and Rodriguez-Martin (1998) mention that osteomas appear in individuals older than 50 years of age and predominantly in females. Individual from

Vartaqar (burial 4) is female and she is older than 45 years of age. Osteoid osteoma type of osteoma is a small, tumor-like lesion consisting of poorly mineralized woven bone developing in the cortex or in the spongiosa of a bone. The location is most often on a long bone of an extremity. Presence of auditory exostoses were investigated in 5 adult individuals from Late Antiquity period in Armnenia (Vartaqar, burial 3: individuals 1, 2; Firmi bagher, burials 5, 8, 9). The results shown a high frequency in the male sample (Vartaqar, burial 3: individuals 1, 2; Firmi bagher, burial 8). Auditory exostoses are commonly recognized as localized hyperplastic growths of predominantly acquired origin. These people could have worked in direct contact with water. It is more likely, that they were included in making canals. Prevalence of cribra orbitalia like the one registered in groups (Vartaqar, burial 4: individuals 1, 2, 4, 5; Firmi bagher, burial 1: individual 1, burial 8, 9) are usually observed in sedentary populations characterised by inadequate sanitary conditions and low levels of hygiene (Stuart-Macadam 1992), and the widespread occurrence of cribra orbitalia in Armenia sites could suggest a worsening of the living conditions during the Classical/Late Antiquity period. High frequency of enamel hypoplasia (Vartaqar, burial 3: individuals 1, 2, burial 4: individuals 5, 6; Firmi bagher, burial 1: individuals 1, 2, burial 2: individual 1, burials 5, 6, 7, 8, 13) suggests that more than half of the analysed individuals survived strong metabolic stress during the early childhood since Goodman (1988), Hodges (1986), and Lanphear (1990) suggested that in the sedentary populations metabolic stress is strongest during the transition from the diet based on the sterile breast milk to the diet rich with microorganisms.

Given the difficult situation in Armenia during the 1st century BC – 3rd century AD cemetery it is likely that the numerous crises led to the decline of the quality of food which is reflected in the low level of oral health of the inhabitants of groups. Dental abscesses have an important role in infectious processes (Vartaqar, burial 2, burial 4: individuals 4, 6; Firmi bagher, burial 1: individual 2, burials 8, 9), as they are propitious for the development of the bacteria that cause infection, not only in the alveolar bone but also in the rest of the body. Individuals tend to have more obliquely worn molars (Vartaqar, burial 4: individual 4, Firmi bagher, burial 6). The direction of molar wear, i.e., the angle of the occlusal surface, has been shown to become increasingly oblique as the proportion of processed (e.g., ground, boiled) foods in the diet increases (Smith 1984). Smith (1984) studied molar wear patterns in five hunter-gatherer and five agricultural groups from around the globe, and found that agriculturalists tend to have more obliquely worn molars than hunter-gatherers. Soft, agricultural foods allow for more contact between occluding teeth without lateral excursion, which causes attrition increasing the natural angle and positions of the molars in the alveolar bone.

Apart from "natural" modifications of the teeth as the result of food mastication, modifications as the result of cultural practices are an important category of study in dental anthropology. These types of modification, sometimes referred to as "artificial modification" or "non-alimentary use", can drastically alter the appearance and functioning of the teeth. Artificial modifications can for example be the by-product of an activity which involves the use of the teeth as tools, or the result of intentional alteration of the appearance of the teeth. In the latter case, the teeth are modified by filing, chipping, in-laying with stone or metal, or even extraction, for aesthetic reasons. In individual from Vartaqar (burial 2) detected severe changes in the anterior teeth on the maxilla. The attrition severity in anterior teeth can be attributed to anterior teeth functioning as molars when the molars are lost antemortem and as tools (e.g., processing animal skin) (Molleson 1994). We do not exclude, the man may have been a carpenter which explains the deformities and location on the dentition as belonging to someone who would habitually hold nails in his teeth while working (Turner, Anderson 2003). Lower prevalence of caries are usually recorded in populations whose diet was generally based on proteins (meat). We identified our present 6 cases as dental caries (Vartaqar, burials 2, 3 (individual 1) and 4 (individuals 5, 6), Firmi bagher, burials 2 (individual 2), 6).

Osteoarthritis of the temporomandibular joint was diagnosed in 3 individuals (Vartaqar, burial 3: individual 1, burial 4: individual 4, Firmi bagher, burial 1: individual 2). An osteophytic aureole can be appreciated on the preserved portions of the ventral and lateral outer edges of the articular plate. This disease, together with other degenerative processes in the vertebral column, has been suggested to be related to high levels of strenuous physical activities and mechanical demands, such as habitual transport of heavy resources (Ogilvie *et al.* 1998). Schmorl's nodes on the vertebrae (Vartaqar, burials 2, 4: individuals 4, 6) are the result of strong mechanical burdens of the spine. Our bioarchaeological studies indicate that the people of Vartaqar led active lives of strenuous physical activity. This probably reflects heavy lifting during agricultural activities. This suggests that heavy work began early in life. The combined features of vertebral osteophytosis and osteoarthritis, new bone formation at muscle tendon and ligament insertions, and osteoarthritis at the major joints suggest that the men and women in this population lived lives of heavy physical labor.

At the proximal end of the femur belonging to the individuals from Vartaqar, there are some enthesopathies previously noted as common in horse riders (Molleson, Blondiaux 1994, Molleson 2007). In intensive horseback riding for instance, the linea aspera on the femur can become very pronounced due to strain of the adductor and some other muscles (Capasso *et al.* 1999). The femora of the two skeletons (Vartaqar, burials 2, 3: individual 1) has a strongly developed linea aspera in conjunction with pronounced areas of insertion of all three gluteal muscles, but especially of the gluteus minimus and gluteus medius on the greater trochanter. There is also a distinct spicule in the trochanteric fossa. The orientation of the lesser trochanter (or Poirier's facet) together with the unilateral expression of enthesopathies in the calcaneus, would be consistent with the pattern expected in habitual horse riding.

The skeletal remains we have excavated at Vartaqar and Firmi bagher are providing important new evidence concerning the health status and living conditions of Classical/Late Antiquity period from Armenia.

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