

## RESEARCH ARTICLE – VÝZKUMNÝ ČLÁNEK

## Victim of an armed conflict? A case study of an adolescent with multiple perimortem trauma from an early medieval cemetery in Northwestern Bohemia

### Oběť ozbrojeného konfliktu?

Případ mladého jedince s mnohočetnými perimortem zraněními z raně středověkého pohřebiště v severozápadních Čechách

Joanna Witan – Barbara Kwiatkowska –  
Jacek Szczurowski – Milan Sýkora

*During rescue excavations at a rural cemetery in Dolany (NW Bohemia) dating to the 11th–12th century, the skeleton of a young male featuring numerous wounds (n=10) of perimortem sharp force trauma was excavated. Nine of the injuries were localised to the postcranial skeleton and one to the skull. An analysis and interpretation of the wounds showed that at least eight blows were inflicted with a slashing weapon, which could have directly contributed to his death. The observed pattern is most consistent with injuries inflicted during armed conflict. Based on historical sources, it is known that there was no warfare in the immediate vicinity of Dolany during the period under review. Therefore, it has been suggested that the male may have been the victim of a fight or battle, and his body was transported and buried in the place where he probably came from. The discovery provides new information on the funerary practices of victims of early medieval armed conflicts in Bohemia.*

violence – weapon-related trauma – skeletal injury – Bohemia – Dolany

*Při záchranném výzkumu venkovského pohřebiště v Dolanech (SZ Čechy) datovaného do 11.–12. století byla objevena kostra mladého muže s četnými poraněními (n=10) po perimortálním úrazu ostrým předmětem. Devět zranění bylo lokalizováno na postkranialním skeletu a jedno na lebce. Analýza a interpretace zranění ukázala, že nejméně osm jich bylo způsobeno sečnou zbraní, což mohlo přímo přispět ke úmrtí jedince. Zjištěný vzorec nejlépe odpovídá zraněním způsobeným během ozbrojeného konfliktu. Na základě historických pramenů není známo, že by se ve sledovaném období v blízkém okolí Dolan válčilo. Proto lze předpokládat, že se muž mohl stát obětí boje nebo bitvy a jeho tělo bylo převezeno a pohřbeno v místě, odkud pravděpodobně pocházel. Nález přináší nové informace o pohřebních praktikách obětí raně středověkých ozbrojených konfliktů v Čechách.*

násilí – úraz způsobený zbraní – kosterní zranění – Čechy – Dolany

## Introduction

Only the effects of violent acts left on the bones in the form of injuries can be observed in anthropological studies of historical communities. Therefore, it is important to interpret trauma in its historical and biocultural contexts as well as the social-ethnographic background (Martin – Harrod 2015). This allows the trauma to be studied not only as the result of a single act of violence but as part of a whole range of factors and motives that led to such behaviour.

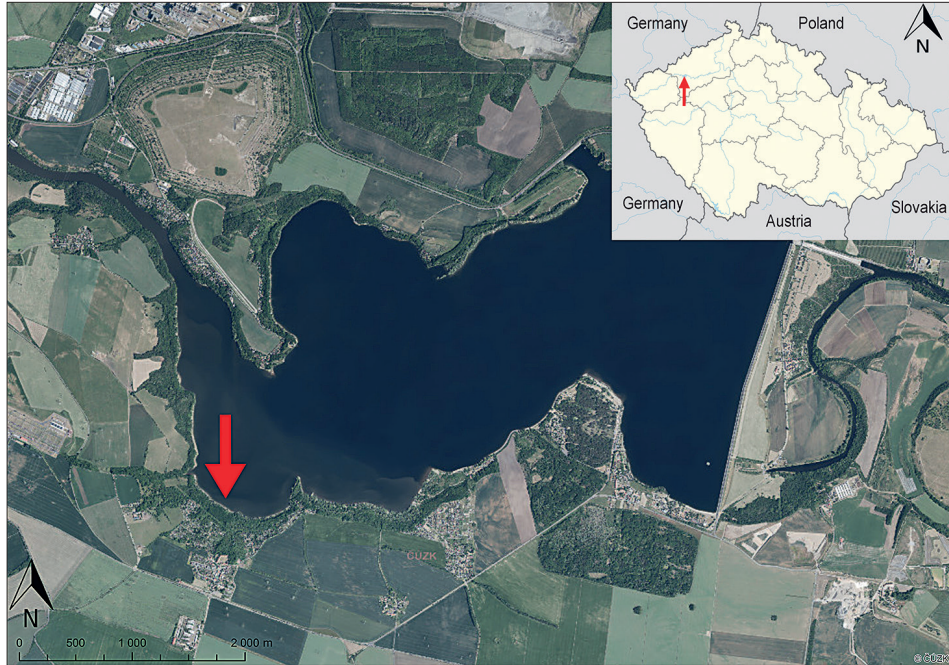


Fig. 1. Geographical location of the archaeological site of Dolany in Northwestern Bohemia.

