ANTHROPOLOGIE • XXXV/3 • pp. 283 – 289 • 1997

LADISLAVA HORÁČKOVÁ, LENKA BENEŠOVÁ

FINDINGS OF WAR-TIME INJURIES FROM THE BATTLE OF AUSTERLITZ

ABSTRACT: During archaeological rescue research carried out in 1994 in the Jiříkovice village area (near Slavkov na Moravě – Austerlitz), a common grave pit has been found with skeletal remains of people killed during the Battle of Austerlitz in 1805. According to anthropological criteria, 18 of the discovered skeletons showed masculine signs, two skeletons were female, and two belonged to subadult individuals. The age of the men ranged between 20–40 years, one of the women was 20–25 year-old, the other was 30–40, and the estimated age of subadult individuals is about 17 years of life. Body height of the men ranged between 166.8 cm and 178.6 cm.

In the foramen vertebrale of the first thoracic vertebra of one of the adult individuals, a bullet of 16 mm in diameter was wedged. Further finds included a fragment of the right femur of an adult man bearing traces of a serious unhealed splintered fracture on its distal end. Due to the localisation and character of both injuries, the two cases were definitely fatal ones. The therapeutic interventions of the time are represented by war-time amputations of long bones of lower limbs. One of them was the amputation of the distal part of the right femur of an adult man. The victim must have died soon after the intervention, as the incision did not bear any traces of healing. Further finds include two amputations of tibiae of adult men. In both cases they were peripheral stumps of limbs thrown into the grave pit. Due to quick retreat of defeated allied armies, it is highly probable that the mentioned surgical interventions were performed also by French physicians under the leadership of J. D. Larrey, the chief surgeon of Napoleon's army.

KEY WORDS: Battle of Austerlitz 1805 – Common grave pit – War-time injuries – Amputation

The remains of skeletons resting for nearly 190 years on the site of Austerlitz battlefield have given the testimony of many particular human tragedies happening on the background of any big battles.

In autumn 1994, during archaeological rescue research a common grave pit with human skeletal remains of at least 22 individuals was discovered (*Figure 1*). The site was revealed in the large building site of McDonald's (near the roadhouse Rohlenka) on the outskirts of the Jiříkovice village area. Objects accompanying the find (buckles, buttons of military uniforms, a small Russian icon) allowed the dating of skeletal remains to the period of the Battle of Austerlitz in 1805. Archaeological research was realized in two phases. The proper rescue archaeological research was carried out by the staff of the Institute of Archaeological Care of Historical Monuments in Brno, and the second part was performed by members of the club of Military History in Brno under the aegis of the District Museum of Brno Region. Anthropological analyses of this part were made with the participation of Dr T. Dacík.

Skeletal material discovered during the archaeological rescue research was subject to anthropological and palaeopathological analysis in the laboratories of the Department of Medical Anthropology (Institute of Anatomy, Medical Faculty of Masaryk University in Brno). According to anthropological criteria (Martin, Knußmann

FIGURE 1. View of the common grave pit with skeletal remains. Photo by P. Vitula.

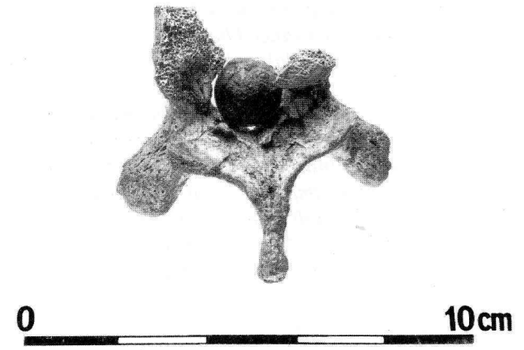

FIGURE 2. The first thoracic vertebra of an adult individual with a wedged bullet in the spinal canal. Photo by S. Skoupý.

1988), 18 skeletons showed typical male features, two skeletons were female, and two of subadult individuals. The age of the males ranged most often near the lower limit of adult category (20–30 years, only one case was 30–40 years). One of the females was 20–25 years, the other being 30–40 years, and the age of subadult individuals has been estimated to about 17 years of life. Cranial indices range the discovered skulls in the categories from mesocrane (medium long) up to hyperbrachycrane (very short). Muscle relief in most bones was very well represented. The height of the men ranged between 166.8 and 178.6 cm in the average, reaching the military height of that time, i.e. 5 feet and 2 inches.

