

Anthropological Investigation of the Bone Remains from the Archaeological Site “Samuil – Tsar of Bulgaria” Monument

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This study presents the results from the anthropological investigation of the bone remains, revealed at the rescue archaeological excavations led on the place of the Samuil – Tsar of Bulgaria Monument. There were revealed 10 medieval graves, dated to the 11th-12th c. AD. The skeletons of 11 individuals were investigated. They were determined to belong to 6 adults (1 male, 4 female and 1 of undetermined sex), 1 juvenile and 4 children. The observation of the bone remains showed that one of the individuals was affected by spondylodiscitis and another one survived a trauma on the left leg. In addition, the skeleton of the male individual bore many traces of violence, including three depressed fractures on the skull, a tip of an arrow stuck in the left sacral ala as well as cut injuries affecting the inferior surface of the fourth lumbar vertebral body and the right humerus. None of these bone damages showed traces of healing, which suggests that the individual died a violent death.

Key words: bone remains, medieval, anthropological investigation.

Introduction

At the end of 2014, rescue archaeological excavations had been performed on the place, where was put up a monument to Tsar Samuil (Sofia, Bulgaria). The archaeological site was located in the garden in front of the St. Sophia basilica within the borders of the Serdika – Sredets Historical and archaeological reserve, in the middle of the Eastern antique necropolis. The excavations were led by archaeologist Polina Stoyanova and covered an area of 13 m². There were revealed 10 medieval graves, distributed to two levels. The upper one included graves numbered from 1 to 5, and the lower one – from 6 to 10. According to the grave goods, the graves from the upper level were dated to the 11th-12th c. AD. The graves from the lower level were synchronous or a little earlier than the upper ones [12].

The results from the anthropological examination of the bone remains, revealed at the rescue archaeological excavations on the place of the Samuil – Tsar of Bulgaria Monument are presented in this study.

Materials and Methods

The *in situ* position of the skeletons was documented on the site of the excavation and then the bones were picked up. The examination of the bone remains was performed in the Institute of Experimental Morphology, Pathology and Anthropology with Museum, BAS. The laboratory work started with cleaning and reconstruction of the fragmented bones, where it was possible. The signatures of the burials are identical with these of the archaeologists. There were two skeletons lying one on top of the other in *Grave 1*, which were marked as 1a (upper skeleton) and 1b (lower skeleton).

The sex of the individuals was determined according to the morphological characteristics of the skull and bones of the postcranial skeleton [1]. The age of the adults was determined according to the cranial sutural closure [1], Gerasimov's scale for dental attrition [11] and Todd pubic symphysis scoring system [1]. The degree of fusion of the epiphyses of the long bones and the fusion of the sacral vertebrae as well as of the pubis, ischium and ilium into single bones were also used for dating the age of the juvenile and adult individuals [6]. The age of the children was determined in accordance with the degree of bone growth and fusion between the bone segments [6], the length of the long bones of the limbs [2], and the stages of dental development and eruption [8].

The skulls and bones of the postcranial skeletons of the adult individuals were examined metrically and scopically by classical anthropological methods [3, 9, 10]. Descriptive statistics was not applied to the data, because of the small sample. The stature was calculated on the basis of the lengths of the upper and lower limb long bones according to the methods of Pearson and Lee [4] and Trotter and Gleser [7]. The long bones of the children were measured in order to be established their age after the method of Facchini and Veschi [2].

Results

Sex and age of the individuals

Grave 1. There were two skeletons of adult individuals, lying one on top of the other. The upper skeleton (1a) belonged to an adult female with an age at death of 35-40 years. The second skeleton, lying below the other one, belonged to a female at about 30 years old.

Grave 2. Only the right and left tibiae and fibulae of the individual were available. They belonged to an adult, but the sex could not be determined.

Grave 3. The skeleton belonged to an adult female with an age at death of 30-35 years. The indexes of the skull showed that it was mesocranic (8:1), orthocranic (17:1), tapeinocranic (17:8), and metriometopic (9:8).

