MUZEUL NAȚIONAL DE ISTORIE A ROMÂNIEI

CERCETĂRI ARHEOLOGICE

XXX

2

ISSN 0255-6812

CERCETĂRI ARHEOLOGICE

XXX

2

BUCUREȘTI

2023

Tehnoredactare și coperta: Petru Ureche

Ilustrația de pe coperțile 1, 4: Podul lui Traian. Foto pila culee (pila C), dinspre SV, înainte de demararea lucrărilor din anul 1984 (anul 1983), fond nr. 854, inv. nr. 954, SJAN MH, dosar 11/1983-1984.

ISSN 0255-6812
www.cercetări-arheologice.ro
https://doi.org/10.46535/ca.30.1
https://doi.org/10.46535/ca.30.2

Volum editat de Muzeul Național de Istorie a României
Calea Victoriei 12, București, 030026, România

Cuprins/Contents

30/2

CA

30/2

A *HUMERUS VARUS* DEFORMITY IN A ENEOLITHIC GRAVE FROM GUMELNIŢA (CĂLĂRAŞI COUNTY, ROMANIA)

MIHAELA CULEA,
ADINA BORONEANȚ

ABSTRACT:

A case of right unilateral *humerus varus* deformity (HVD) was observed on the skeleton of an adult male individual uncovered on the eastern terrace of the Măgura Gumelnița, Călărași County, Romania. Skeleton M2/1962 was found crouched on the left side, the upper part of the body facing down. It was attributed to the Gumelnița culture (4600/4500 – 3800/3700 BC). Age at death was estimated to 30-32 years. The skeleton was subsequently restored in the Laboratory of Paleoanthropology, Institute of Anthropology Fr. I. Rainer, Bucharest in the 1960s, but no anthropological information was ever published and is still in the possession of the Institute.

The affected humerus shows a bulky proximal epiphysis and an angulated diaphysis. No signs of fracture are present. The rest of the skeleton has a normal appearance. The proposed differential diagnoses for *humerus varus* are thalassemia, mucopolysaccharidosis, infection and birth trauma. Individuals with HVD have a functional limitation of the affected limb as shown by clinical data. The rate of morbidity caused by this deformity is low. This is the only reported case from the Romanian Eneolithic and brings a substantial contribution to the study of HVD in skeletons from archaeological contexts.

RÉSUMÉ: DEFORMATION DE L'HUMERUS EN VARUS DANS UNE TOMBE NEOLITHIQUE DE GUMELNIŢA (DEPARTEMENT DE CĂLĂRAŞI, ROUMANIE)

Une déformation de l'humérus en varus (HVD) s'est produite d'une manière unilatérale (humérus droit) sur un squelette appartenant à un individu mâle adulte découvert sur la terrasse orientale du Măgura Gumelnița, près de la ville d'Oltenița, dans le département de Călărași.

Le squelette, découvert en 1962 suite à plusieurs prospections archéologiques, a été déposé en décubitus ventral gauche et est attribué à la culture Gumelnița (4500/4600 – 3800/3700 av. J.-C.). L'âge au décès est estimé à environ 30-32 ans. Le squelette a été restauré dans le Laboratoire de Paléoanthropologie de l'Institut d'Anthropologie «Fr. I. Rainer» de Bucarest dans les années 1960, sans publication d'aucune information anthropologique, et est toujours en possession de l'Institut.

L'humérus affecté présente une épiphyse proximale volumineuse et une diaphyse anguleuse. Aucun signe de fracture n'est présent. Le reste du squelette a un aspect normal. Le diagnostic différentiel indique principalement la thalassémie, une infection ou un traumatisme de naissance. Les individus atteints de HVD souffrent d'une limitation fonctionnelle du membre affecté, comme le montrent les données cliniques. Le taux de morbidité qui en résulte est faible. Il s'agit du seul cas rapporté pour l'Enéolithique (Roumanie), ce qui est utile pour établir la prévalence et le degré d'expressivité du HVD dans les squelettes provenant de contextes archéologiques.

KEYWORDS: paleopathology, *humerus varus* deformity, birth trauma, Eneolithic, Gumelnița culture (Romania).