An important part in the research of the skeletal remains from Jiříkovice was the study of pathological changes in bones. Of course, young and healthy men were supposed to prevail in all the three armies – French, Russian and Austrian; therefore, also the expected spectrum of pathological findings should differ from that in common population of various ages. And indeed, not a single case showed traces of serious long-term disorders (e.g. tuberculosis, syphilis, tumour, hematogenous or metabolic disease, etc.). This fact, however, does not eliminate the alternative that soldiers might have suffered from acute diseases, especially infections, leaving no traces in the skeletal remains.

Signs of war-time injuries and therapeutic interventions of the time belonged undoubtedly to the most interesting findings in the bones of the studied sample. Traces of fractures were the most frequent finds on the skeletons. Besides fractures caused by secant and stabbing weapons, gun-shot fractures can be often observed in such samples. These fractures belong to the most serious ones, as they are opened and often also splintered, with numerous sharp bone fragments threatening the adjacent tissues.

At the time of historical battles, there were limited possibilities of medical care, utterly insufficient hygiene and frequently unfavourable weather conditions representing the cause of the most-feared complication of these injuries – gaseous gangrene. Taking into account also the impact of general health condition of soldiers influenced by poor nourishment, lack of sleep and psychic stress, exhausting marches and many other negative effects, the hope of survival with this type of injury was minimal even in young and strong individuals.

Neither at present the treatment of such lesions is easy. First, the bleeding must be stopped (by compressing the artery), the wound must be cleaned mechanically, and alien bodies and bone fragments removed. Then, the broken parts must be placed into original position, and immobilized. Even when applying all the modern knowledge of medicine, complications of gun-shot injuries occur very frequently. It is therefore obvious that at the level of medical knowledge during Napoleonic wars, the frequency of complications of gun-shot traumas must have been much higher with a more severe course. The injured were threatened especially by massive haemorrhage, mainly 2–4 hours after the injury, when the primary vascular spasm was released. Field dressing stations could not provide adequate conditions for managing a further danger for the injured, i.e. post-traumatic shock. It was completely out of the possibilities of the nursing staff to provide sufficient silence, warmth and fluids. All the surgical interventions were carried out without any anaesthesia. Moreover, there was absolute lack of the only sedative agent, a mixture of alcohol and opium tincture, the so-called *laudanum*. Therefore, only alcohol was used most of the time. Due to mechanical contamination of wounds with projectiles and their parts, with clothes of the injured, soil, insects, etc., the most feared complications of those injuries were

FIGURES 3, 4. Splintered fracture of the right femur of an adult man without signs of healing. Photo by S. Skoupý.

infections. The course of many of them was fatal, such as phlegm, gaseous gangrene, tetanus, erysipelas, fat embolism, etc.

An interesting find of a gun-shot lesion that left traces on the bones from the Jiříkovice grave pit was the injury to the first thoracic vertebra in an adult (*Figure 2*). The vertebral body was destroyed with a projectile of 16 mm in diameter that had separated the vertebral arch and got stuck in the spinal canal. According to the character of the injury and wedging of the bullet, it may be supposed that the projectile got into the body through the jugular fossa, or passed through the lateral wall of the thorax. Owing to the severity and extent, it was undoubtedly a fatal injury, irrespective of the mechanisms of its origin.

Another interesting find of a typical gun-shot injury in the skeletal remains from Jiříkovice is a splintered fracture of the femoral body (*Figures 3, 4*). It is known that after injuries to the head, thorax and abdomen, gun-shot traumas to the thigh are the most serious ones, threatening the patient's life most of all the injuries to the limbs. The femur gets splintered by the bullet stroke, large blood vessels of the thigh are often affected, and bleeding to death can occur. The danger of anaerobic infection is considerable, because the injuries are usually deep, and extensive muscle mass provides favourable conditions for the development of gaseous gangrene (Jirásek *et al.* 1950). In the case of Jiříkovice finding, the splintered fracture occurred in the right femur of an adult man. Only its proximal half was