In the analysis of human remains, bone fractures are the most common cases and therefore the use of the words trauma and fracture are often synonymous. Their differentiation depends on the mechanism of injury, which can be direct, i.e. the result of stress, or indirect, i.e. a result of pathological changes (Lovell 1998). By analysing and interpreting the fractures on an individual scale, it is possible to determine their potential causes (e.g. a fall from a height, violence-related injury), and the time of their occurrence (ante-, peri- and postmortem injuries). Analysis of injuries on a population scale, on the other hand, provides information about patterns resulting from certain social behaviours, such as exposure to the dangers of everyday labour and the type of work most likely to cause injury, as well as the prevalence of interpersonal violence and the intensity of conflict (Walker 2001; Agnew et al. 2015; Martin – Harrod 2015; Collier – Primeau 2019; Dittmar et al. 2021).

Injuries characteristic of intentional violence are considered to be wounds inflicted by weapons, perimortem trauma, multiple injuries to a single individual, as well as trauma to the cranial vault and face (Šlaus et al. 2012). Forensic anthropology studies suggest that cranial injuries located above the hat brim line are generally associated with violence (Kremer et al. 2008). Weapon-related injuries can be divided into three types: sharp-force trauma, blunt-force trauma, and penetrating trauma, where sharp-force trauma is an injury resulting from the use of an instrument with at least one sharp edge. The inflicted wound is characterised by an elliptical/linear fracture outline, the edges are clear and ‘clean’, while the edge opposite the incision is often irregular and rough (Knüsel 2005; Boylston 2006). Blunt-force trauma is caused by a blunt object or a collision between a body and a flat or



Fig. 2. Excavation of the cemetery on the shore of the Nechranice Reservoir (photo by J. Šály).

rounded surface. Very often, it can appear as a single fracture line or a compound fracture with numerous fracture lines. Importantly, due to its elasticity, the bone first collapses at the point of strongest stress and fractures laterally or concentrically (Wedel – Galloway 2014). For penetrating trauma, the appearance of the injury depends mainly on the tool, e.g. the shape of a gunshot wound usually mimics the shape of a bullet (Knüsel 2005; Forsom – Smith 2017). However, the appearance of any trauma depends on a great many factors, such as the type of tool, the force applied, the angle, the location on the body, and the type and thickness of the tissues on the exact spot to which the blow was inflicted (DiMaio – DiMaio 2001). Nevertheless, it should be emphasised that the number of traumas observed on the skeleton may not represent the total number of wounds that were present on the soft tissues (Knüsel 2005).

All of the aforementioned types of injuries occur in archaeological material. They are most abundant at sites of collective armed conflicts such as battles, raids, etc. (Kjellström 2005; Durrant 2011). They can also occur in the context of massacres or ethnic cleansing (Harrod 2018). Numerous studies of trauma in late antique and medieval Europe show that, on average, traces of trauma potentially related to violence can be found on a dozen individuals per cemetery (Novak – Šlaus 2010; Šlaus et al. 2012; Krakowska 2017; Collier – Primeau 2019; Tumler et al. 2019; Dittmar et al. 2021, while individuals with clear evidence of intentionally inflicted injuries are few or non-existent.

The purpose of this study is to comprehensively analyse and interpret the injuries of the young male buried in the early medieval cemetery of the now-defunct village of Dolany in Northwestern Bohemia. Efforts were made to reconstruct the circumstances of the incident as well as the type of tool used to inflict the injuries. Moreover, we aim to gain

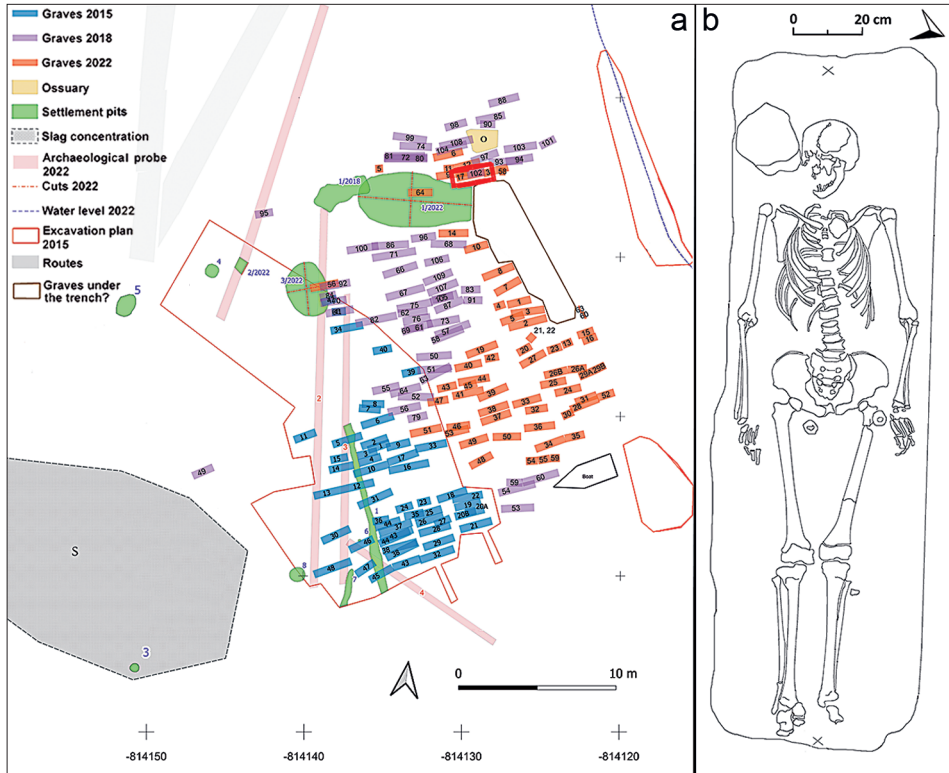


Fig. 3. Plan of the early medieval cemetery in Dolany with grave H17/22 marked (a) and a detail of grave H17/22 (b).

deeper insight into the role and involvement of representatives of rural and provincial populations in conflicts in early medieval Bohemia.