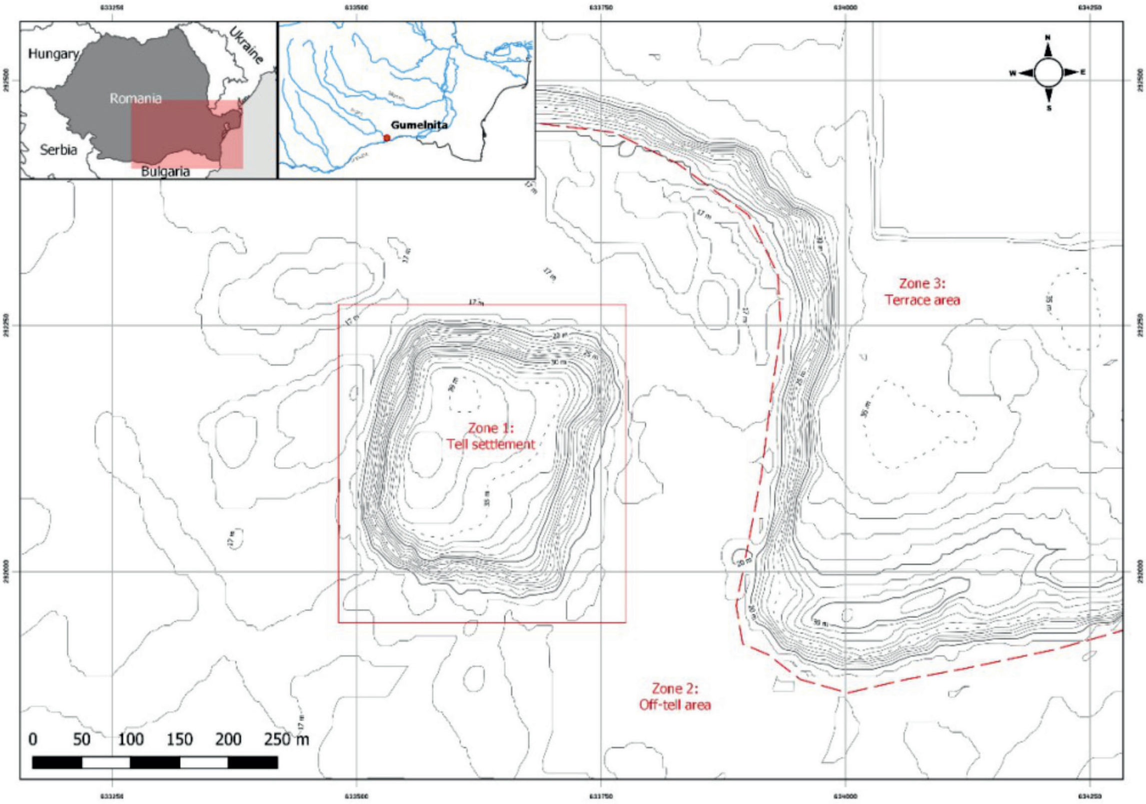
MOTS CLES: paléopathologie, déformation en varus de l'humérus, traumatisme de naissance, énéolithique, culture Gumelnița (Roumanie).

Introduction

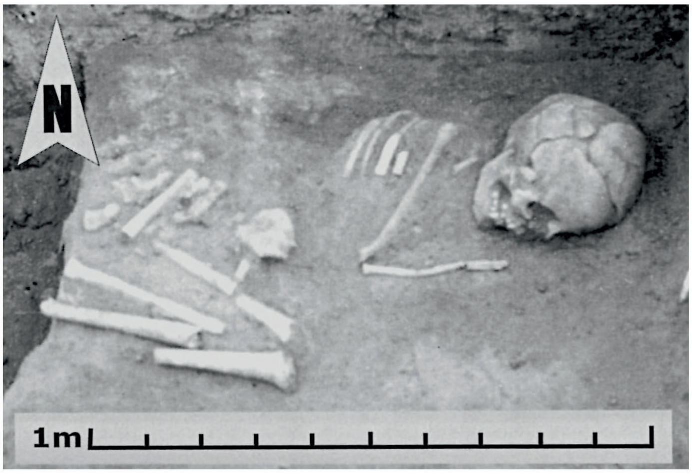
The aim of the present paper is to report on a relatively rare type of pathology (*humerus varus deformity*) in human osteoarchaeological collections. The present case was observed on a human skeleton excavated in 1962 in one of the two Eneolithic necropolises of the Gumelnița archaeological site (Călărași County, southern Romania – Pl. I/1). The necropolis is in the area nowadays known as Sector Terasă / Terrace Area[1], ca. 250 m east of the

[1] Lazăr et al. 2020, 151.

1



2



Pl. I. 1: Map of the Gumelnița site indicating the location of the Terrace Area where M2/1962 was found (after Lazăr et al. 2020); 2: Burial M2/1962 (after Lazăr 2020).

Gumelnița tell. Archaeological excavations were carried out in this sector in 1961 and 1962, with a few graves (seven or eight) destroyed in 1950 by clay pits. The burial in discussion here (M2/1962) was excavated by Silvia Marinescu-Bîlcu, and the archaeological information was published ca. 40 years later[2]. Recently, excavations were resumed on the Terrace Area and further burials were uncovered[3].

The skeleton was found crouched on the left side (Pl. 1/2), head pointing east. The lower legs were tightly flexed. The arms were also flexed and brought in front of the upper body. The burial pit was not visible, and the skeleton was noted at only 0.20 – 0.30 m from the surface. No grave goods were present.

[2] Lazăr 2001, 174; Lazăr 2020, 227-228.
[3] Lazăr et al. 2020, 15.

The same year (1962), two more skeletons were uncovered (M1/1962 and M3/1962), while the remains of two others had been excavated the previous year (M1/1961 and M2/1961). More excavations followed in 1977 and uncovered three more burials (M1/1977, M2/1977 and M4/1977). All skeletons were crouched, heads pointing east and no or very few grave goods[4] were recorded.

All human remains resulting from these investigations are part of the collections of the Laboratory of Paleoanthropology of the Institute of Anthropology 'Fr. I. Rainer' in Bucharest. No detailed anthropological information was ever published until now.

Methodology

Macroscopic examination of M2/1962 was performed to determine the biological sex, stature, estimated age at death, and to recognize any signs of disease still visible on the skeletal remains. The inventory, sexing, ageing, as well as the measurements, non-metric traits, and post-mortem changes followed the set of recommendations of Buikstra and Ubelaker[5]. Biological sex was determined based on *os coxae* (the sub-pubic concavity, sub-pubic angle and the shape of the great sciatic notch). The age-at-death assessment was based on the auricular surface only. A lab manual[6] was used to identify and assign the osteological fragments.