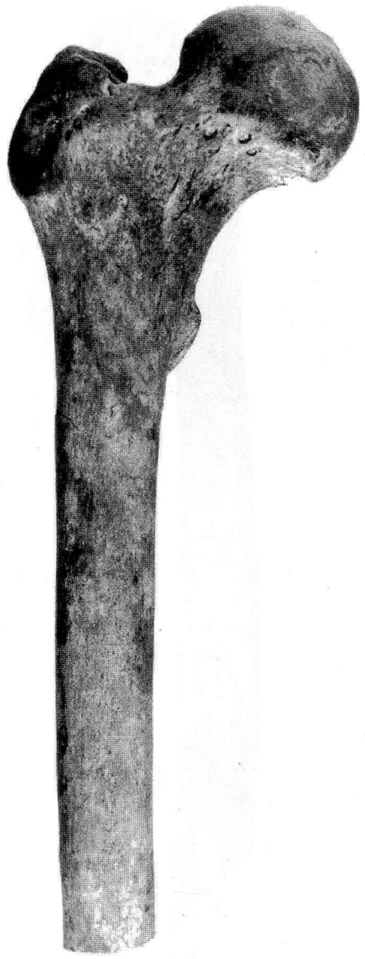

FIGURE 5. The right femur of an adult man after the amputation of the distal part – without signs of healing. Photo by S. Skoupý.

FIGURE 6. Detail of the incision of the right femur of an adult man with traces of amputation saw. Photo by S. Skoupý.

left, while the rest of its corpus was splintered into six larger fragments. The whole distal end of the femur was missing. The location of the lesion allows to suppose that the femoral artery was most likely afflicted in the distal section, in the so-called *canalis adductorius*, through which the artery gets from the thigh to the posterior side of the knee joint. This type of arterial injury is very severe and difficult to manage even under present therapeutic conditions. In this case, there is no doubt that the injured individual bled to death very shortly after the trauma, because the preserved bone showed neither signs of healing processes nor those of any therapeutic intervention, which – at that time – could only have been amputation.

At the turn of the 18th and 19th centuries, i.e. in the period of Napoleonic wars, amputations were relatively frequent surgical interventions. Previous times, especially the beginning of the 18th century, were characterized by extreme malpractice of amputations – limbs were amputated even in the case of common fractures. In the latter half of the 18th century, however, there appeared some objections against that practice. Many physicians got into the other extreme and rejected amputations absolutely (Dobiáš 1958). It was Jean Dominique Larrey (1766–1842), the chief surgeon of Napoleon's army, who did a lot to create a correct view of effective application of amputations and improved amputation techniques.

War-time amputations had always been performed as an urgent surgical intervention saving human life. The main indication for removing a part of the human body by surgery are extensive contusions of tissues that had been crushed, deprived of nourishment, and without any hope for restoration. Extensive injuries to great arteries are

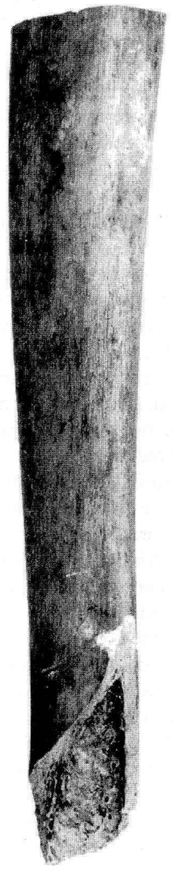

FIGURE 7. Peripheral amputation stump of the right tibia of an adult man. Photo by S. Skoupý.

usually reasons for amputation in the cases of injuries located in places without the possibility of substitutional (collateral) circulation. Other reasons for amputations are unmanageable septic conditions and extensive secondary (especially arterial) bleeding from wounds (Knobloch 1965). In field conditions, the absolute indication for this surgical intervention is gaseous gangrene in limbs. In that case, the amputation must be made high in reliably healthy tissue using the simplest method (a circular incision in one level). Any other method would unnecessarily and dangerously complicate the biological situation of the wound. The level of amputation incision is given by "*indicatio vitalis*" and, particularly in upper limbs, with respect to the future destiny of the injured person.

Three long bones of lower limbs with clear signs of amputations were found in the Jiřikovice grave pit.

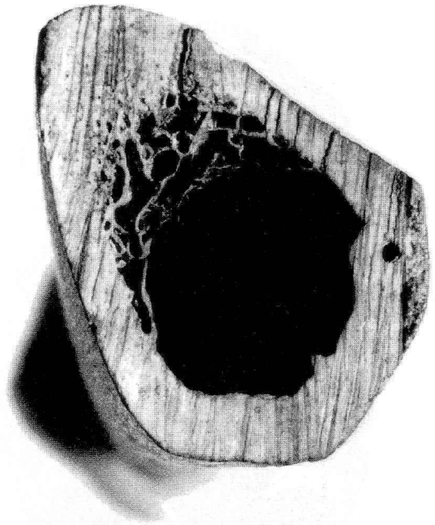

FIGURE 8. Detail of the incision of the peripheral amputation stump of the right male tibia. Photo by S. Skoupý.

