CRANIAL TRAUMA FROM THE NEOLITHIC TIMES UP TO THE BRONZE AGE OF ROMANIA

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„Trauma refers to injury to living tissue that is cause by a force or mechanism extrinsic to the body, whether incidental or intentional"[1].

Archaeological finds from Romania provide us, sometimes, very interesting cases of pathology, that eanble us to take a glimpse into the living conditions and customs of the prehistoric populations. Some of the pathological conditions are being determined by the conflicts or social-economic conditions of a certain community.

A warrior society can experience more pathology than a peaceful one, especially due to the conflicts it experiences. Of course, in such conditions, the most frequent cases are lesions inflicted by weapons (arrows, spears, axes, clubs).

For the peaceful communities there are mostly found the pathological conditions determined by various illnesses or trauma resulted from blows.

We should stress here that trauma resulted from combat are intentional, while those produced by accidents are unintentional.

Such aspects could be considered as phantasies if we wouldn't know that data related to the type of community could be inferred both by the finds in the setlements, or those unearthed in the graves. By putting the information together and depending upon the location of the trauma, we could find an explanation for some of the trauma, induced by combat. For others, it could be clearly observed that they resulted from blows but, sometimes, they could be also determined by accidents.

We should not neglect the evolution of the weapons and the raw materials they were made of. The harder the raw materials, the stronger impact would be on the bone.

Usually, regarding the skull fractures or lesions, there are usually considered those placed on the cranial vault or base, but without the facial ones,

1 Nancy C. Lowell, *Analysis and interpretation of skeletal trauma,* in M. Anne Katzenberg, Shelley R. Saunders, Biological anthropology of the human skeleton, John Wiley and Sons Inc., 2008, p.. 341.

that are separately taken. The basal fracture demands a strong force to produce a fracture and, due to the proximity of the paranasal synuses and mastoid air cells to the dura mater, the fractures with such a location are usually compound and they create a good mileu for infections.

In a study about the cranial trauma should be included several important aspects that result in the lesion, or fracture of the skull:

-raw material of the blowing object. For the arrow points or spears it is also important, because it exerts an influence upon the velocity at the impact zone. It is surely a difference between the impact of a flint arrow point and the one of a bronze one. Besides, according to Nancy C. Lowell, there could be found three types of skull trauma, resulted from a different velocity. Besides, we should point out here that the depressed fractures do not appear when the weapon is used with a slow velocity and the impact force does not exceed the flexibility of the bone end does not affect the cohesion of the bone molecules[2].

-linear (crack). In this situation the velocity is small, its force inflicts just superficial damages and the lenght of the crack is proportional with the force of impact. Such fractures do not appear on children skulls, as their bones are very elastic;

-depressed (usually associated with fracture lines). The velocity is stronger and results in a deformity of the skull bone, at in the contact zone area. This also induces ecchymoses on the dïploe, as a result of breaking the blood vessels that run into that area. The depressed fracture could exert a pressure upon the dura mater or brain. In the case when such a bone fragment would penetrate the mentioned structures, it would cause death.

Such a situation, of acquiring a depressed fracture of the skull may result from the accidental fall of the individual upon a shyarp corner, or upon a flat surface with a raising object upon it, but also by assault by a club of another blunt object. It could seldom appear from punches on the head, as such blows are more easy to be applied in the facial zone;

-penetrating. The velocity is strong and fragments of bone are simply pushed inside the cranial cavity. Such injuries are usually induced by projectiles, that affect a small surface of the bone, but with a strong force in the impact area;

-location of the impact zone. The most frequent position on the skull is the one on the cranial vault. Subsequently, it follows the fracture of the sphenoid area, which is also a serious cause of death[3].

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2 V. Panaitescu, Mariana Roşu, M. Gligor, Luminiţa Matei, A. Sîrbu, *Cranial fractures identified in a late Neolithic population, exhumed from the Middle Basin of Mureş river – „Lumea Nouă" (Romania),* Rom.J. of Leg. Med., 16 (4), 2008, p. 267.

3 Nancy C. Lowell, Analysis and interpretation of skeletal trauma, in M. Anne Katzenberg, Shelley R. Saunders, Biological anthropology of the human skeleton, John Wiley and Sons Inc., 2008, p. 350-351; V. Panaitescu, Mariana Roşu, M. Gligor, Luminiţa Matei, A. Sîrbu, *Cranial*

According to its location on the skull, the position of the assailant could be inferred. Usually, if the blow came from a right-handed person who is in front of her victim, the blow trace is located on the left parietal, or temporal bones. More seldom it appears on the frontal bone, probably because it is not a very facile one, when weapons are being used.