## Materials and methods

### Site and Burial Description

Dolany is a defunct village in Northwestern Bohemia (Chomutov District, Ústí nad Labem Region). It was demolished in 1967 during the preparation of the site for the construction of the Nechanice Reservoir. The remains of the village are currently located underwater in the southern part of the reservoir (Fig. 1). Periods of drought and dike repairs resulted in a significant drop in water levels in 2015, 2018, and 2022, when a heavily eroded cemetery dating to the 11th–12th century was exposed (Fig. 2). It is situated about 500 m northwest of the centre of still-standing village of Poláky and 200 m southwest of the former centre of Dolany. A total of 187 regular graves and an ossuary comprising the remains of at least 23 individuals (MNI=23) were uncovered over three seasons of excavations.



Fig. 4. Belt buckles in grave H17/22 (photo by J. Witan).



The grave of the young male with multiple skeletal injuries (grave no. H17/22) was investigated in the autumn of 2022. H17/22 was a single burial without a coffin, located in the western part of the cemetery (Fig. 3: a). The grave pit was oriented in the west-east direction and measured 180 × 60 × 33 cm. The skeletal remains of the H17/22 individual were almost complete and in a very good state of preservation; only the arrangement of the foot bones had been disturbed by the excavation of a grave below (Fig. 3: b). The supine position of the deceased with head oriented to the west and the upper limbs placed along the body corresponds to the burial customs characteristic of the Early Middle Ages in this region. The equipment of the individual consisted of two iron belt buckles (Fig. 4) found below the pelvis.

## Methods

Age at death and the sex of the individual were assessed according to standard methods used in physical anthropology (Buikstra – Ubelaker 1994; White – Folkens 2005). The order of fusion of bone epiphyses and measurements of long bones were considered in the age assessment (Baker et al. 2005; Schaefer et al. 2009). Sex was determined by pelvic and cranial morphology (Buikstra – Ubelaker 1994; White – Folkens 2005).

The trauma was assessed macroscopically and with a magnifying glass. The type of injury, its location, and likely time of occurrence were determined. The nature of the injury was identified based on the categories of violence-related trauma (Redfern – Roberts 2019), where the category of sharp force trauma was differentiated into cutting and chopping marks (Humphrey – Hutchinson 2001; Lynn – Fairgrieve 2009). In addition, the injuries were described according to the characteristics proposed by Lewis (2008). These features include length, shape, flaking, feathering, cracking, breaking, shards, and aspect (or angle of entry of the weapon).

The timing of injuries was determined by the characteristics of antemortem, perimortem, and postmortem injuries. Antemortem injuries were considered those in which healing processes were evident. The differentiation between perimortem and postmortem injuries was based on multiple features (see Tab. 1).

Feature	Perimortem	Postmortem
Plastic deformation	Yes	No
Colouration	Uniform or very close to the bone surface	Fracture surface lighter than the rest of the bone
Edges	Sharp and clean without roundings	Sharp, often occurred as jagged/stepped-in fracture surface
Fracture line	Radiate outward from the point of impact	Perpendicular/horizontal
Hinging	Yes	Seldom
Area adjacent to the fracture site	Small bone fragments adhere to the fracture site	Tendency to break into a number of pieces

Tab. 1. Differentiating features of peri- and postmortem trauma (adapted from *Kimmerle – Baraybar 2008; Ubelaker – Montaperto 2013; Galloway et al. 2014; Byers 2017; Łukasik et al. 2019; Tumler et al. 2019*).

## Results

### Individual description

Individual H17/22 was a 16–18-year-old male whose body height was estimated to be approximately 168.8–174.0 cm (on the basis of various authors collected in *Piontek 1996*) and around 170.8–171.5 cm according to equations created for a relatively close Polish early medieval population from Giecz (*Vercellotti et al. 2009*). Part of the epiphyses of his long bones (i.e., heads of the humerus, the distal epiphyses of the forearm bones, the distal epiphyses of the femurs, the proximal epiphysis of the left fibula) was not fully fused to the bone shafts. Twenty-four teeth were preserved in the individual's dentition, while the third molars had not yet erupted. The teeth of the upper arch were characterised by light crown attrition in phase D, while the teeth of the lower arch showed attrition typical of phase E (*Lovejoy 1985*). There were small deposits of tartar on the teeth at the first grade of severity according to *Brothwell (1981)*. The edge of the mandibular alveolar processes was rounded and porous. A single hypoplastic line was present on the right mandibular canine.