FIGURE 9. Peripheral amputation stump of the left tibia of an adult man. Photo by S. Skoupý.

FIGURE 10. Jean Dominique Larrey – the chief surgeon of Napoleon's army. Drawing taken from Junas (1977).

The first case was the amputation of the right femur of an adult man (*Figure 5*). The incision was made vertically to the longitudinal axis of the bone, at the distance of 23 cm from the top of the *trochanter major*. Transversal lines caused by the amputation saw can be seen in the incision. The victim must have died shortly after the intervention, because no signs of healing can be observed in proximity of the amputation incision (*Figure 6*). The peripheral stump of that bone has not been discovered among the skeletal material.

Another war-time amputation was made in a part of the right tibia corpus in an adult individual. It is evidently a peripheral stump thrown into the grave pit, because the distal part bears signs of an unhealed complicated fracture (*Figure 7*). The amputation incision was led in transverse direction, in about the half of the tibia, 115 mm above the injury. Also this section bears evident signs left by the amputation tool (*Figure 8*).

A similar example of amputation is the peripheral stump of the left tibia of an adult man. The reason for this amputation cannot be given explicitly, because the preserved bone fragment shows no signs of traumatic changes (*Figure 9*). Here, the amputation might have been performed due to extensive contusion of soft parts of the crus, calf, or a severe injury to the foot.

In conclusion, the general level of military medicine in the time of Napoleonic wars should be mentioned. In most armies of that time, hygiene was on a very low level, principles of asepsis were unknown, and the basic epidemiological measures were not respected. In field hospitals and during transportation the injured were currently put together with people suffering from infectious diseases. The number of soldiers killed directly on the battlefield was much lower than losses of lives caused by insufficient medical care under poor hygienic conditions. The state of health of soldiers was highly dependent on the organizing structure in the particular armies. Historic sources document that there existed considerable differences in the level of inner organization of armies, and in the development of medical care in all the three powers involved in the Battle of Austerlitz. France had the highest level of medical sciences, and the best elaborated methodology of war-time surgery. One of the best-known figures of war-time medicine of that time was the already mentioned Jean Dominique Larrey (*Figure 10*). He became famous not only as the chief surgeon of Napoleon's army, but also as the inventor of numerous new surgical techniques, described in his book "Mémoires de chirurgie militaire et campagnée" (Memoirs of War-Time and Field Surgery). His extraordinarily rich experience was gained during 22 years of his active military service, during which he took part in more than 400 battles (Junas 1977). He was an advocate of timely amputation as prevention of gangrene. He is known to have performed, e.g. in the Battle of Borodino in 1812, 200 amputations in the course of 24 hours (Niklíček, Štein 1985). He also contributed to the establishment of a system of the first mobile field dressing stations enabling to secure early medical care directly on the battlefield. Having introduced these measures, the decrease of mortality rate of the injured was so much evident that mobile field dressing stations became a permanent component of medical service equipment in other armies as well. The experience of French war-time medicine was soon used also by the Prussian army where the level of medical care had so far been very low. An interesting piece of evidence in this aspect is a letter written by Johan Christian Reil from Halle, one of the first organizers of Prussian field dressing stations, to Minister von Stein about the Battle of Nations at Leipzig in 1813: "I have found nearly 20,000 injured and ill soldiers of various nationalities in Leipzig. They were lying ... in dark holes where neither animals could get enough oxygen ... Their cut off limbs ... affected with gangrene were scattered everywhere among stumps. This situation is further complicated by lockjaw (tetanus) which is increasing in number with increasing cold and hunger. In fact, the injured were literally rotting in their own excrements." (Schott 1994).

The situation was similar in the Russian army as well, where the first manual dealing with matters of field surgery was published as late as in 1808. Its author was an outstanding Russian internist, later medical corps doctor,

Matvey Yakovlevitsch Mudrow (1776–1831). According to the French model, he himself and J. Villi, another prominent medical corps surgeon, worked out a plan for improving the organization of health service that, however, was not fully realized at that time (Dobiáš 1958).