If the blow traces are being placed on the occipital bone, they are usually applied to a flee person, while her enemy follows her from behind.

-age of the individual. The bones of a child or older person are much more sensitive to such an impact than those of an adult individual.

-body building. A slender individual, with thin bones, can be more easily affected than a strong, heavy built person.

In the following lines, we would further render some characteristics of the trauma found in the mentioned time sequence:

Dimensions of the blow trace

They usually vary, according to the object used as a weapon. Of course, there is a strong differentiation among the blunt and sharp instruments. Their traces could be usually traced upon the bones, of course, when they were preserved in rather good conditions.

Depth of the blow

Such a characteristic is being strongly influenced by few factors: weapon type (sharp or blunt), thickness of the skull bone, condition of the skeleton. Of course, we should not neglect the possibility of counteracting by the attacked individual, who could parry a blow, either by using some kind of shield or directly with the arm, fact which would surely diminish the impact upon the bone.

Healing

Out of the existing cases, it could be observed that, even when the blow had induced rather large damages, it could be seldom followed by an infection (osteitis) or other complication. In the latter case, the lesion of the brain is the most dangerous one. But normally, even if might sound surprising for that time, the bone had healed without any problem, despite the uncomplicated treatments used at that time.

Further on, we will present the most well known cases of skull trauma. Some of them had not been studied by anthropologists, being considered as trephinations just by archaeologists.

Neolithic time

Trestiana, Vaslui County – Criş Culture

On the skull no.6 a trauma with a loss of bony matter on the right parietal bone, appeared *intra vitam*. The perforation was placed above the *lambda* point, its median limit being determined by the sagittal suture, the lateral one, with a

fractures identified in a late Neolithic population, exhumed from the Middle Basin of Mureş river – „Lumea Nouă" (Romania), Rom.J. of Leg. Med., 16 (4), 2008, p. 267.

very irregular outline bearing traces of healing. The orifice had dimensions of 34 mm x 20 mm and was resulted from a trauma upon the skull[4].

Ceamurlia, Constanţa County –Hamangia Culture

During the excavations from Ceamurlia, in the upper part of the second layer, two pieces of skull had been found, bearing a rounded perforation, with a diameter of 0,014x0,012 m, performed in the old times and having no traces of healing[5]. The author of the excavations had considered it a possible trephination.

Lumea Nouă, Alba County- Foeni Cultural Group

In the up mentioned site there was found a pile of human bones, among which there were also four incomplete skulls, with depressed fractures. The first one (A), a calva belonging to the skull 13, was affected by a cleft on the right parietal bone, with a maximal depth at the superior and medial sides. Thre is also a maximal depression, indicated by another fracture line of 25 mm, situated in an upper and medial position and 2 mm towards the inner side.

The second cranial vault (B), belonging to skull 24, on the back side of the left parietal bone was also affected by a depressed fracture, with an oval shape and 30x20 mm, with the main axis hasving an oblique orientation, medially and backwards, in the angle between the sagittal (45 mm away) and lambdoid (20 mm away) sutures. The back side of the mentioned surface had a rugged appearance and right from it two almost vertical clefts had began, with a backwards orientation and a width of 8-12 mm. The inner table is „detached, rugged and covered with petrified mould".

The third cranial vault (C), belonging to skull 26, had also a depressed fracture on its left parietal bone, also in the angle between the sagittal and lambdoid sutures. Its dimensions were 34x30 mm, with its lower back side with a cleft and lack of bony matter. Upon this skull fragment there are also two abrasion areas, both triangle-shaped (66x30 mm, interrupted in its lower and lateral parts and 20x18x18 mm), on the right parietal bone.

The fourth skull fragment (D), belongibng to skull 62, was represented by almost entire right parietal and also by „a narrow, paramedial section of the left parietal"[6]. On the left parietal there was also a depressed fracture, with an oval shape and 20x25 mm. In the fracture area there was a transversal cleft of 11 mm,

4 Olga Necrasov, Serafima Antoniu, Contribuţii la studiul anthropologic alpopulaţiilor vechi care au trăit n zona oraşului Bârlad, AMM, 1, 1979, p. 21.

5 D. Berciu, *Săpăturile de la Ceamurlia de Jos,* in Cultura Hamangia. Noi contribuţii.1, Bucureşti, 1966, p. 133.

6 V. Panaitescu, Mariana Roşu, M. Gligor, Luminiţa Matei, A. Sîrbu, *Cranial fractures identified in a late Neolithic population, exhumed from the Middle Basin of Mureş river – „Lumea Nouă" (Romania),* Rom.J. of Leg. Med., 16 (4), 2008, p. 265.

corresponding to the maximal depression of the bone.