The presence of HVD on the right humerus of M2/1962 was recognized following macroscopic evaluation and skeletal paleopathological literature[7]. The study was further detailed by examination through magnification lens (x 7), X-ray (Siemens-Multix Top) and computed tomography (Siemens Somatom Definition Edge), with the purpose of obtaining maximum information on the respective bone. The X-ray was carried out on both humeri, using the anteroposterior placement of the bone. For a better understanding of the anatomical substrate, the right humerus was subjected to computed tomography also.

Results of the anthropological study of M2/1962

Ours was not the first anthropological examination of M2/1962. The skeleton was restored during the initial examination following its discovery, but data on sex, age, or pathology have never been published at the time. The restoration of the long bones was accomplished by assembling the fragments along a wooden rod, forced into the diaphysis through the medullary canal thus destroying the cancellous tissue, and excessive adhesive was poured in (Pl. II/1, 2).

Still, the existing remains are relatively well preserved, with slight stone deposits. The surface of the bones is slightly damaged, due to repeated attempts to remove the limestone deposited over time. The skeleton in the collection is incomplete. Plate III/1 shows the state of preservation of the remains (anterior view). By comparing it with the photograph of the burial (Pl. I/2), it is very likely that some of the bones were not collected at the time of the excavation, probably because of their very poor state of preservation. The photograph also suggests that the toe bones were probably spaded before it was observed that a burial had been found.

Contrary to the published photograph (Pl. I/2) and published information, the skull is missing. No fragments of the mandible or jaw were present either. The postcranial skeleton is represented by fragments of most bones: clavicles, humeri (proximal epiphyses damaged), ulna (distal epiphyses missing) and radii (the right one complete, the left one without proximal epiphysis), small rib and fragments of 11 vertebrae (lumbar and thoracic), sacrum and ilium bones, femurs (right femur complete, left femur with broken epiphyses), tibias (left one complete, right one without proximal epiphysis), both calcaneus and talus bones (slightly damaged).

The biological sex was estimated to be male, and the age-at-death was assessed to 30 – 32 years. Calculated height is 166.29 cm. No animal bones or grave goods were identified among the remains when examined.

No signs of infection or trauma were noted.

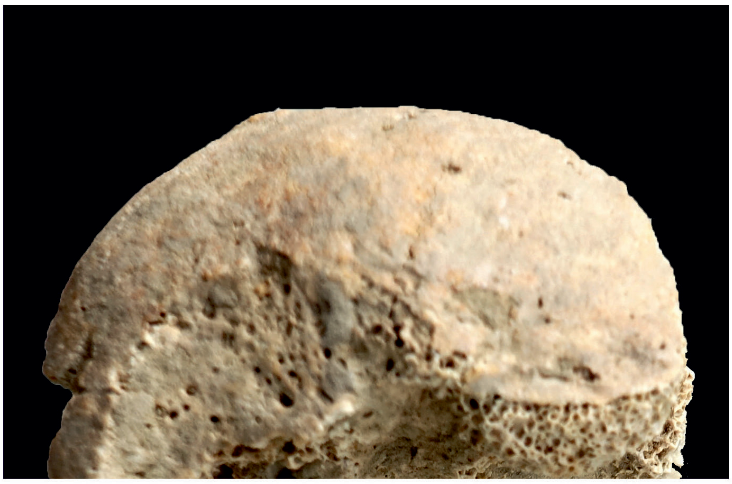
All bones have a normal appearance except for the right humerus, which is unusually short (maximum length = 266 mm). Thus, it was compared with the right humerus of M1/1962 from the same site, identified as a male individual of the same age and calculated stature of 165.92 cm, and a significant difference of 32 mm was recorded (maximum length of the humerus = 298 mm). Also, the macroscopic inspection of the M2 right humerus indicated a marked *varus* of the head, in relation to the shaft of the humerus, which explains the shortening observed in the bone. The head of the humerus is turned posteromedial and inclined inferiorly relative to the longitudinal axis of

4 Lazăr 2001, 1974-1975.
5 Buikstra and Ubelaker 1994.
6 White, Black and Folkens 2011.
7 Ortner 2003.

1

2

3

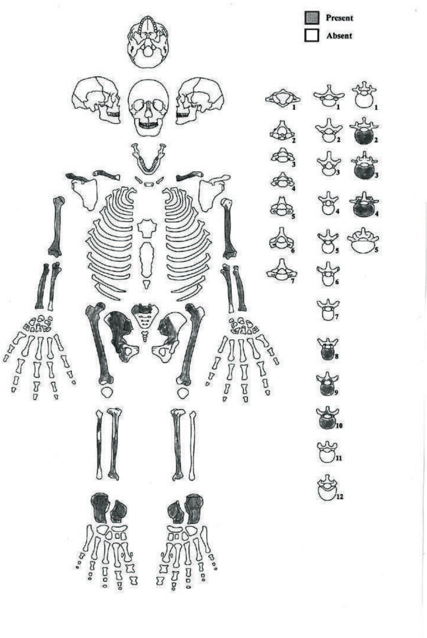


Pl. II. Proximal end of right humerus (1) along with CT scan extract image (2), showing the damage caused by the restoration with a wooden rod; 3 morphological changes on the articular surface.
Photos (1, 3) by M. Culea, CT image (2) by E. Mihaly.

the bone (Pl. III/2). The articular surface of the head presents morphological changes (irregular pit formation) on the preserved fragment. The articular surface of the humeral head is irregularly shaped, enlarged, and displaced. To the centre, there are traces of the rough and deepened portion of a cavity (Pl. III/4). A septal aperture on the distal left humerus has been observed also. This nonmetric trait appears as a true perforation, and it is visible both in the anterior and the posterior views (Pl. III/5).