Porotic hyperostosis was found in the area of the lambdoidal suture, with the largest cluster on the right parietal bone located parallel to the suture. Porosities were also observed on the occipital bone. The male also had a malformation of the second cervical vertebra in the form of the failure of the posterior lamina of the right transverse process to fuse with the vertebral arch (*Fig. 5*). Furthermore, many skeletal lesions were observed, clearly suggesting that the individual was suffering from an infectious disease. However, the aetiology of this disease requires additional research and is not analysed in this study.

### Trauma

A total of 10 trauma marks were observed on the skeleton (*Fig. 6*), one on the skull and nine on the postcranial skeleton. None showed signs of healing, so the timing of their formation was determined as perimortem. Wound features such as a distinct kerf, smooth walls, and sharp edges were present in all 10 wounds, classifying them as sharp force trauma. Accurate descriptions were made according to the classification by *Lewis (2008) (Tab. 2)*.

The length of the trauma marks visible on the bones varies from 11 to 32 mm, and the dominant part of the damage was elliptical. Only trauma no. 4 was characterised by a triangular shape. The morphology of most of the traumas (no. 3–6 and 8–10) indicated that



Fig. 5. Malformation of the second cervical vertebra of individual H17/22 (photo by J. Witan).

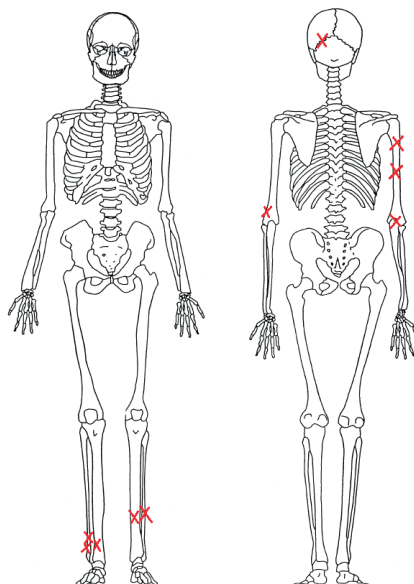


Fig. 6. Location of perimortem trauma of H17/22 individual. Modified from *Buikstra and Ubelaker (1994)*.

they were caused by cutting; however, the cranial injury (no. 1, *Fig. 7*), one of the three traumas to the right humerus (no. 2 and 3, *Fig. 8: a*), and one of two injuries to the right fibula (no. 7, *Fig. 9: a*) show attributes of chop marks due to their length, depth, and distinctly elliptical shape.

Trauma occurring on both shins (no. 6, 8, 7, and 10) are most likely the result of a single blow. This is evidenced by the same height at which the injuries occur, as well as the identical angle of their placement on both bones. In the case of the right lower limb, the blow was delivered at a 45-degree angle from above and mainly affected the fibula. The total length of the injury on the right lower leg bones was 25 mm. On the left shank, in contrast, the deeper wound was on the tibia and, passing laterally to the fibula, became increasingly shallow (*Fig. 9: b*). The total length of this injury was 37 mm.

Unilateral flaking and feathering occurred in half (5 out of 10) of the injuries. Feathering was more common (6 out of 10), as the injury on the left tibia was characterised by bilateral feathering. Cracking injuries were present in three cases (no. 1, 2, and 4). Trauma no. 1 and 2 were the deepest and were classified as chop marks. The evaluation of a breakage injury (no. 8) remained unclear because, although the colour of the breakage was similar to the rest of the bone shaft, its edges were not smooth. It cannot be ruled out that this bone was fractured from sharp-force trauma and the pressure of the water in which the bone rested after the reservoir was built (i.e. the bone broke postmortem). Most of the traumas (7 out of 10) were inflicted at an angle (glancing), and only three injuries (including one combined on the left lower leg) resulted from perpendicular blows. The right humerus, which was most affected by the sharp-force trauma, sustained both impact types – two wounds appeared to be glancing type and one was perpendicular.

There was no significant dominance in the occurrence of trauma related to the body side, although 6 out of 10 traumas occurred on the right, and four on the left side. However, the distribution of traumas in the anterior-posterior axis draws particular attention.



Fig. 7. Perimortem sharp-force trauma on left parietal and occipital bone (photo by J. Witan).

The wounds located on the front side of the body occurred only in the area of the lower extremities on the tibiae and fibulae (no. 6, 8, 7, and 10) and were caused by single cuts, meaning that only three blows were inflicted in the lower extremities. The five other skeletal injuries inflicted above the waist, i.e., three injuries on the right, one on the left humerus (Fig. 6: b), and one on the skull, were located on the posterior side of the body.

## Discussion

### Perimortem trauma and interpersonal violence

The multiple perimortem traumas found on the H17/22 individual are clearly related to the use of a weapon. Based on the preserved trauma marks, it can be concluded that the individual received at least eight blows. Such deep injuries, which left marks on the bones, must have been combined with soft tissue injuries and caused significant bleeding. It cannot be ruled out that the blow inflicted on the left shin may have damaged the anterior tibial artery. Such type of injury, which is an immediate threat to life, could have been a potential cause of death (Huber – Manna 2023; for anatomical structures that are potentially damaged in this type of injury, see Tab. 3).