The fifth skull calotte (E) belonged to the almost complete skull no. 7. Just the left temporal bone and a small part of the left parietal were missing. Close to the coronal suture, 5 mm away from it and 20 mm in a parasagital position to the left, there was a depressed fracture of 25x23 mm, with two thirds of it missing. The supero-anterior part of the bone has a depressed fracture in a half-moon shape, with 8 mm height. An area with a similar shape was found on the cranial base upper view. Towards the back side of the skull, 20 mm away from the sagittal suture and 25 mm away from the lambdoid one, there was also an abrasion area, of 30x20 mm, with its long axis in horizontal position.

The cranial vaults from Lumea Nouă had been precisely detached from the skeletal remains and their faces[7]. The sectioning was always taken at the same level, just in some cases maintaining the superior part of the nasal bones. All of these procedures could be either the result of „a violent action or a ritual ceremony". There were archaeological evidences that Neolithic people tried to offer protection to those human remains. As no traces of epidemics or massacres existed, the interpretation for the find was connected to the existence of a center for ritual practices, similar to Herxheim, or the existence of a kind of „regional cemetery"[8].

Băile Herculane „Peştera Hoţilor"

Another interesting situation was found in the mentioned site, in a cultural mixture of Sălcuţa and Tisza cultures, in a ritual complex, that also comprised a skull, with traces of violence upon its left parietal, that resulted in extensive detachment of the skull base, temporal bone and occiput. The skeleton belonged to a woman of 25-30 years of age[9].

Valea Lupului (Îaşi County)

During the transitional period from the Neolithic to the Bronze Age, a single skull was found with traces of skull trauma on the left parietal bone, possibly inflicted with a hammer with a rounded basis. This belonged to skeleton no. 22 from Valea Lupului[10].

Bronze Age

Cândeşti – Monteoru Culture

In the large necropolis found on that site, one of the skulls (no. 744), belonging to a mature female individual, of 55-60 years, bore traces of two

7 V. Panaitescu, Mariana Roşu, M. Gligor, Luminiţa Matei, A. Sîrbu, *Cranial fractures identified in a late Neolithic population, exhumed from the Middle Basin of Mureş river – „Lumea Nouă" (Romania),* Rom.J. of Leg. Med., 16 (4), 2008, p. 266-267.

8 V. Panaitescu, Mariana Roşu, M. Gligor, Luminiţa Matei, A. Sîrbu, *Cranial fractures identified in a late Neolithic population, exhumed from the Middle Basin of Mureş river – „Lumea Nouă" (Romania),* Rom.J. of Leg. Med., 16 (4), 2008, p. 267.

9 Nicolăescu-Plopşor & Wolski, 1974, 4.

10 M. Dinu, Şantierul arheologic de la Vaklea Lupului, Materiale, VI, 1959, p. 205, fig. 3.

depressions in a parasagittal and almost simetrical position, with similar dimensions. The first one had a bony loss with an almost oval shape (32x27 mm), looking like a hemisphere with margins and walls smoothed and shiny. It is situated 30 mm away from the coronal suture, the outer limit going 2-3 mm over the temporal line. The lesion was resulted from a blow and its surface was subsequently cleared by the „witch-doctor". The individual had survived the surgery.

The second trauma could be found on the right side of the frontal bone, being aproximately at the same distances from the already mentioned marks. This depression had an almost rounded outline (31x29 mm), and its outer-temporal edge went about 1 cm over the temporal line. This second intervention, unlike the other one that was fully healed up, bore just a beginning of healing, especially on its frontal-temporal edge, fact that backs up the presumption that, in this case, the surgery was done upon a living patient but, he had shortly survived afterwards, probably less than one year. The healing had covered about 3 mm on the outer table of the frontal-parietal and parietal-temporal depression. In turn, the edge to the frontal, but also the entire surface of the depression had a porotic appearance that might suggest the precence of a supurative process on the soft parts.

The first surgery was done towards the adulthood of the female individual, while the second one was done much later, around 55-60 years of age. The reasons of those interventions could not be surely established. It was considered that it was possible that the first operation could determined some internal lesions, possibly a haematoma, that would demanded a new intervention[11].

Conclusions

As we could see by reading the up writen lines, the aspects regarding the skull trauma are very diverse, but also complex, due to their social or cultural significance. It was not our intention to include here the trephinations as well, as the picture would have became even more complicated.