Grave 4. The bone remains belonged to an adult male. The age of the individual was determined at about 30 to 35 years.

Grave 5. The skeleton was determined to belong to a juvenile individual (15-16 years), probably female.

Grave 6. The bones belonged to a child at the beginning of the 1st year.

Grave 7. According to the available bone remains, the individual was determined as child around the age of 3 years and 8 months.

Grave 8. The skeleton belonged to a female individual. The age was determined in the age group *Adultus* (20-40 years). The indexes calculated between the skull measurements showed that the skull was hyperbrachicranic (8:1) and stenometopic (9:8).

Grave 9. The skeleton was determined to belong to a child at the age of 1 year and 10 months.

Grave 10. The bone remains belonged to a child at the age of 2 years and 7 months.

Position of the skeletons in situ

The burials were performed by laying of the bodies on the back with head to the west and with arms folded at the elbows and lying in the abdominal or thoracic region according to the Christian burial rite. However, two of the children deviated from the burial rite. The child from *Grave 7* was found with head on the right side, legs on the left side, the right arm turned upwards along the head and the left arm along the body. The child from *Grave 9* lied on the back in the upper part of the body, but with legs on the right side and arms along the body. On the site of the excavations, there were also found scattered human and animal bones.

Stature of the adult individuals

The stature of the adult individuals, calculated on the basis of the available long bones of both upper and lower limbs, is presented in **Table 1**.

Table 1. Stature of the adult individuals according to the methods of Pearson and Lee [4] and Trotter and Gleser [7]

Grave	Methods	Stature
Grave 1a (female)	Pearson-Lee	156.7 cm
	Trotter-Gleser	161.6 cm
Grave 1b (female)	Pearson-Lee	153.9 cm
	Trotter-Gleser	157.8 cm
Grave 3 (female)	Pearson-Lee	153.2 cm
	Trotter-Gleser	158.5 cm
Grave 4 (male)	Pearson-Lee	168.0 cm
	Trotter-Gleser	174.5 cm
Grave 8 (female)	Pearson-Lee	159.1 cm
	Trotter-Gleser	165.7 cm

Paleopathological data

Three of the buried individuals showed trace of some kind of pathological condition or violence.

The pathological changes observed on the bones from *Grave 2* showed that the individual probably suffered a trauma on the left leg above the ankle. The left tibia had a bony growth with an additional articular surface in the lower part of the bone. This articular surface was directed to the fibula, which also had a small bony growth with a corresponding additional articular surface (**Fig. 1a**). There were no traces of fractures on the bones. The pathological changes might have been caused by a traumatic injury affecting the muscles and tendons in this part of the leg. The injury probably led to a gait disturbance, resulting in severe osteoarthritic changes in the right knee, observed on the superior articular surface of the right tibia (**Fig. 1b**).

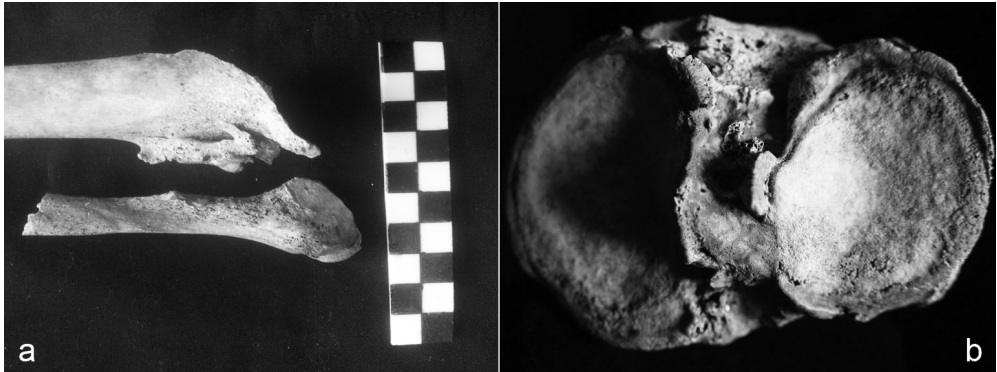


Fig. 1. Bones of the individual from *Grave 2*: a) The lower parts of the left tibia and fibula; b) The superior articular surface of the right tibia