It is noteworthy that individual H17/22 did not show trauma (stabbing wounds) in the thoracic region (ribs, sternum, vertebrae), which are often found on victims of interpersonal violence (Manso et al. 2021; Handlos et al. 2023), as reported by archaeological sources (Tumler et al. 2019; Zeppilli et al. 2023). Also, no traces of trauma were found on the hands and forearms, where traumas are usually linked with defensive reflexes of the victim (Bohnert et al. 2006; Novak 2007; Judd 2008). However, it cannot be ruled out that the injuries in the area of the distal epiphyses of both humerus bones resulted from attempts to shield with the arm. Analysis of the angle of injury to the right humerus epiphysis (no. 4) shows that the cut was inflicted during maximum flexion of the upper limb at the elbow joint, as evidenced by the absence of injury marks on the ulnar process.





Fig. 8. Perimortem sharp-force trauma on right humerus (a) and) left humerus (b) (photo by J. Witan).

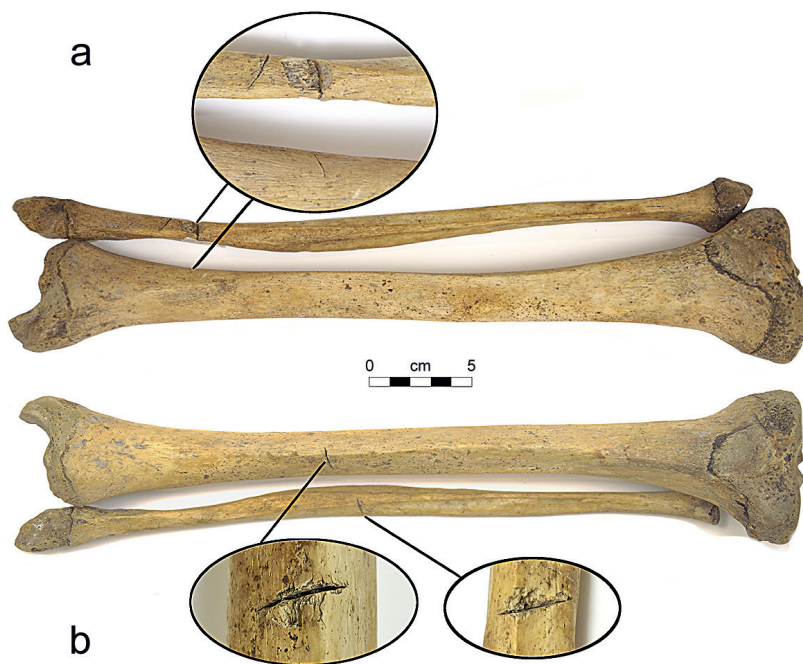


Fig. 9. Perimortem sharp-force trauma on right tibia (a) and fibula left tibia and fibula (b) (photo by J. Witan).

Wound	Bone	Side	Location	Length (mm)	Shape	Flaking	Feathering	Cracking	Breakage	Shards	Aspect
1	Parietal/ Occipitalis	L	On the lambdoid suture, injury passes through the left parietal bone and occipital-it lies 33 mm to the left of the lambda anthropological landmark.	32	Ellipse	Unilateral	Unilateral	Present	Absent	Absent	Glancing
2	Humerus	R	Anterolateral surface to posterior surface. At the height of the upper edge of the deltoid tuberosity.	25	Ellipse	Unilateral	Unilateral	Present	Absent	Absent	Glancing
3	Humerus	R	Anterolateral surface, at the height of the lower edge of the deltoid tuberosity.	15	Ellipse	Unilateral	Unilateral	Absent	Absent	Absent	Perpendicular
4	Humerus	R	Posterior surface of trochlea, up to the olecranon fossa.	14	Triangle	Absent	Unilateral	Present	Absent	Absent	Glancing
5	Humerus	L	Above lateral supracondylar crest.	11	Ellipse	Absent	Unilateral	Absent	Absent	Absent	Glancing
6	Tibia	R	Interosseous surface in 1/5 of the shaft height above distal epiphysis.	11	Line	Absent	Absent	Absent	Absent	Absent	Glancing
7	Tibia	L	In 2/3 of the shaft height- from interosseous surface up to anterior crest.	13	Line	Absent	Bilateral	Absent	Absent	Absent	Perpendicular
8	Fibula	R	In 1/5 of the shaft height above distal epiphysis, on the lateral surface.	11	Ellipse	Unilateral	Unilateral	Absent	?	Absent	Glancing
9	Fibula	R	In 1/5 of the shaft height above distal epiphysis, on the lateral surface, right below lesion no. 8	12	Line	Absent	Unilateral	Absent	Absent	Absent	Glancing
10	Fibula	L	At mid-height of the shaft, it passes through the anterior border, lateral border and surface.	11	Line	Unilateral	Absent	Absent	Absent	Absent	Perpendicular

Tab. 2. Description of perimortem trauma on individual H17/22.