With the left humerus broken and the proximal epiphysis missing, there was always the question of whether our individual had bilateral *humerus varus*. The answer lies within the examination of the configuration of the bone.

1



Pl. III. 1: Diagram showing the state of preservation of M2/1962; 2-5: Right humerus of M2/1962 (2) compared to right humerus of M1/1962 (3) – lateral view; right humerus of M2/1962 (4) compared to left humerus of M2/1962 (5) – anterior view. Note the abnormal configuration of the right humerus of M2/1962. The white arrow marks the nonmetric trait (septal aperture). Photos by M. Culea.

There is no deformity in the tuberosity area, and the diaphysis is not angulated and has a normal appearance. Also, the lack of proximal epiphysis made impossible the study of the glenohumeral joint. The distal epiphysis does not indicate intense muscular activity and as such, there is no evidence of arthrosis.

The real size reduction of the right humerus when compared to the left one could not be determined. Still, although incomplete, the left humerus was measured from the area corresponding to the surgical neck to the distal epiphysis. Thus, the maximum length of the present fragment is 290 mm indicating that, although broken, the left humerus was at least 24 mm longer than the whole right humerus. This bone dimensioning shows the significant difference between the two humeri.

Discussion

Humerus varus describes a deformity of the shoulder, where the angle between the humeral head and the diaphysis falls below its normal value (less than 140 degrees), *a greater tuberosity elevated above the superior margin of the humeral neck and a reduced distance between the articular surface of the humeral head and the lateral cortex of the humerus*[8].

This rare condition affects the development of the humerus and may be triggered by idiopathic, post-traumatic, and congenital causes[9]. It occurs in both sexes, both unilaterally and bilaterally. It is a progressive condition, and its severity depends primarily on the cause that produced it and the age it occurred at[10]. The alteration of the configuration of the proximal epiphysis of the humerus, the shortening or lack of the anatomical neck and an angulated deltoid area, result in inequality between limbs in the case of unilateral *humerus varus*, and the shortening of both limbs if it is bilateral. In both cases, the range and variety of movement are limited. Clinically, there is a deficit in the coordination of the upper limbs[11].

HVD might be the result of birth trauma, accidental fractures of the humerus head or it may be triggered by several types of disorders: thalassemia, mucopolysaccharidosis and congenital skeletal dysplasia.

What triggered the *humerus varus* in M2/1962?

Given the fact that proximal humeral fractures are relatively common and tend to occur frequently in the adult population[12], we took into consideration the hypothesis that the HVD may have been triggered by a **fracture** occurring in adulthood. The HVD documented in adult individuals is frequently the result of traumatic events (proximal humerus fractures account for about 26% of all humerus fractures). Improper repositioning of the medial continuity of the humeral head and the mispositioning of the greater tuberosity leads to decreased limb functionality and discrepancy. One such case is reported from a Hallstatt burial in Babadag (Tulcea County, Romania). The skeleton of a female (24 – 25 years) shows unilateral left HVD associated with multiple traumas, probably a fall injury[13].

But in the case of M2/1962, radiological examination in anteroposterior incidence did not show any alteration of the bone structure and the cortical bone in the left humeral deltoid region had not lost its integrity (Pl. IV). Thus, it was clear that the *varus deformity* had not been triggered by a fracture. Furthermore, computed tomography confirmed the inferior-medial growth arrest and indicated that the *humerus varus* deformity was not the result of either trauma or infection (Pl. II/2).

Then we took into consideration various types of health disorders associated with HVD.

Thalassemia is a congenital blood disorder[14]. Severe thalassemia (*beta thalassaemia major*) can lead to numerous skeletal changes[15]. Historically, this disease is found more often in Old World populations, such as Middle Eastern and Southeast Asian prehistoric populations. One of the earliest cases comes from Israel (the site of Atlit-Yam, Palestine, ca. 8100 BP)[16] where two individuals with HVD also showed signs of thalassemia. One individual, an adolescent (male, 16-17 years old) exhibited on the left upper limb the same grossly deformation of the proximal end of the humerus, which was also unusually short. But in this case, unlike M2 where the aspect of the bone was

8 Gill and Waters 1996, 306.
9 Ogden, Weil and Hempton 1976, 160.
10 Ellefsen et al. 1994, 479.
11 Ugwonali, Bae and Waters 2007, 530.
12 Kantharaju et al. 2021,702.
13 Perianu 1993, 11.
14 Aufderheide and Rodriguez-Martin 2006, 347.
15 Techataweewan et al. 2021, 7.
16 Hershkovitz et al. 1991, 10.

normal, the *X-ray of the entire humerus showed porotic changes in the cancellous bony elements together with hyperostotic changes in the cortex*[17].

The same aetiology has been proposed in the case of HVD in a hunter-gatherer (ca. 8000 BP) population in Windover, Florida. The respective skeleton belongs to a female, aged early to mid-20es that exhibited bilateral HVD (bilateral foreshortening of the humeri with indications of premature epiphyseal fusion). Both proximal humeri are mediolaterally compressed, the glenohumeral joint surfaces exhibit medial deformation, and bones show expansion of the medullary cavity with increased cancellous bone growth. Other specific features associated with thalassemia, such as multiple signs of anaemia were also noted[18].

But no such traits were noted on M2/1962.