The bones of the female from *Grave 3* also showed traces of pathological changes. The individual was affected by spondylodiscitis. There were lytic lesions on the vertebral bodies from the sixth thoracic vertebra to the fifth lumbar vertebra (**Fig. 2a**). The adjacent body surfaces between the twelfth thoracic and the first lumbar vertebrae and between the fifth lumbar vertebra and the body of the sacrum showed destructive changes indicative of epidural abscesses (**Fig. 2b**). The spondylodiscitis could be associated with different diseases – tuberculosis, brucellosis, staphylococcal infections, etc [5]. Besides, the skull characterized with a complete atrophy of the maxillary alveolar process (**Fig. 2c**) and *cribra orbitalia* on the roof of the left orbit. Periostitis was observed on both tibiae and fibulae.

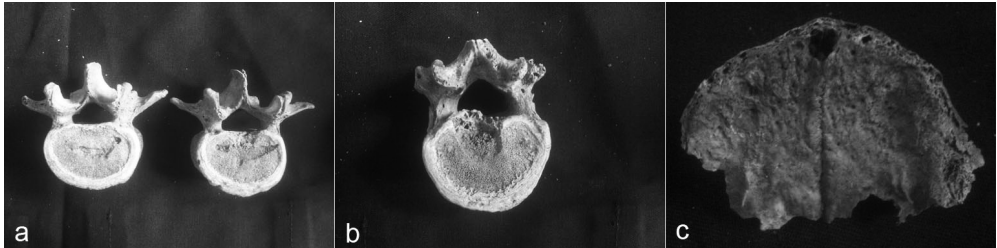


Fig. 2. Bones of the individual from *Grave 3*: a) The superior body surfaces of the second and third lumbar vertebrae; b) The inferior body surface of the twelfth thoracic vertebra; c) Complete atrophy of the maxillary alveolar process

According to the bone damages, observed on the bones from *Grave 4*, the individual appeared to have died a violent death (**Fig. 3**). Although the skull was fragmented and had missing parts, there were visible few damages on its outer surface. A rounded defect with an approximate diameter of 45 mm was observed on the coronal suture and adjacent areas of the frontal and left parietal bones (**Fig. 3b**). The outline of the defect was distinctly visible on the outer surface of the skull, but there were not damages on the internal table, and therefore, the underlying soft tissues were not affected directly. It is very likely that the defect was caused by striking a blow with a blunt object, which resulted in a depressed fracture. Another rounded defect was observed on the left parietal bone at a distance of 43 mm at the back of the above-described traumatic injury (**Fig. 3c**). The defect had a diameter of 27 mm on the outer surface of the skull and was smaller than the first one. On the internal table of the skull, it showed a bigger diameter than the outer one and had an