Wound	Bone	Side	Muscle	Blood vessels	Nerves
1	Parietal/ Occipitalis	L	Epicranial aponeurosis, occipitalis muscle	Occipital artery	Occipital
2	Humerus	R	Deltoid, infraspinatus, teres major, triceps brachii-lateral head	Posterior circumflex humeral artery, cephalic vein	Axillary, superior lateral cutaneous nerve of arm
3	Humerus	R	Triceps brachii- lateral and medial head	A collateralis radialis v. cephalica)	Radial
4	Humerus	R	Distal tricep brachii tendon, elbow joint capsule	Rete articulare cubiti	Radial
5	Humerus	L	Triceps brachii- medial head, brachioradialis	Radial collateral artery, cubital anastomosis	Ramus profundus radial nerve, ramus radial nerve
6	Tibia+fibula	R	Extensor hallucis longus, distal fibularis longus tendon, fibularis brevis, extensor digitorum longus	Fibular artery Fibular veins	Superficial fibular
7	Tibia+fibula	L	Tibialis anterior, extensor hallucis longus, fibularis longus, extensor digitorum longus	Anterior tibial artery Anterior tibial veins Fibular veins	Deep fibular nerve, superficial fibular

Tab. 3. Anatomical structures of muscles, blood vessels and nerves likely to have been damaged by a blow penetrating the body of individual H17/22 to bone depth.

According to the observation of trauma on skeletal material, the occurrence of skeletal injuries related to the use of weapons is also found at archaeological sites not directly associated with armed conflicts. In assemblages from medieval Sweden, the incidence of such cases ranged from 2.1% (Striguna) to 4.3% (Västerhouse) (*Kjellström 2014*). In Turin, six skeletons from the medieval and Renaissance periods were found with various head injuries (*Giuffra et al. 2013*). In early medieval South Tyrol, weapon-related injuries were observed on seven individuals (*Tumler et al. 2021*), but the most notable was individual SK63, who was found to have 26 perimortem traumas (*Tumler et al. 2019*). At the 15th-century Croatian site of Čepinin, the incidence of violence-related injuries was as high as 15% (*Šlaus et al. 2010*), which researchers link with the invasion of the Ottomans. In all of the above examples, cranial injuries dominate extracranial injuries by a significant margin, indicating that in small-scale conflicts and violence, the easiest (and most lethal) target for attack was the head of the opponent. In contrast, the distribution of individual injuries on the postcranial skeleton varied widely and it is difficult to observe specific injury patterns in this case.

### Interpretation of trauma pattern

Intentional and direct violent behaviour during historical armed conflicts creates a specific pattern and distribution of trauma on the skeleton. In their analysis, *Kjellström (2005)* and *Novak (2007)* show that cranial injuries predominate in organised warfare. Cranial traumas are most characteristic of organised violence, as is confirmed by other authors who analysed the victims of such events dating from the Middle Ages to the modern period (*Zoffmann 1982; Fiorato et al. 2007; Dziedzic et al. 2011; Eickhoff et al. 2012; Boucherie et al. 2017; Constantinescu et al. 2015; Łukasik et al. 2019; Nicklisch et al. 2017*). However, a different picture emerges from research conducted by *MacKinnon (1997, after Knüsel 2014)*. Among individuals buried at the Fishergate Parish cemetery, between 59% and 82% of all injuries occurred on the postcranial skeleton. These people were likely participants of the Battle of Stamford Bridge or the Battle of Fulford, which followed the Norwegian invasions of Britain in the 11th century. Analysis of the remains of the victims of the Battle of Wisby by *Ingelmark (1939)* also showed the dominance of postcranial injuries (60% of all injuries). Moreover, the most commonly affected bones were the tibiae. Single cases of tibia trauma also appear in studies by other authors (*Cunha – Silva 1997; Kjellström 2005; Boucherie et al. 2017*). The strategy of mutilating the lower limbs was often used by early medieval combatants due to the type of armour at that time, which left these parts exposed, while the parts of the body above the knees were more difficult to access. There was apparently also an effort to restrict the movement capabilities of the opponent, making it easier to deliver a fatal blow to the head (*Boucherie et al. 2017; Constantinescu et al. 2015; Forsom et al. 2017*).

The injuries observed on the described H17/22 individual are most similar to the patterns of battle injuries. Although the presence of traumas to the shoulder bones raises some doubts about this interpretation, it cannot be ruled out that their presence is related to the type of armour the male was wearing, which did not cover the upper and lower limbs, but covered the upper parts of the torso. Such a scenario would explain the absence of trauma in the chest area. Nevertheless, the wounds on the lower limbs were very similar to those observed on skeletons from Wisby and Fishergate (*Ingelmark 1939; MacKinnon 1997 after Knüsel 2014*). The predominance of the trauma locations on the posterior side of the body

allows us to conclude that the opponent inflicted blows while standing behind the victim's back. Injuries located on the left side near the back of the skull, as in the case of individual H17/22, are also characteristic of organised conflicts. A concentration of skeletal injuries in this area has occurred on skulls from Uppsala (*Kjellström 2005*) and Sandbjerget (*Boucherie et al. 2017*). According to *Ingelmark (1939)* and *Šlaus (2010)*, such altercations also indicate that blows were dealt from behind to a person who was on the run or who was not in a standing position (*Brødholt – Holck 2012*). A high percentage of upper limb injuries among all postcranial skeletal injuries, with the dominance of those located on the right side (60%), also occurred among individuals from the Towon mass grave (*Novak 2007*). The author of the study interprets the right arm as the 'leading hand' of the weapon, making it a possible target for an enemy counterattack. When interpreting the inequality of injury incidence between the right and left upper limbs, consideration should still be given to the additional protection of the left limb that the shield provided (in most cases for right-handed people). Also relevant is 'ultimate defence', in which the only possibility of protecting oneself is the reflex of covering the body with the forearm or arm of the dominant hand against a blow. Injuries on the distal epiphyses of the humerus, which with some probability can be regarded as wounds of a defensive nature, occur in all the aforementioned types of conflicts. Therefore, they can only be regarded as a general identifier of violence-related behaviour.