A general conclusion that we could infer would be that such trauma are determined by various causes, have different locations, but those on the parietal prevail and can be inflicted accidentally or by direct combat. This, of course, refers just to the cases discovered on the territory of Romania.

11 Georgeta Miu, Două cranii trepanate identificate în necropola Monteoru de la Cândeşti (perioada Bronzului Mijlociu), Arheologia Moldovei, XXIX, 2006, p. 214-217.

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LIST OF ABREVIATIONS

AMM – Acta Moldaviae Meridionalis. Anuarul Muzeului Judeţean Vaslui, Romania
Rom.J.Leg.Med. – Romanian Journal of Legal Medicine, Bucharest, Romania
Materiale Materiale şi cercetări arheologice, Bucharest, Romania

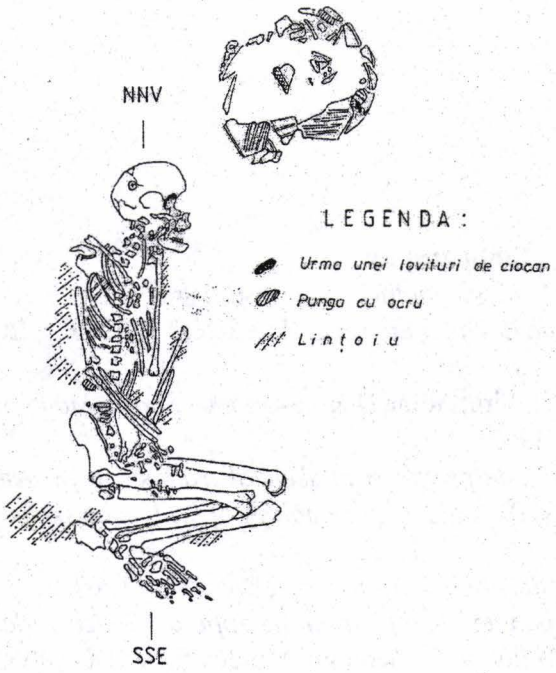

Fig. 1 – Skeleton no. 22 from Valea Lupului, bearing traces of trauma on the skull (apud M. Dinu, 1959, p. 205, fig. 3).

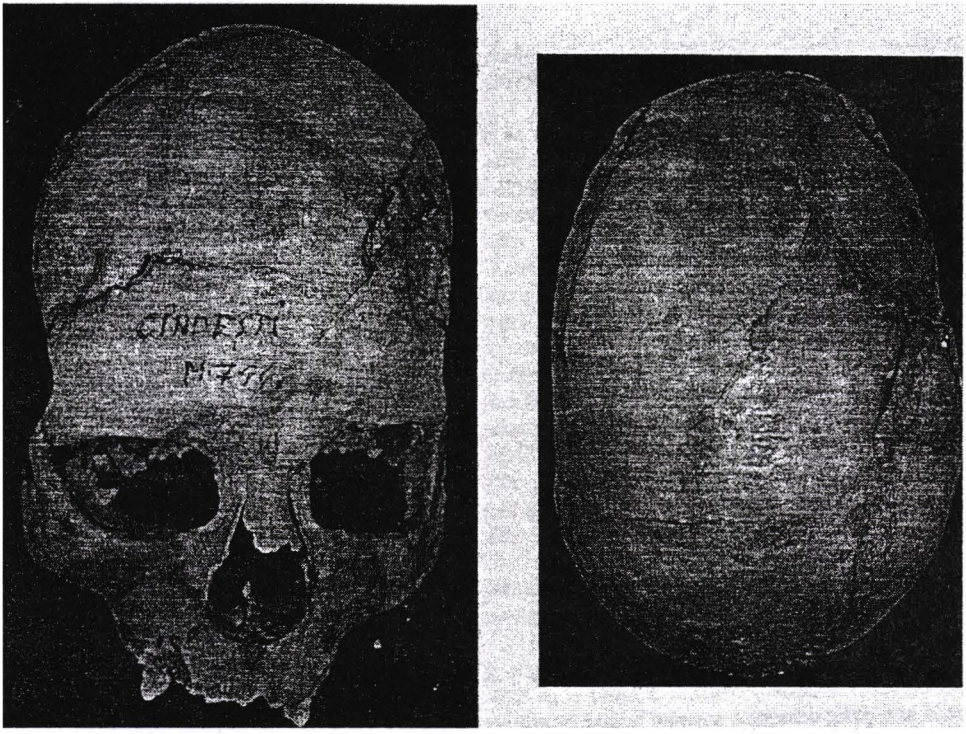

Fig. 2 – The skull no. 744 from Cândeşti with two trauma (apud G. Miu, 2006, p. 215, pl. 2a).