Mucopolysaccharidosis, an autosomal recessive disorder[19] is characterized by dysplastic changes to the skeleton, including HVD. The earliest diagnosis has been dated to the early dynastic Egypt[20]. The disorder was identified on the deformed humeri of a 14-year-old teenager/young adult curated at the Natural History Museum in London. Both humeri show abnormal humeral head development and reduced lengths (the left humerus is 20 mm shorter than the right), suggesting bilateral HVD with smaller left asymmetry. M2/1962 shows the development of the epiphysis unlike the case described by Ortner (*The external morphology of the humeral heads suggests an almost complete failure in the development of the epiphysis*)[21] and the HVD is not bilateral.

Pl. IV. X-ray of M2/1962 humeri. 1 – lateral view of right humerus, 2 – antero-posterior view of right humerus, 3 – antero-posterior view of left humerus. X-ray image by Laura Floareș.

Genetic disorders resulting in **congenital skeletal dysplasia**, which may affect growth[22] or skeletal shape[23], have also been associated with HVD. Scoliotic deformities of the thoracic spine, severe degenerative changes on the heads of the ribs, posteromedial angulation of the left femoral diaphysis, osteoarthritic destruction of the second and third metatarsals, and bilateral HVD were recorded in a male individual, aged 25 – 35 dated to the Old Kingdom (2868-2181 BC) from Saqqara, Egypt[24]. The diagnosis was multiple epiphyseal dysplasia. Another case of skeletal dysplasia (pseudo achondroplasia or multiple epiphyseal dysplasia) was reported from the Late Iron Age (Switzerland) in a young 20 – 29-year-old adult male. In addition to severe skeletal alterations (cranial asymmetry, mandibular asymmetry, osteophytic development of the thoracic and lumbar vertebral bodies, bilateral spondylolysis of L5 and unilateral *varus coxae* of the left femur) this individual presents bilateral HVD deformities of the humeral heads[25]. One individual (female, 36-50 years old) with dwarfism from the Eunpyeong cemetery in Korea dated between 1780 and 1920, shows bilateral HVD[26].

Again, none of the above were noted on the Gumelnița skeleton.

Neonatal osteomyelitis has also been proposed as a cause of HVD[27]. X-rays performed on newborns affected by it, show faster growth of the lateral region of the proximal humerus while the medial growth plate is destroyed by

[17] Hershkovitz et al. 1991, 52.
[18] Thomas 2016, 88.
[19] Ortner 2003, 491.
[20] Ortner 2003, 489.
[21] Ortner 2003, 491.
[22] Alman 2008, 24.
[23] Aufderheide and Rodriguez-Martin 2006, 369.
[24] Kozieradzka-Ogunmakin 2011, 200-206.
[25] Debard et al. 2021, 29-36.
[26] Woo 2015.
[27] Molto 2000, 103.

the osteomyelitis process. Because of complications such as septicaemia, most of the babies do not survive[28]. In adults, in the case of infected and atrophic posttraumatic pseudoarthrosis of the humeral diaphysis, osteomyelitis may result in the shortening of the bone, including the deformation of the humeral head[29]. As far as we know, such cases have not been yet reported archaeologically (HVD associated with osteomyelitis). In the case of M2/1962, neither the X-ray investigation nor the computed tomography indicated any signs of osteomyelitis.

Finally, HVD may also be present in the context of an acquired form of glenoid retroversion due to obstetric brachial plexus palsy or **direct trauma to the humeral head at the time of birth**.

The earliest individual associated with a physical birth injury or perinatal trauma comes from the medieval cemetery of Madeleine (tomb T2017, Orléans, France). The skeleton of a child (6 – 7.5 years old) shows the features of a unilateral (right) humerus varus, without other anomalies[30].

In two medieval individuals (a young adult male from Pont-sur-Seine, France, dated to the 10th – 12th centuries and another one from Toulon dated to the interval 1752 – 1828), the obstetrical aetiology was based on the unilaterality of the lesion and a lower degree of distortion[31].

A similar case, but from Romania, was recorded in the medieval cemetery (14th-15th century) at Enisala *Palanca*. A 45-year-old male individual shows unilateral left HVD triggered by trauma that occurred during childbirth or early life[32].

Traumatic epiphyseal detachment of the humeral head at the time of birth has been documented since 1870, and that of the femoral head since 1908[33]. The possible outcome of the epiphyseal detachment at the proximal end of the humerus and femur was the subject of an experimental study on deceased newborn infants. The experiment showed that the detachment is caused by strong external and internal rotations [34]. A review of the clinical cases reported at that time suggested that *the condition was the end result of an epiphyseal injury at birth or in early life*[35].

We have shown that the observations on M2/1962 are not consistent with thalassemia, mucopolysaccharidosis, infection, or skeletal dysplasia. The skeletal profile of our individual is normal, except for the right humerus. No pathologies were present on the clavicles, ribs, and spine (such as degenerative joint disease or osteophyte formation). The pelvic girdle has a normal aspect, and so do the lower limbs. The size of the bone falls within normal parameters (Table 1) and moreover, the individual had reached adulthood. The appearance and size of the left humerus indicate the presence of unilateral HVD on the right side only.

Table 1. Comparative measurements of the preserved long bones of M2/1962, M1/1962 and M3/1962 (in mm).