Let us mention briefly the organization of medical care of the injured during the Battle of Austerlitz. The French side had at its disposal the main field ambulance located at the village of Šlapanice where the activities of field surgeons were directed by Larrey together with another war-time surgeon Pierre François Percy (1754–1825). Each division had its own field dressing station with trained staff. In the course of the battle, when the number of injured soldiers was constantly increasing, the division ambulance from the village of Ponětovice joined the central ambulance at Šlapanice (Uhlíř 1984). Emergency care was provided at places protected from bullets, usually in the open air. Health service staff were carrying bags with dressings, and a small satchel with surgical instruments. Each soldier had his own dressing material. The soldiers with smaller injuries were treated only provisionally, and if their health condition allowed, they were transported to the final treatment to the town of Brno. There they were placed into provisional hospitals, monasteries, factories and burghers' houses. Severely injured soldiers, however, were left in field hospitals, operated, dressed; and amputations were made at those places as well. The need for urgent surgical interventions exceeded the possibilities of nursing staff due to continuous supply of the injured. In such a situation, physicians were forced to introduce more effective methods by the requirements for rapid and good treatment. It is highly probable that Larrey himself, or other French surgeons, participated in some of the amputations found in the skeletal material from Jiříkovice, because Russian and Austrian soldiers were retreating and had no time to take care of and treat their injured soldiers on the spot. The injured from the allied armies who had escaped captivity and were able to undergo transportation, were gradually treated especially in the field hospitals in northern Moravia (Olomouc, Opava, Uničov, Dlouhá Ves near Krnov, Těšín, Nový Jičín, Fulnek, Odry, Valašské Meziříčí, Šternberk, etc.) (Amort 1971). The captive and seriously injured allied soldiers were transported to Brno and nearby villages to be given care within the available possibilities. However, the help could not be sufficient because medicaments, sanitary material and foodstuff were missing. Moreover, Napoleon ordered to devote preferential care to soldiers of the French army. The destiny of injured Austrian soldiers was somewhat more favourable than that of Russian soldiers due to the advantage of home environment. Neither native population was spared from the horrors of war. The whole region suffered from several years of poor crops, plundering by armies on the move, and especially from infections. The fear of epidemics forced quick burying of the dead. Soldiers killed in the battle or dead from an injury directly on the battlefield, were buried at Slavkov and nearby villages in a lot of common grave pits. Despite this, epidemics of dysentery, typhus fever, cholera, smallpox and plague were spreading.

Skeletal remains of the victims of the Battle of Austerlitz have been found until today in the whole wide area. They have been deposited with due respect into the ossarium in the Peace Monument on Pratec Plateau. The case of the interesting sample of bones from Jiříkovice is only one of a number of findings, and certainly not the last one.

This research has been supported by the Grant Agency of the Czech Republic – grant project No. 302/96/0236.

REFERENCES

AMORT Č., 1971: *Kutuzov a Napoleon na Moravě* (Kutuzov and Napoleon in Moravia – in Czech). Prague.

DOBIÁŠ V., 1958: *Přehledné dějiny všeobecného a vojenského lékařství* (Brief history of general and military medicine – in Czech). Naše vojsko, Prague.

JIRÁSEK A., LICHTENBERG J., 1950: *Válečná chirurgie* (War-time surgery – in Czech). Naše vojsko, Prague.

JUNAS J., 1977: *Průkopníci medicíny* (Pioneers of medicine – in Czech). Avicenum, Prague.

KNOBLOCH J., 1965: *Obecná chirurgie* (General surgery – in Czech). SZN, Prague.

MARTIN R., KNUßMANN R. (Eds.), 1988: *Anthropologie. Handbuch der vergleichenden Biologie des Menchen.* Bd. I/1, Stuttgart, New York.

NIKLÍČEK L., ŠTEIN K., 1985: *Dějiny medicíny v datech a faktech* (History of medicine in dates and facts – in Czech). Avicenum, Prague.

SCHOTT H., 1994: *Kronika medicíny* (Annals of medicine – in Czech). Fortuna Print, Prague.

UHLÍŘ D., 1984: *Slunce nad Slavkovem* (The sun over Austerlitz – in Czech). Archiv, MF.

Ladislava Horáčková
Masaryk University
Faculty of Medicine
Dept. of Anatomy
Komenského nám. 2
662 43 Brno
Czech Republic
E-mail: lhorac@med.muni.cz