### Weapon characteristics

The criteria presented by *Lewis (2008)* were used to determine the tool presumably used to injure the H17/22 individual. Features such as the length, depth, shape, cracking as well as glancing aspect of all injuries on the body were consistent with the image of injuries that can be inflicted by cold steel. Features such as unilateral flaking and feathering injuries and a tangential angle of blow infliction, which occurred only in an injury at the centre of the shaft of the right humerus, are characteristic of many blade types. However, it cannot be ruled out that this specific injury was inflicted with a different weapon than the other ones.

The final appearance of the injury depends on a great many factors. Tool features such as weight, edge sharpness, and size also matter. The injury at the proximal epiphysis of the right humerus was relatively deep, and its appearance was similar to some of the injuries presented by *Lynn and Fairgrieve (2009)*, so it cannot be ruled out that it was caused by an axe blow.

In the Early Middle Ages, axes and swords were the primary equipment of most warriors, often accompanied by secondary weapons such as spears, lances, or daggers. According to the sword typology by *Geibig (1991)*, types 4 and 5 were the most widespread in Europe in the 11th century. These swords had blades reaching 80–90 cm in length, with a relatively short handle. The parameters of such weapons allowed only for one-handed use. Furthermore, according to the group division of swords found in Bohemia created by *Hošek et al. (2022)*, group b blades (72 to 82.5 cm long and 4.5–5.4 cm wide) were in common use in the late 10th and probably during the 11th century. Although it is not possible to directly relate the trauma features to the blade types presented above, it is clear that the skeletal injuries that occurred on the H17/22 individual were characteristic for cold steel weapons, particularly a sword and/or axe.



### The H17/22 individual in the context of the Dolany population and early medieval Bohemia

Individual H17/22 stands out from the early medieval inhabitants of Dolany. Injuries were common in this population, but mostly as a result of labour. Sharp force trauma related to violence occurred in only three cases out of 120 skeletons examined (*Witan – Sušická 2024*), but all were isolated and inflicted antemortem. The low number of sharp-force traumas and the lack of skeletal injuries to other individuals from the cemetery make it possible to rule out the hypothesis that H17/22 was the victim of an attack on the village unleashed, for instance, to destroy infrastructure or obtain supplies. Attacks of this type, according to *Gassmann (2018)*, were relatively common in the Early Middle Ages.

The individual was also unique from a bioarchaeological point of view. Based on the male's skeleton, it can be concluded that he was rather massive in stature. The fact that individual 17/22 reached an estimated body height above the mean height of males from the Dolany population, which was 164.4–167.4 cm (*Witan – unpublished data*), even before full skeleton ossification, strongly suggests his higher social status.

Moreover, he was the only one among the males buried in the cemetery equipped with buckles around his pelvis. Although buckles are a common find in graves from the Early and High Middle Ages in Bohemia (*Mazáčová 2012*), it is problematic to determine their specific use. Finds from Dolany were simple iron round buckles measuring c. 3.3 cm in diameter, in which spikes were not preserved. This type has been found at other cemeteries including Lažany (graves L016, L117; *Frolík 2019*, 38), Klecany I (graves H5/37, H47, H11; *Profantová et al. 2015*, 121), Levý Hradec (graves ŽAP-47/2013, ŽAP-9/2003, ŽAP-32/2005; *Tomková et al. 2020*, 152–154), Zeleneč (graves H74, H89; *Lutovský – Špaček 2020*, 60), and Praha-Lahovice (graves 41/57, 46/60, 54/60; *Krumphanzlová et al. 2013*, 110, 158, 160). Additionally, a list of individual buckles found in Northwestern Bohemia can be found in the master's thesis by *Podhorský (2019)*. However, it should be noted that within a single cemetery, metal buckles are present in only a few graves, so it is possible that the buckles were not a standard item of clothing the individuals were buried in. A notably similar case to grave H17/22 from Dolany was found in the Tasov cemetery (*Unger 2011*). Here, in grave 129, two round buckles made of coloured metal were found in almost identical locations. Based on the positioning of the buckles and iconographic references, the author concludes that they were used to fasten the hosiery.

Interestingly, a significant number of buckles were discovered at the site of the Battle of Wisby. In the three mass graves, buckles were found along with 26.1–53.3% of buried individuals. Some of them were used to fasten armour, but the vast majority belonged to clothing (*Thordeman 1939*, 118). The most common type were round iron buckles arranged in pairs in the pelvic area (*Thordeman 1939*, 119). Their precise function is difficult to determine. However, the author suggests that they served as belt buckles or as part of the hosiery.