Right side				**Left side**			
	M1 ♂	**M2♂**	**M3♂**		**M1♂**	**M2♂**	**M3♂**
	30-35 years	**30-32 years**	**26-32 years**		**30-35 years**	**30-32 years**	**26-32 years**
Humerus				**Humerus**			
1. max. length	298.00	266.00	283.00	1. max. length			297.50
4. inf. epiph. width	61.00	62.00	59.00	4 inf. epiph. width	60.00		59.00
5. middle max. diam.	21.69	20.85	20.47	5. middle max. diam.	22.71	21.20	19.96
6. middle min. diam.	19.36	18.61	16.69	6. middle min. diam.	18.55	17.46	15.56
9. max. transv. diam. head	46.31		40.00	9. max. transv. diam. head			42.63
10. max sag. diam. head				10. max sag. diam. head			
6:5. diaph. sect. I.	89.26	89.26	81.53	6:5. diaph. sect. I.	81.68	82.36	77.96
9:10. head sect. I.				9:10 head sect. I.			

28 Ogden, Weil and Hempton 1976, 160.
29 Noveanu 2009, 201.
30 Kacki et al. 2013, 119-126.
31 Darton et al. 2015, 40.
32 Siena 2022, in press.
33 Henssge et al. 1969, 114.
34 Henssge et al. 1969, 125.
35 Davies et al. 1956, 296.

Radius				**Radius**			
1. max. length	226.00	254.00	225.00	1. max. length			224.00
4. transv. diam	15.40	16.00	13.92	4. transv. diam.	14.85	15.71	13.31
5. sag. diam	11.21	12.68	11.44	5. sag. diam.	11.35	12.68	11.44
5(6). distal epiph. width.	31.00	31.00	30.00	5(6). distal epiph. width.		31.20	
5:4. diaph. sect. I.	72.79	79.25	82.18	5:4. diaph. sect. I.	76.43	80.71	85.95
Ulna				**Ulna**			
1. max. length	250.00		250.00	1. max. length			249.00
*2a. phys. length	221.00		214.50	*2a. phys. length			216.50
3. minimum perim.				3. minimum perim.			
11. dorso-volar diam.	14.21		12.72	11. dorso-volar diam.	12.64		12.22
12. transv. diam.	18.44		15.96	12. transv. diam.	16.80		16.27
11:12 section I.				11:12 section I			
Femur				**Femur**			
1. max. length	457.00	459.00		1. max. length			
2. nat. pos. length	456.00	445.00		2. nat. pos. length			
6. middle sag. diam.	25.40	25.68	25.28	6. middle sag. diam.	26.25	26.09	25.50
7. middle transv. diam.	27.27	27.56	27.94	7. middle transv. Diam.	26.85	27.18	27.64
8. middle perim.				8. middle perim.			
9. subtroch. transv. diam.		33.29		9. subtroch. transv. diam.	35.05	33.86	28.26
10. subtroch. transv. diam.		26.53		10. subtroch. transv. diam.	27.78	29.46	24.88
18. vert. head diam.	43.32			18. vert. head diam.			
19. transv. head diam.	43.49			19. transv. head diam.			
21. distal epyph. width				21. distal epyph. width			
6+7:2 robusticity I				6+7:2. robusticity I			
6:7. Pilastric I				6:7 Pilastric I			
10:9. Platimetric I				10:9 Platimetric I			
Tibia				**Tibia**			
1. max. length	340.00	387.00		1. max. length	341.00		334.00
1a. medial length	329.00	370.00	324.00	1a. medial length	329.00		
3. prox. epiph. width	71.00			3. prox. epiph. width			
6. distal epiph. width	48.00	48.00		6. distal epiph. width	51.00		44.00
8. sag. diam. middle	29.78		29.09	8. sag. diam. middle	28.88	29.53	29.15
8a. sag. diam. n.f.	32.79		30.82	8a. sag. diam. n.f.	33.63	34.59	30.72
9. middle transv. diam.	21.86		20.16	9. middle transv. diam.	22.15	24.38	20.82
9a. n.f. transv. diam.	24.25		21.03	9a. n.f. transv. diam.	23.97	26.46	21.57
10a. n.f. perim.				10a. n.f. perim.			
9:8. diaph sect. I	73.40		69.30	9:8. diaph sect. I	76.70	82.56	71.42
9a:8a. cnemic I	73.96		68.23	9a:8a cnemic I	71.28	76.50	70.21

It is thus reasonable to assume that in the case of M2/1962, HVD occurred at birth, during the extraction, or shortly after, following intense manipulation.

Conclusions

This study reports on an abnormality in the external configuration of the proximal epiphysis of the right humerus (HVD) of an otherwise healthy male individual from the Gumelnița necropolis (M2/1962). The excessive inward angulation, known as the *varus deformity,* was confirmed by subsequent X-ray inspection and computed tomography.

Mechanical forces (compression or traction) acting on the *fœtus* during birth delivery[36] or perhaps excessive manipulation during birth delivery triggered irreversible damage to the right side of the shoulder girdle and further lack of medical care triggered the hypertrophy of the humeral head[37]. Despite the fact it had not been a life-threatening condition (the individual lived to be 30 – 32), it nevertheless led to impairments in his body functions:

- As a result of the impingement of the greater tuberosity on the acromion, including arm shortening, this individual exhibited limited active abduction or forward flexion, a significant decrease in internal rotation, and weakness of the shoulder girdle.
- He was not able to perform certain movements such as reaching overhead or bearing weights on his right upper extremity. The pain must have been of at least moderate intensity during these movements.
- He probably faced a progressive loss of motion and strength in his upper extremity (mild atrophy of his deltoid, infraspinatus, and pectoralis major muscles on the right)[38].