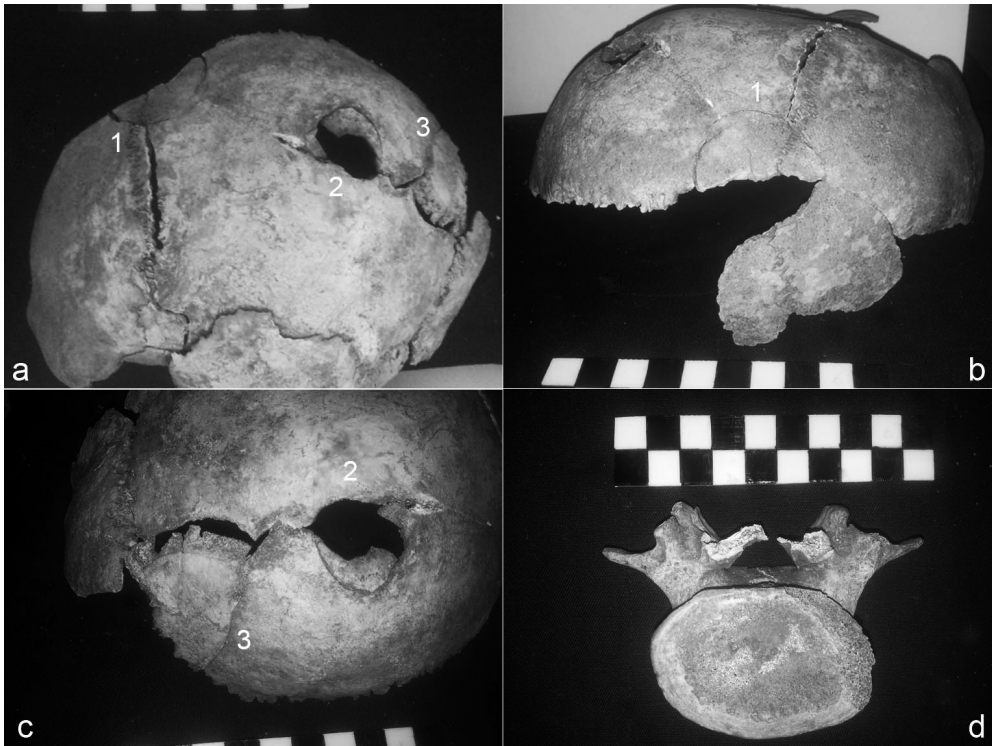


Fig. 3. Bones of the individual from *Grave 4*: a-c) Reconstructed parts of the skull with traces of depressed fractures, designated as 1, 2 and 3; c) The inferior body surface of the fourth lumbar vertebra

irregular outline. The depressed fracture in this case probably was also caused by a strong blow with a blunt object, but on a relatively small area. The blow caused knocking out of at least two bone fragments, which sank inwards and might have damaged the underlying meninges and brain tissue. Moreover, there was observed one more defect with semilunar shape, situated at a distance of 15 mm behind the second above-mentioned defect. It represented a crack between two bone fragments. The upper fragment had an oblique margin and was at a distance of 10 mm from the lower one, whose inner surface had a similar corresponding oblique outline. The distance between the fragments probably was a result from the strong postmortem deformation of the parietal bone. The outline of this third depressed fracture cannot be completed, because of the lack of parts of both left parietal and occipital bones (**Fig. 3c**).

Furthermore, a tip of an arrow was found stuck in the left sacral ala of this individual. It was obliquely stuck at a depth of 22 mm (**Fig. 4**). The tip laid on the left transverse process of the fifth lumbar vertebra, which might have affected the corresponding nerve and blood vessels. Besides, bone damage was observed on the inferior surface of the body of the fourth lumbar vertebra, which presented a slightly oblique section in a depth of 11 mm in the intervertebral space (**Fig. 3d**). The cut surface was smooth and suggested a blow with sharp object, inflicted almost horizontally on the right side of the waist. This blow is very likely to have affected some of the internal organs. The right humerus also showed a trace obtained by a blow with sharp object. It was observed in the middle of the diaphysis and was 20 mm long. The cut was deeper and wider on the lateral surface and became shallower and narrower towards the medial surface.



Fig. 4. Skeleton of the individual from *Grave 4 in situ* with a tip of arrow stuck in the left sacral ala

The described bone damages showed no traces of healing and most probably caused the death of the individual. Besides all these traumatic injuries, a bone growth was observed in the upper 1/3 of the *linea aspera* of the right femur. It might have been caused by a trauma affecting the soft tissues in this part of the thigh without bone fracture. Unlike the other injuries, this one was survived.

Conclusion

As a whole, the results from the anthropological investigation of the bone remains revealed at the rescue archaeological excavations led on the place of the Samuil – Tsar of Bulgaria Monument showed that they belonged to 11 individuals (6 adults, 1 juvenile and 4 children). Pathological changes were observed on the bones of three of the adults.

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