Nevertheless, the artefacts excavated from grave H17/22 could be considered belt buckles due to the manner in which they were placed *in situ*. While the buckle near the pubic symphysis could be assumed to be the main buckle, the buckle near the greater trochanter of the femur may have been used to attach weapons or other objects. As is well known, belts were a basic and multifunctional part of clothing in the Middle Ages and they played an important role on a symbolic level (*Hoch 2021*) as an indicator of the social status of their owner (*Šlancarová 2016*). Therefore, based on biological features and the equipment

of the deceased, it can be suspected that the young man in grave H17/22 may have belonged to a social stratum called ‘*militēs*’, i.e. to the administrative apparatus of the leading member of the Přemyslid dynasty, which ruled Bohemia in the Early Middle Ages and was responsible for military and administrative affairs. Many of these warriors were stationed in various regions of Bohemia, not only in castles but also in manors and villages. The latter, in particular, were referred to as ‘*militēs secundi ordinis*’, or second-order warriors, because of their background. They were united with the others by their military service, but in terms of wealth and social status, they lagged far behind the primary warriors of the Přemyslids (*Choc 1967*, 36–83; *Žemlička 1997*, 171–172).

Two significant battles took place in the area of northwestern Bohemia in the 11th and 12th centuries. The first took place in the area between the city of Most and Břlína in 1040 (*Žemlička 1997*, 59–60; *Krzemieńska 1999*, 268–287; *Synek et al. 2013*, 110–113), while the second was fought near the village of Chlumeč in 1126 (*Choc 1967*, 389; *Žemlička 1997*, 221–222). Individual H17/22 cannot be directly linked to any of the aforementioned events, and the number of potential conflicts in which he may have died is much larger, as many minor skirmishes accompanied the Holy Roman Empire army’s incursions into Bohemia in the 11th–12th century. Also, it cannot be ruled out that the buried individual died at a greater distance from the burial site, i.e., in other parts of Bohemia or Moravia. Moreover, it should be taken into account that the H17/22 individual may have fallen not as a result of the invasion of foreign armies, but by the internal wars between members of the Přemyslid dynasty, which particularly intensified in the second half of the 12th century (*Choc 1967*, 36–83; *Žemlička 1997*, 171–172).

As the study by *Krejsová et al. (2008)* shows, the incidence of weapon-related perimortem trauma in early medieval cemeteries in Bohemia was not high. The aim of the research was to verify the hypothesis proposed by *Choc (1976)*, who explained the low number of skeletons with traces of mortal injuries by leaving the bodies of the fallen in graves near battle sites. Using historical and archaeological sources, the number of armed expeditions was compared to the number of individuals with battle injuries from 74 medieval cemeteries in Bohemia, Silesia, and Moravia. In a group of 1,839 adult men, only 23 were found with weapon-related trauma. The vast majority (19 out of 23) suffered between one and three injuries, and in two cases, the number exceeded to five. Skeletal injuries were most common on the skull (19 out of 23), and limb bone injuries were not observed. The lack of documented battle graves from the early medieval period in Bohemia, as well as the small number of case studies (*Blažerová et al. 2010*), greatly limits the possibility of developing a complete pattern of injuries in the Early Middle Ages and comparing it with the presented case of a male from the Dolany cemetery.

## Conclusion

The results of the analysis of multiple injuries observed on individual H17/22 provide new information on violence in early medieval Bohemia. The distribution of cranial and limb trauma observed on the male skeleton indicates that they occurred during a large-scale conflict rather than as a result of direct interpersonal violence. Analysis of the nature of the skeletal injuries suggests that a cold steel weapon was used in the attack, i.e. possibly a sword and/or an axe.

The exceptional grave equipment as well as the very good biological condition of the individual compared to other individuals of the early medieval Dolany population, suggests that he may have belonged to the *'militēs secundi ordinis'*. According to historical data, numerous armed conflicts took place in the region of Northwestern Bohemia during the 11th–12th century. Therefore, the hypothesis that the young male buried in grave H17/22 may have died in battle and, due to his rank in the local community, the body was transported to his hometown, is plausible.

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JOANNA WITAN, *Institute for Preservation of Archaeological Heritage of Northwest Bohemia, Jana Žižky 835/9, CZ-43401 Most, Czech Republic; Department of Archaeology, Faculty of Arts, University of West Bohemia, Sedláčkova 15, CZ-30614 Plzeň, Czech Republic; witan@uappmost.cz*  
 BARBARA KWIATKOWSKA, *Department of Anthropology, Institute of Environmental Biology Wrocław University of Environmental and Life Sciences, ul. Koźuchowska 5B, PL-51631 Wrocław, Poland barbara.kwiatkowska@upwr.edu.pl*  
 JACEK SZCZUROWSKI, *Department of Anthropology, Institute of Environmental Biology Wrocław University of Environmental and Life Sciences, ul. Koźuchowska 5B, PL-51631 Wrocław, Poland jacek.szczurowski@upwr.edu.pl*  
 MILAN SÝKORA, *Institute for Preservation of Archaeological Heritage of Northwest Bohemia, Jana Žižky 835/9, CZ-43401 Most, Czech Republic; Department of Archaeology, Faculty of Arts, University of West Bohemia, Sedláčkova 15, CZ-30614 Plzeň, Czech Republic; sykora277@gmail.com*