Unfortunately, this condition benefits of little documentation regarding both the archaeological and clinical cases[39]. We would like also to suggest that the literature does not adequately reflect the presence of HVD in archaeological contexts. Hopefully, future studies will complete the patterns of this condition and may show to what extent it does or does not affect other segments of the skeleton, and of course, will provide new information on the living condition of prehistoric individuals.

Acknowledgements

The authors would like to thank Dr Mihaly Enyedi – Junior Lecturer at the *Carol Davila* University of Medicine and Pharmacy in Bucharest - for performing and interpreting the CT imagery. Equal thanks go to Laura Floareș – primary care physician at the National Institute for the Expertise and Recovery of Working Capacity, Bucharest, for performing and interpreting the X-ray images.

References

Alman, B.A. 2008. Skeletal dysplasia and the growth plate. *Clinical Genetics* 73 (1): 24-30. https://doi.org/10.1111/j.1399-0004.2007.00933.x.

Aufderheide, A.C. and Rodriguez-Martin C. 2003. *The Cambridge Encyclopedia of Human Paleopathology.* Cambridge: Cambridge University Press.

Buikstra, J. and Ubelaker, D. H. 1994. *Standards for data collection from human skeletal remains*. Arkansas Archaeological Survey Series No. 44. Fayetteville. https://doi.org/10.1002/ajhb.1310070519

Darton, Y., Gallien, V., Richard, I., Paresys, C. and Bailet, P. 2015. Glenoid retroversion: The palaeopathological perspective. *International Journal of Paleopathology* 1, 10: 31-42. https://doi.org/10.1016/j.ijpp.2015.04.003

Davies, A.G. 1956. Bilateral humerus varus. *The British Journal of Radiology* 29(341): 295-296.

Debard, J. Dutour, O., Mariéthoz F., Kottas G., Gios and M., Desideri, J. 2021. A unique case of skeletal dysplasia in an adult male in Late Iron Age Switzerland. *International Journal of Paleopathology* 1, 34: 29-36. https://doi.org/10.1016/j.ijpp.2021.06.003.

Ellefsen, B.K., Frierson, M.A., Raney, E.M. and Ogden, J.A. 1994. Humerus varus: a complication of neonatal, infantile, and childhood injury and infection. *Journal of Pediatric Orthopedics* 14 (4): 479-486.

Gill, T.J. and Waters, P. 1997. Valgus osteotomy of the humeral neck: A technique for the treatment of humerus varus. *Journal of Shoulder and Elbow Surgery* 6, 3: 306-310. https://doi.org/10.1016/S1058-2746(97)90021-5.

[36] Kacki et al. 2011, 124.
[37] Ellefsen et al. 1994, 481.
[38] Gill and Waters 1997, 309.
[39] Siena 2022, fig. 8.

Henssge, J. and Böckmann, H. 1969. Perinatale traumatische Epiphysenablösung am Humerus-und Femurkopf. *Archiv für orthopädische und Unfall-Chirurgie mit besonderer Berücksichtigung der Frakturenlehre und der orthopädisch-chirurgischen Technik* 66: 114-26.

Hershkovitz, I., Ring, B., Speirs, M., Galili, E., Kislev, M., Edelson, G. and Hershkovitz, A. 1991. Possible congenital hemolytic anemia in prehistoric coastal inhabitants of Israel. *American Journal of Physical Anthropology* 85 (1): 7-13. https://doi.org/10.1002/ajpa.1330850103.

Hershkovitz, I. and Edelson, G. 1991. The first identified case of thalassemia? *Human Evolution* 6: 49-54. https://doi.org/10.1007/BF02435606.

Kacki, S., Duneufjardin, P., Blanchard, P. and Castex, D. 2013. Humerus varus in a subadult skeleton from the medieval graveyard of La Madeleine (Orléans. France). *International Journal of Osteoarchaeology* 23 (1): 119-26. https://doi.org/10.1002/oa.1249.

Kantharaju, H., Gawhale, S.K., Prasanna Kumar, G.S., Sahare, B. and Shah, N. 2021. Factors influencing the varus deformity of humeral head in proximal humerus fractures and its relation to functional outcome. *Indian Journal of Orthopaedics* 55: 702-7077. https://doi.org/10.1007/s43465-020-00275-4.

Kozieradzka-Ogunmakin, I. 2011. Multiple epiphyseal dysplasia in an Old Kingdom Egyptian skeleton: a case report. *International Journal of Paleopathology* 1, 3-4: 200-206. https://doi.org/10.1016/j.ijpp.2011.10.002.

Lazăr, C.A. 2001. Date noi privind unele morminte gumelnițene. *Preistoria Dunării de Jos. Cultură și civilizație la Dunărea de Jos* XVI-XVII: 173-183.

Lazăr, C. 2020. *Rituri și ritualuri funerare în neoliticul și eneoliticul din România*. Studii de Preistorie. Supplementum 5. Târgoviște: Cetatea de Scaun.

Lazăr, C., Opriș, V., Ignat, T., Manea, B., Frujină, O., Covătaru, C., Darie, A., Bălășescu, A., Radu, V., Vasile, G., Golea, M., Mărgărit, M., Popescu, G., Dimache, M., Pîrvulescu, D., Streinu, M., Șandric, B., Tufaru, M., Iancu, A., Dinu, G., Parnic, V., Căpiță, C., Zavalaș, T., Dima, A. and Sava, T. 2020. Gumelnița: research results of the 2018 and 2019 fieldwork seasons, *Cercetări arheologice și numismatice* 6: 13-100.

Lazăr, C.A., Dimache, M., Cristache, S., Zavalaș, T., Pîrvulescu, D., Opriș, V., Ignat, T., Darie, A., Bălășescu, A., Golea, M., Vasile, G., Parnic, V., Florea, M., Radu, V., Haită, C., Mărgărit, M., Covătaru, C., Manea, B., Carozza, L., Toma, A., Popescu, G., Căpiță, C., Șerbănescu, A., Roth C., and Frujină, F. 2022. Gumelnița, mun. Oltenița, jud. Călăraşi Punct: Măgura Gumelnița (Măgura Calomfirescu), *Cronica Cercetărilor Arheologice din România. Campania 2021*: 151-154. https://biblioteca-digitala.ro/?volum=12873-cronica-cercetarilor-arheologice-institutul-national-al-patrimoniului-2022&fbclid=IwAR3Pei6kbUVutRYR2WQb5OoRuPtGCKL_IK_4fDMkA8j9K6xS84Fu3Vyxwkk

Molto, J.E. 2000. Humerus varus deformity in Roman period burials from Kellis 2. Dakhleh. Egypt. *American Journal of Physical Anthropology* 113 (1): 103-109. https://doi.org/10.1002/1096-8644(200009)113:1<103::AID-AJPA9>3.0.CO;2-A.

Noveanu, D. 2009. *Infecții osoase articulare exogene*. București: Editura Anamarol.

Ogden, J.A., Weil U.H., and Hempton, R.F. 1976. Developmental humerus varus. *Clinical Orthopaedics and Related Research* 116: 158-165.

Ortner, D.J. 2003. *Identification of pathological conditions in human skeletal remains*. Second Edition. San Diego: Academic Press.

Ortner, D.J. and Putschar, W. 1981. *Identification of pathological conditions in human skeletal remains*. *Smithsonian contributions to anthropology* 28. Washington: Smithsonian Institution Press.

Perianu, M. 1993. Aspectul paleopatologic într-un mormânt colectiv hallstatian. *Studii și Cercetări de antropologie* 30: 9-14.

Siena, S. 2022. A Case of Humerus Varus Deformity from the Medieval Cemetery of Enisala Palanca (Sarichioi, Tulcea County) în M. Gligor and A. Soficaru (ed.), *Studierea și interpretarea practicilor funerare din trecut. O perspectivă bioarheologică*, Cluj-Napoca: Editura Mega. ISBN: 978-606-020-575-3, in press.

Techataweewan, N., Mann, R.W., Wolk, M., Ruengdit, S., Panthongviriyakul, C. and Buckley, H.R. 2021. Thalassemia major in a 49-year-old Thai female: Gross and X-ray examination of dry bone. *International Journal of Osteoarchaeology* 31, 5: 866-880. https://doi.org/10.1002/oa.3003.

Thomas, G.P. 2016. An 8000-year-old case of thalassemia from the Windover Florida skeletal population. *International Journal of Paleopathology* 1, 14:81-90. https://doi.org/10.1016/j.ijpp.2016.05.011.

Ugwonali, O.F., Bae, D.S. and Waters, P.M. 2007. Corrective osteotomy for humerus varus. *Journal of Pediatric Orthopaedics* 27(5): 529-532. https://doi.org/10.1097/BPO.0b013e318070cb69.

White, T.D., Black, M.T. and Folkens, P.A. 2011. *Human osteology*. Academic Press.

Woo, E.J., Lee, W.J., Hu, K.S. and Hwang, J.J. 2015. Paleopathological study of dwarfism-related skeletal dysplasia in a late Joseon dynasty (South Korean) population. *PloS one* 21, 10 (10). https://doi.org/10.1371/journal.pone.0140901.

Liste d'illustrations

Pl. I. 1: Carte du site de Gumelnița indiquant l'emplacement de la zone de la terrasse où M2/1962 a été trouvé (d'après Lazăr et al. 2020); 2: Sépulture M2/1962 (d'après Lazăr 2020).

Pl. II. Extrémité proximale de l'humérus droit (1) et image extraite du scanner (2), montrant les dommages causés par la restauration avec une tige en bois; 3 Changements morphologiques sur la surface articulaire. Photos (1,3) par M. Culea, image CT (2) par E. Mihaly.

Pl. III. 1: Diagramme montrant l'état de conservation de M2/1962; 2-5: Humérus droit de M2/1962 (2) comparé à l'humérus droit de M1/1962 (3)- vue latérale; humérus droit de M2/1962 (4) comparé à l'humérus gauche de M2/1962 (5)- vue antérieure. Notez la configuration anormale de l'humérus droit de M2/1962. La flèche blanche marque le trait non métrique (ouverture septale). Photos par M. Culea.

Pl. IV. Vue conventionnelle de l'humérus M2/1962.1 – vue latérale de l'humérus droit, 2 – vue antéro-postérieure de l'humérus droit, 3 – vue antéro-postérieure de l'humérus gauche. Image radiographique par Laura Floareș.

Tableau 1. Mesures comparatives des os longs conservés de M2/1962, M1/1962 et M3/1962 (en mm).

MIHAELA CULEA
Institutul de Antropologie „Francisc I. Rainer”, București
m_gatej@yahoo.com

ADINA BORONEANȚ
Institutul de Arheologie „Vasile Pârvan”, Academia Română, București
boro30@gmail.com